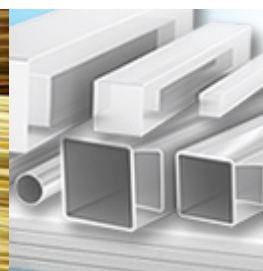




BITIMPEX
ANSTALT

Non-Ferrous Metals

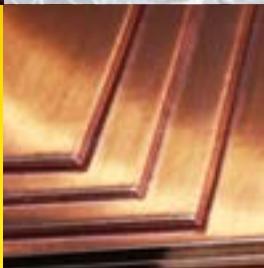
C A T A L O G U E



28
Ni
Nickel
58.6934



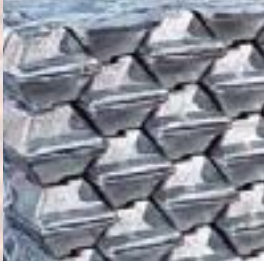
13
Al
Aluminium
26.982



29
Cu
Cuprum
63.546



30
Zn
Zinc
65.39





About us

NON-FERROUS METALS

Non-ferrous metal market is a new direction for the company BITimpex ANSALT. Our company has the opportunity to develop further in the direction of its activities; further the quality of the products still remains at the highest level. An additional focus of our holding is a wholesale rental of non-ferrous metals. Our company has its own fast-growing production, as well as offering products of the largest Ukrainian and Russian manufacturers, who is our partners and reliable suppliers: Zaporozhye non-ferrous metal working plant, ANFMWP, Kirov non-ferrous metal working plant, Kamensk-Uralsky non-ferrous metal working plant, Kamensk-Uralsky Metallurgical plant. The quality of materials used in production directly depends on the final product competitiveness, so we offer only high quality, certified products.

Our company produces and sells non-ferrous metal which correspond to Interstate and International standards:

Aluminium

GOST 295-98 (Russian Federation)
GOST 21631-76 (Russian Federation)
GOST 11069-2001 (Interstate Standard)
GOST 4784-97 (Russian Federation)
GOST 4113-78 (Russian Federation)
DIN EN 1676-1996 (Germany)
DIN 226 (Germany)
GOST 1583-93 (Russian Federation)
ASTM B179-92a (USA)
ASMT B108-92 (USA)
GB85-92a (Great Britain)
GB/T 1196-2008 (Great Britain)
ISO 209:2007 (International)

Bronze

GOST 493-79 (Russian Federation)
GOST 613-79 (Russian Federation)
GOST 614-97 (Russian Federation)
GOST 18175-78 (Interstate Standard)
ASTM B103/B103M-15 (USA)
ASTM B62 – 15 (USA)
DIN EN 1982 (Germany)
EN 1652 (European)
EN 1758 (European)
ISO 1337:1980 (International)
GB/T 30016-2013 (Great Britain)

Nickel

GOST 2170-73 (Russian Federation)
GOST 849-2008 (Interstate Standard)
GOST 492-2006 (Interstate Standard)
GOST 19241-80 (Russian Federation)
GOST 2132-90 (Russian Federation)
ASTM B39-79:2013 (USA)
GB/T 6516-2010 (Great Britain)
ISO/DIS 6372 (International)
ISO 6372:1989 (International)
DIN 17740 (Germany)
DIN 17750 (Germany)
DIN 17754 (Germany)



Copper

GOST 4515-93 (Russian Federation)
GOST 546-2001 (Interstate Standard)
GOST 859-2001 (Interstate Standard)
GOST 1173-2006 (Interstate Standard)
GOST 31382-2009 (Interstate Standard)
ASTM B280 (USA)
ASTM B68 (USA)
ASTM B30 (USA)
EN 12735-1 (European)
EN 1982 (European)
ISO 431 81 (International)
DIN 17656 (Germany)
BS 1400:1985 (Great Britain)
BS 1432:2003 (Great Britain)
BS EN 1978:1998 (Great Britain)
GB/T 467-2010 (Great Britain)
ASTM B115-10 (USA)

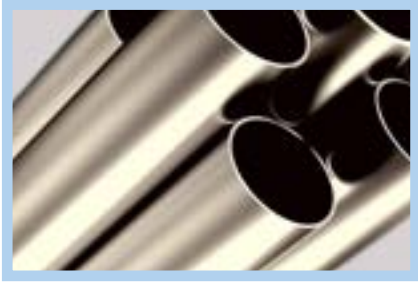
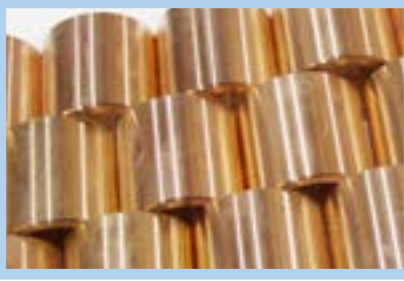
Zinc

GOST 3640-94 (Interstate Standard)
GOST 19424-97 (Russian Federation)
GOST 21437-95 (Russian Federation)
GOST 21438-95 (Russian Federation)
BS EN 1179:2003 (Great Britain)
ISO 752:2004 (International)
ASTM B6-12 (USA)
GB/T 470-2008 (Great Britain)
ISO 301:2006 (International)
ISO 752:2004 (International)
DIN 1725 (Germany)

Focusing on the needs of the client is the main principle of our work. We strive to meet the needs of the customer, we are closely watching the changes taking place in the market and react quickly to them.

There are more than 1 000 tons of products in the warehouses of our company, convenient geographical location, technically equipped warehouse, experience and qualification of the personnel allow and efficiently carry out any orders. The company is constantly strengthening its position in the market, expanding the product range and improves the quality of customer service. A flexible system of discounts, attention to each client and effective marketing policy allow providing favorable conditions for our customers. We are working successfully with major manufacturing companies.

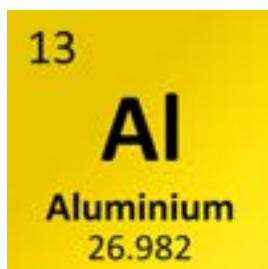
The strength of our company in the corporate spirit and professionalism of personnel, which allows looking to the future!





ALUMINIUM

General information



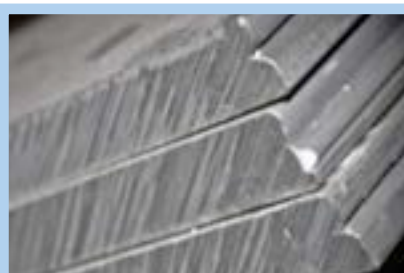
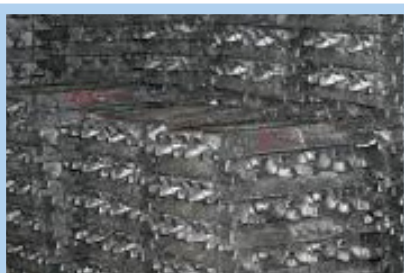
Aluminium and its alloys are widely used in all sectors of industry, construction and agriculture. This is facilitated by the unique combination of its technological and consumer properties: high corrosion resistance, low density, plasticity and toughness, resistance to magnetization, high electrical conductivity. Excellent processability of both hot and cold plastic working allows to obtain semifinished such as sheets, strips, plates, rods, profiles, tubes and wires.

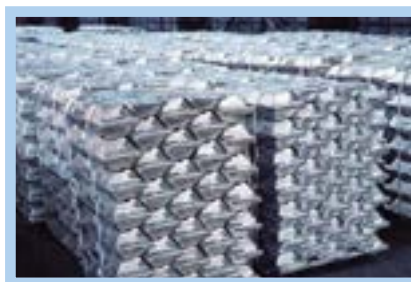
The amount of aluminum alloys is huge, brands and chemical composition regulated by GOST 4784-97. A unique feature of aluminum alloys is the possibility of their mutual plating for various metal-roll characteristics.

Aluminium, thanks to the huge variety of alloys, heat treatment, surface finishes confidently holds the leading position in a huge range of steel products.

ALUMINUM MANUFACTURING FACILITIES



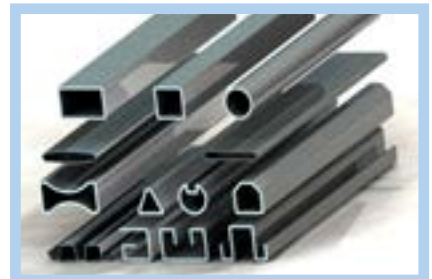




Rolled aluminium

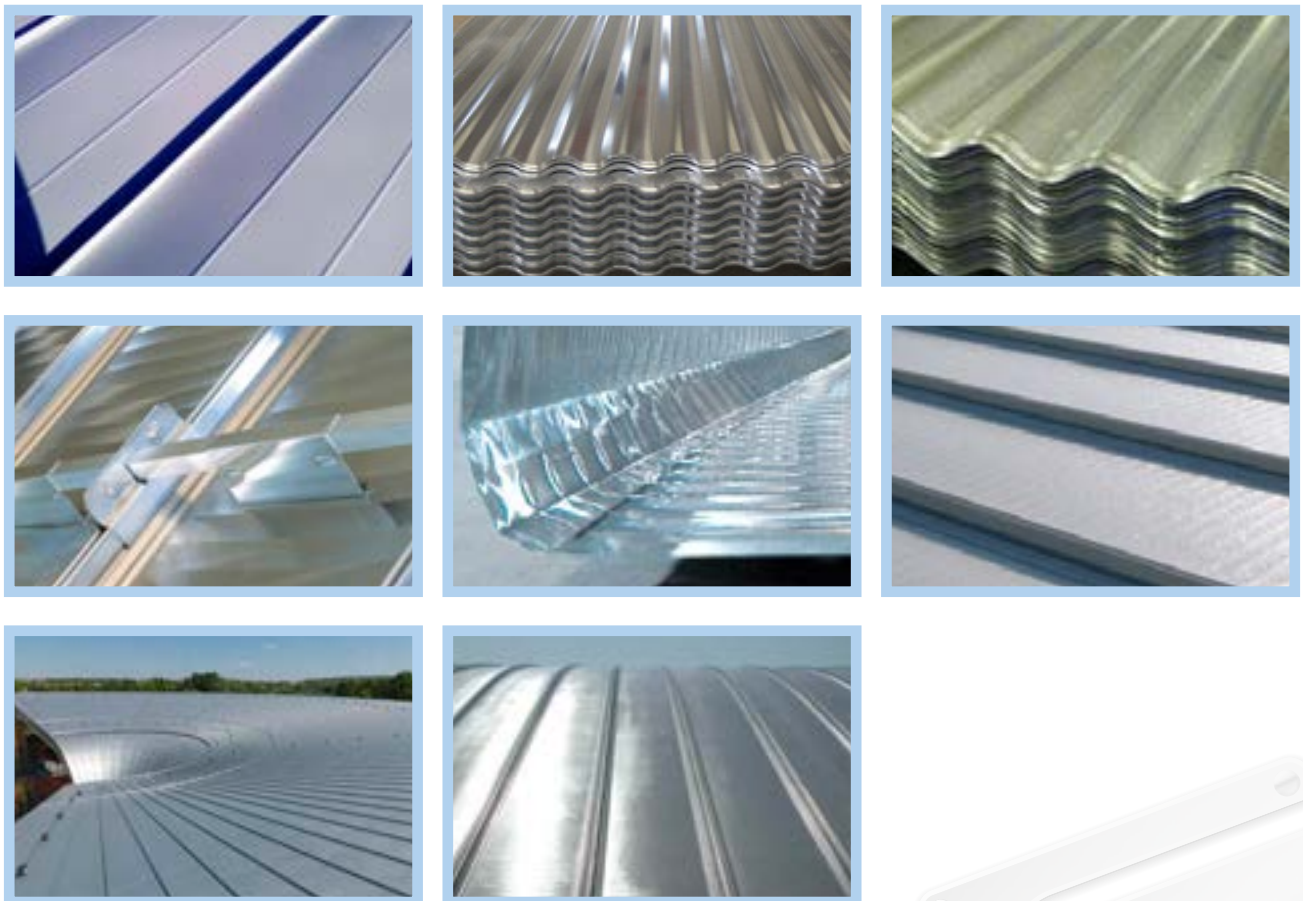
Rolled aluminum is widely used as a structural material in industries such as automotive, shipbuilding (using a special marine aluminum), nuclear engineering, and railroad car manufacturing, aerospace, petrochemical, food and medical industries as well as in the production of household appliances. The construction of the aluminum rolling increases the durability and reliability of structures - aluminum beam has no equal in the ratio of lightness, strength and cost. It is widely used for the construction of suspended structures, supports. In addition, it is used in the design for the decorative finishing and decoration.

Pure aluminum has a relatively low strength, so it is used in most cases in the form of different alloys, often alloyed with copper, silicon, zinc, manganese, magnesium, or combinations thereof. Aluminum metal is corrosion resistant, has a high electrical and thermal conductivity, heat resistance and ductility. Aluminum lends itself to hot and cold processing (pressing, drawing, stamping, forging and rolling) and has a low weight. Depending on the method for producing aluminum alloys are subdivided on the deformable (manufactured semifinished: sheet, rod, profile, pipe, bar) and casting (using a crucible for the aluminum, in which the melt after - casting in forms commonly used recycled output is obtained product or ingots / bar). By heat treatment are thermally hardenable alloys (e.g., duralumin, alloys of Al-Cu-Mg) or a thermally hardening (e.g. AMts alloys AMg2, AMg3, AMg5, AMg6 etc.). Aluminum metal is also divided, given the scope of its use, for example, aviation, marine, food. The use of aluminum in the first two Ferah due to its lightness, as in aircraft and ship building is an extremely important factor in weight that determines the performance characteristics of the product. Aircraft aluminum used in the creation of spacecraft parts: fasteners, brackets, containers, chassis and housings. Today, the proportion of aluminum in the dry weight of a conventional passenger aircraft is 2/3 - 3/4 and 1/20 of the rocket - 1/2.



Aluminium roofing

Nowadays, aluminum is one of the most important materials in all industries - largely thanks to its lightness, resistance to corrosion. Many vehicle parts, equipment is made of aluminum. Aluminium roofing - another popular use of metal. In the CIS such roofing is a relatively new, but it is very popular for a long time in many European countries. Seam roof made of aluminum has many advantages. The first can be considered the universality of such a roof. Aluminum shingles can be installed on most types of roofs, forms and reliefs. Material can last you more than 50 years. It is simple to operate, resistant to fire, water, sun. Roof made of aluminum has a large variation of colors and is easy to change shape. Aluminum Roofing has its drawbacks. The most significant of them - the cost. Another such seam roofing aluminum has high thermal conductivity, because of which require additional coatings for heat insulation. Aluminium roofing should be installed by experienced professionals because it is necessary for compliance with a number of subtleties long life material. Due to the specific nature, aluminum roofs can generate noise from the rain, if the installation was made without sound insulation layers. Anyway aluminum roofing is an excellent option to upgrade roof. Aluminium is very durable and resistant to the environment, easy to operate.



Aluminium grits AKV

Aluminum grits AKV cheaper granules showing generally similar performance. Hence the high demand for grits domestic industry. The most important purpose of the product is a

deoxidation iron aluminothermy, creating ferroalloys, mining and processing operation. Made of aluminum grit AKV relevant GOST 295-98 secondary alloys with aluminum content of more than 87% and impurities (Pb, Cu, Si, Zn) at least 13%. This secondary aluminum made from aluminum waste primary: scrap, turnings, defective parts. The use of recycled aluminum in order to deoxidize rationally not only economically. When different temperatures of steelmaking, isobaric-isothermal oxidation potential specific impurities and aluminum is aligned, resulting in an affinity to oxygen becomes also equal. This leads to a complex deoxidation, in which case a complex system such as spinel $MgAl_2O_4$. The reaction thus proceeds deeper, fuller, faster. Characterized aluminum grits AKV absence of impurities, gray, low carbon percentage. grit particles are spherical, their size less than 12 mm. Aluminium grits AKV corresponds to the set standards. Aluminum grits AKV packed in bags. Net weight and size distribution of grits - as agreed.



Aluminium tape

Currently, aluminum tape rather common type of aluminum rolled products. Tape shows a strip of aluminum and its alloys. The advantages of aluminum tape are:

- thermal stability;
- non-magnetic;
- the presence of bactericidal properties;
- plastic;
- corrosion resistance;

durability.

According to a method of producing aluminum tapes are clad and unclad. As the material:

A - aluminum tape with conventional plating;

B - tape with plating process;

H1 - a quarter of the cold-worked;

H2 - semi cold-worked;

H3 - cold-worked three-quarters;

M - annealed;

P - high quality finishes.

In precision manufacturing tapes are symmetrical and asymmetrical abnormalities, which in turn are divided into single-precision (D) and increased accuracy (P). Dimensions of the aluminum strips vary in the following ranges:

width - from 4.0 to 450 mm;

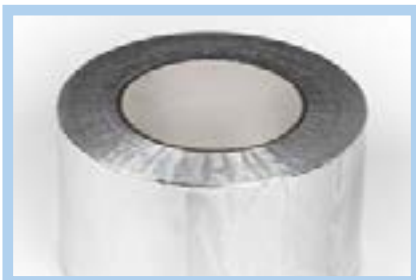
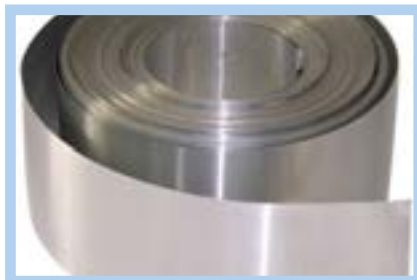
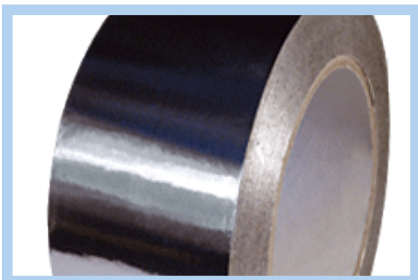
thickness - of 0.2 to 2.5 mm.

Physical form of tapes:

coils in diameter from 150 to 500 mm;

length in the bands of 1000 to 5000 mm.

Use aluminum tape in a variety of industries: construction and installation work, instrument-making industry, food industry



Aluminum tape 1105 AM

Tape Aluminum 1105 AM applicable restoration, repair, installation, construction works for sealing, insulation and others. Use of the product is often justified for the treatment of areas where use aluminum foil difficult. Demanded tape aluminum in petrochemical, construction, household, food industry, can be used to create a radiator, a variety of profiles, components, devices for thermal insulation tape aluminum pipe-lines. Technically alluminium 1105 AM is a thin strip having a high physical integrity, insulating ability, ductility, corrosion immunity, durability, flatness, environmentally friendly, non-magnetic, fire resistance, antibacterial, thermal stability. Regulating the production of

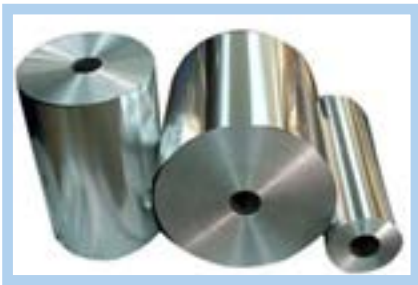
this tape are standard GOST 1018, GOST 13726, GOST 4784. The tape is characterized by thick aluminum (0.25 - 10.5 mm) and width (4 - 200 cm). tape material is duralumin. Alloy 1105 is chemically similar mark D1 is deformable under smelted aluminum with copper and magnesium additions. The alloying ingredients beneficial effect on the stiffness, durability, strength, but reduces ductility, chemical resistance, electrical conductivity. to transportation, storage requirements, packaging tape regulated by GOST 9510. The tape is available annealed aluminum 1105AM, with plating, available in rolls, with an additional protective coating (paper, film, etc.).



Aluminum tape AD1N

Tape AD1N aluminum is often used in order to seal the various joints and seams during repair, construction, installation works. This tape is used primarily for the treatment of those areas where it is difficult to use aluminum foil. According to GOST 13726-97 tape aluminum AD1N is a thin strip having good insulation properties, high ductility, physical integrity, corrosion resistance, durability, ecological compatibility. In size AD1N aluminum tape width is 40 - 2000 mm and a thickness of 0,25 - 10,5 mm. Also GOST normalizes

tape temporary resistance, yield strength, elongation and other mechanical properties. The material from which the tape is made AD1N aluminum, is in accordance with GOST 4784-97 the alloy composition of aluminum (99%), silicon and iron (main component) and impurities titanium, zinc, iron, manganese, copper and magnesium. These elements affect the strength of the belt, reducing the electrical conductivity, plasticity, corrosion resistance. The tape is available annealed aluminum AD1N or without heat treatment, and (rarely) work-hardened. It is supplied in rolls, the weight of the tape, thus, it is mainly determined dimensions. Rolls, in turn, must have an additional protective coating, available in appropriate containers. The rolls and containers marked (net weight, the manufacturer's name, grade alloy, etc.).



Aluminum form

Aluminum form is a kind of frame-panel formwork systems used in the construction of reinforced concrete. The benefits that aluminum form has to steel counterparts - a smaller proportion of 1m² shuttering frame (easier installation), corrosion resistance. Aluminum form is a frame modular panels. Dimensions of boards due to the parameters of the manufacturer or individually designed for a specific project. Shields can be either straight (flat) and spatial (angular or radial). Generally, aluminum panels manufactured shuttering small dimensions (up to 3.3 m) for the convenience of transportation and installation. Enlargement boards going in place. The main elements that make up the formwork aluminum: Aluminum frame - the majority of producers consists of a closed thin-walled (2-3 mm) of the profile complicated cross-section, the approximate to the square, at least - a lightweight version of the brackets (designed for smaller loads); working surface (deck) - Laminated pressed birch plywood 18mm (at least - composite materials or PVC sheet), is attached to the aluminum frame with screws, place sealed joints;

locking wedge - the fastening element for connection of two adjacent shuttering panels aluminum;

screw coupling nut shrink - fixing elements opposed shields. Aluminum decking has the following parameters:

frame material - aluminum profile;

The average specific weight - 30 kg / m²;

Design load - 60-100 kPa;

The deflection at the maximum permissible load - 1/350;

The turnover of the working surface - up to 100 cycles;

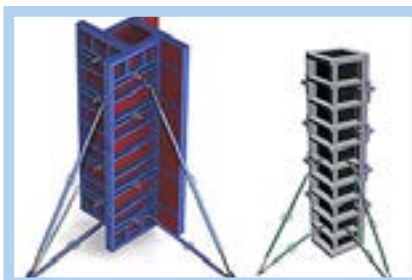
Turnover frames - up to 450 cycles;

Thickness Profile - 2-3 mm;

panel width - from 0.25 m to 1.5 m;

board height - from 0.3m to 3,3m;

Transport and storage - in bundles no more than 10 pieces.





Aluminum plate D16

Aluminum plate D16 - common type of aluminum rolled products. It is obtained from the demanded alloy D16. D16 - duralumin with the chemical. the composition in accordance with GOST 4784. Products made of aluminum can be ennobled after manufacture, to give them an even greater heat resistance and strength. The alloy welded solely by spot welding. D16 alloy has low corrosion resistance. Blanks of this sheet alloy cladding AD1pl. D16 plates made in accordance with GOST 17232. Prior to the other aluminum plate material has a number of quite serious advantages, it is:

It has a low specific weight;

Cooper easy in machining;

It has a high anti-corrosion and electrical conductivity; has high flame resistance, moldability and strength;

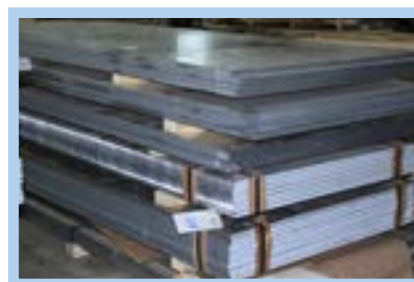
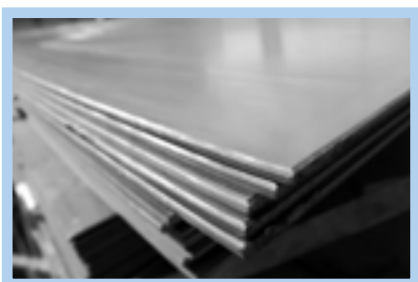
recyclable;

tolerate strong fluctuations and high humidity, it allows the use of aluminum structure under very adverse weather conditions, for example, in the Far North and the Arctic;

selling price of aluminum is significantly lower in copper products;

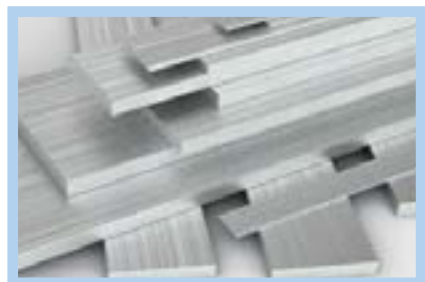
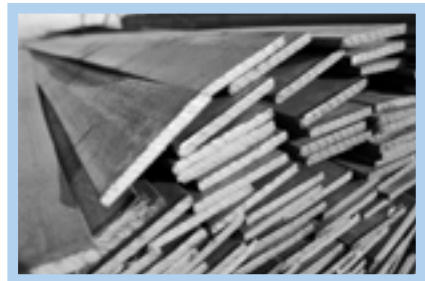
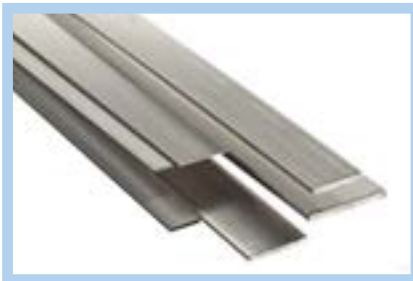
containing aluminum plate replaces the structure of copper is almost wherever possible.

Plates D16 aluminum widely used in accordance with the regulatory requirements and standards: in the food industry; in the automotive and aircraft industry; in construction; in nuclear power; in heavy transport engineering.



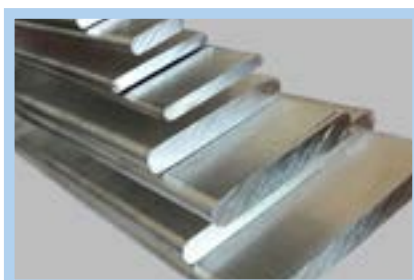
Aluminum strip

The most common in the world of the metal is extracted from bauxite. It is quite complex and energy-intensive process, so the bauxite processing plant under construction, where there is access to free sources of energy. First, the ore is enriched, and then isolated therefrom alumina and, at the final stage, using electrolysis, produce aluminum. This metal is widely used because of its adaptability, resilience, electrical conductivity, low specific weight and affordable price. Aluminium made a lot of useful things, including manufactured aluminum strip. It is a continuous aluminum profile with a rectangular cross section. Aluminum band finds its place in the electrical industry. Most buildings, parts such as couplings, connectors, etc., are made of aluminum strip. Successfully used in the construction: manufactured curtain walls, suspended ceilings, used for external cladding and internal decoration; of it made the base of advertising structures. He found a niche list, and in shipbuilding - sheathe their boards. Indispensable strip of aluminum in a light and refrigeration industry: it is made of radiators and cooling elements refrigerators. From food tapes are manufactured, various kinds of packing, of thicker - accessories for the kitchen. The strip of aluminum in a rectangular cut often has a width from 50 mm to 1250 mm and a thickness of 0.3 mm to 2 mm. As a rule, it is brought in rolls, the length of which depends on the thickness and grade of aluminum. Making limited bandwidth requirements of GOST 13726. For her, taken stock of aluminum grade, A5, A7 BP ADOO, ADO, blood pressure; and aluminum alloys V95-1 brands. The chemical composition must comply with the parameters of GOST 11069.



Aluminum electrical bus

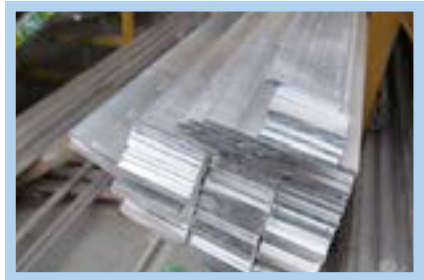
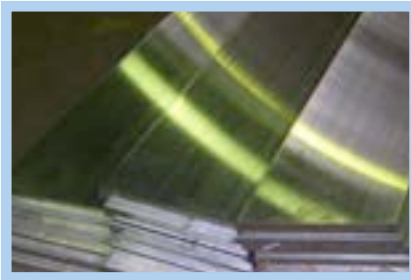
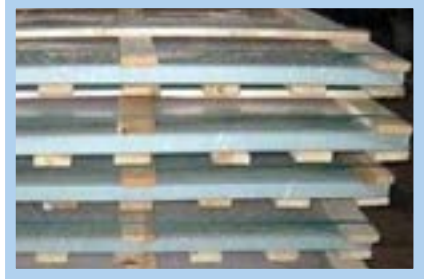
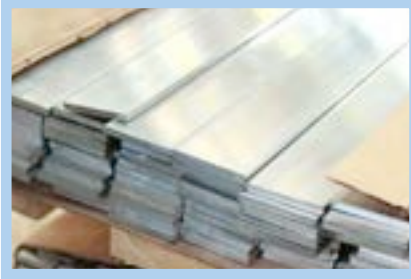
Aluminum bus - is rectangular strip. At the heart of them can be pure aluminum or some of its alloys (AD31, AD31T, AD00, A5, A7). Mark AD31T most needed. Buses are required for the manufacture of assemblies, busbars, switchgear, conductors. Track Aluminum - the most popular product from this list. They are made of aluminum bus bars in dimensional, random length coils, beams, frames. Depending on the intended use, the material can be hot-pressed, artificial or natural aging without thermal, full or partial hardening. The price of the commodity product delivery form shapes, sizes, options alloys from which aluminum is produced tire. The most popular flat tires and aluminum 50h5 60h10, tire aluminum box section and 100h45h6 75h35h4. Aluminum electrical bus complies with GOST 15176-89. Bus width is 1-52 cm, the thickness of the tire - 3-110 mm, length of the tire -. 3-10 m cross-section is chosen according to the results of calculation of electrical load. The chemical composition of the material AD31T (. Cm GOST 4784-97) as follows: Mg (less than 0.9%), silicon (less than 0.6%), iron (less than 0.35%), and other impurities (less than 0.1%) aluminum (the rest). The aluminum content in the other of said stamp greater than 99.5%. Also standardized mechanical, electrical, and other characteristics of the tire, size deviation, labeling rules, acceptance, packaging, storage. When transporting requires a temporary corrosion protection.



Aluminum bus AD0

Electrical aluminum bus AD0 flat solid type, cross-sectional shape is rectangular. It corresponds to GOST 15176. aluminum alloys of different grades (AD31, AD31, AD00, AD0) are used for the production of tires. In the production of the material is often hot-rolled, and then can further be carried out hardening, ageing. Tires have a length of 3 to 10 meters depending on the desired cross-sectional area. From tire brands depends on its electrical resistance, because aluminum bus AD0 differs from the bus AD31 metal purity in AD0 99.5% aluminum and it is more plastic. But on the elasticity and strength of the tire AD31 in the forefront. Unlike other tire aluminum have several advantages: they are lighter, rust, have high ductility and conductivity do not change their properties under

temperature fluctuations.



Aluminum bus AD31T

According to GOST 15176 aluminum bus AD31T used for electrical purposes. It is a kind of rolled aluminum and is used to create a voltage distribution systems, and is also used for the manufacture of the joint profile, accessories. The demand for corrosion protection due to its relative cheapness and aluminum in combination with its high electrical conductivity. Finished Aluminum AD31T tire comes in the form of strips or spools, while it may have a different width and thickness. Its minimum thickness is 3mm, and the maximum - 15 mm. The width varies between 20-180mm. The greatest possible length of the tires AD31T aluminum is 60 meters to the bay and 9 m for the band. Other than the size, aluminum rail may differ strength. There is a standard and increased strength, the product of the second category have marked "PP". The very letter T indicates that the tire has passed an additional heat treatment, the process allows to remove all the stress that appeared in the material during manufacture. It is worth considering that the tire has a high aluminum AD31T compared with other marks tire durability, which is achieved by doping aluminum. But it should be noted that the doping also reduces the electrical conductivity of the tire and its ductility. However, because of the reliability and durability of products from aluminum AD31T he is often given preference when choosing tires alloy.



Aluminum wire

Aluminum wire is a kind of aluminum metal obtained by drawing. Application of aluminum wire - the production of cables, parts and products in different sectors of light and heavy industry. Aluminum wire has a sectional shape varied, from 0,8-12,8 mm diameter. Production of aluminum wire separator can be categorized as follows: for cold heading, welding, pull the wire electrical round, round and overhead power lines. As the aluminum wire is made of pure aluminum and with the addition of admixtures (up to 7%): manganese, copper, chromium, magnesium and silicon. These impurities are added to impart special properties, for example, with the addition of magnesium is very ductile and resistant to corrosion by the addition of copper and magnesium durable and firm. Aluminum wire may be supplied to the beam or the winding of the coils and coils. Finished with aluminum wire coil placed in polyethylene bags and then sealed cases or boxes. Weight of the aluminum wire in the coils should not exceed 500 kg, and 50 kg in coils and have a diameter of 400-700 mm. Each type of aluminum wire has its own symbol. So the first letter that comes after "aluminum wire" means the manufacturing method: Pull - in, pressed - P. Then, impurities are indicated and the percentage of the aluminum wire. Next, put the state of aluminum wire, the diameter of what is available and guests, by which made this aluminum wire.



Aluminium rolled wire

The aluminum rod is the primary raw material in the manufacture of wire and cables. The use due to the properties inherent to aluminum: electrical conductivity, strength, antikorrozinyimi properties. Prepared rod rolling ingots of aluminum on the wire-rolling mill, or a method using a continuous casting and rolling with use of the mold. When marking indicates the method for producing wire rod: AK - obtained by rolling aluminum ingots on a rolling machine and AKLP - by continuous casting and rolling. Manufactured aluminum rod having a diameter in the range of standard 9 - 25 mm, probable deviations in the ranges set by the standard. Available in solid rod, semi-solid and soft. The solid

aluminum rod is available in two grades, a soft wire rod and semi-solid - three. Class is due to the value of the electrical DC resistance. In the production of any of the standard varieties katanok, depending on its inherent chemical and physical parameters are used and the aluminum stamp A7E A5E, containing silicon and titanium allowable impurities, chromium, manganese. GOST are requirements for roundness, electrical resistance, mechanical characteristics. The aluminum rod is shipped in special coils with weight from 600 kg to 2.5 tonnes. The main consumer of aluminum rod is the electrical industry. Wire rod is used as a base in the manufacture of wire used in power units, electricity, electrical current collectors, the equipment for power plants, electrical wiring.



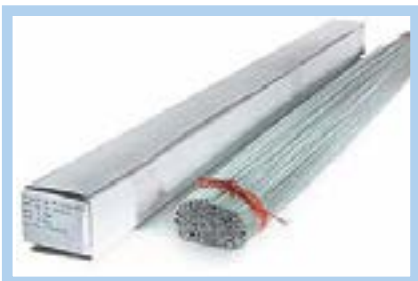
Aluminium wire for welding

The technology of welding aluminum surfaces differs from the welding of steel parts. This metal has a different composition and properties, therefore, a special wire for welding aluminum work with him. When using automatic or semi-automatic way aluminum welding wire acts as a consumable electrode. This means that it forms an arc, and simultaneously used as a material for the joint connection. If the connection is made by means of an argon welding, the welding is consumable electrode and wire is a filler material. In order to not occurred on the metal oxide film welding passes in pure argon or the gas mixture with helium. Welding aluminum wire should have properties similar to the composition of the welded surfaces. Products can be made of pure metal, with the addition of magnesium aluminum, silicon, copper, titanium, or other components. Based on this, select the appropriate brand consumables. There are several types of wire, aluminum welding wire is:

- undiluted metal NEA 99, NEA 97 NEA 85T;
- aluminum-magnesium alloys SvAMg 3 SvAMg 5 Sv1557;
- Alloys aluminum-silicon SvAK5, SvAK10;
- aluminum-copper alloy Sv1201.

The ratios of components and other material parameters specified in the GOST 7871-75. Typically, aluminum welding wire is supplied in reels / rolls, weighing between 0.5 kg and

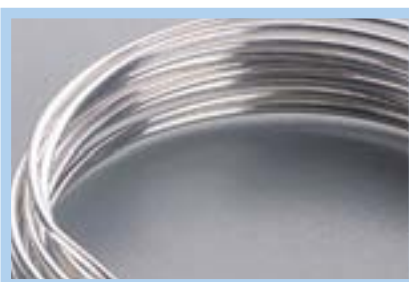
above. The most popular diameters which has aluminum welding wire: 0.8 mm, 1 mm and 1.2 mm.



Aluminum wire AD1

Aluminum wire AD1 is applicable in the production of cables, wires, used in the creation of various electrical products, welding. Wire means that the diameter of the elongated articles substantially less than the length. With its special characteristics AD1 wire is extremely popular in the industry (food industry, aviation, shipbuilding, machine building, instrument-making). This is because chemical stability, plasticity, electrical conductivity, etc. Of GOST 4784-97 follows that AD1 aluminum wire includes: a. Aluminum (base), manganese (less than 0.025%), Silicon (less than 0.3%), zinc (less 0.1%), copper (less than 0.05%), magnesium (less than 0.05%), titanium (less than 0.15%), calcium (less than 0.05%), iron (less than 0.3%). These impurities enhance wire strength, but decrease the ductility, electrical conductivity, corrosion resistance. According to GOST 14838-78, product diameter of 1.4 - 10 mm, with aluminum AD1 itself produced work-hardened

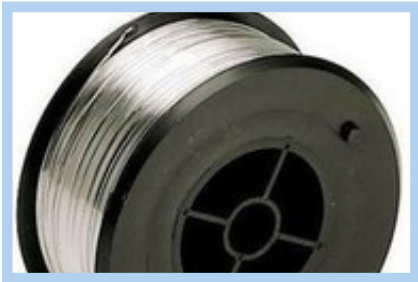
wire. Also, according to GOST it requires that the surface does not contain mechanical damages (scratches, broaches, dents), if they are permitted for cleaning displays diameter deviation. They are standardized and shear resistance (less than 60 MPa), prescribed acceptance rules, lists the methods of analysis. Comes AD1 aluminum wire in coils, and (rarely) in coils, then unwound the bay. It is necessary the presence of the required standard markings: bay number, batch number, manufacturing precision, wire diameter, alloy name.



Enameled aluminum

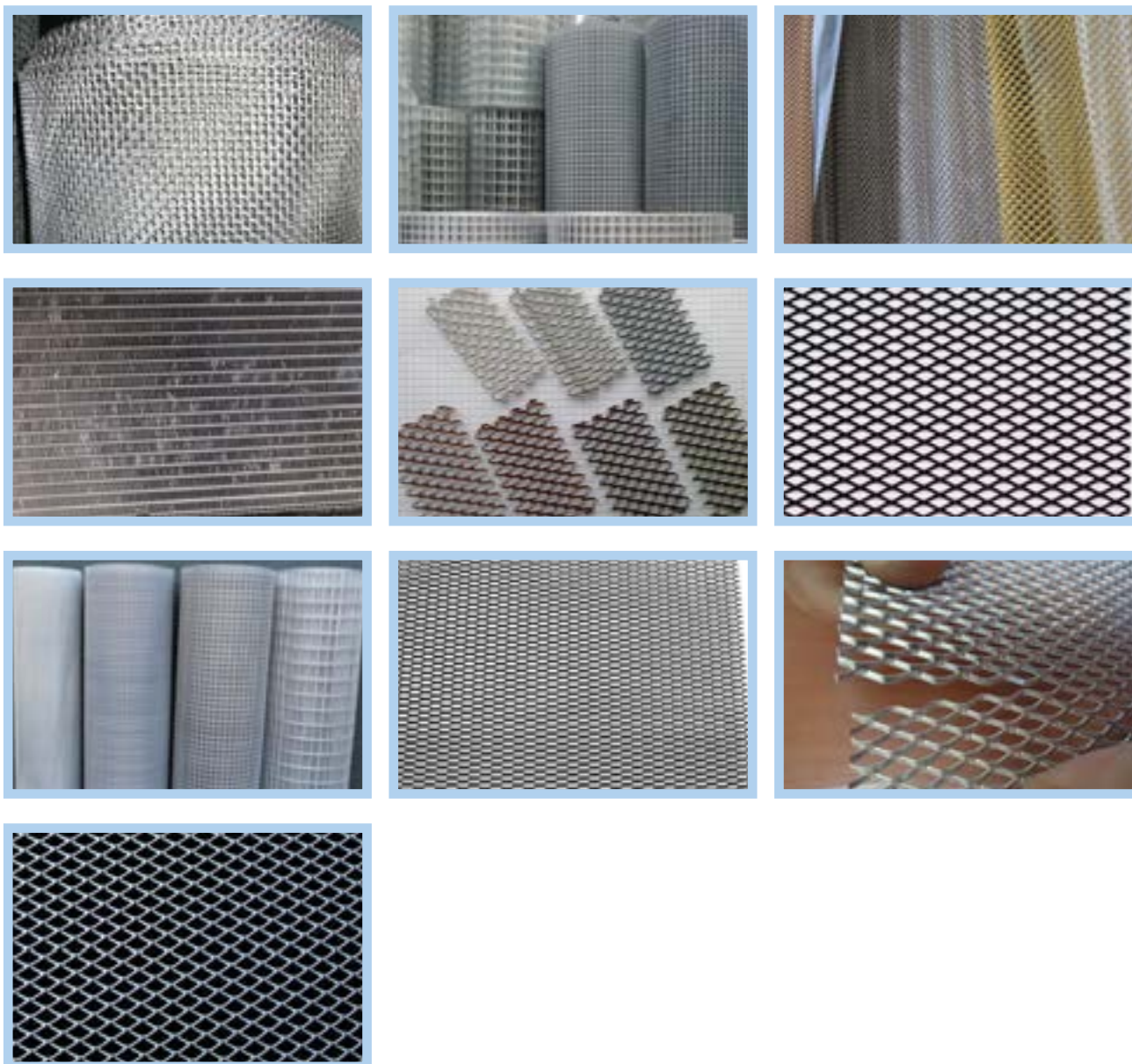
Enameled wire refers to the popular mind the scope of electrical products - winding wires. Winding wires are used to create motor windings, different machines, mills. These windings create a magnetic field inside the motor, which cannot be operated without the rotor or the armature, depending on the type of motor and the winding itself. The former Soviet Union produces more than 20 kinds of winding wire. They all have different materials of the wire and its coating. Among the coatings can be identified fiber glass, enamel, film, and many combination options. Most of them are made of copper. Another type is the high-resistance wire. Less than "running" can be regarded as enameled wire, aluminum, since it is less than the market. Enameled Aluminum is available in several variations - stamps. Most brands produce enameled wire DOEA 1 - D200A, DOEA 2 - D200A, PEEI1-130A, PEEI2-D200A, DOEA-155, DOEA-130-L PSDKT. Each of the marks has different thicknesses, but they are all included in the range of 0.4 to 2.5 mm. In general, the production of wires with enamel isolation meets GOST 26615-85 and abroad is IEC

60317-25 and IEC60317-0-3. insulation thickness is 1 or 2. Insulation Class 1 - the normal thickness of insulation, type 2 - reinforced insulation. Aluminium Electro-coated enamel-insulated, it has a high electrical conductivity and ensures correct operation of the engine at high voltages up to 5000V. Temperature resistance also depends on the brand, and is usually indicated on the labeling. Since the labeling only this characteristic is indicated by the figure, the temperature index is not difficult to determine. For example, enameled wire, aluminum DOEA 1 - D200A has a temperature index of 200, and can be used at temperatures above 200 degrees Celsius. Enameled Aluminum is used for winding motors of various production machines, engines experiencing thermal stress, working under heavy chemical or mechanical action.



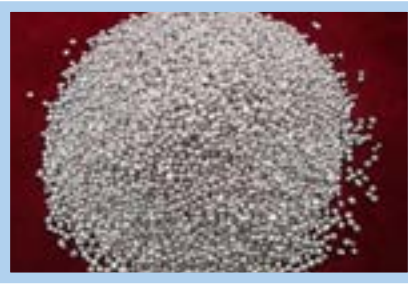
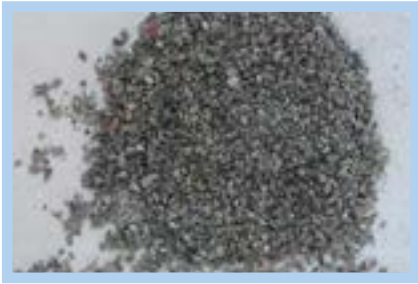
Aluminum mesh

The aluminum mesh, manufactured by the domestic industry, produced braided expanded metal process, significantly less welding and others. The most widespread expanded metal aluminum mesh. It is made of thin sheet-metal by simultaneously stretching and embossments. The cells are arranged in a checkerboard pattern, can be large (over 25 mm), medium, small (less than 15 mm). Wicker and welded connections are not available, so the strength, this mesh can compete with perforated sheets of similar thickness. Also, this type of nets is economical, durable, durable, safe, easy, versatile, environmentally friendly. Aluminum mesh is combined with other materials of construction, easy processing, different chemical inertness. Some less popular aluminum mesh netting (netting) and fabric manufactured according to TU. They are made of aluminum wire, characterized by the side of the cell and a wire diameter corresponding to 14838. Standard GOST mesh material 4784 and is commonly alloys of aluminum-silicon-magnesium and duralumin. Suitable for the manufacture of aluminum mesh sieves, fencing, decking, different packaging. It improves the sound and heat insulation. Claimed in the decoration, protection from mosquitoes PVC windows, car radiators and air openings makes more mesh a thickness of 0.5 to 6 mm and a length of 1 m, a width of 50 cm. It may not be colored or painted, and supplied in rolls packs. The most popular forms of cells are rhombic, square, hexagon.



Aluminium granules

Aluminium granules are dustless, which leads to their explosion and fire. Aluminum pellets are produced from pure aluminum or scrap. The most common sources of raw materials are aluminum cans, shavings, foils, defective products that have become unusable metal profiles et al. Externally granular aluminum is silvery-white. The shape and size distribution of the granules may vary significantly. This usually spherical and cylindrical particles of less than 2 mm. Surface coated granules passivated oxide film. Widely applicable aluminum pellets in chemistry, metallurgy, energy, construction, aviation, industry, instrument, pyrotechnics. The pellets are used for deoxidation of steel, creating propellants, laboratory preparations. Available in aluminum pellets in a number of specifications. Chemistry granules also regulated. Granules comprise pure aluminum up to 1% of impurities, and the production of secondary aluminum may contain up to 15%. Pre-packing made of PET or metal drums. Also the granules may be packed in a multilayer packaging paper 25 kg. Each batch of the pellets should be accompanied by a certificate of quality and labeling.

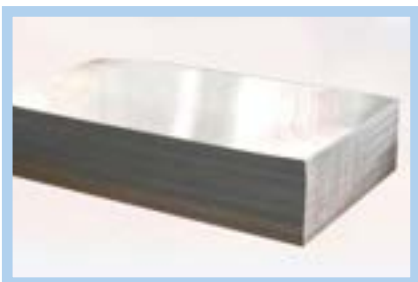
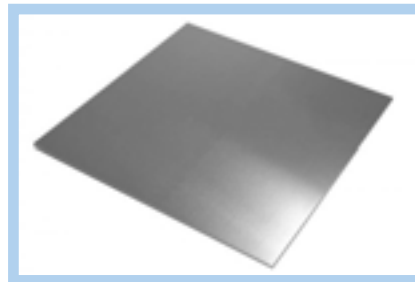
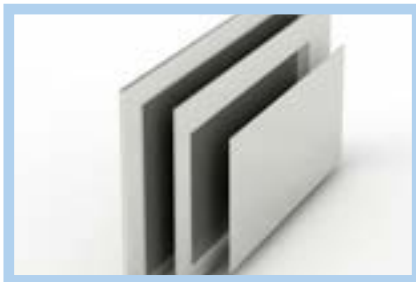


Aluminium sheets

Aluminium sheets manufactured from flat slab ingot or rolled wrought technique. Aluminum Sheets Rollers get hot (so-called hot) and cold Rollers (so-called cold-rolled). Aluminum sheet size available: width 1000-2000 mm, length up to 7000 mm, thickness of 0.5-10 mm. The same aluminum sheet can be produced with dimensions for your terms of reference. In the structure of aluminum sheets, except aluminum alloy constituents are copper (7%), magnesium (up to 2.8%), silicon (up to 2.2%), manganese (1.2%) zinc (up to 6, 5%) and impurities of iron, nickel, chromium, titanium. Aluminum sheet is divided into a general-purpose, special. It is made of alloys of grades VD1 or A5, according to GOST 21631, the same brand used AD1. Aluminum sheet has a matte, flat surface and a different dimension of the issue. Due to the properties of aluminum (light weight, corrosion resistance, etc.) Sheet aluminum is used to make a variety of products manufactured by various methods (drawing, stamping, bending, etc.). For each method, respectively, aluminum sheet suitable grade is selected. For example, an aluminum sheet bending advised to choose from a range semicold-worked marks (A0, A5, A6, A7, AMts, AMtsS, AMg3, D16), since bending cold-worked aluminum sheet can go cracks or collapses to the fold.

In the construction used aluminum composite sheet for cladding facades of buildings and structures. Produce composite aluminum sheets using a thin sheet of aluminum (brand AK7, AL34 or their foreign equivalents) with mineral or plastic layer. When supply aluminum sheets are marked with paint or stamped mark indicating the alloy, the thickness of the

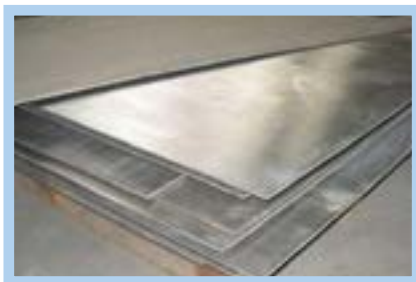
sheet, optional stamp control and batch number, as indicated, if used, plating sheet.

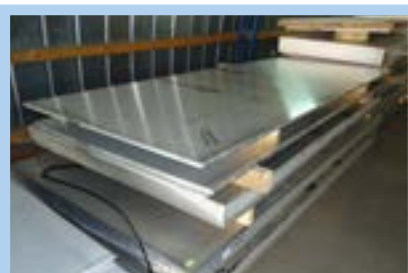
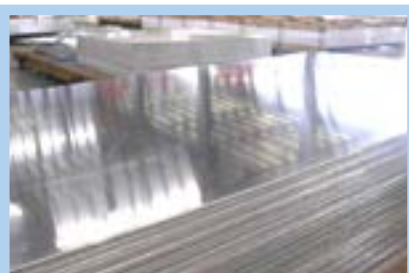
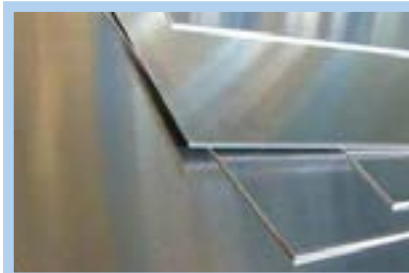
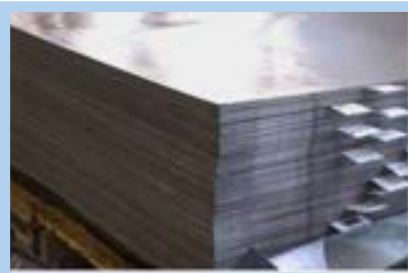
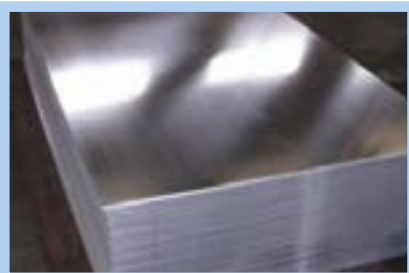


Aluminum sheet AD1N/AD1/AD1M

Aluminum sheet AD1 complies with GOST 21631-76 (product specifications) and GOST 4784-97 (material parameters). Chemically AD1 aluminum sheet is made of aluminum (over 99.3%), iron and silicon (less than 0.3% each), zinc titanium impurities somewhat increase the strength characteristics, significantly reducing the performance of electrical conductivity, ductility, corrosion resistance, thermal conductivity, weldability, formability, alloy weight remain at the same level Aluminum sheet AD1N -... cold-worked, that is more durable, hard, solid state. Performed sheets AD1 can also annealed (code "M" instead of "H"), that is more plastic, cold-worked or partially without heat treatment at all.

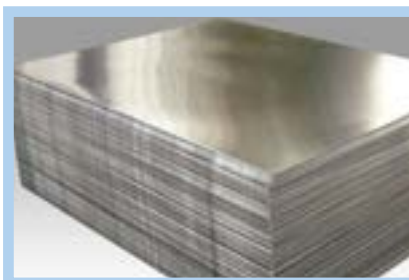
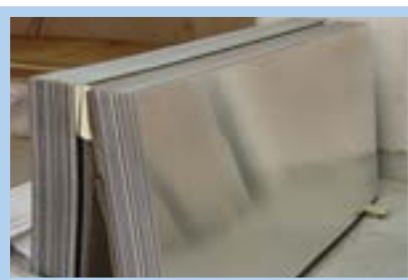
This sheet metal is easily bending, cutting, grinding, forming. It characterized by high heat reflecting ability, well-polished. Applicable in the manufacture of sealants, cladding panels. Aluminum sheet AD1 demand for the creation of non-loaded welded structures, thermal shields, tanks, ventilation shafts, in the decoration. Standard sizes of sheets are as follows: Width of 0.6 - 1.0 m, thickness 0,3-10,5 mm, length 2 m for not cold-worked sheets AD1 limit the length is 7 m, width - 2 m aluminum sheet is corrugated. corrugated, food, general-purpose, perforated. Labelled stamping or paint brands of material, its condition, thickness, number games, technical inspection stamp. Packaging - packs and foot.

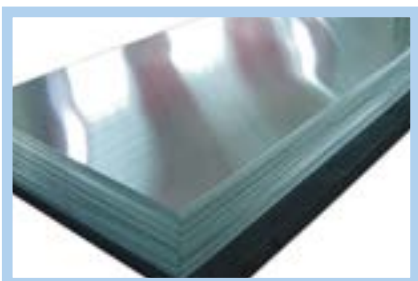
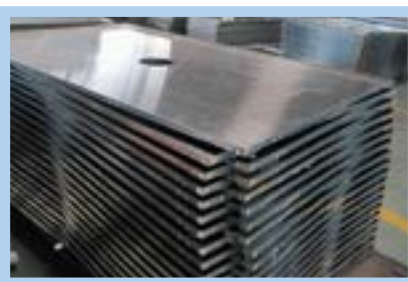




Aluminum sheet AMg2M/AMg2/AMg2NR

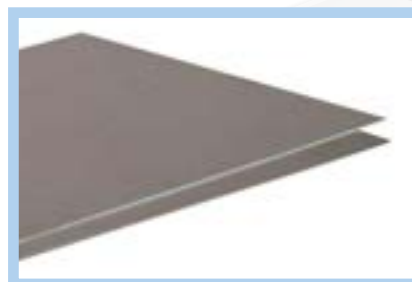
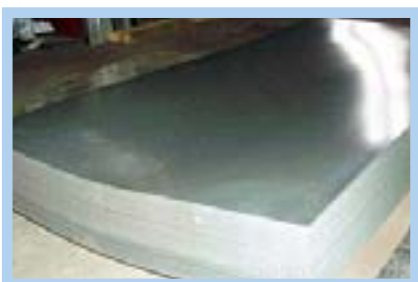
Aluminium sheets allow to produce durable design, not subject to deformation and corrosion, and have good flexibility and ductility. These characteristics allow to carry out welding and heat treatment of aluminum alloy sheets without further passes AMg2M preparing aluminium sheet annealing in the manufacture of, and included in the magnesium alloy product increases resistance under direct influence of external factors, what makes the use of such structures and articles indispensable in many regions with changeable climate, with large temperature swings, humidity or heat sunlight. Due to the physical properties AMg2 aluminum sheet used in various industrial fields, in the manufacture of products in the food industry, in shipbuilding and aircraft construction, the manufacture of window frames, as well as for products with high thermal conductivity facilitating and maintaining weight structures necessary strength. Aluminum AMg2 sheets easy to handle, which saves time during the production of complex products and guarantees excellent results. Furthermore, the sheet can be used to create a light and strong frames, and for an additional surface treatment, it is used as a finishing material and the high strength flooring. Aluminum sheet AMg2 often comes in the form of cut sheets, the thickness of which is represented in the range of 0.5-10 mm, given the specificity of production and the requirements of the technical documentation.

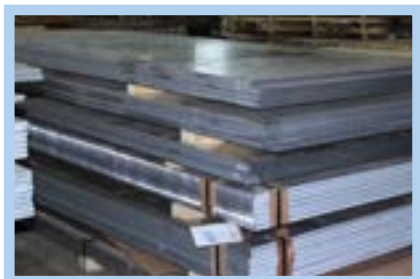
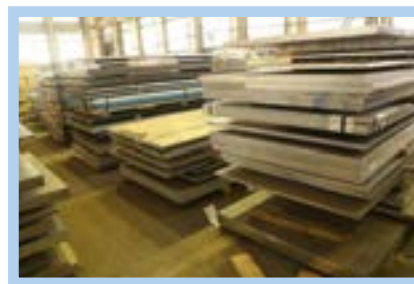




Aluminum sheet AMg3M/AMg3

Aluminum sheet AMg3 - widely demanded product in the manufacture of welded cans, medium durable structures, hydraulic equipment, industrial piping, frames and casings of railcars. Leaf is popular in shipbuilding and mechanical engineering, in radio and electrical engineering, home and construction, food processing, aerospace, chemical industry. It is characterized by an aluminum sheet AMg3 chemical and temperature resistance, weldability, electrical and thermal conductivity. It is plastic, stamping, easy. Produce aluminum sheet AMg3 GOST 21631-76 by rolling (with and without compression). "M" index means that the annealed sheet is issued. If "M" is put in brackets, the sheet is a non-heat treated, while still meeting the requirements for products annealed standards. Products are available in different performance accuracy and quality finishes. By destination lists are food, perforated, general purpose, grooved. The types of corrugation are basically a quintet and a duo. Aluminum sheet AMg3 has a wide range of sizes, is made without plating. Dimensions: width 1.2 m, length 2.7 m, thickness 0,5-10,5 mm. Chemical composition of normalized GOST 4784-97. Aluminum sheet AMg3 includes magnesium (3.2 - 3.8%), aluminum (base), the impurity. The latter include chromium, titanium, zinc, silicon, iron, copper and manganese. The proportion of magnesium in the sheet is such that the deformability is still high, but the strength and significant. Marked sheet stamping or paint. It specifies the brand and condition of the material, thickness, batch number. Put a stamp of technical control. The form of delivery is foot / pack; it is possible sale of the piece.

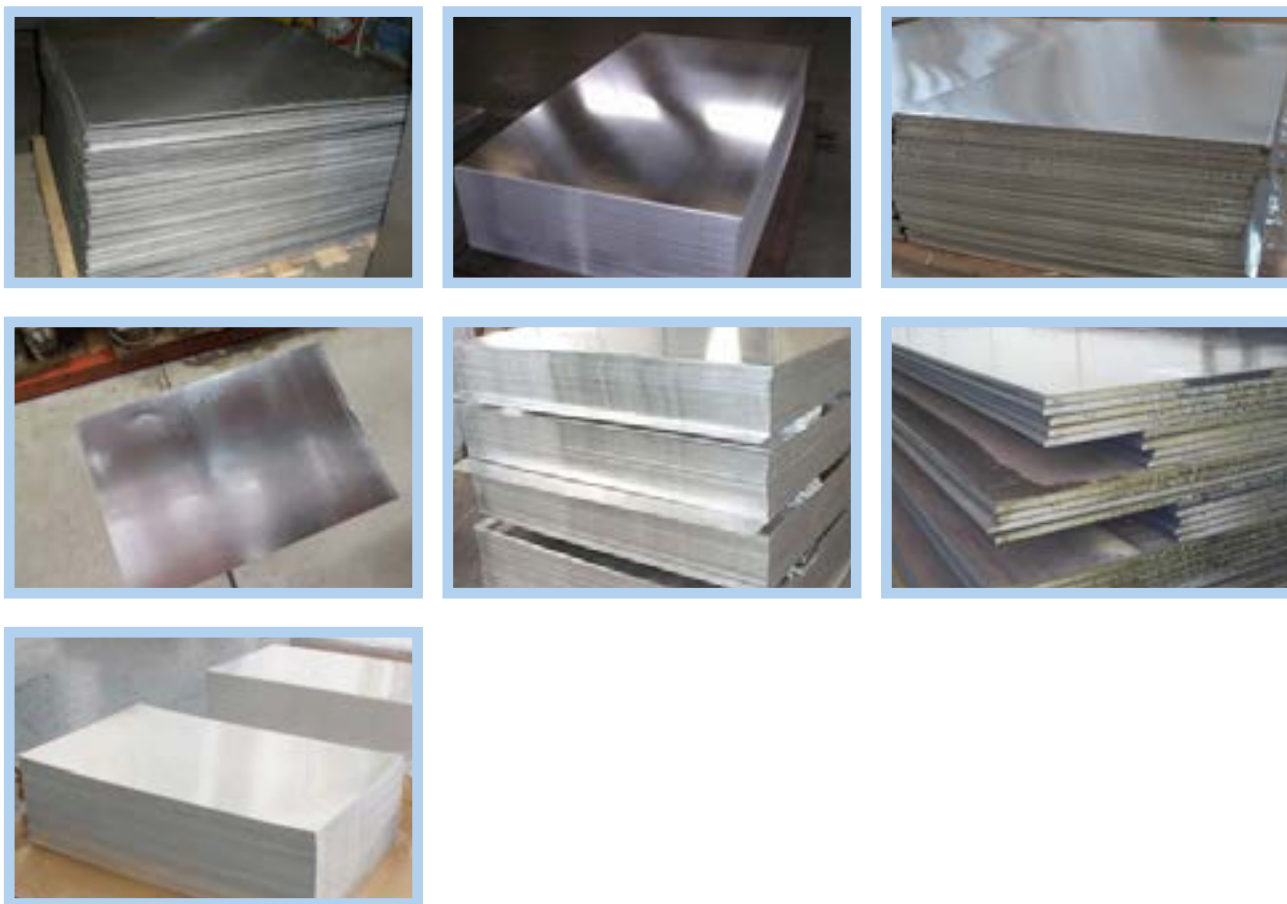




Aluminum sheet AMg5M/AMg5

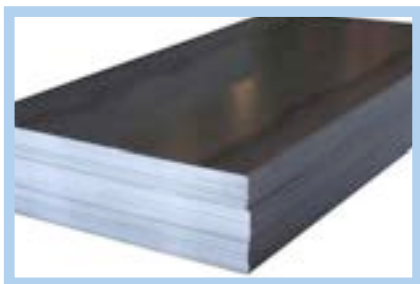
Aluminum sheet AMg5 has high weldability, corrosion inertness, ease, workability, ecological, thermal and electrical conductivity, fire resistance. As a result, the sheet is a product widely applicable in electronics, electrical engineering, construction, mechanical engineering, instrument making, shipbuilding, aviation, chemicals, food industry. The data sheets produce transport body, roofs, stairs, floors, and other products, used sheets at home. The aluminum sheet AMg5 GOST 4784-97, besides magnesium (4,8-5,8%) and aluminum (base), includes titanium, chromium, zinc, iron, manganese, silicon, copper, other impurities. The deformability of the sheet is inversely proportional to the percentage of magnesium alloy. Produced by AMg5 aluminum sheet products (hot or cold), with and without plating, different accuracy of performance, quality finishes. As the material in the annealed products are divided and termo untreated. Less common are work-hardened, hardened, aged, and so on. The aluminum sheet is perforated, food, corrugated, general purpose, corrugated (quintet, lentils, the duo). Dimensions of the product is usually: width 1.2 m, thickness 0.5-10 mm, length 2-7 m Label sheets paint or stamp. It is necessary to specify the status and grade of material, plating, batch number, thickness. It also requires a stamp of technical control. Supplied sheets in packs or feet, carefully packaged, protected from corrosive influences.





Aluminum sheet AMg6BM

Aluminum sheet AMg6BM widely applicable for covering vessels, seaplanes, railway cars. Demand in the automotive industry, the manufacture of welded structures, construction, communications and buildings. Highly regarded that the aluminum sheet AMg6BM resistant to corrosion, mechanical damage, temperature changes. It is flexible, heat and electrically conductive, has a low density, easily welded, aluminum sheet stamping. Producible AMg6BM GOST 21631-76. Usually it is 2.1 m wide and 7.2 m long, has a thickness of 0,5-10,5 mm. The size range is wide. Index "M" indicates that the list is available annealed, and the index "B" indicates a plating process. Leaves are food, corrugated, general purpose, grooved. They are produced by rolling. The composition of the sheets is prescribed to GOST 4784-97. Aluminum sheet AMg6BM contains magnesium (5.8 - 6.8%), impurities, aluminum (the rest). Impurities are titanium, chromium, manganese, iron, copper, zinc and silicon. A high percentage of magnesium leads to reduced deformability, but of all the aluminum-magnesium sheets of this stamp most durable. The downside is slightly reduced corrosion resistance. Marking produce paint or stigma. Record the batch number, product thickness, condition and material grade. Required test mark. Packaging - packs and foot.



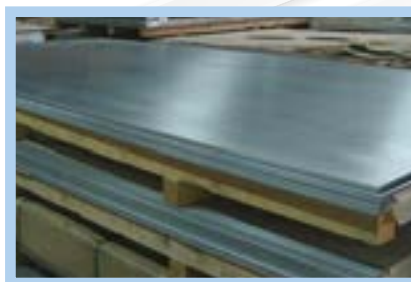
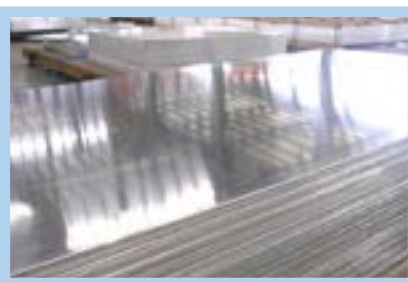
Aluminum sheet AMtsM/AMts

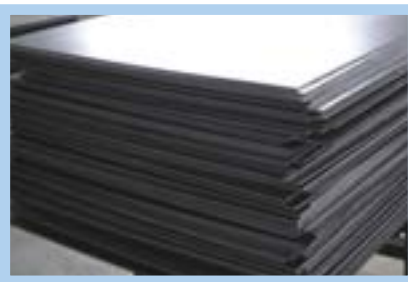
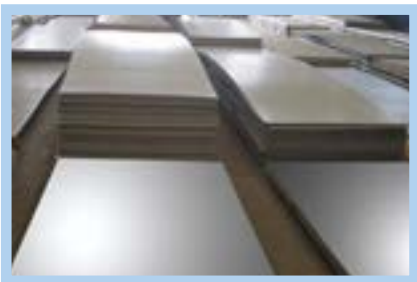
Used in the industry aluminum sheet varies by cutting methods, marks, chemical composition, physical characteristics. One of the most popular is the aluminum sheet AMtsM manufactured according to GOST 21631-76. When labeling alloys of aluminum letters may be referred to another additional element, and figures - its percentage. The chemical composition of GOST 4784-74 AMts limited, it contains impurities of copper (Cu) and manganese (Mn) in an amount of about one percent. Impurities present alloy provides high flexibility with good hardness and resistance to corrosion. Also, the material of this type are well welded. Also, additional letters may be referred to the type of mechanical or thermal treatment. As the surface treatment method, the sheets are divided:

aluminum sheet AMtsM (annealing);

aluminum sheet AMtsN2 (cold deformation).

The annealed sheet, due to its physical and mechanical properties, is the most widely used. Aluminum sheet AMtsM flexible, perfectly withstand deformation in the cold and hot conditions. Annealed aluminum lends itself well to the gas, atomic hydrogen and argon arc welding modes, as seam strength corresponds to the strength of the material after annealing. Suitable for the manufacture of window frames, decorative elements, building structures - floors and frames, to cover the roofs and floors. Chemical resistance it is used in the production of radiators, containers for beverages, glassware, working under pressure. Widely used in aluminum sheet AMtsM structures of coastal areas, as well as in the casing of river and sea vessels.





Aluminum sheet D16AT/D16AM/D16

Semi-finished products in the form of aluminum sheets D16AT, D16AM D16 and D16 are made of wrought aluminum alloy brand. to the chemical composition of the alloy requirements are set GOST 4784. The aluminum content of the alloy D16 is 90,90-94,70%, copper - 3,80-4,90%, magnesium - 1.20-1.80%. alloy Weight - 2.77 kg / l. Sheets D16AT, D16AM and D16 differ in the method of manufacturing and material:

D16 - clad, without heat treatment;

D16AM - with normal plating annealed;

D16AT - with normal plating, hardened, naturally aged. Specification for aluminum sheets mounted GOST 21631-76. According to the specifications of the aluminum sheet can have the following dimensions:

sheets with a thickness of 0.5-0.7 mm allowable width is 1000, 1200, 1400, 1500 and 1600 mm, length - 2000-5000 mm;

sheets with a thickness in excess of 0.7 mm to 10.5 mm allowable width - 1000, 1200, 1400, 1500, 1600, 1800 and 2000 mm, length - 2000-7200 mm. For cladding sheets and D16AM D16AT on each side of the cladding material is applied on the basis of aluminum (not less than 99,30% by weight). The thickness of the cladding layer depends on the thickness of the sheet and is in normal plating not less than 2% of its value. Mechanical properties of the sheets under tension due to their too thick. D16AT sheets with thickness up to 1.9 mm have a strength of 405 MPa, a yield strength of 270 MPa and elongation of 13%. In thicker sheets, the figures are 425 MPa, 275 MPa and 10-11% respectively.

Marking is applied to the aluminum sheet D16 paint or distracting. Marking includes:

aluminum brand;

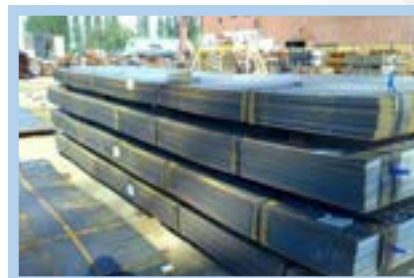
plating;

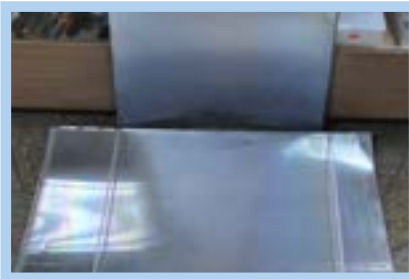
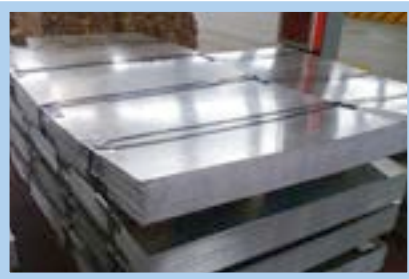
state of the material;

sheet thickness;

batch number;

OTC stamp.

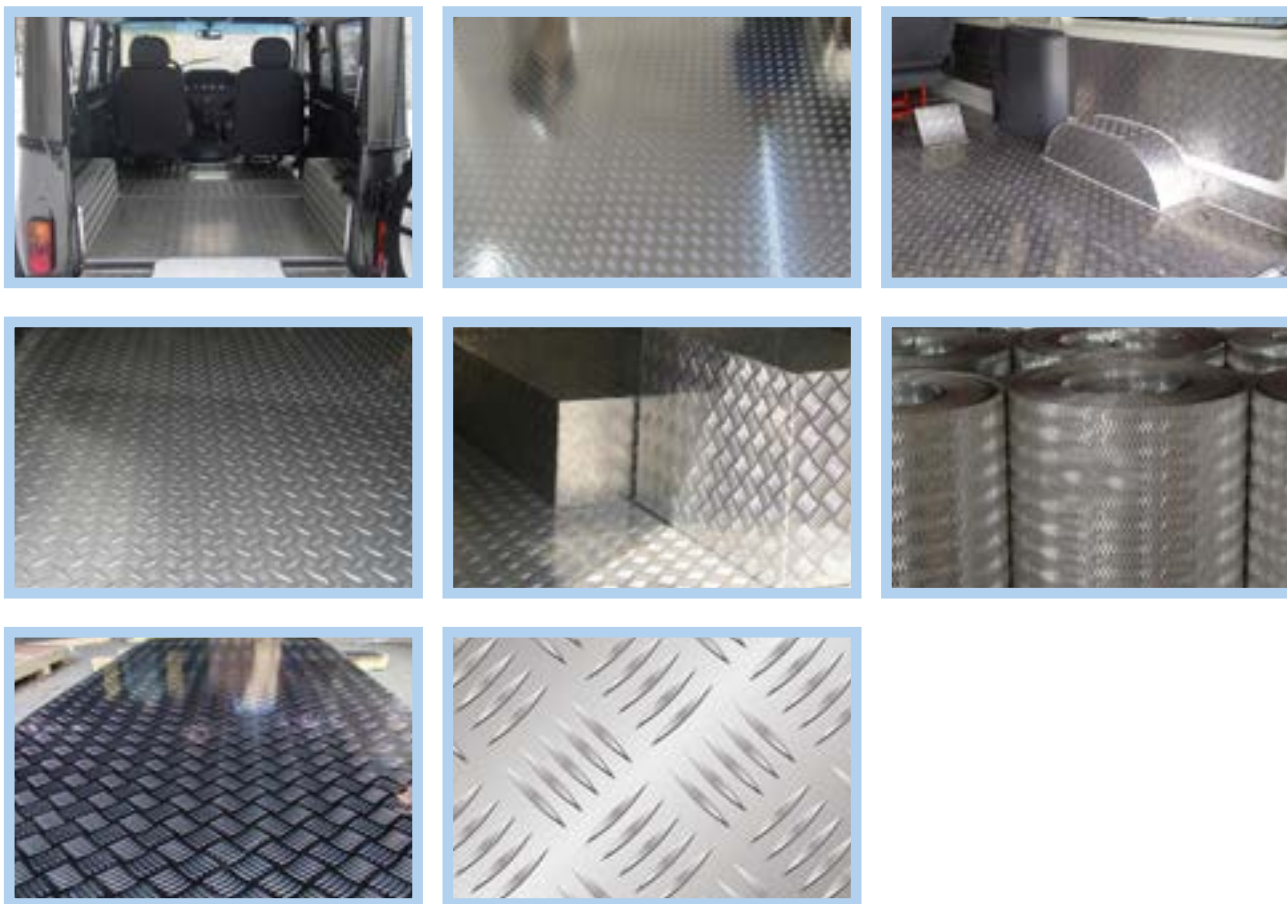




Aluminum corrugated sheet

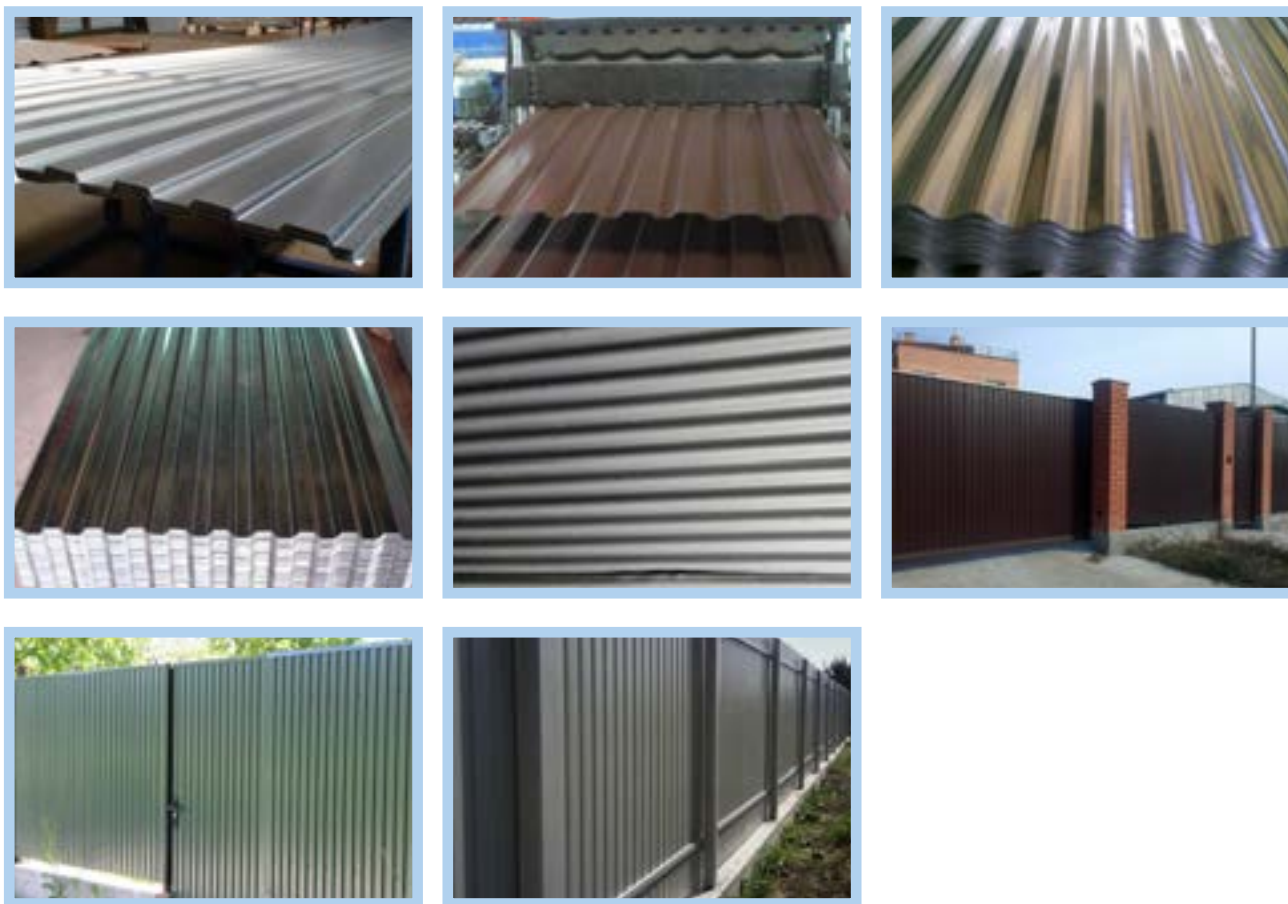
Aluminum corrugated sheet - matt, glossy rarely rolled sheet having a raised pattern. By the number of corrugation corrugated aluminum sheet can be of three basic types: "lentils", "Duet" (2) "Quintet" (5). For decorative types belong: "Orange peel" and "rice grain" There is also a "Diamond" - a sheet of corrugated aluminum, which resembles a diamond pattern. Cathay aluminum corrugated sheets, often use aluminum-magnesium alloy of the following brands: AMg2 (AMg2M, AMg2R, AMg2NR, AMg2N2, AMg2N2R) and AMg3 (AMg3N, AMg3M, AMg3NR, AMg3N2, AMg3N2R). Also enjoy Alloys aluminum-copper-magnesium: D1 (D1NR, D1AMR) and VD1 (VD1AN, VD1AM, VD1NR) and aluminum-manganese (AMts). Aluminum sheet is corrugated at least 99.5% must consist of aluminum. Most typically aluminum trays of a cutting or 1500h3000 1200h3000 mm and a thickness of 1.5 to 4.0 mm. Aluminum checkered sheet is characterized by corrosion resistance, light weight, lack of slip spark safety and long operational life. As an intermediate product of aluminum corrugated sheet is irreplaceable as a floor to prevent slipping (stairs, bridges) and in structures subject to corrosion. As the design of the material used decorated Aluminum corrugated sheet in the construction of facades, steps, stairs, ceilings, trim, furniture, elevators. In advertising, store design corrugated aluminum sheet is used to create shelving, partitions, display cases and stands. Aluminum corrugated sheet AMg2NR often used for anti-skid flooring. In engineering, they trim the walls of wagons. In the food and chemical industry corrugated aluminum sheets AMg2NR because of their high corrosion resistant is used to create structures resistant to rusting. Aluminum corrugated sheet AMg3N2 actively used in rail transport for low- and moderate structures in the skin wagons. Corrugated aluminum produced using cold and hot rollers. The first method is used to get a thin and durable corrugated aluminum sheet. Produce aluminum checkered sheet in stages, starting from the casting of ingots, preparation, hot / cold rollers, and finishing the heat treatment, and trim. Given the supply of forms, corrugated aluminum is divided into:

- annealed aluminum sheet (M);
- cold-worked aluminum sheet (N);
- half skin hard aluminum sheet (H2);
- quenched and aged naturally aluminum sheet (T); quenched and aged artificially aluminum sheet (T1); Refined aluminum sheet (P) made of aluminum.



Aluminum decking

Aluminum decking - rather demanded building material. In fact, it is an aluminum corrugated sheet whose trapezoidal shape (more often) or wave (sinusoidal). Itself corrugated aluminum sheet can have many other shapes and profiles. Also, there are sheets of steel with aluminum surface. Highly appreciated that the trapezoidal sheet aluminum is lightweight, aesthetic, plastic, fire resistant, chemically resistant, durable. Installation is simple and convenient corrugated material available and not expensive. Applied profiled aluminum sheet in the housing and construction industry, serves as a roofing material (aluminum slate), they sheathe loggias and balconies, it is demanded for lining buildings inside and out. To increase the attractiveness of decorative slate aluminum cover color coated. As a result, such a roof is easily masked by other materials. Profiled aluminum sheet is made of aluminum (GOST 21631-76). Produced on a number of specifications. Profile is divided into a wall (P) bearing (H), at least at the carrier-wall (NA). Also present in the marking numerical index indicating the height of the profile (not of the sheet). Further, the labeling is usually specified width. Characterized profiled headroom and useful width, profile height, thickness, length. Length of 1-12 meters in width - 1000-1200 mm, useful width - 900-1100 mm. It comes corrugated aluminum sheet in the feet or packs. The sheets are stacked so that the volume occupied by them was minimal, but still maintain the integrity and appearance.



Aluminium rolls

Aluminum roll - this is one of the most popular and relevant types of rolled aluminum. The thickness of the roll sheet of 0.1 mm to 15 mm, roll weight up to 8 tons. Used different markings depending on the method of manufacture and processing of aluminum. By way of manufacturing aluminum rolls marked as follows:

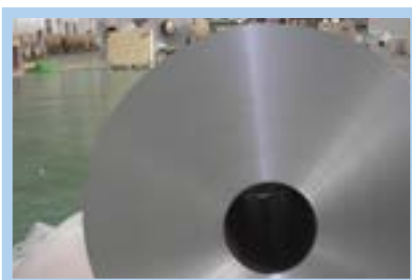
- M - aluminum heat treatment;
- H - cold-worked aluminum;
- H1 - 25% work hardening;
- H2 - 50% work hardening;
- H3 - 75% work hardening;
- A - normal plating;
- B - plating technology;
- P - increased aluminum finish.

By brand and destination aluminum roll is divided:

- AD1M, AD0, AD1N2 A5N, A5Ms, A5N2 - for the food sphere;
- VD1AN, VD1AM, VD1AN2, 1105N21105AN, 1105AM - industrial;
- AMg6 AMg5, AMg3, AMg2N2, AMC, AMg32M - acid-resistant aluminum;
- D16, B65, B95, D16T - duralumin.

(, Up to 0.02% copper and other iron 0.3%, silicon up to 0.3%) to obtain a clad aluminum rolls mark AMg6 D1 and D16 use aluminum containing less than 0.7% impurities. When plating V95 and V95-1 sheets impurities is not more than 2% (up to 1.3% zinc, 0.3% iron, up to 0.3% silicon, and others). This material can be used in the construction industry for

insulation in the industry for the production of air conditioning and ventilation ducts, in various mechanical parts. Aluminum roll can be used to cover the structures of complex shape due to its flexibility. The sheet may be coated with a special polymer coating PVDF and PE, which ensures greater resistance to mechanical wear and corrosion.

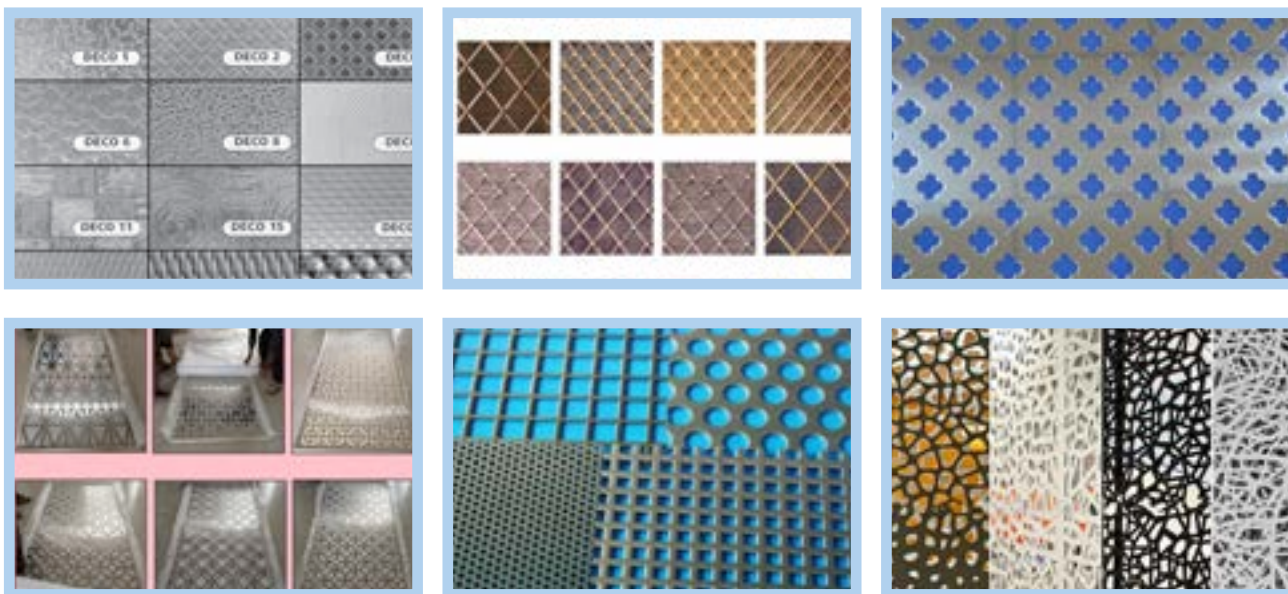


Decorative aluminum sheet

Aluminum is used a variety of industries. At the present time, it is gaining more popularity use of aluminum in the decoration of apartments, houses. Decorative aluminum sheet used in the advertising industry, the food industry, in the furniture business. There are several types of decorative aluminum. Basic - anodized aluminum sheet and aluminum mirror. Anodizing - chemical process of creating an oxide film. Thanks to this film, you can use a decorative aluminum sheet in the decoration, as it lends itself to great painting, it looks bright and aesthetically pleasing. You can get aluminum painted in any color, suitable for the most different design. painted aluminum sheet in a similar way is long, it is very practical.

Among other types of decorative aluminum is not the last place is occupied by aluminum polished. It differs from the absence of starting material roughness. Another variation of the decorative material - the aluminum satin sheets. Processed by another technology, a decorative sheet of aluminum is often used in car design and kitchen furniture, thanks to a special appearance. Satin aluminum is very popular in the European auto industry, which is why in the high-quality material prices are high. His qualities of decorative aluminum sheet would make the necessary paint in the interior dilute palette. In our assortment you

will find a sheet of aluminum color right for you. Decorative aluminum sheet with each passing day more and more in demand and popular.



Perforated aluminum panels

Perforated aluminium panels is a special kind of product from any metal. It differs by the presence of a sheet of holes of variant shapes and sizes. The most commonly used perforated aluminium panels in design, because you can create a unique facades and interiors. Also often used in the creation of the outdoor advertising. Material production is determined by the task. The most versatile can be considered a perforated aluminum panels, which have the ability to sufficiently long operation due to high ductility and corrosion resistance. Features such sheets have not been established for sure - it depends on the manufacturer. Perforated aluminum panels have a standard sheet thickness of 2-4 mm. For example, a sheet of 3mm thickness has sufficient strength to be used for most jobs facade cladding. The maximum dimensions of such sheets have the same restrictions do not normalized, but are considered standard sheets 1000h2000 mm. Perforation also can be changed. The most common are all simple geometric shapes. In general, perforated aluminum panels - aluminum is perforated plates a specific shape, size, that are cut in a certain order. The finished product is resistant to corrosion, the corrosion can be further covered by a lacquer layer to protect against mechanical damage and oxidation. Scope huge for these materials. Perforated aluminum panels are used for the realization of the set design ideas are used in the design of advertising logos and proper outdoor advertising. The panels are also used for interior decoration of shops, offices and others.





Brushed aluminum

Sheet metal from aluminum alloys of aluminum and intended for export and the needs of the national economy, is made in accordance with GOST 21631-76. Fixed assortment is varied: it includes brushed aluminum sheet width of 0,6-2,0 m and 2,0-7,2 m in length (depending on the state of the material). rolled thickness ranges from 0.3 to 10.5 mm. Sheets produced by process regulations aluminum marks A0, A5, A6, A7 containing basic element from 99.0 to 99.7% (GOST11069-74) or alloys whose chemical composition corresponds to GOST 4784-74, 1131-76. According to a method for producing polished aluminum sheet is divided into:

clad (no additional markings);

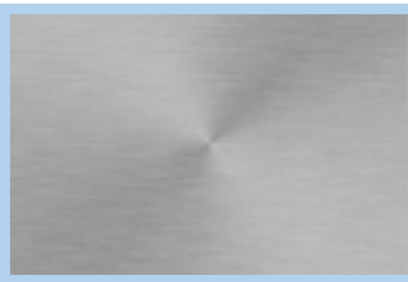
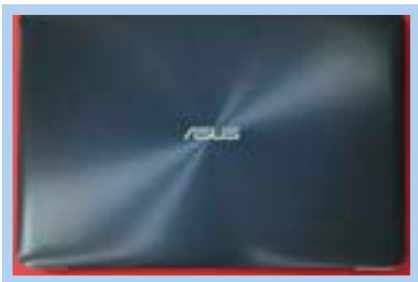
Clad - coated aluminum alloy with a certain content of ligatures and impurity metals. This rental is classified depending on the thickness of the plating on the technology (grade B), normal (grade A) and thickening (grade A). According to state of the metal brushed aluminum recovered, not the last heat treatment (the additional symbols available), and the sheets are subjected to the corresponding operations:

annealed (M);

cold-worked (H);semicold-worked (H2);

quenching and artificial aging natural (T1 and T, respectively); hardened, cold-worked, and naturally aged (TN). The presence of capital letters B and P in the marking of rolled aluminum, coming after a year of the approval of the standard specifies the quality of the surface finish: U - high, B - high. The absence of signs includes the usual finishing material. On delivery, the party rolled metal made of aluminum sheet is placed on the

upper stamp (applied paint or distracting), which specifies the characteristics such as alloy grade (aluminum), batch number, the state of the material, sheet thickness, plating and due to tech control.



Sheets made of aluminum 1105/1105AM

Sheets made of aluminum 1105 - highly demanded metal. They are used in vehicle, wagon, shipbuilding, aircraft, instrument, decor, construction and chemical industries. The chemical composition of the alloy corresponds to GOST 1131-76. Material close duralumin D1 consists of aluminum substrate, alloying of copper (2 - 5%), magnesium (2% max.), Manganese (1% max.). Impurities are chromium, iron, silicon, zinc, zirconium, titanium. This duralumin durable, environmentally friendly, chemically inert, lightweight, heat-resistant, non-magnetic, bactericidal, is plastic. Easy stamped, welded, conductive, heat. In some areas with domestic rivals duralumin sheets aluminum sheet imported. According to ISO 209-1 made several similar alloys 2000 series. Exports to the EU, China and Russia, is less common North American and Japanese products. Chinese plates are characterized by a similar quality to the Russian and western lists differ somewhat improved forming and heat treatment, but at the same time, and increased use of recyclable materials in them. Production is regulated by GOST 21631-76. For imported sheets rules contained in ISO 6362. Available in sheets of aluminum in 1105 for various purposes, the accuracy of performance, quality of finish, type of heat treatment. They are produced by rolling. Produces aluminum sheets 1105 without plating, have a wide range of sizes. The dimensions are: width of 0.6 - 2 m, the length of 2 - 7 m, a thickness of 0.5 - 10.5 mm. Marked stamping or indelible ink.

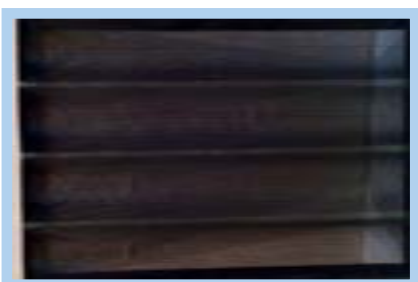
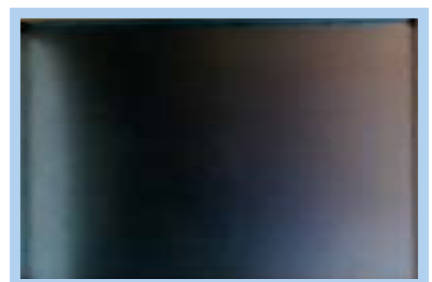
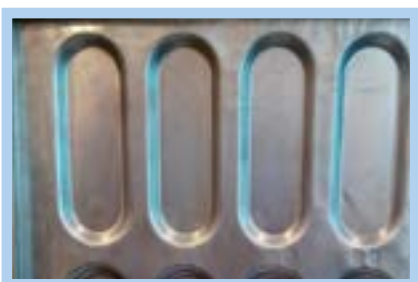
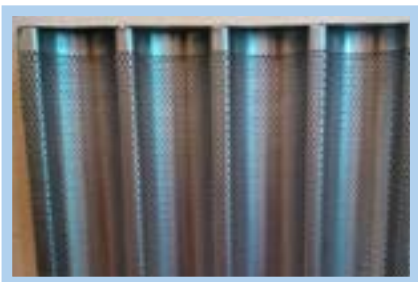


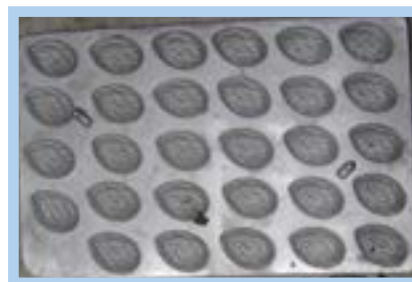
Food aluminum sheet A5Ms/A5

Food A5Ms aluminum sheet / A5 is widely used in industrial fields, since it has advantages over other similar materials and secreted high wear resistance, is resistant to corrosion and has a small weight and has a number of additional advantages. For use in the food industry, food ideal aluminum, which does not change shape when heated or frozen and has a warranty period of use for over 80 years. In the market several products represented, which are classified based on:

aluminum sheet A5Ms food (soft);

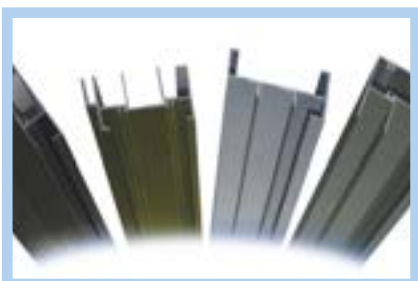
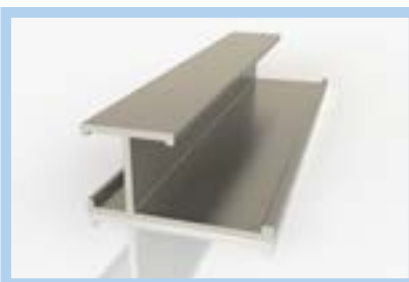
aluminum sheet A5N food (cold-worked). Presented aluminum sheet food, A5 marking differs from other species by the method of production, strength and widely used engineering companies, construction and other areas of production. In the different production segments dominated by the use of appropriate characteristics of aluminum products, for example, for the manufacture of complex components and structures bettersuited soft aluminum food and to create rigid frames is better to use cold-rolled sheets. The flexibility and strength of aluminum materials ensures a high reliability of structures that must be made based on established norms and requirements. Depending on the labeling and physical properties of the materials can be purchased in the form of whole or cut sheets, rolls or in another form under the order, and use the services of marketing personnel in cutting and packaging.





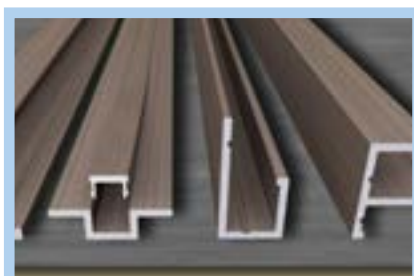
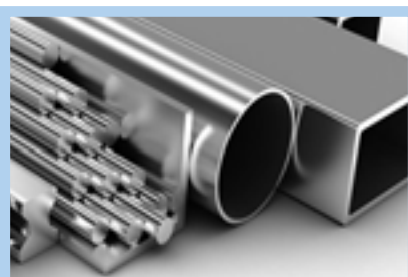
Aluminium profiles

Aluminium profiles are popular, they are functional, aesthetic, practical. Aluminium profiled meets Russian standards GOST 22233-2001, and has its own standards for imported products. Manufactures compression, the further heat treatment. It is used most often aluminum profiles for construction, decoration, repair. Creates windows, entrances, elements of the facade. Aluminum is often applied in frames and frames. Use straight and bent aluminum profile. Also, the profiles used in production equipment, electrical engineering, food industry, automotive industry, for example, the profile of the aluminum car is used to create boards, cladding, etc. It is characterized by the profile of a number of advantages. Workability, durability, durability, maintainability, ease, ecology, heat resistance, corrosion inertness. They are made of aluminum profile from a variety of alloys. It duralumin, silumin, air and so on. Almost all of them comply with GOST 4784-97. For profiles can be virtually any configuration. It corners, bars, brand, plates, channels, boxes, moldings, blinds, sills, prism box. The cross section is rectangular, triangular, square, hexagonal etc. Produced length profiles 2 - 6 m, and a wall thickness of flanges 1.0 - 3.2 mm, the diameter of a circle less than 220 mm. Other sizes are allowed on request.



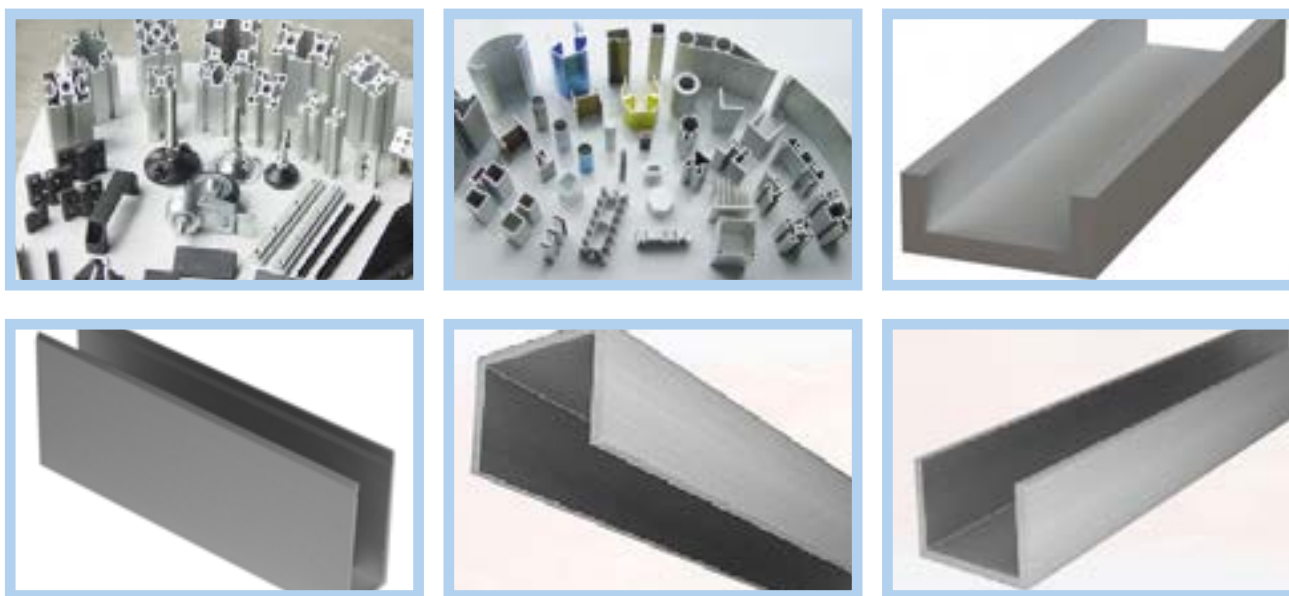
Aluminum mounting profile

A huge range of used aluminum alloy makes the material demand in all sectors. One of the areas of most aluminum usage is construction, because the corrosion resistance of the metal, and ease of use required for such work. One of the most popular aluminum material is an aluminum mounting profile, which is considered to be universal. Aluminum mounting profile is anodized coated with polymer paints made “under the tree”, that depends on the application. Aluminum sheet - the raw material for the mounting profile. The profile itself receives a special form after rolling. Aluminum mounting profile has a U-shaped stiffening ribs, which adds additional strength to the structure. The standard thickness - 1.5mm, 2.5mm. Factory aluminum mounting profile is available 2-6 meters. Aluminum profile is activated during installation of composite panels. With it installed and wall panels, if appropriate shape and thickness of the material. Profile used for the installation of suspended ceilings of all sizes and shapes. These mounting materials are widely used in the assembly of ventilation systems. Lightweight, corrosion resistance, chemical purity metal aluminum uprights made truly universal. Aluminium retains its properties and quality after recycling, environmental profile making material.



Aluminum profile of civil construction

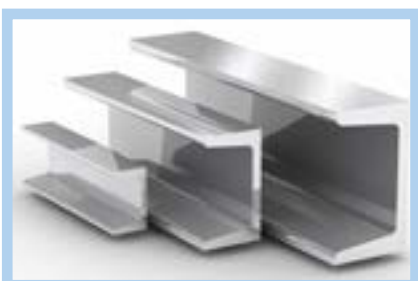
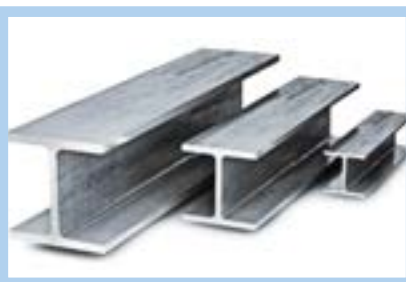
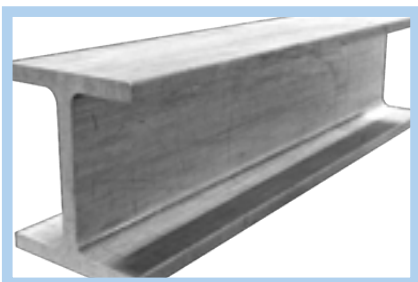
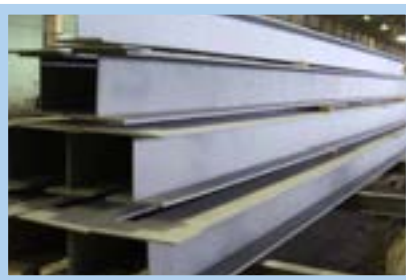
Application of aluminum is increasing at a significant pace. Building is considered a leader among the industries that consume aluminum. Construction aluminum profiles are used in large quantities for the construction of many objects in the ordinary assembly of structures and design decor. Aluminum profile civil construction considerably simplifies the construction or facing challenges. Such an application he has earned its environmental friendliness and durability, relatively low cost, resistance to corrosion. Aluminum civil construction has a great variation of forms. Among common: round, rectangular, square, channels (U-shaped), brand (T-shaped), the corners of various proportions rods. Round civil construction aluminum profile is used as a support, rectangular pipe is often used in the creation of the framework, it is an integral corner material in the furniture business, for the promotion and protection of the angles in the construction, installation of structures of varying complexity. Now civil construction aluminum profile is made in two ways - by pressing or using a cold bending. Pressed profile is manufactured using a hydraulic press. Aluminium acquires the desired shape under pressure. Cold-formed aluminum profile civil construction is made from sheets of aluminum special bending machines. The advantages of aluminum profiles over other are: lightness, corrosion resistance, easy installation, versatility.



Aluminum I-beam

The aluminum I-beams - is elevated stiffness profile, the shape of which resembles cut the letter "H". General quality characteristics, which corresponds to the product, stated in the Standard Classification of 8617. I-beams includes the following elements. They differ in location of faces that can be slanted or parallel. Depending on the final details of the application are normal, columns, wide-designed for suspended ways of construction, as well as the reinforcement shafts. Along the length of the aluminum I-beam is divided into dimensional, multiple-dimensional and unmeasured. Finally, given the accuracy of production determines the quality of the finished product: normal, enhanced, or high

accuracy. The profiles differ in the state of the material, the type of strength coating. Marking of aluminum profiles is made according to GOST 22233-2001, it specified aluminum alloy brand and condition of the material, type, thickness and color of protective and decorative coatings, as well as the designation of the standard. Aluminium profile makes strong and rigid, stable and durable. The main difference from aluminum I-beams made of other materials is their ease. Profile of this type are widely used in construction industry: used as a floor element, lightweight bearing metal, pendant, support, bridge structures. Thanks to the unique properties of aluminum I-beams - demanded product in many sectors of the automotive industry.



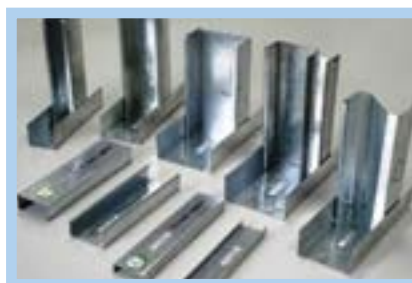
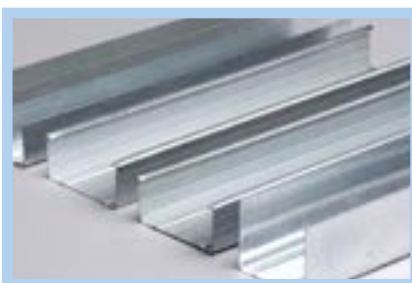
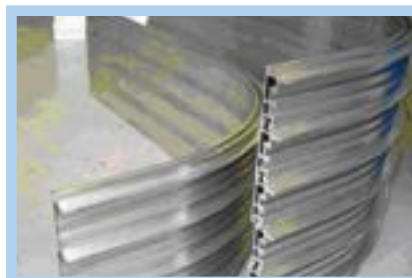
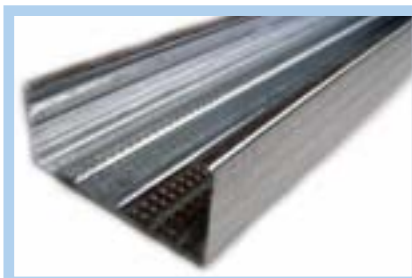
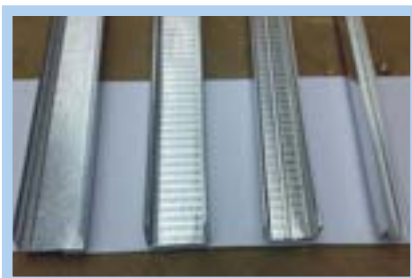
Aluminum profile for drywall

You want your interior was flawless and as a finishing material chosen drywall? Then you need aluminum profiles for drywall required for its fastening to the walls or ceiling. Before purchasing the necessary materials and fasteners, see our information on the basic types of profiles that are needed to create a rigid skeleton. For the installation slabs you will need the following types of profiles:

- The guide profiles for mounting PN frame (UW). Standard depth of equal to 40 mm and the width can range from 50 mm to 100 mm on a 25 mm. Width is selected based on the thickness of the wall mounted.
- Ceiling aluminum profile for plasterboard PNP (UD) is required for ceiling mounting bases. He also sometimes used when installing walls.
- To form the ceiling frame you need the ceiling profile PP (CD). Installation of this type of

metal sheets is carried out by means of direct or suspensions anchor clips.

- Rack metal profile PS (CW) is required for mounting the basics when creating partitions or walls.
- Corner profile is necessary to prevent damage that can be caused to the ends of the boards during their exploitation. Apart from aforementioned types of profiles, we offer and the flashing profile, which quite often are used to align the wall plastering. They are necessary to create a sort of “rails” on which there is a rule.



Aluminum profile for wardrobes

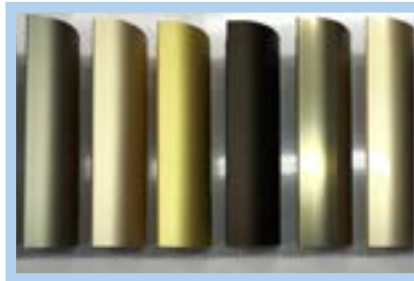
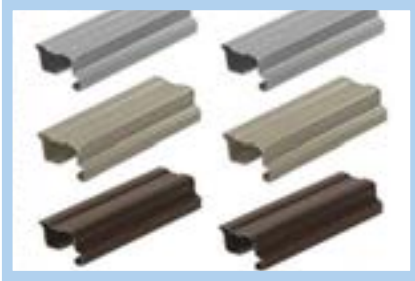
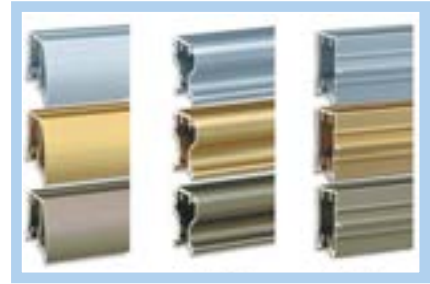
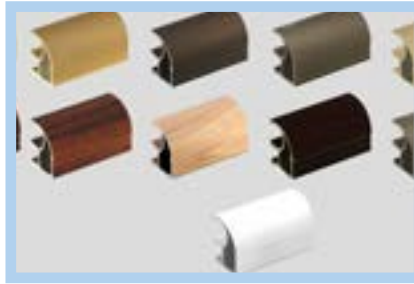
To our furniture is good and for a long time we served, you need to take care of the presence of high-quality accessories for her. Now, for example, are in great demand wardrobes, they save space, easy and practical to use. But, to sliding cabinet doors served for a long time, you need to take care of the fastening mechanism. Normally, basic profiles material is steel or aluminum. Now, however, a growing demand is aluminum profiles. They are much more expensive than steel. This is from the fact that aluminum as metal, has a higher cost than steel. Aluminium profiles light, have a long service life, provide noiseless sliding doors, which is important. Material wear and corrosion. Also aluminum profiles are good in terms of design: in front of you opens a large selection of colors, due to its shape, profiles conceal from the eyes of the entire structure. The shape distinguishes open and closed profiles. When purchasing profiles, pay attention to the marking - a guaranteed quality While manufacturing using extrusion - a method of extrusion material through the shape of the holes. After a profile is applied to a thin metal layer (cladding), the final step - painting or anodizing - the profiles are covered with a thin layer of the protective film of high strength. There are four types of coatings:

matte;

brilliant;

glossy;

tree. When you purchase it is advisable to choose the aluminum profile for wardrobes from the point of view of economy, durability and design.



Aluminum brands

Taurus aluminum or T-shaped profile is widely used as an element in the aluminum structures and frameworks - in construction, in the automotive, aviation, cargo- and car building. It is used in the creation of decorative elements of an interior, doors, windows and furniture. Types and marking

Profile aluminum T-section is divided, considering the following:

1. The cross-sectional shape:

One T-bar;

I-beams.

2. Processing of the material:

profile aluminum T-section without heat treatment;

annealed aluminum brands M1;

hardened aluminum T brands, weathered naturally;

hardened aluminum brands T1, the aged artificially

not completely hardened aluminum brands T4, the aged naturally;

not completely hardened aluminum brands T5, the aged artificially.

3. Accuracy of manufacturing:

aluminum profile brands with a normal (N) accuracy;

aluminum profile brands with higher (P) accuracy;

aluminum profile brands with a high (in) accuracy.

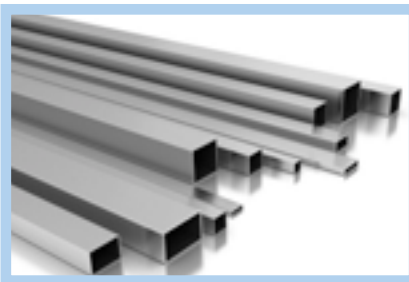
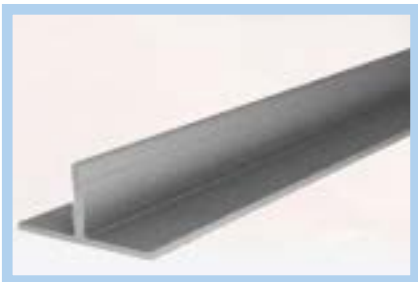
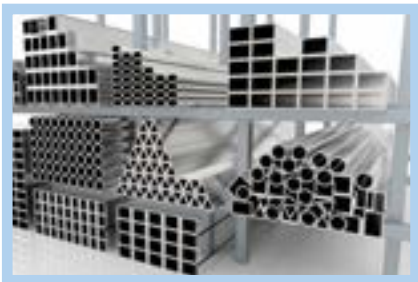
4. Durability:

Aluminum brands with normal strength;

Aluminum brands with high (PP) strength.

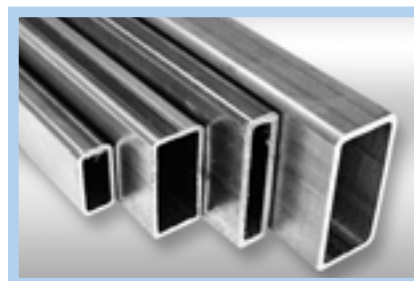
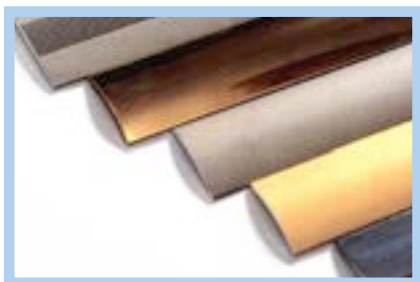
brand size designated in millimeters based on the width and thickness of shelves and brands height. Along the length of the aluminum profile brands varies in the range 1 - 7 running meters.

Produce brands of aluminum in most cases of alloy grades D16T 1915, AD31, and AMg3. Profile aluminum T-section has a high strength, durability, corrosion resistance, wear resistance, ductility, low specific weight. To improve the quality and life of the aluminum profile brands supplied with different coatings: anodic oxide (AN), a liquid electrophoretic (PVCs), liquid paint (YF), an integrated dual-layer (C), the polymer powder (P).



Aluminum channel

Aluminium channel (aluminum U-shaped profile) - finds its application in a variety of industries - from manufacturing interior items to highly technical aircraft. In the interior of the U-sections available, the aluminum channel is used for decoration and trim, as well as in complex structures as a link. It is widely applicable for the production of frames for signage and façade designs. Produce aluminum channel bar bent using bending. There are equal and unequal aluminum channel. On the strength of the aluminum channel is normal or increased strength; accuracy: normal, high, and high precision. According to GOST length of aluminum profile comes from one meter to seven. Also allowed to cover it with foil of other metals, anodizing, powder coating application or enameling. The distinctive features of constructions, which are made of aluminum channel, a high strength, rigidity and lightness. Profile Aluminium channel has plasticity, which allows you to make of it metal constructions of different shapes, and high corrosion resistance allows the use of aluminum profiles for external use.



Structural aluminum profile

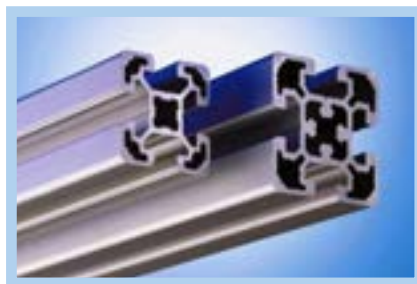
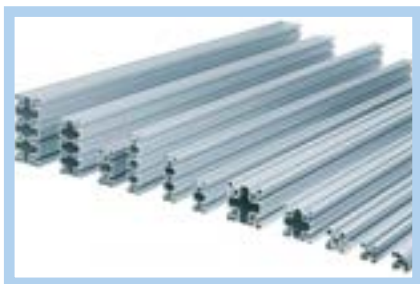
Structural aluminum profile is in demand because of its excellent performance data. This material is produced by chemical production of aluminum alumina, smelting and pressing. The following parameters can be attributed to the main benefits:

- Not a lot of weight.
- Durability.
- Durability.
- Versatility.
- Attractive appearance.

Profile produced using the fusing three main components - aluminum, magnesium and silicon. It has excellent thermal conductivity and is divided into two types - warm and cold. Cold is used for outdoor type of work, as warm or as it is often referred to as combined, for work in the heated rooms. Structural aluminum profile thinner than the machine tool. Therefore, it is cheaper, and the scope is much broader. The range of aluminum profile and the composition of the alloy must comply with GOST 4784-97. According to these rules, structural aluminum profile without anode coating available commercially in the form of lamellae of 3000 millimeters. On request, or in accordance with the requirements of production dimensions may vary. Typically, slats made multiple sales in 1000 millimeters. The scope of use is very extensive. Most often it is:

- The high-tech machine tools.
- Guards.
- Installation frames for furniture.
- Manufacture of the trading equipment and furniture.
- Design of advertising products - signs, banners, LED light boxes, and the like.

Since the profile is made of alloy, then the seller should be a certificate of quality and the accompanying documentation. When purchasing be sure to pay attention to it. If possible, it is best to order in a specialized production profile.



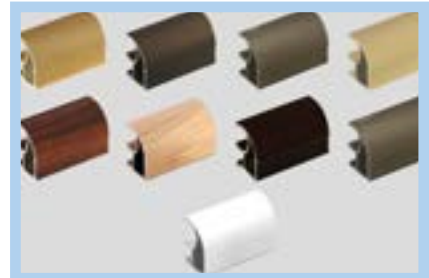
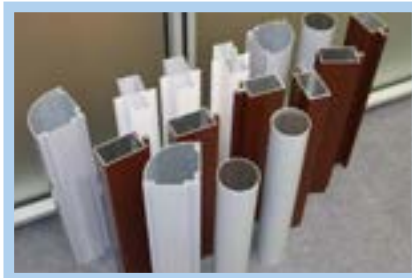
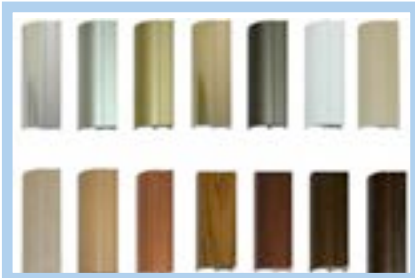
Aluminium profiles for partition

Increasingly popular in today's world have gained interior partitions. Aluminum profile and allows you to build a solid frame construction, and is also used for fixing panels in the process of lining the walls. Aluminum has a high strength profile for different partition types. The material can withstand high humidity level, not crack and is not deformed. Due to its versatility, the profile can be disassembled many times (to fix with the help of screws and screwdriver), without using any binding construction materials and mixtures. The big plus is the fact that aluminum profiles do not require painting works. There are two forms of the profile for the partition:

U-profile (simple system, consisting of two U-shaped channel, the smaller profile of which is attached to the floor, and more attached to the ceiling);

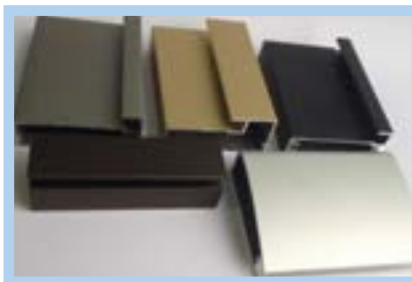
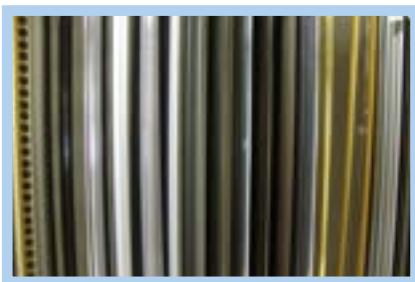
clamping profile (versatile system that is presented as a foundation to which a material clip). There are profiles for partitions:

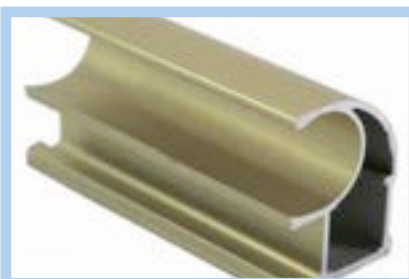
- 1) Aluminum profile for partitions (single or double filling of 4 to 16 mm).
- 2) Profile for mobile partitions (with single or double filling from 4 to 8 mm).
- 3) Profile for Sanitary partitions (with the filling of 4 to 8 mm). Profile is represented in white RAL9018, RAL9006 light gray shades and anodized "Silver." An individual color order, for example, for different types of wood or powder coating. Profile for partition walls have a thickness of 1.2 to 1.5 mm and may reach 2500 to 4600 mm, depending on the type and the destination profile.



Aluminium profiles for facades

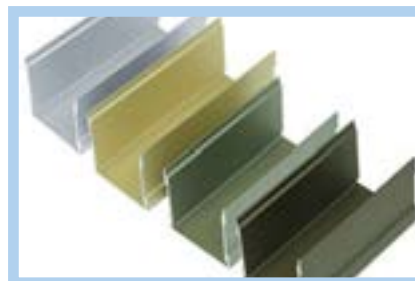
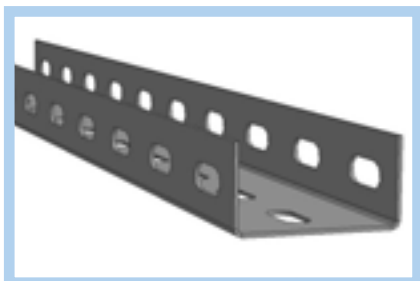
When referring to aluminum profiles for facades, it often refers to a variety of facades, lined with mounted panels. This profile was made possible building full of light consisting of glass and metal. Aluminum is lightweight, so produces much less stress on the building than the other materials. Working with the aluminum profile is not as labor intensive, such as stainless steel. Aluminium is easy to drilling and welding, environmentally friendly, and has a high resistance to corrosion. Aluminium profiles for facades used instead of galvanized. the moment of inertia of the range for different types of profiles ranging from 40 to 2072 per cm. For better thermal insulation and sound insulation of aluminum profiles for facades made with thermal barrier. Produced profile of the following alloys: AMts, AD0, AD1, AMg2, AMg3, AMg3S, AMtsS, AMg5, AMg6, AD31, AD31, D16. The profiles of the alloys: AD0, AD1, AMts, AMtsS - produced without heat treatment, they have a tensile strength of 6 to 10 kgf / mm² and an elongation of 16 to 20 percent. Products made of alloys AMg5, AMg2, AMg6 AMg3 - available with or without heat treatment or annealed, their temporary resistance is in the range of 15 to 32 kgf / mm², the relative deviation ranges from 13 to 15 percent. Profiles D16, AD31, AD31 - discharged as without heat treatment, have not fully hardened and naturally aged, they temporary resistance in the range of 13 to 42 kgf / cm² and an elongation at 8-13 percent.





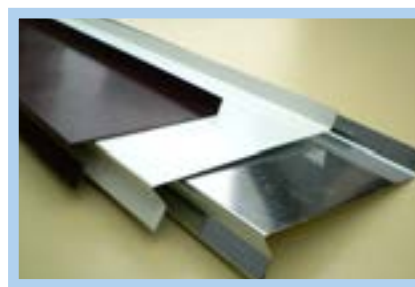
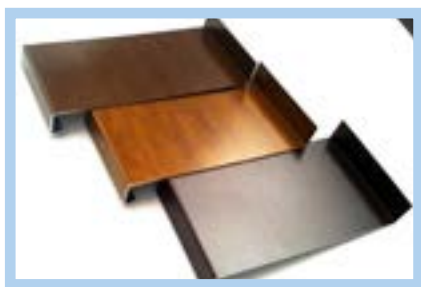
U-shaped aluminum profile

U-shaped aluminum profile, often referred to as the channel, characterized by continuous, not having cavities section. Products are usually used as the docking components in various designs, applied in aviation and mechanical engineering, design, construction, furniture making. They are made of aluminum n-profiles bending techniques, pressing, stamping, meet GOST 22233, GOST 8617, a number of different specifications and OST. Channels are classified by purpose: electrical, general, to reflect, fencing and other structures. Produced Profile Aluminum n-Shaped D16 alloys AMts, AD31, AMg2, AMg3 that meet GOST 4784. Condition material tempered, annealed or less aged. Available channels without processing, different precision manufacturing, the degree of strength and so forth. The marking commodity profiles indicate sectional height (10 cm) section width (20 cm) length product (6 m), flange thickness (12 mm) alloy name, type of heat treatment, performance and others. The profiles can be standard sizes or corresponding drawings of the customer. U-shaped aluminum profile repairable, durable, durable, environmentally friendly, heat-resistant, withstands corrosion. Aluminium U-shaped profile is traditionally supplied in bundles, protected by powder-coated, painted, if necessary, anodizing and other means.



Ebb aluminum

Sills made of aluminum rolformingom (a specific type of rental), flexible or pressing from sheet or roll materials. The cross section of these products is solid and is represented in two basic designs - a drip in or out. Ebb meet a number of specifications, can also partially meet the standards GOST 22233-2001, spreading on aluminum profiles. Typically, the thickness of the low tide does not exceed 3 mm, length - 6 m, width - 50 cm. They are made they are often the customer's drawings, which causes the lack of after mounting non-liquid residues. The materials are often ebbs system alloys aluminum-magnesium-silicon corresponding to GOST 4784-97. To protect the sills are covered by powder coating, paint layer, anodized. Characterized aluminum tide advantages: maintainability, workability, strength, durability, lightness, heat resistance, environmentally friendly, corrosion inertness, thermal stability. Low tide aluminum easy to maintain, is low noise. They are used in the aluminum window sills or balconies groups. They are necessary for protection against frost, rain, snow, construction joints and the lower portion of the window openings. Mounted low tides in conjunction with frames and glazing windows. Drips can be equipped with brackets. Mounting brackets are applicable for more reliable fastening of long tides. It toughens design reduces noise and increases durability. Delivered in bundles of aluminum sills. The surface is protected by a removable plastic film after installation. Presence of holes for the screws. The possibility of different markings.

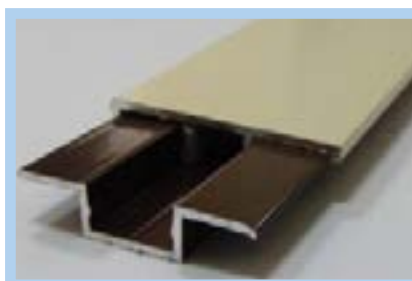
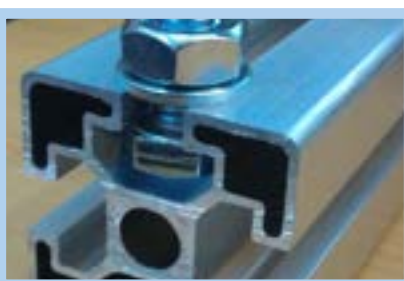
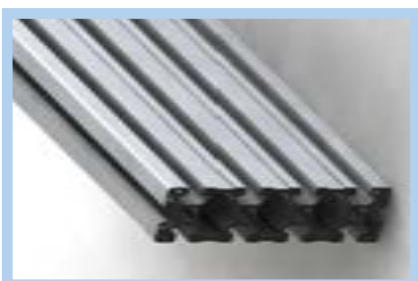


Industrial aluminum profile

Simplification of the method and reducing the cost of production of materials has led to an increase in the share of rolled sections. Due to the shape of the produced rolled aluminum load increases many times, that it is able to accept without critical damage to the integrity of the architectural structure or mechanism. On a functional basis, industrial aluminum profile is divided into:

- Supporting the most frequently involved in the creation of interiors and private premises. The most common form of the reference profile is a box-shaped profile.
- Supporting required when installing electrical and other networks in buildings, maintenance of process equipment and tooling, etc. The most commonly available in the form of U-shaped steel.
- Connection of the aluminum industry profile is required for connection of several individual parts into a single structure, for example, a corner or strip.
- The bridge profile used in the construction of that experience significant load. From other types of industrial rolled aluminum alloys it is distinguished by a complex structure using a plurality of ribs.
- Standard rolled aluminum in the form of channels, angles, H-shaped, Z-shaped profile, and other products.

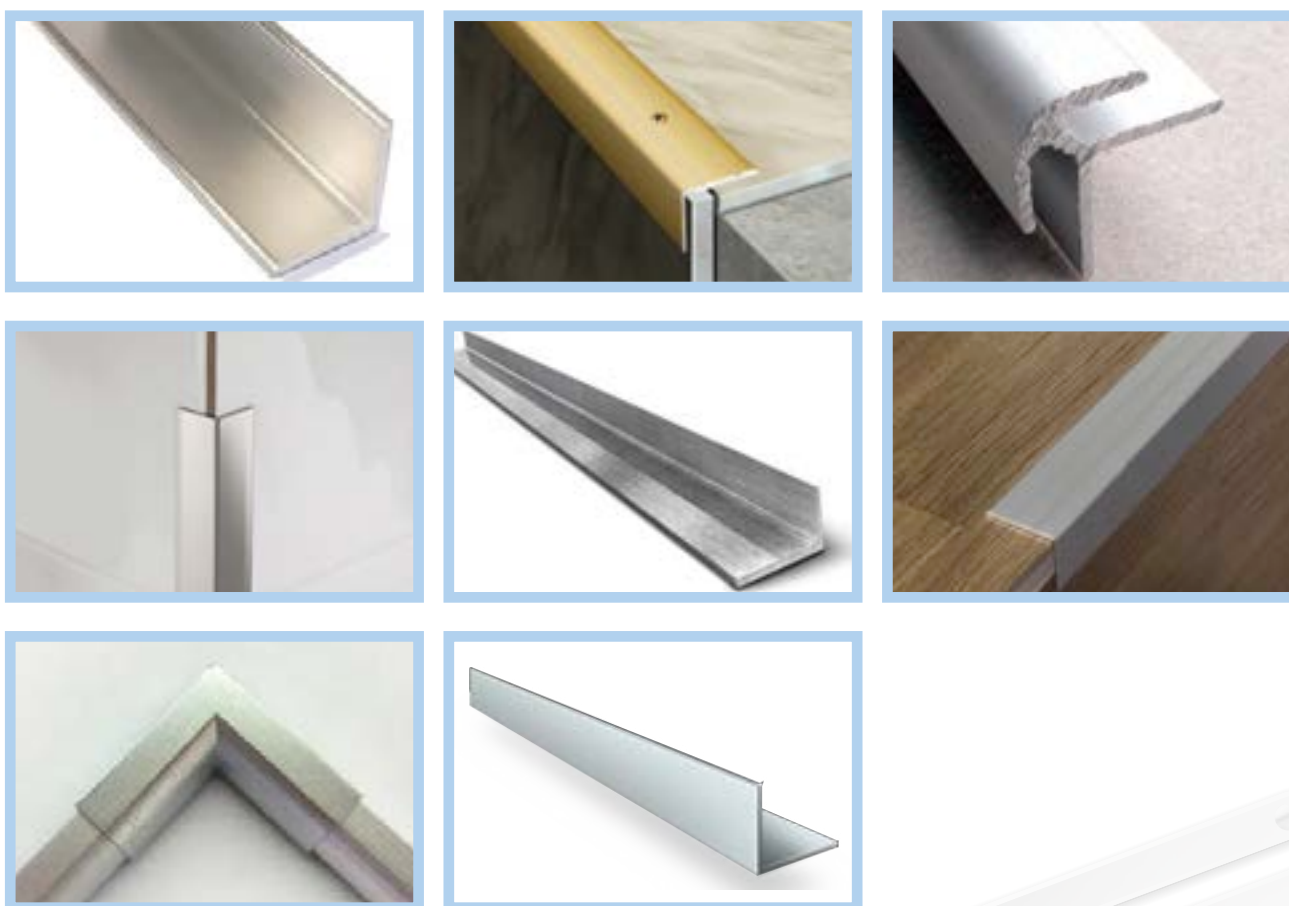
Depending on operating conditions, design features and a number of other factors, industrial aluminum profile can be subjected to color anodized or with different technologies (complex, two-layer, powder, polymer, liquid electrophoretic etc.). Furthermore, it may be subjected to heat treatment (partial or complete quenching or annealing), and produced with varying degrees of accuracy.



Aluminium area

Aluminum corner - it's metal profile with a solid T-shaped cross-section. Differ aluminum corners flexibility, ductility, strength, corrosion immunity, ease. Aluminium profile corner you can use in the installation of windows and office partitions, furniture, decorating rooms, building construction, tiling, domestic repair. Profile aluminum angle is made from a number of wrought alloys (D16, AD31, D31, AMg) of the sheets by cutting and subsequent bending. The material meets the requirements of GOST 4784-97. Angles characterized by a wall thickness ratio of the width of the shelves (the sides), more often equal angles. Aluminium angle profiles are perforated, profiled, decorative and so on. Equilateral aluminum angle corresponds to GOST 13737-90, GOST unequal made 22233-2001, GOST 8617-81. The length of the corners is 2 - 6 m, flange thickness - up to 14 mm, its width - 10 - 200 mm. The name often indicates only the width of the shelves and two (optional) thickness, for example, aluminum corner 30x30.

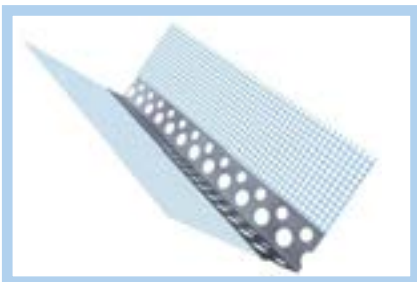
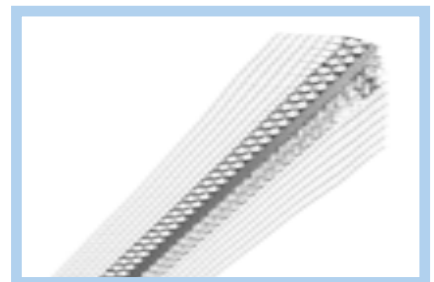
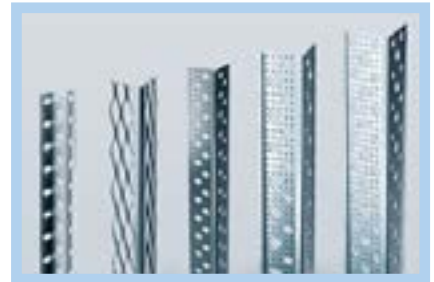
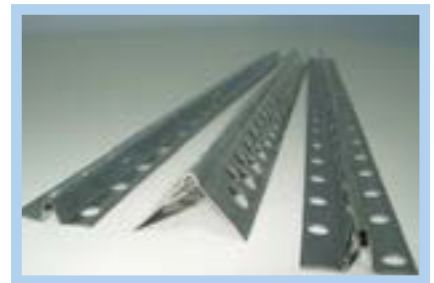
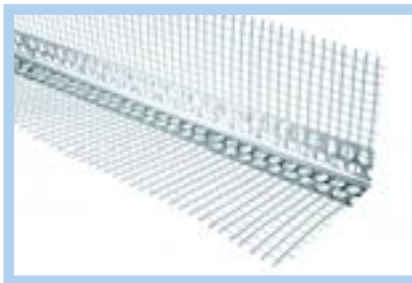
Small may have a decorative and protective coating (anodizing, paint). Aluminum corner anodized product is passivated influence of electrolytes, and the aluminum corner painted - powder coated or polymeric colorants.



Small perforated aluminum

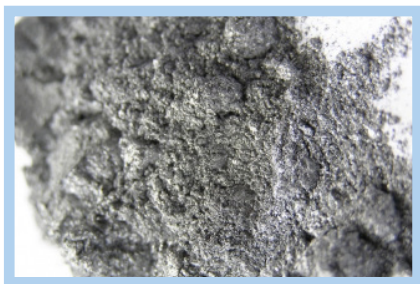
In our time, no repair cannot do without the alignment angles of the walls. Your attention is aluminum perforated corner. It's worth noting that the corners are perforated aluminum, plastic, with metal and fiberglass mesh. Such corners often have a length of 2.5 or 3

meters; the height of the boards is 25x25 mm. The perforated area has an angle of 90 degrees, thereby adheres to the substrate. Cut a corner is possible by means of ordinary scissors on metal. And so, let's look at their differences. Small aluminum perforated. This area is used for interior and exterior corners of rooms, both inside and outside the building, the angle of protecting from damage. Angle aluminum plaster with metal mesh. Typically, this angle is used for the installation of window frames, door frames, as well as for exterior facades angles. Mainly used when working with cement-sand plaster. Small aluminum plaster with glass net. Apply for finishing corners plaster and cement plaster, as used in the reinforcement of foam and polystyrene foam. Application. On processed angle applied plaster or cement plaster, set exactly Corner aluminum plaster, and leave for a while (to secure). After making sure that the angle is set fixed, you are ready to spray him putty or plaster. You can buy aluminum perforated corner, both wholesale and packaging (in multiples of 100 pieces).



Aluminum powder

Aluminum application spectrum is wide enough. Due to its properties, the metal used in aircraft construction, car manufacturing, design, construction, and so on. One of the particular manifestations of the use of aluminum can be considered a product such as aluminum powder. Such alumina powder obtained after pulverizing the fused metal. The metal may be primary or secondary. Depending on the quality, which is aluminum powder will be marked with certain symbols. For example, the primary aluminum after pulverizing, the powder will be called PA. A number after PA represents the size of the final product granules. The aluminum powder is used in the mining industry as additives to explosives. Another application - ferrous metallurgy, which is responsible for the reduction of iron and is involved in many foundry processes. Aluminum powder in the chemical industry is not less in demand, as applied to certain chemical reactions. Even the car industry uses aluminum powder, when adding this material in rubber for tires. One kind of powder is aluminum powder. It has labeled PAP and grain sizes 1 or 2. Powder paints used as retroreflective elements, and in many building mixtures. Also, the powder is used to create aluminum powder. Another type considered aluminum nanopowder - comminuted mechanically or physico-chemically aluminum. Aluminum powder of this type has very little pigment, which opens up new application possibilities. Summary - obtaining those alloys that are almost impossible to obtain with melted metal or milled pigments having large.



Aluminum paste GPB1

Aluminum paste is made up of crushed aluminum particles and a binder additive. Actively used in the production of aerated concrete, rubber adhesives, paints, anti-corrosion grease, etc. For the production of aerated concrete as the blowing agent used aluminum paste GPB1 and GPB2. The methods of manufacturing the paste is dry and wet grinding method. A disadvantage of the first is the use of highly corrosion inhibitors to reduce the percent of spontaneous and unwanted chemical gasification reactions. On the other hand, the content of the binder additive in the wet milling using equals 15-30%, which significantly reduces dusting. The positive side of the dry method has a greater shelf-life and a higher content of active aluminum that affect the kinetics of the gassing stability performance and reduces the consumption of blowing agent. Aluminum gas-paste GPB1 for concrete includes a 78.3% mass fraction of active aluminum. The material contains in its composition aluminum powder PAP-1 brands with an organic additive (diethylene glycol). Packaged aluminum paste GPB1 in metal drums weighing from 25 to 45kg. Pasta has kinetics of hydrogen gas evolution expressed in the 10 cc 2 minutes. Indicator material particle dispersion was 50%. Unlike aluminum powder, aluminum paste GPB1 more uniform and safe to use, has a higher economic indicator. Through connectivity particle paste is less toxic and explosive.

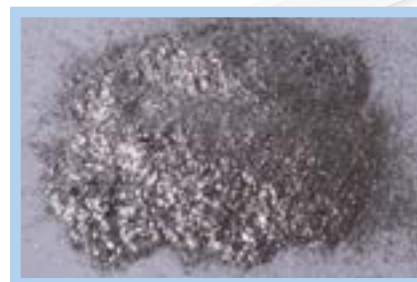
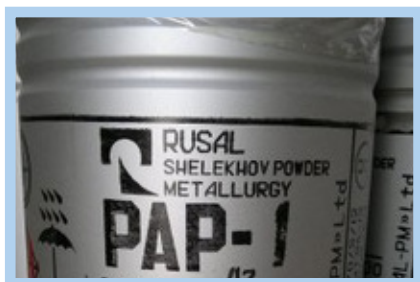


Aluminum powder ASD-4

Made of aluminum powder ASD-4 4 of primary aluminum GOST 11069 melt spray, which allows for very high dispersion. Powder consists of plate-like particles, their average thickness is about 150 nm. As a result, this brand is superior to similar powder brands PAP, UDD, PAA, PAG, made, for example, according to GOST 5494-95. Aluminum ASD-4 powder has a characteristic gray color and a marked metallic luster. Applicable as most analogs, chemistry, metallurgy, pyrotechnics during welding. Powder may be added in high-light and thermo-coating composites. In chemistry, this aluminum powder is successfully used for rehabilitation purposes. It reacts rapidly under acidic, neutral, alkaline environments. This releases hydrogen, which takes the basic rehabilitation functions. On composition aluminum powder SDA-4 based on aluminum (99%), it also contains impurities: copper, silicon, iron, etc. Less allowed titanium and magnesium content. Granulation usually characterized by a broad range of fractions, making the powder more versatile. SDA-alumina powder 4 has a bulk density of about 1 kg / l, less than 0.2% moisture. The specific surface area of 1 g of the powder is about 0.1 m². It packed in airtight metal drums or similar containers.

Aluminum powder PAP-1

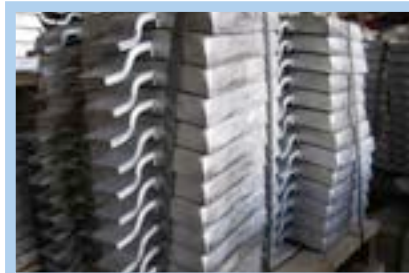
Aluminum powders are an essential element for the chemical activities, metallurgy, construction. Each type of powder is intended for use by certain industries. Among all aluminum powders one of the most consumed is considered aluminum powder PAP-1. The substance is a low toxicity; it is made by grinding primary aluminum in a special mill. The main difference, which has aluminum powder PAP-1 over conventional powder - is the size of the aluminum pigment. The powdered pigments is considerably less material involved in solving more problems. Aluminum powder PAP-1 is found in a wide variation of paints and adhesives, which is peculiar luster. Aluminum powder pigment plays a significant role in the production of aerated concrete. Such powders are often involved in the manufacture of gunpowder and pyrotechnics. In fact, the design has long used such aluminum powder which gives a special gloss surfaces. Various increasingly covered surface such powders or mixtures thereof. Through this use of aluminum powder is also called Serebryanka. Anti-corrosion properties of aluminum affect the application of silverfish in impurities to a special coating of steel. After adding aluminum powder in plastic goods improves the strength and increases the wear resistance of the material, reinforces the mechanical properties. Other methods of application: production of special water-resistant putty, production of other metals, for special fluids application.





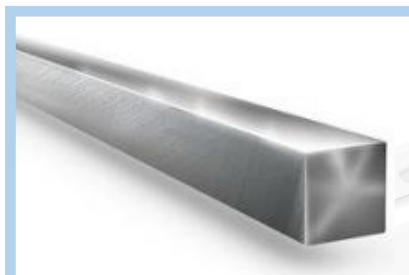
Protectors aluminum

Production, constantly improving, requires owners of property, to perform a set of measures, certain requirements of the corrosion protection of engineering structures. The most relevant, well-established introduction of the last decades of scientific and technological progress was security complex - protectors with aluminum painted steel surfaces. Installed outside of cabinet design, aluminum tread having a radius of more than three meters, provides corrosion protection for years. Mounted within the housing, it provides a protection for decades. The composition depends on the destination of the tread. The most frequent alloys containing aluminum base. Additive is a zinc, tin. zinc mercury additives are used at elevated requirements for current output indicator. Sacrificial protection of tanks for fresh water may be made only of aluminum-magnesium alloys, as required to comply with environmental requirements, in terms of the content of the safe concentration of the corrosion process products. The requirements imposed in part of tin, zirconium, iron, magnesium, zinc, manganese, copper, silicon, combined with GOST 26251-84. This allows you to organize the production of standard protectors, appropriate uniform parameters. Standard unifies the designation of the type, basic parameters and dimensions. Total issued four types of aluminum tread: squirrel (K) is not disconnected from the ballast (H), the suspension (S), adjustable (P). The letter appearing after the designation of the type of tread, it denotes the group affiliation: single (D), or group. The number after the hyphen denotes the mass. Then, the alloy contains brand, containing two letters identifying the base metal - aluminum (A), magnesium (M) or zinc (C), with the number of the ordinal number of the alloy. Rounding out the marking of the standard room. The marking is made in casting, also allowed the marking by impact 12 mm stamps. Available tread aluminum, must be prepared for installation by welding, or have a different kind of fixture corresponding to the destination. Delivery is carried out in containers or plank boxes, depending on the party, in consultation with customers. The accompanying documents must contain the name and (or) the manufacturer's trade mark, the alloy brand, size, mass party, year party, the standard designation. The five-year warranty is provided subject to the conditions governing the transport and storage. Accuracy when specifying the brand in order to obtain the necessary guarantees to the customer protectors.



Aluminum square

Aluminum square - solid oblong square profile. Occasionally here also include square tubes that mistake. Profile is applicable to the construction, decoration, design works, manufacture of furniture. But most popular square of aluminum as a blank for the subsequent production of specific products, details. Made mostly of aluminum square AD31, D16, AMg2, AMts, AMg6 AD1, D1, A0, and others. The alloys comply with GOST 11069-2001, GOST 4784-97, and others. The material is aluminum with additions of manganese, magnesium, copper, and others. Aluminum square comes unmeasured and measured length. It corresponds to GOST 21488-97. According to the standard for square rods fit standardized diameter circle, often it is 8 - 200 mm. This diameter commensurate with the side of the square. Maximum Length - 6 m. Ecological material differs, durability, corrosion resistance, lightness, workability, good conductivity, plasticity. Aluminum square nonmagnetic, available, cheap. This explains the demand for products in electronics, aviation, mechanical engineering and instrument making. The square can be hardened, old and annealed; released with normal and elevated precision workmanship and durability. The surface of the square rods may include non-essential defects. Available in square rods parties. It takes the necessary protection and labeling.





Circle aluminum

Circle aluminum - solid oblong circular cross-section profile. The circle is used for grinding out shafts, nuts, bolts, spindles, fasteners, bushings, valve. He produced in accordance with GOST 21488-97. Made of aluminum circle corresponding to GOST 4784-97 wrought alloys. This brand of blood pressure, AMG, E, AMC, AK. For example, a circle of aluminum produced duralumin D16T composition: aluminum (base), copper (less than 5%), magnesium (less than 2%), manganese (less than 1%) impurities. "T" subscript indicates that the material was quenched and naturally aged. The product is in demand in the construction, aviation, mechanical engineering, petrochemical, instrumentation, shipbuilding, food processing industry. bars Material released durability, corrosion immunity, resistance to temperature extremes, low density. Also, aluminum is flexible, non-toxic, easy to process, electrical and heat conductor, nonmagnetic, cheap, available. The largest diameter and the maximum length of respectively 400 and 6000 mm. Aluminum round timber can be hot-pressed, old, annealed, hardened; produced with high or normal precision workmanship and durability. The microstructure of the products should be characterized by the absence of burnout, if the heat treatment has taken place. The macrostructure may contain small foreign inclusions. There may be some external defects. Available in aluminum circles batches, equipped with protection against corrosion and mechanical damages and properly labeled.

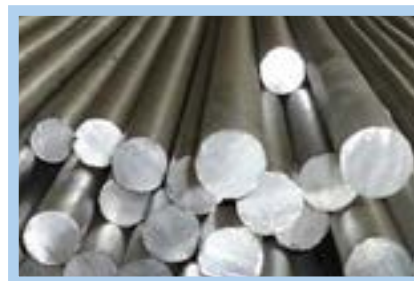
Aluminium rod AMg

Aluminium rod AMg - the best-selling product, used in the manufacture of industrial equipment, railway cars, vehicles, aircraft, chemical vessels, various semi-finished products. The produced aluminum rod AMg compliance with EU standards 21488-97. Produced rods AMg2 alloys AMg3, AMg5, AMg6. Products from AMg2 produced without heat treatment, the other rods are made often annealed. For a variety of specifications is permissible to use other magnesium-aluminum alloys. AMg1, AMg4 and other material meets the standards GOST 4784-97. Digital index in the alloy name indicates the percentage share of magnesium. The main components - aluminum dopant - magnesium impurities - chromium, beryllium, zinc, iron, titanium, copper, manganese, silicon. Aluminium rod AMg durable, corrosion resistant, lightweight, thermal and electrically conductive. The bars are welded well, deformed, handled and processed. They are divided on the alloy brand, its state of manufacturing accuracy, size, cross-section, of strength. The most common cross-section of the round product, less rod is hexagonal and square. The diameter of the round rods is 8 - 400 mm. For profile bars indicates the diameter of the inscribed circle is 8

- 200 mm. Aluminium rod AMg usually has a length of 6 m, inclusive. The macrostructure of products can be characterized by minor foreign inclusions and external defects. No microstructure prescribed burnout if heat treated bars. It comes aluminum rod AMg of bays or beams.

Rod aluminum D16T/D16

Rod aluminum D16T - dural kind of long products with a significant predominance of the length of the diameter. Perhaps a square, hexagonal, circular cross-section. The aluminum rod D16T easy, flexible, durable, chemically resistant, easy to weld, handled. Differs has sufficient electrical conductivity, high fatigue and static strength, can withstand temperature changes. Involve the metal in the construction, chemical industry, mechanical engineering. D16T aluminum rod apply in the manufacture of semi-finished products, metal, stampings, components, power components, chemicals. Typically, the cross section of the rolled metal round. Standard diameter is 8 - 400 mm. On the strength characteristics of the heat treatment affects the form hardening, non-heat treated condition, the natural aging process. For bars, hexagonal cross-section of which, or a square, a range of diameters (inscribed circle) is 8 - 200 mm. The maximum length of commodity bars - 6 m. Product D16T aluminum rod corresponds to GOST 4784-97 and GOST 21488-97. Material chemically rods is aluminum doped with copper (less than 5%), manganese (less than 1%), magnesium (less than 2%). Also present are impurities zinc, iron, zirconium, chromium, titanium, silicon. When storing the rods required by mechanical damages and corrosion protection. Delivery shall be Party, ordered the presence of accompanying document on quality and marking prescribed.



Hexagonal aluminum

Aluminium hexagon is made according to the standards GOST 21488-97. Products are classified by the following parameters: accuracy (normal, increased, high), heat treatment (without the use of heat treatment, hardening, annealing), strength (normal, high). The main dimension is the nominal diameter of the inscribed circle, which varies from 8 to 200 mm. The rest of the geometric dimensions and tolerances is also regulated by GOST. Aluminum is used for manufacturing the main element with the content of 98.8% to 99.5%. aluminum alloys with aluminum percentage share is also used by 84.25% to 97 - 98%. The main technological manufacturing method - hot rolled on specialized mills. Then, if necessary, the rods are subjected to heat treatment. Example of possible symbols: bars D16.T.PP SHG50P × 1000KD GOST 21488-97. Stands: D16 - used Alloy, T - hardened, naturally aged, PP - high strength, SH - hexagonal profile, 50 - the diameter of the inscribed circle, 1000KD - length that is a multiple of 1000 mm. Applying the stamp bars labeled at the outlet end (away from the end face must not be more than 50 mm) with the OTC company, brand or aluminum alloy, the type of heat treatment, a batch number. You can also be marked with paint or label. For storage covered by special anti-corrosion coatings. Supplied separate rods or beams for the price of 1 kg. Hexagonal aluminum because of its light weight, high corrosion resistance can be used to produce many products in almost all major areas of mechanical engineering.



Pipes of aluminum alloys

Pipes made of aluminum alloys - one of the most popular and common types of rolled aluminum today. Benefits:

high throughput due to the low roughness coefficient; workability (easy to work);

resistance to chemical and atmospheric influences;

strength and light weight design due to the small specific weight of aluminum tubes.

Aluminium pipes are widely used in manufacturing, construction and industrial applications due to advantages over aluminum and steel:

conditioning and ventilation systems;
shipbuilding;
aircraft;
manufacturing ferrules, cable joints and connectors;
supply of natural gas;
manufacture of furniture;

Laying of engineering networks. In the pipe manufacturing methods can be divided into welded, welded, cold-pressed and. On the finished aluminum products, according to GOST cannot be vesicular formations, traces thermal burnout and cracks - visible flaws. sectional form:

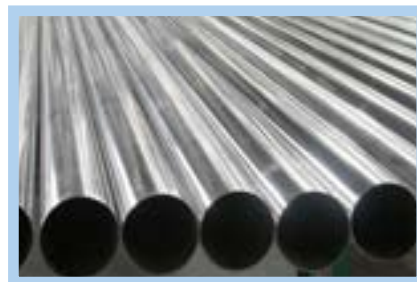
oval aluminum tube;
aluminum round tube;
Aluminum square tube;
rectangular aluminum tube.

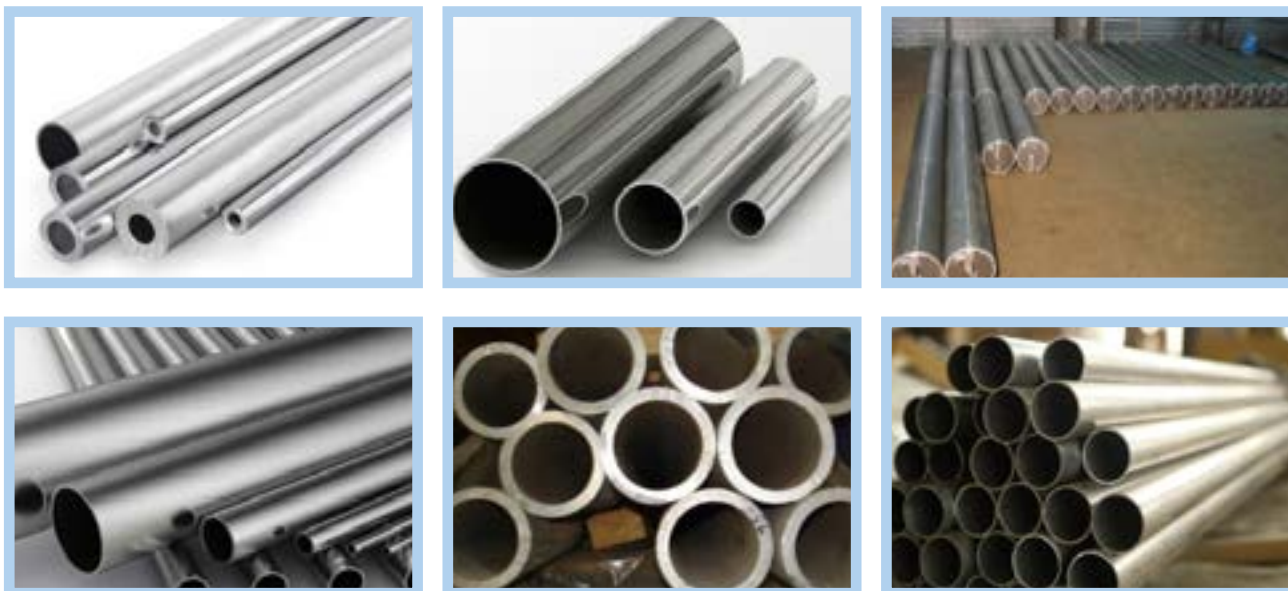
According to the thickness of the pipe walls are thin-walled and thick-walled. Upon contact with the exterior surface of the tubes of aluminum tends to be covered by patches of gray, which greatly spoils the appearance. In most cases, to avoid these processes, manufacturers of anodized aluminum. When anodizing is formed on the surface of the oxide film using electrolysis. Anodized aluminium tubes acquire anticorrosive properties and become more resistant to corrosion. Also produced naturally aged and hardened aluminum tubes - T, artificially aged and hardened - the T1, tubes without heat treatment and annealed - of M. Stamps aluminum tubes:

A7, A6 and A5 (GOST 11069-2001);
AMg5, AMg60, 1925S, 1915, 1925, V95, AK6, AD31, AMgZ, AMg2, D16, AD00, AB AMTSS, ADSAMTS AD, AD0, AD1, D1 AMgZS, AD35 (GOST 4784-97);
VAD1 (GOST 1131-76).

Possible diameter - 6 mm - 340 mm.

sectional wall thickness - 0.5 mm - 43 mm. Aluminum tubes to sixty millimeters are bound in bundles, and the label attached to them with all the necessary information. At the end of the pipe with a diameter greater than 60 mm should be listed brand, state of the material, brand control and batch number. Pipes supply of cove communicate in three places.





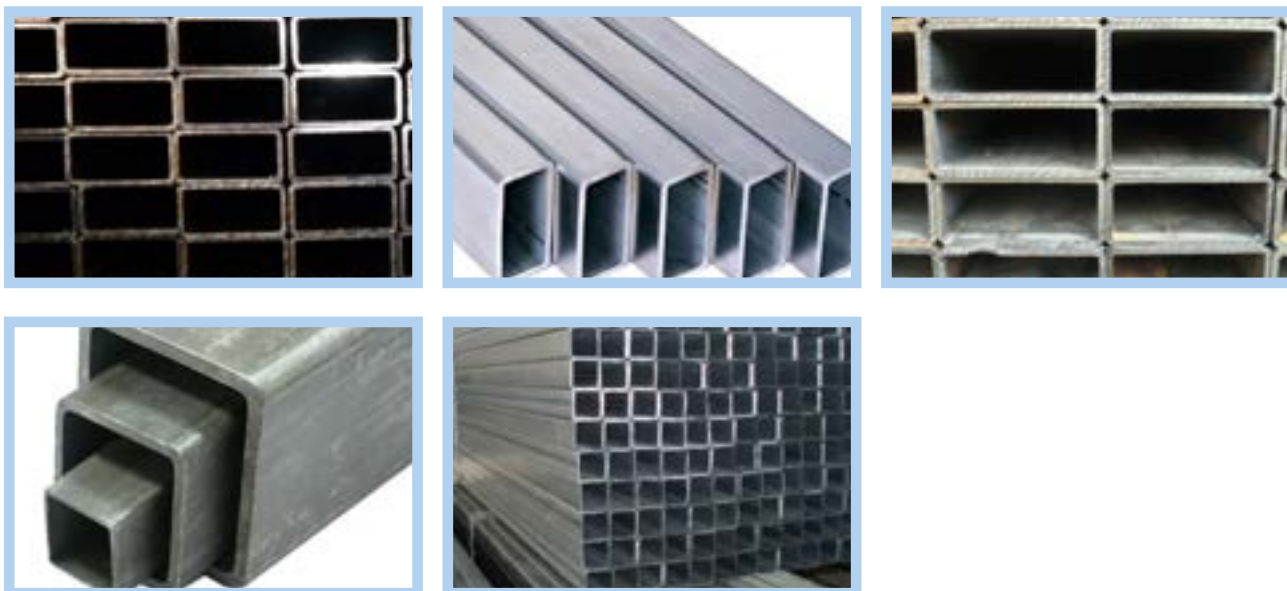
Aluminum pipe profile

Sectional tubes - products with an internal cavity having a different cross section. Used for a variety of tasks. These tubes are made from a variety of materials, depending on the tasks. The most common steel and aluminum. In an equal price range Aluminium profile tube has the main advantage - resistance to corrosion and high ductility. Aluminum lends itself to machining and easy to work with. Pipe aluminum profile has the following dimensions: the wall thickness of 0.5-40 mm, an outer diameter of 6-300 mm and a length of 1 to 12.5 meters. There are different methods for producing such products. The aluminum pipe can be cold-worked, molded and welded longitudinally welded alloy. All production methods are confirmed by a variety of guests, which provides a guarantee of quality. Pipe aluminum profile section has a lot of options. There are square, round, rectangular, shaped section. It is worth noting that the same aluminum tube profile has a wall thickness grading. Tubes with wall thicknesses less than 5 mm are thin-walled, and all have a thickness greater than 5 mm - thick-walled. Used to produce a variety of materials, because the Aluminum profile tube which is so valued in the construction, must perform a variety of tasks. All the materials from which produced aluminum tube, can be divided into groups, depending on the guests who they meet. The first group - Group A alloys (5-7), the chemical composition of which is specified in ISO 11069. The second most commonly used include alloys such as AD31, AD1, AD00, AMG V95 and many others listed in GOST 4784-74. The aluminum pipe manufactured from VAD1 alloy belongs to the third group, the production of which is controlled in accordance with GOST 1131-76. Another criterion for classification is the state of the material. Aluminium tube can be annealed (M), work-hardened, hardened (Aged artificially or naturally - T and T1), work-hardened and tempered (Aged artificially or naturally). The last type of qualification is considered to be the length of the pipe. Aluminium profiled tube can be cut length, random length, the length of a multiple dimensional and in coils (for certain materials, such as AD00, AD0, AD1, A5-7, AMts, AMtsS).



Aluminium rectangular tube

Pipe profile rectangular section of aluminum - an aluminum rectangular tube, also known as an aluminum box. It is well suited for the construction of structures with large spans, ventilation ducts, drainage. Without losing strength and other useful properties of aluminum rectangular pipe bends well. It is resistant to high and low temperatures, the aluminum pipe is not rectangular nor is harmful to the environment or to humans, is a good conductor of electricity and heat. Great weldable and corrosion resistant, easy to transport. Available in aluminum rectangular pipe stretches from 1 meter to 6 tubes, sections 140 to 150 millimeters, issued no more than 4 meters in length. It comes aluminum rectangular pipe segments unmeasured, dimensional and multiple lengths, depending on the section. Rectangular tubes of aluminum AD1, AD0, A5 and aluminum alloys AMg0,7, AMg1 1955, AD31, sections up to 16 mm inclusive, with a wall thickness of 1 millimeter thinner segments produce random length. The largest deviation in size or multiple pieces of measured length should not be more than 1.5 centimeters. Pipes multiple lengths are available based on the 5-millimeter allowance for subsequent cutting. The pipe must be a straight line, a tolerance in a 1-meter length.

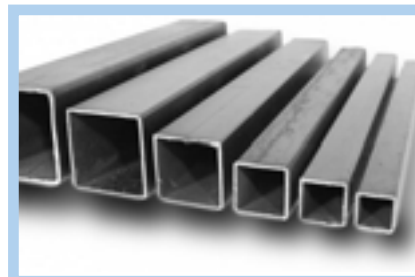
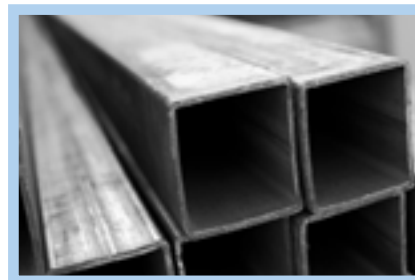


Square aluminum tube

Has many advantages and aluminum alloy made from his tubes and profiles are highly popular in many industrial and construction sectors. Classification can be made of aluminum rolled products in the form: shaped pipes, rectangular, square aluminum tube and round. Aluminium square tubes have been successfully used in the construction of buildings, machinery and other dimensional structures. This form is popular in architecture and construction. Square aluminum tube is strong enough, because it has a symmetrical wall and is better able to resist external pressure. In the manufacture of aluminum tubes technology fall into three categories:

1. A method of pressing;
2. A method of welding an aluminum sheet;
3. The method of cold-formed aluminum wheel.

Also, there are various methods of processing material: cold-working, semicold-working, artificial and natural aging. During cold-working square aluminum tube becomes much stronger, which improves its performance. The pipe is made of square aluminum alloy grade AD31, wherein immunity to corrosion and low temperatures. Easy, low strength of the alloy contributes to the production of pipes with complex configurations without changing the characteristics of the product on the bending areas. Square aluminum pipe may contain an impurity material of silicon, magnesium, titanium, iron, and copper. alloy modifications are distinguished by the degree of heat treatment used to increase the hardness of the brand. Mark AD31T1 denotes an aluminum alloy, which reached maximum strength during heat treatment. Square aluminum tube labeled AD31T5 the alloy, has passed step hot working and artificial aging. Tubes are available in lengths of not less than 2 m and not more than 6m. Square aluminum tube always cut off at a right angle. The aluminum alloy can withstand a temperature range of -80 to 120 ° C. Rolled aluminum found its use in the pipeline construction, pipeline, manufacturing of cryogenic equipment, as well as shipbuilding, aircraft construction and finishing works.



Aluminum drill pipe

Alloy drill pipe used in sets with the drill string and are used in deep, horizontal work. Drill pipes are made of aluminum alloy by direct hydraulic pressing. LBT are made of aluminum alloy D16, the chemical composition must comply with GOST 4784-74, supplied in quenched and naturally aged condition. drilling pipes are made of two types: TB - internal terminal thickening and TBP - a protective thickening in the center of the pipe. Drill pipe diameter size 73 and 90 mm are produced without thickening of the tread, are supplied without locks. Drill pipe of diameter 129 and 147 which differ thickening mm at the pipe end of the coupling operation area in the vicinity of rotor wedges. The main advantages of aluminum drill pipes are:

Lightweight products LBT weight several times smaller steel pipes.

High tensile strength that exceeds the strength of the steel pipes. Excellent vibration damping properties of the drill pipe, this feature allows you to reduce resonance in the system. In addition to conventional aluminum drill pipes used drilling aluminum tubes of high reliability (LAIDP). Among different drill pipe connection types, outer, inner and nipple. Because of the type of drill pipe connections have different cuts, LBT, ABT, LBTN and others. Aluminum drill pipe different cross-section and a wall thickness (4.75 to 11 mm). Pipe joints are special locks and semi-lockers equipped with coarse thread.



Retraction aluminum

Retraction Aluminum - duralumin connection element and aluminum pipelines designed to correct their trajectory. Produced often bends aluminum by stamping. The raw materials are leafy, pipe, and other blanks. Production is regulated by a number of specifications. Produced removal is seamless aluminum (curved, stamped, hot soaked significantly less cast) or welded (segmented, Stamped). Method of production depends on the mother's (highly doped aluminum significantly inferior in formability) and available raw materials. The material is a wide range of aluminum alloys. It AlMg alloys, BP AMts, D. regulating their chemical composition of GOST 4784-97. Manganese, copper, magnesium - main alloying components. Characterized removal aluminum angle bend, bend radius, wall thickness, outer diameter. The last two figures correspond to the standardized sizes of aluminum tubes, made in accordance with GOST 18475-82, GOST 23697-79, and others. The maximum outside diameters and wall thicknesses are, respectively, 300 and 40 mm. Bend Radius attached to the outer diameter. Its value exceeds the value of the outer diameter of 1 - 2 times. Bending angle (between axes) is generally 30-90 ° (step 15 °), and 180 °. In coordination sizes may differ, often bends are manufactured according to customer TK. Different removal aluminum number of advantages - lightness, corrosion immunity, flexibility, etc.



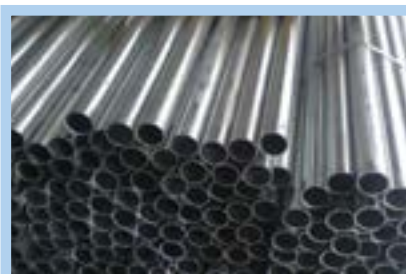
Aluminum pipe AMg

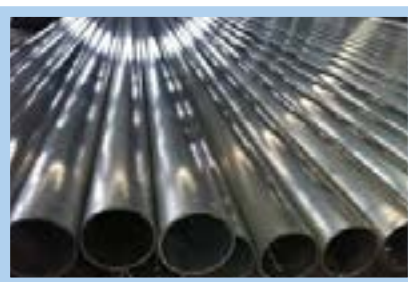
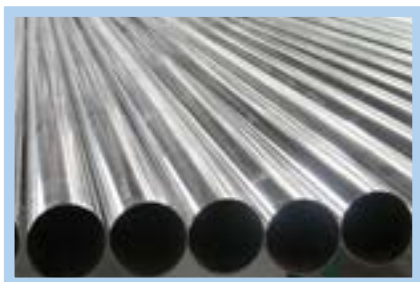
Aluminum Pipe AMg meets the requirements of a number of GOST. Pipes are divided into cold-deformed (GOST 18475-82), welded (GOST 23697-79), pressed (GOST 18482-79). They are made of alloys AMg1 - AMg5. Less well from AMg6. According to TU permissible use of magnesium-aluminum similar materials. It features an aluminum tube AMg durability, high chemical resistance, easy, relatively cheap, environmentally friendly, non-magnetic. Pipes in demand in shipbuilding and aircraft construction, road construction, petrochemical industry. They are applicable in the main pipelines, drainage systems, air ducts, chemicals. Chemical composition of the pipe is regulated by GOST 4784-97. Digital index in the alloy name indicates the percentage of alloying magnesium. The basis is aluminum alloy - zinc, chromium, beryllium, copper, iron, titanium, silicon, manganese. Introduction of magnesium significantly modifies the material. Significantly improved strength properties, but some other indicators deteriorated. For example, aluminum AMts pipe, being the closest analogue AMg pipe, characterized by a greater ductility and corrosion resistance, thus yielding a more strength. This is due to the predominance of AMts over magnesium manganese. Divided pipe heat treatment, shape, wall thickness, alloy. Aluminum Pipe AMg produced without heat treatment, cold-worked, annealed. Available in multiple, off-gage, cut length (less than 12.5 m) in bobbins, beams, coils. Most often AMg aluminum tube has a circular cross section. The wall thickness is less than 40 mm, maximum outer diameter of 300 mm.



Pipe aluminum D16T

D16T - one of the most popular brands of aluminum tubes, on the western classification is analogue, abbreviated 2024T3. It comes parties usually in bunches. D16T is a modification of duralumin alloy D16, heated to 500 degrees Celsius, followed by quenching in water. The letter T in this case stands for: hardened and naturally aged - usually about 4 days, as it was on the fourth day the alloy reaches its maximum strength. Production and composition are regulated D16T pipes GOST 18482-79 and GOST 4784. The chemical composition somewhat different from D16 - lower impurity manganese, a higher proportion of silicon and magnesium, resulting in D16 compared with higher strength but lower ductility. The formula according to ISO 209-1 - AlCuMgI. The proportion of impurities (in percentages, in descending order) Cu - 3,8; Mg - 1,2; Si - 0,50; Fe - 0,30; Mn - 0,30; Cn - 0,25; Ti - 0,15; Cr - 0,10, balance essentially aluminum proportion accounted for. Density varies 2,77-2,78 kg / dm³. Yield 450 MPa-, standard flow 275 (28) MPa - specific parameters depend upon the composition and method of treating a particular alloy. D16T aluminum pipe itself can be as a profile, and round, and the specific dimensions and drawings can be adjusted with the customer. D16T aluminum pipe is widely used in industry and the national economy. It can be used for feeding any gases and liquids, except for potable and industrial water.





Aluminum seamless pipe

Aluminum seamless pipe GOST 18475-82, and material parameters - GOST 4784-97. Pipes are divided over the cross section (shaped, square, round, rectangular) of the material (work-hardened, hardened, annealed, aged). Available protected with paint or anodizing. The materials are alloys AMg and duralumin. The first doped with magnesium (less than 6.8%) and manganese (less than 0.8%), and duralumin - copper (less than 4.9%) and also manganese (less than 0.9%) with magnesium (less than 1.8%). The basis of aluminum impurities does not exceed 2%. For a variety of specifications is permissible to use other alloys. Tube length is 1 - 6 m, a wall thickness of less than 5 mm, a diameter of less than 150 mm. Pipes knit into bundles, labeled, provided with the technical documentation, packed in shipping containers. Visually aluminum seamless pipe may sound like a pipe with seams, but is a completely different product. Aluminum seamless pipe is manufactured by two principal methods: a hollow extrusion ingot at an elevated temperature; similar extrusion when pre-insertion material blank with a special needle. Hence, the complete absence of a seam. It characterized this pipe resistance to pressure, heat, corrosion, deformations. Pipe aesthetic and durable. Used aluminum seamless pipe is most frequently in the chemical industry and construction. The demand is related to the ability of the pipe to withstand high pressure and to work in hostile environments. The product, moreover, quite durable.





Thin-walled aluminum tube

Thin-walled aluminum tube - a tube, the main feature of which is, among other aluminum tubes, is the ratio of wall thickness to diameter. Thin tube from aluminum are available in different shapes - round and shaped (square, rectangle). In the manufacture of aluminum alloys are technical AD1 doped magnesium AMG3, AMg5, AMG6, duralumin D16, D16T. Like other products of aluminum alloys, aluminum, thin-walled tubes are characterized by low density and ease. Technical conditions under which the produced aluminum thin-walled tube, described in GOST 18482-79. The composition and quality of going to the production of alloys are regulated by GOST 1131-76, GOST 11069-74, GOST 4784-74. Stamps alloys differ significantly in properties, due to different compositions. To increase the strength of the initially low peening methods are used, quenching and aging. Thin-walled aluminum tube can be made in three ways - by rolling, pressing or welding. 1-11,5 tubes have a length m, the wall thickness of 0.5-5 mm. Use thin-walled aluminum tube often for manufacturing of cryogenic equipment, furniture parts and appliances, as a casing for various electrical products, it is a carcass material in the manufacture of structures, used pipe for supplying liquid and gaseous substances.



Aluminum pipe of large diameter

Aluminum pipe of large diameter has a relatively low weight, high operational durability and maximum resistance to various chemical agents. Pipes of large diameter aluminum is used for transporting all kinds of liquids, they can be used for heating buildings are mounted technical conduits. It is used in construction of buildings and structures, shipbuilding, aircraft construction, in road construction. This use is because the aluminum tube has high corrosion resistance, so it is not going to the inner walls of plaque fluid flows evenly. Do not use aluminum pipes for drinking water supply. Produce square, round and rectangular tubes. They are subjected to, the manufacture of, a special heat-treated, quenched, ageing. So pipe receives the necessary qualities to it. Pipe diameter reached 800 mm, wall thickness 0.7 - 100 mm and a length from 2 to 6 meters. In the production of aluminum tubes is not used pure aluminum and alloys used in blood pressure, A7, AMC and others. Advantageously use the data pipes, they have a relatively low weight. The widespread use of aluminum pipes of large diameter due to the relatively long life.



Aluminum round pipe

By type of manufacturing pipe round aluminum can of cold, pressed or welded with direct suture. Condition material is aluminum or an alloy marked for hot-tubes, or by the following letters:

“M” -for annealed;

“H” -for cold-worked;

“T” -for naturally aged and hardened;

“T1” -for artificially aged and hardened;

“T5” -for artificially aged and not completely hardened; “T1N” -for artificially aged, cold-worked after quenching. In accordance with the standards of labeling, aluminum round tube to be marked with an indication of data on the alloy brand with the state of the material, cross section shape, the outer diameter and wall thickness, as well as room, among other, for example: Pipe AD1.T1N.KR.50h5 GOST 18475. Pipe aluminum round

is made in segments, the length of which - from 1 to 6 meters, and the interval length - 500mm. For tubes having a diameter of 140 to 150 mm in length is limited - 4 meters, no more. Maximum deviation allowed for the length of the pipe - no more than 15 mm. In GOST 4784-97 determined that the aluminum round tube made only of wrought alloys or rolled on their base, which is determined by the chemical composition of GOST 1131-76 and GOST 4784-97. Due to the low specific weight, easy deformation possible without heating and high corrosion stability of aluminum round tube is the most widely used in the petrochemical industry, as well as in some sectors of the construction.

Aluminum pipe AD31

AD31 aluminum pipe is profiled product made of a deformable aluminum alloy AD31 mark which belongs to a system alloys Al-Mg-Si, is resistant to corrosion, high ductility, electric conductivity. The basis of this alloy is aluminum, the mass fraction of which may be up to 99.3%, in the alloy also contains other elements such as Fe, Mn, Cu, Si, Zn and allowable impurities. The alloy lends itself well to various types of welding and preserves the anticorrosive characteristics on the spot weld. Pipes made of alloy AD31 light, are not affected by chemical agents and resistant to mechanical influences. They find wide application in the chemical, food and oil industries, the aviation industry and mechanical engineering. The ductility of aluminum tubes allows them to be used effectively in the construction of structures for the manufacture of windows, doors and facades of buildings, in the manufacture of furniture. Aluminium pipes can create structures with thin walls and a variety of forms, which possess sufficient strength and can be operated continuously. This grade has a high corrosion resistance, as well as aluminum tube AD1N, but surpasses it in strength and elasticity. Dimensions, which has an aluminum pipe AD31 may be different. Possible length of the product is from 2 to 6 m and a diameter of from 6 to 100 mm. Depending on the type of thermal exposure may be mild (M) work-hardened (H) or hardened (T, T1, T5) of the tube. Processing temperature increases the strength of the product, but reduces the ductility.

Thick-walled aluminum tube

According to GOST 18482-79 thick-walled aluminum and aluminum alloys is considered to be a pipe, in which the wall thickness is greater than 5 mm. The ratio of the diameter to the wall thickness of such pipes should range from 6 to 12.5. The main brands of alloys, which are made of aluminum tubes are: AD1, AMg3, AMg5, AMg6. The diameter can vary from 18 to 360 mm; wall thickness should not exceed the value to diameter ratio of 12.5; GOST 18482-79 length should be in the range of 1.5 to 11.5 m. The wall thickness allows the use of these products for liquid and gaseous substances under great pressure. Therefore, the main use of such pipes - chemical industry. Resistance to corrosion allows to maintain the tube in contact with aggressive media. Small friction coefficient allows to transport bulk materials as well. Thick-walled aluminum pipe used in wells with procuring natural resources. In construction it is used as a protective shell for utilities (electrical wiring, conduit) even under the ground, as well as the frame elements in the construction of buildings and structures.



Aluminium corrugated tubes

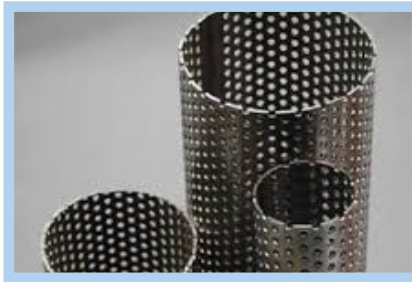
It refers to the semi-rigid spiral-seams ducts. Made of aluminum tape width of 50-65 mm and a thickness of 0.1 mm, by rolling on its edge rib special profile and connecting the castle. Then, to get a given diameter corrugated aluminum pipe on special rollers give birth to a profile in the lock by connecting the strip edges together in a spiral. Common standards on the diameter of the pipe does not exist. The most common aluminum pipe with diameters ranging from 75 to 310 mm. But we can supply the corrugated aluminum with a diameter up to 500 mm and the wall to 1.4 mm. Consumer corrugated pipe is supplied as a compact compressed pipe length not exceeding 700 mm, which are then stretched to a length of 3-4 meters. Since the corrugated aluminum tube has sufficient stiffness and good flexibility, it is widely used for non-industrial installation of ventilation systems. Bend radius of the duct may be equal to the diameter of the pipe, enabling the ducts laid without any additional fittings. This can significantly reduce the cost of materials and ease of installation and reduces its cost. The connection parts of air ducts are carried out by means of: direct and reduction of connectors, tees, crosses and knees respective diameters. In cases where a reliable fastening of pipes, the connection is allowed by means of mounting tape. Grounding corrugated aluminum does not require, as in the ventilation systems of its static electricity is not available. The temperature range that can withstand pipe - from -30 C to +80 C. It has high resistance to corrosion. The main drawback of these pipes is a high thermal conductivity, which resulted, in some cases, moisture can form inside the duct can occur. To avoid this, it is necessary to isolate the separate sections of the ventilation system. The second drawback - the inability to withstand high temperatures for a long time. Therefore, as the smoke from the exhaust of the boiler, fireplace or column corrugated aluminum tube is not used.



Perforated stainless pipe

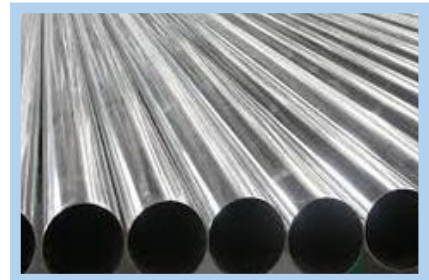
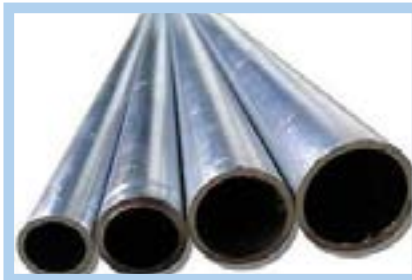
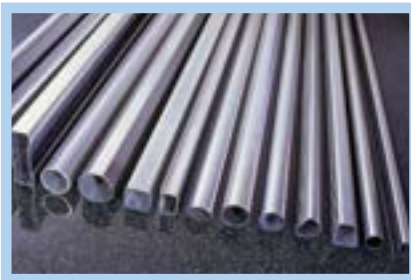
Stainless Perforated pipe is used for the manufacture of filters, drainage structures, automobile mufflers, showcases, racks and other constructions for trade and storage, in drilling water wells, construction formwork and repair ventilated buildings. Perforation of pipes - is often the same punching holes with the same predetermined center to center pitch. Perforation helps to reduce the weight of the pipe, while maintaining the functionality and durability. The diameter of the perforated design - 50 to 1650 mm. A perforated metal tube can be made of a conventional flat sheet or tube, with a further desired diameter by rolling. There are several types of perforation: round, square, oval and decorative. Possible perforation of the tube from materials such as steel, copper, brass, plastic, iron, aluminum, stainless steel with different markings. The most chassis brand of stainless steel AISI 304 meet in the Russian nomenclature 08H18N9, 08H18N10 and 08H18N11. The number "3" is a group of austenitic stainless steel, "04" - its grade. Sometimes at the end of specified features of the steel. For example, AISI 304L contains 0.03% carbon. The Russian first marking indicates the percentage of carbon content and then chromium and nickel. Well-known steel marking 430 standard AISI. She meets domestic brands 12X18H9T and 12H18N10Tb.





Aluminum tubes

Aluminum Tubes are multi-functional packaging cylindrical shape, one part of which is covered with the cap is twisted onto the threads, and the other - or repeated bending of sealing. This packaging protects the inner contents of the action of oxygen, ultraviolet radiation, moisture. Aluminum Tubes made from pure aluminum, which provides a sterile package, resistance to corrosive impacts, environmentally friendly and non-polluting toxic substances. The material is neutral in relation to the contents of the tube and allow him a long storage period. As containers for products of aluminum tubes are used for pharmaceuticals, adhesives, paints, cosmetics, foods and various household chemicals. Special blanks in the shape of disc with a pressing machine molded into tubes with thread and cut to the required length. The resulting package lends itself to mitigate and on the inside of the applied lacquer coating separating from touching the metal surface and the contents. For better sealing seal carry the widest part of the tube a special elastic ring. Tubes aluminum vary in length, since the thread on the neck, diameter, wall thickness, volume. Equipped with a cap of polypropylene or polyethylene, which provides sealing content after removal of the protective membrane. Aluminium packaging can easily be disposed of, or be subjected to processing.



Aluminum ingots

For the production of ingots of aluminum products used in the form of an aluminum bar. Such a bar has a trapezoidal cross section, and one or more kinks - in the cross-sectional constrictions are used to divide the ingot. These semi-finished products - aluminum ingots, has an extensive range of mass and chemical composition (e.g., aluminum or aluminum AD1N A6). The form of ingots is determined by way of casting. The shape of pigs rules are not strictly regulated. There are restrictions only on the maximum weight of the ingot - Aluminum ingots (ingot) must not weigh more than two hundred kilograms. Form release more weight is the aluminum slab or bloom. aluminum slab is a rectangular blank (weight not more than 45 tons). Blum - blank square mass not exceeding 15 tons. Smelted aluminum ingots and bullion, is often used as primary and secondary materials. In the second case it acts as a secondary raw material of aluminum scrap and waste. Industrial aluminum ingots often contain copper, magnesium, manganese, silicon, zinc and incidental impurities is not, for the most part a technological aluminum ingot alloy with additions of alloying elements.

Alloyed aluminum acquires new physical and chemical properties. Thus, aluminum-magnesium alloys are resistant to corrosion and high weldability (for example, aluminum alloy AMg6) aluminum ingot of the alloy claimed in mechanical engineering. Other brands, having a low resistance to corrosion, have high strength and toughness (aluminum alloy AD31, duralumin). Other alloys because of their strength and ductility at the same time used in the aviation industry (aluminum alloy VD17). For the production of bicycles popular aluminum 7005. A special place is occupied alloys produced by powder metallurgy - Sintered aluminum alloys. In this case, the material is made by sintering fine powder.





Aluminum castings

Casting - harvesting a certain product or a finished product. Production of castings has long been a common practice on a variety of foundries. Casting conventionally divided into several types: ingots, semi-finished products, shaped castings and finished products. For each of the types of materials used by the individual, set different GOST. The most common materials - steel, cast iron, aluminum. In the last few years it is the aluminum castings are produced in large quantities. The point of their lightness compared to other metals. Aluminium casting on a large scale to create several ways: aluminum gravity die casting, injection molding (low and high) and is not very popular in the molding sand and clay molds. The latter method has not caught on here, but widely used in Europe. For small amounts of casting method can be used in non-ferrous casting plaster combined form and method of investment casting. Aluminum castings made of cast alloys. Purification of aluminum alloys using flux and ceramic foam filters from.

These products a huge range of applications. Aluminium castings are used in electric motors as aircraft parts, etc. The main sectors of application are automotive manufacturing and construction. The main advantage of which are aluminum castings - a corrosion resistance and lightness. Provided the additional processing surface of the product with metal problems are excluded. The material can be used for multiple purposes, changing its color and thus it is strong enough.

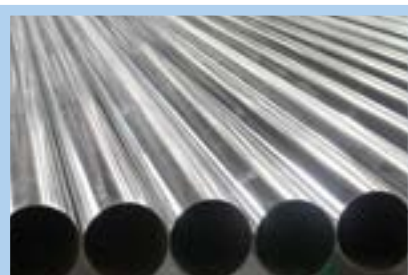




Aluminium 1561

Aluminium 1561 is produced in pigs, which may be different configurations, it is for aluminum transportation convenience. This form is most convenient for processing into semi-finished products and production of marketable products. It belongs to Aluminum 1561 magnal, i.e. It consists of 92% aluminum and 6 fundamentals% magnesium. Another designation of the same alloy - AMg61. Also, almost identical to the brand name it is SvAMg61 according to GOST 7871-75 and is very close - AMg6 according to GOST 4784-97. 1561 aluminum demanded in shipbuilding, industrial production. This is due to weldability, high corrosion immunity, ease, strength. This differs from analogues magnal reduced elasticity, increased strength, greater cost.

The alloy is thermally durable, as a result of easily forged, stamped, welded. Effective 1561 aluminum as the material for the speed of modern ships. Available in iron, a form corresponding to GOST 1583-93. From pigs then have produced specific products and parts. Commodity pigs usually weigh less than 20 kg, but can be made and large (more than 200 kg ingots). The macrostructure should be rid of waste and defects. The marking is done stamp or paint.





Aluminium 6061 (AD33)

Aluminium metal is soft enough - easily deformed and bent. The industry uses aluminum alloys that can increase the hardness of this metal is ten times. Thermally hardenable 6061 is aluminum-magnesium-silicon alloy, corresponds to GOST 4784-97 with the designation grade AD33 1330 and ISO 209-1 with the designation of the brand AlMg1SiCu 6061. The chemical composition of 6061:

Al (aluminum) - 95.8-98.6%.

Mg (magnesium) - 0.8-1.2%. The main element of the extension. It increases strength without reducing the ductility. Increases corrosion resistance and weldability.

Si (silicon) - 0.4-0.8%. It is used as an alloying element. Reduces cracking provides termosealing alloy.

Cu (copper) - 0.15-0.4%. Is used as an alloying element in conjunction with magnesium, zinc and silicon, increases the strength.

Fe (iron) - 0.7%. It provides significant resistance cast structure.

Cr (chromium) - 0.04-0.35%. Neutralize the possible negative impact of iron increases the strength of the alloy and welded joints.

Ti (titanium) - 0.15%. Pulverizes molten metal grains, reduces the tendency to cracking.

Zn (zinc) - 0.25%. It is used as an alloying element in conjunction with magnesium copper and improves durability.

Mn (manganese) - 0.15%. It is used as an alloying element - cold-grinding structure promotes, increases the recrystallization temperature, strength and heat resistance.

Other components - 0.15%.

As a kind of semi-finished product for the manufacture of sheets, pipes, wires, and other aluminum rolled products, aluminum ingots cast in 6061 for subsequent remelting ingots is a different mass and shape. aluminum ingots to 6061 requirements for compliance with the technical specifications indicated by GOST 1131-76 "wrought aluminum alloys in ingots."

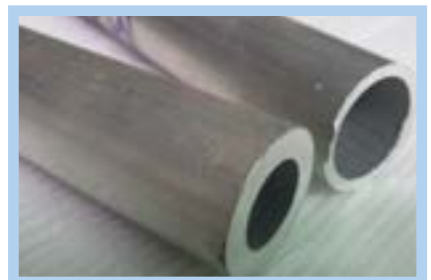
Standard defines brand, size, chemical composition, type and purpose of processing alloys, weight, size and shape of ingots. Each ingot undergoes strict quality control. According to the specifications on the surface of pig must not be present sagging, bays, slag and other foreign elements (including a break). Ingots of aluminum 6061 large size should not have cracks deeper than 10 mm, however, there may be traces of cutting and stripping defects. Each particular batch of products should include pigs of the same brand and size. The accompanying document must contain:

name of the manufacturer and the product;
batch number;
number of heats;
chemical composition of each heat;
alloy brand;
the mass of the party;
Standard notation.

Each pig of 6061 is marked, which contains:
trademark or manufacturer's name;
heat number;
alloy brand;

The use of aluminum alloy 6061. This tech is different sufficient strength, the ability to termosealing and plasticity, easily welded and processed, has a considerable resistance to the emergence of corrosion. Alloy is ideal for the manufacture of parts operating under high humidity and even in sea water, in a temperature range of -70°C - $+50^{\circ}\text{C}$.

6061 provides an opportunity to increase strength while reducing weight by using triple butted technology, creating a variable thickness and oval design of the walls. The above characteristics allow the use of 6061 in the automotive industry, aviation, shipbuilding, railways, construction, electrical engineering, aerospace, oil and chemical industries.



Aluminium A5

Significant place in the metallurgy of aluminum covers. It belongs to a series of light metals and is one of the most applicable metals. This lightweight metal is silver. It's pretty easy to various types of processing and processing. Aluminum has a high thermal conductivity and resistance to corrosion. There is such a thing as a "pig". A metal casting in the form of a bar or a trapezoid. Chushka is a semi-finished product and shall comply with the requirements of GOST. Aluminum is often used A5. For the production of this brand is often different aluminum scrap. It can be divided into two stages of the manufacturing process itself. In a first step aluminum is melted in furnaces, various impurities are introduced hereinafter, whereupon liquid metal is poured into forms and crystallize. Used aluminum ingots A5 quite widely. Most often it is used for further processing in rolled aluminum. A5 Aluminium ingots do not require any special storage conditions for it. The material safe for health and do not contain any hazardous chemicals.

Aluminium A7

Aluminum grade A7 refers to primary aluminum of commercial purity and comes in the form of ingots. To this brand requirement set GOST 11069-2001. According to them, the proportion of aluminum in the chemical composition of this mark must not be less than 99.70%, respectively, and the proportion of impurities must not exceed a total of 0.30%. If this metal is used for the production of food dishes, the arsenic content should not exceed 0.015% by weight therein. Aluminium A7 corresponds brand EN AW-1070A European standard EN 573-3-94 and marks 1070, 1070A American Aluminium Association. aluminum Marking A7 is as follows - in the pig indelibly applied to a pair of vertical yellow stripes. In addition to the marking shall be indelible, it is presented is another requirement - it should not be a source of contamination. Primary aluminum is produced by electrolysis. Original raw material for its production is bauxite and nepheline ore.

The contract for the supply of primary aluminum are installed:

list of impurities and the share of each of them;

method of calculation of the brand;

the contents of the document on the quality;

shape, size and weight of the pigs. The document on the quality, attached to each batch of aluminum ingots A7, indicate:

Supplier name;

mark;number of heats;

number and weight of the party;

Chemical analysis results for each melt.

Information on the first three points can be applied paint or stamp on every pigs. For transportation of pigs used in accordance with GOST 21399-75 special packages.

Aluminium AB87

Aluminium AB87 applies to secondary aluminum. It is produced obviously, aluminum raw material (waste, shavings, scrap, defective products) in the form of chunks, and pellets.

This brand often applies for deoxidizing steel. This is due to the high cost and technological complexity of the production of primary aluminum. However, aluminum AB87 largely not lost primary. Technical aluminum can be melted down repeatedly without loss of properties. It is permissible to use as a non-critical purpose alloy. Also in demand in the production of brand Ferroniobium, ferrochrome, ferroboration, silikotsirkoniya, ligatures, aluminothermy. Commodity aluminum AB87 meets the requirements of GOST 295-98. It consists of aluminum (over 84%), magnesium (less than 3%), silica (less than 5%), tin (less than 0.2%), zinc (less than 3.3%), lead (less than 0.3%) copper (less than 3.8%). The combined share of less than 13% of impurities. Mark AV87f characterized by low tin content.

Available in aluminum AB87 in small or full-sized pig. Reserve their mass, respectively, is 4 and 20 kg. Valid for harmonization and pigs over 200 kg. On the surface of the foreign matter is unacceptable, but allowed shrinkage shells. Other Technical requirements can be agreed and established in addition. Label ingots vertical stripes of red and green colors. Available pigs in containers (small-sized), unpacked (large), in packages (standard).

Aluminium AD31

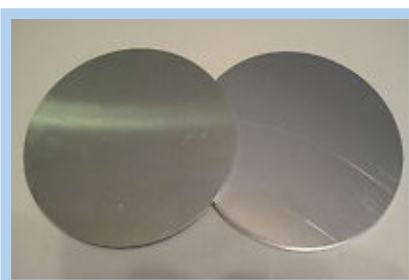
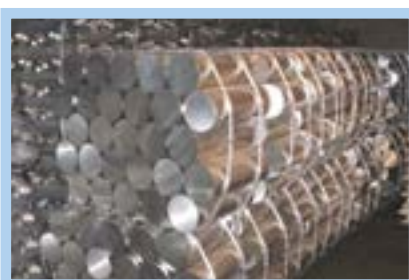
AD31 aluminum alloys belong to the group of Mg-Al-Si, which features high formability. The main advantage is the excellent plastic properties. Fantastic, rolled, stamped, drawn and amenable to other types of treatment. As AD31 aluminum has high corrosion resistance and is hardened by heat treatment. In the annealed condition it has a tensile strength of 10-12 kilograms per square millimeter, and after hardening reaches 18-20 kilograms per square millimeter. Elongation at this reduced by 15-20%. Increasing the strength of the alloy and possibly at a temperature of 160-190 deg., But it is a destructive effect on the properties of the plastic. The main components of the aluminum alloy AD31 are magnesium (Mg), aluminum (Al), silicon (Si) and iron (Fe), and assume a number of impurities (Cu, Mn, Zn, Ti). Where Al main component, the proportion of Mg is 0,45-0,9%, Si 0,2-0,6% and Fe 0,35%. The proportion of impurities does not exceed 0.1%. Technical requirements for aluminum alloy AD31 regulates GOST 4784-97. Alloy used for the manufacture of parts of low strength, which are required to excellent corrosion resistance and decorative appearance. Examples can serve as the cabin of aircraft and helicopters, escalators, door frames, car body and so on.

There are three most common form of ingots. This ingot weighing 7-7.5 kg, 13.5-14.5 kilograms and 16 kilograms. Standard limits themaximum weight of 20 kg ingots. Ingots due to its trapezoidal shape is very compact fit in a pack. Packages are packed

and bound with tape or a metal wire.

Aluminium AK12

Aluminium AK12 refers to silumin, i.e. silicon and aluminum alloys. This alloy prevalence close dural but more resistant to corrosion under high humidity, in sea water, a weakly acidic and in alkaline environments. According to durability and strength, however, win Duran. Weldability, density, conductivity types of the two alloys are virtually identical. Characterized aluminum AK12 good casting characteristics - high fluidity, low linear shrinkage, low tendency to crack, low melting point (560 ° C). Widely demanded aluminum AK12 in aviation, mechanical engineering, automotive, sculptural technique for household and sanitary purposes. It is applicable in the manufacture of molded parts in appliances, thin-walled castings, housings, hubs, pistons, wheels, auto cylinders units, heat exchangers, grinders, casings and pumps more. Product Aluminium AK12 GOST 1583-93. It consists of a silicon (10-13%), aluminum (base) of impurities (less than 2.1%). The latter include iron, copper, zinc, manganese, nickel, zirconium, lead, calcium, titanium. Depending on the proportion of impurities, the alloy passes the appropriate heat treatment. This silumin ingots produced six brands: AK12zh, AK12och, AK12pch, AK12ch, AK12P, AL2 (or AK12). They differ only impurity ratio. Also AK12 produce aluminum castings. Pigs must weigh less than 20 kg (in consultation available mass products of more than 200 kg), to be rid of toxins and other impurities, cracks and other defects. Marked ingots indelible ink or branded. Ingots small mass is formed into packets (the total mass of less than 1500 kg) for heavy castings is required.



Aluminium AlMg (aluminum-magnesium alloy)

Aluminum alloy AlMg refers to the alloys Al-Mg system or magnalium. The alloy of properties similar to pure aluminum and has a high strength, high resistance to corrosion in alkaline and acid medium, plastic and all kinds of well amenable welding. The chemical composition of the alloy of magnesium in addition to aluminum, the mass fraction which can range from 0.5 to 6.3%. Alloying of magnesium imparts additional hardness and strength. Aluminium AlMg easy to various types of hot or cold deformation. This quality allows the use of rolling, forging, pressing, drawing, sheet metal stampings in the production of an alloy of various types of semi-finished or finished products. Is used to harden the alloy cold deformation, which is an increase in hardness and strength, but reduces the plastic properties. To restore the plastic properties of recrystallization annealing is carried out. When labeling after the lettering alloy composition follows a figure which indicates the magnesium content in percent, for example, AMg2 contains about 2% magnesium. Depending on the thermal effect of the alloy can be rolled without heat treatment, annealed (M), cold-worked (H). Widely used AMg aluminum in construction, shipbuilding, mechanical engineering, oil industry, aircraft construction. It is used to create medium loaded building structures, elements of pipelines, production of various parts, such as rivets, containers for liquids, automotive radiator and fuel tanks, masts and hulls of vessels, elevators, cranes nodes.



High purity aluminum

High purity aluminum produced by electrolytic refining. With this method, reduced in aluminum content of gaseous impurities and metal because it greatly increases its conductivity and corrosion resistance, which can not affect the cost and quality. The refining of electrolytic aluminum by electrolysis of molten salts is carried out by a method of three-level. The inventive method is enclosed in the following. Three layers are melted in the refining cell. The layers are arranged harmoniously. The lower layer - the most difficult, is located on the hearth, which is conductive; it serves as the anode.

A layer of synthetic heavier copper. The middle layer is represented as incandescent electrolyte, its density is much less than the lower layer. Third layer - this layer refiner, it is the easiest and presented in liquid form. Upon dissolution of the anode current, all the impurities that are more electropositive than the aluminum alloy is forced to remain in the anode, not passing into the electrolyte itself. Soluble only pure aluminum. The anode is usually prepared from an alloy of copper and pure primary aluminum production, in which the metal is introduced in the amount of about 30-40%, no more. The final density of the anode composition somewhere $3.2-3.5 \text{ g / cm}^3$; the density of pure aluminum cathode is only $2-2.3 \text{ g / cm}^3$. It is in this harmonious relation of three layers, create the necessary conditions for good separation.

Aluminium A995

A995 aluminum applicable in the production of deformable semifinished products. Flat bars, rods, ingots and powders etc. Further semifinished go into sheets, tapes, wires, and other products. Product A995 aluminum ingots is (GOST 11070-74) bars any possible configuration, shape, weight. Dimensions pigs are not standardized, the product can be produced even bulky. These parameters are negotiated between the clients, but the mass of products is almost always 5-1000 kg. Aluminium A995 in such a form suitable for transport and subsequent melting. high-purity aluminum has a lower density, extremely high purity, greater thermal conductivity, ductility, conductivity and resistance to corrosion. GOST 11069-2001 it is released following chemical composition: aluminum (over 99,995%), gallium (less than 0.003%), silica and iron (less than 0.0015% each), and other impurities (less than 0.001% each). Also Standard specifies requirements for quality control and other standards. The produced aluminum A995 is marked by four vertical stripes, drawn indelible green ink. By agreement of clients allowed marking and other method. Chushki should not be on the surface of the slag, foreign inclusions and other impurities. Also not allowed is not clogged cracks. Other requirements as discussed with the manufacturer. Guests who meets A995 aluminum ingots, dictates the structure, acceptance of rules, some of the conditions of transport, storage, packaging, environmental requirements.

High purity aluminum A999

Aluminium KhCh is characterized by relatively high ductility, chemical resistance, electrical conductivity, and easily applied in electrical engineering, chemistry, and other fields. Unalloyed aluminum has used in the manufacture of rectifiers, capacitors, semiconducting appliances, transformers, cables massive, microcircuits. Also high purity aluminum A999 successfully replaces copper. This aluminum is produced in three ways: through subhalide distillation, zone melting, electrolysis of organic aluminum compounds. zone melting method is most in demand in the domestic industry. According to GOST 11069-74 (still relevant in the CIS), high purity aluminum A999 may contain a total of less than 0.001% of impurities. This zinc, silicon, titanium, copper, iron and other ingredients which do not affect, however, the properties of commercial aluminum. The material can also be labeled as aluminum A5N - compositions of

the two marks are identical. Product aluminum is produced in the form of pellets, wires, rods, powders, ingots, shavings, bars, ribbons, rods, flakes, tablets, cones and other products. The products comply with a number of different standards. Available usually in small lots (0.3 kg), there are many forms of delivery. In particular, the dosage granules are normalized diameter, packed in plastic containers, each consignment is accompanied by a certificate.

Primary aluminum A99

Primary aluminum A99 comes in the form of wire rods, strips, bars, ingots, and so on. It is characterized by chemical inertness, high ductility, electrical conductivity, low density, large heat resistance, weldability. Prepared by a three-layer A99 aluminum electrolytic refining or high-temperature distillation through halides. Aluminium ingots - the most demanded form the A99 brand delivery. Ingots are further processed and melted into the wire, extruded products, cable products, castings, powder, pellet dosage, and other semi-finished products and rentals. The most common primary aluminum A99 is engaged in electrical engineering (electrodes, capacitors, integrated circuits, transformers, semiconductors), which replaces the active copper. Perhaps the use of the mark and in other industries. In accordance with GOST 11069-2001 aluminum A99 collectively comprises less than 0.01% of impurities that affect the properties of the material only slightly. This gallium, titanium, zinc, manganese, iron, magnesium, silicon, copper. Technical requirements dictated ingots GOST 11070-74. Shape, size, weight ingots / bars are standardized, but are allowed by agreement and other sizes. Packed primary aluminum ingots A99 stacking in containers or, in the case of large ingots supplied without packaging. Marking ingots of aluminum, four vertical black stripes inflicted indelible ink. Also, the presence of prescribed heat number, grade aluminum, net weight.



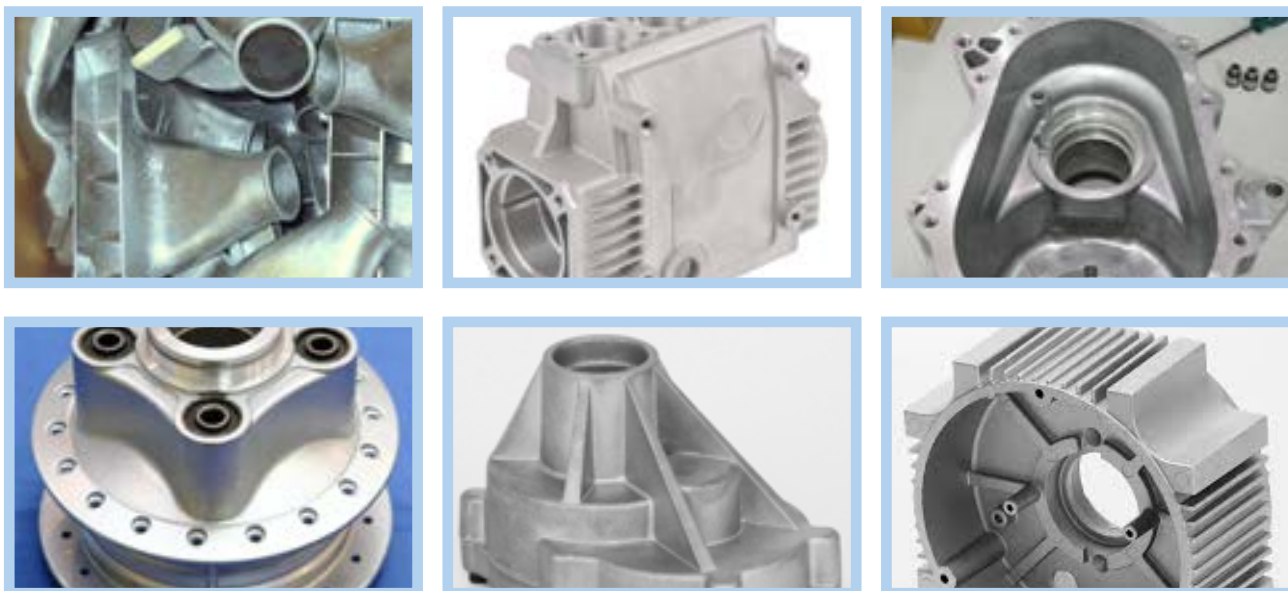
Casting aluminum alloys

Cast aluminum alloys, there is quite a huge amount, it is customary to label their letters AL (aluminum alloy, foundry). According to GOST casting aluminum alloys are divided into groups:

1. Alloys with high casting properties, which are doped with silicon, also called silumin. These casting of aluminum alloys are characterized by such features as a low casting temperature fluidity, low mechanical properties. Cast aluminum is used for the manufacture of complex castings, which do not take significant loads. Simple Silumin - aluminum alloy AK12 (AL2) - durable heat, resistant to corrosion, has low shrinkage, fusible, it has high fluidity at low mechanical properties. Variety AK12 alloy - aluminumAK12pch where the inverter is of high purity, demand in the engineering industry, in the food industry. Widely applicable aluminum AK7 (AL9V), which has a low density, excellent high-temperature strength, ductility.
2. Splavy aluminum-silicon-copper (AL3, AL5 et al.).
3. Splavy aluminum-copper (AL7, AL9). These alloys include copper considerably, which is why they are more expensive.
4. Splavy aluminum-magnesium (AL8, AL22). Their "horse" - low density and high mechanical properties.
5. Other casting aluminum alloys which is doped with other chemical elements. This group is quite extensive, includes AL1, AL11, AL24 and other alloys.

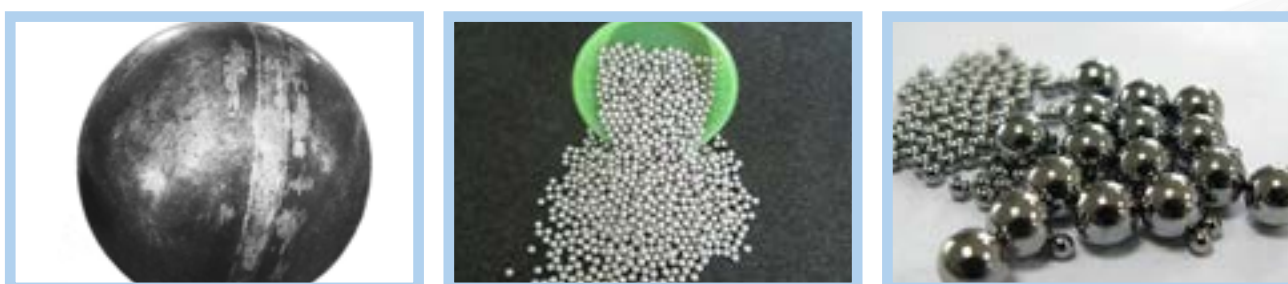
Aluminium AK5M2

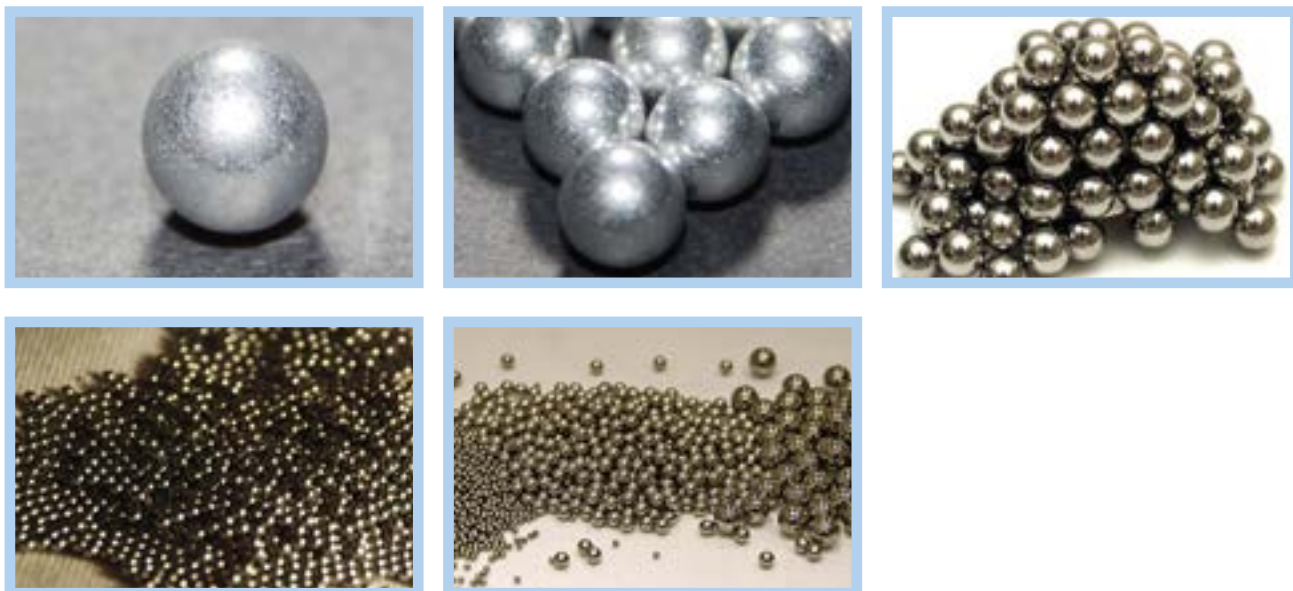
Aluminium AK5M2 (formerly AL3V) - cast alloy, claimed in the creation of shaped castings, and for other purposes. The popularity of this brand is caused by the low cost of the alloy, the possibility of multiple processing, the relative plasticity, strength. Aluminum AK5M2 made of copper, aluminum and silicon. The alloy complies with GOST 1583-93. Aluminum is chemically (more than 85%) with a substantial fraction of copper (1.5-3.5%) and silicon (4.6%). Its alloying components determine its ductility, strength, corrosion immunity, electrical conductivity, wear resistance, weldability, lightness. Used aluminum AK5M2 increasingly irresponsible as the alloy. Apply sculpture, engineering, serves to create a cast aluminum cookware (here there are strict rules for zinc, lead, arsenic, beryllium). Rafting is popular and abroad (exports). It is used for the introduction of responsible alloys for cost reduction. Characterized by high aluminum AK5M2 castability - low-melting, good fluidity, low linear shrinkage. Manufactured from the alloy product the product must be free of defects and slag. Comes AK5M2 aluminum ingots with different dimensions. Product form - pig less than 20 kg or bulky ingot more than 200 kg.



Balls made of aluminum

Balls of aluminum used in the automotive, aviation, aerospace, electronics, military, medical and chemical industries. They are widely applicable in a number of narrow regions. Production is mainly one-way valves and ball bearings. Thus, the use of products like rolling elements and the locking elements severely limited the material strength. Demand aluminum balls while also welding operations and, even as the spherical bullets. Larger balls can be employed as a workpiece for spherical and rounded articles such as furniture handles spherical. Get the balls of aluminum often cast, while actively used recycled. Then treated with abrasive balls and milling. The materials are popular duralumin, alloys AMg and blood pressure, silumin, aluminum bronze and others. Manufactured from aluminum balls on a range of specifications, as well as the customer's request. Color silver products. Valid machining of rolling, but not allowed significant deviations in sphericity and joints, shells, cavities, slag inclusions. Performance may vary. Characterized by balls of aluminum corrosion resistance, wear resistance, lightness, workability. The alloys heat treated to improve mechanical properties, but in some cases appreciated, in contrast, softness. The balls can also be made passivated. Available in small-sized balls are usually in plastic containers 100 - 5000 pcs. The weight depends on the density of the alloy. For example, the diameter of 6 mm weight duralumin ball is about 0.3, the most popular diameters of less than 25 mm.



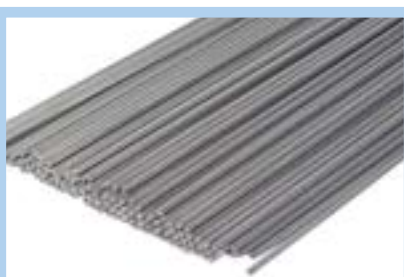
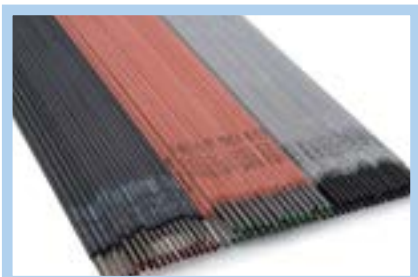


Electrodes for aluminum welding

Welding of aluminum produced filler with special aluminum electrodes. Aluminum electrodes melt much faster than others, so the welding process must take place more quickly. Furthermore, before using the electrode, it is necessary for two hours to dry it. This is an important prerequisite for the use of this material. Thus for aluminum welding electrodes should have negative polarity, but the cord which is applied to the plate should have a positive charge. If aluminum plate having a thickness of 2 mm, the welding process is carried out directly by the electrode. Before carrying out welding to prepare the surface, and that means clean of any debris using white spirit, solvent RS-1, RS-2 or technical acetone.

In the CIS countries made a series of two electrodes - OAD, UANA and Ozan. OAD-1 used for welding only pure aluminum. The structure of such an electrode includes aluminum wire SvA1. In order to weld aluminum-silicon alloys are required electrodes OAD-2, which consist of wire SvAK10, SvAKZ and SvAK5.

Ozan - an electrodes for aluminum, which are made from aluminum wire and AD1 AV2T and SvAKZ or SvAK5. With their help, you can also clean weld aluminum materials and aluminum-silicon. Welding electrodes for aluminum Ozan-1 have three forms of delivery - is 400 mm, with 4 mm diameter, 350 mm and 310 mm. With regard to electrodes UANA series, they are more suitable for cast and wrought aluminum alloys. In practice, the aluminum electrodes are not often used, although such a method has important advantages - electrodes inexpensive cost and simple process use. Such a welding method is more suitable for field use and for small workshops.





BRONZE

General information

In the industrial production of bronze is used for manufacturing the bronze rods, tubes, sheets, plates, wires, reinforcement of ingots, strips, bands. From bronze castings make complex configuration, for example, bronze art castings.

Tin bronze is divided into the tin-zinc, tin-phosphorous and tin-zinc-lead. Due to the presence of anti-friction qualities of tin bronze is widely used in the manufacture of automotive parts and mechanisms, and due to its high chemical resistance make bronze pipes, rebar, wire, used in many industries.

Of particular interest is beryllium bronze as a precipitation hardening alloy, it has high elasticity, hardness, corrosion resistance, heat resistance. Parts made from non-magnetic beryllium bronze, resistant under low-temperature regime, a different sort of shock load without spark issue.

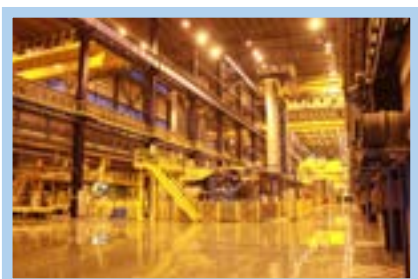
Aluminum bronzes have good machinability and corrosion resistance. It is used primarily for bronze this critical small parts: bushings, gears, flanges.

Bronze alloy with silicon is resistant to corrosion and high density in the castings. Chromium bronze has high recrystallization temperature, high heat resistance

and electrical conductivity of this bronze parts are easy to process. Because it is made of chemical equipment parts, muffle furnaces and others.

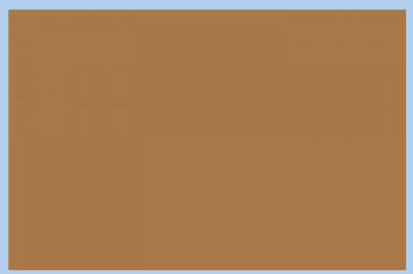
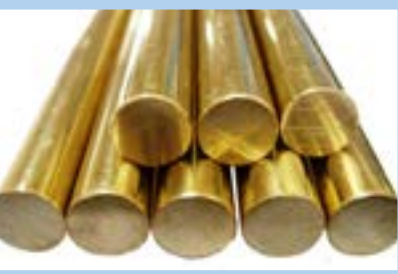
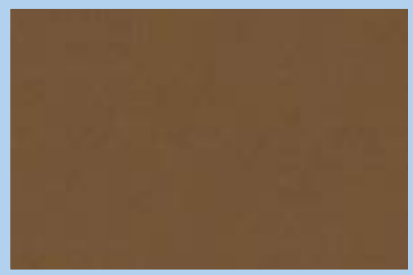
Bronze bands, sheets and strips are characterized by their uniformity and relaxation properties, they are indispensable for the purposes of electrical and telecommunications. In modern industry, the great demand for bronze rods, bronze plates, wire, brass hex, they are widely used in chemical, electrical engineering, mechanical engineering.

BRONZE MANUFACTURING FACILITIES



Rolled Bronze





Bronze powder

The bronze powder is dispersed fine chemical powder particles petal-shaped or scaly, red / pink / red copper / gold colors (colors that are typical of bronze), which has three components: bronze, brass and copper. The production method. Thin joint stepwise grinding brass, bronze and copper (or zinc alloy), with the addition of lubricants: stearic acid or paraffin, and excluding caking powder particle oxidation and subsequent polishing. Scope. Actively used in various fields of the chemical industry, for example, in the printing, pencil. Also used: as an agent for protecting the surface of objects from the destructive action of environmental factors; as a decorative finish - for the production of oil and varnish paints.

Application - mixing the powder with binders immediately before use in a ratio of 1: 4 (6). The function of the binder used linseed oil, oil paints, nitrovarnishes. The paint is applied to the surface of a rigid object with a brush or spray. Another way - paintable object is dipped into the paint. The paint is thoroughly pounded.

Typology. Depending on the elemental composition and the destination is issued several kinds of brands.

1. Powder BPK. It is used for decorative work (painting different types of surfaces: wood, metal, etc.).
2. Powder brand BPO. It is used for offset printing.
3. Powder brand BPP. It is used in the printing industry.
4. Powder BPI brand. Used for the manufacture of tools.

Health hazard. Contact with metal powder to the respiratory channels cause allergies, swelling, spasms.

Precautionary measures. During the work on the painting and after their completion, ventilate the room. It is also recommended to use rubber gloves to protect your hands. Keep better in a dry place, protected from moisture. Powder scatters easily with air currents, so you need to watch out for drafts. Keep away from fire.

Bronze powder BPO

Modern printing industry commonly uses inks containing metallic pigments. Some of them are in wide use apply the term "gold", as when printing an effect of the presence of the noble metal. In particular, it uses bronze pigment shades and regulated by the presence in the mixture% copper. The current bronze manufacturing technology allows you to get the grain of the metal pigment which has the necessary conditions for the print size. For example, in offset printing it is 3.5 microns. Bronze powder (bronze powder) is a fine powder of a layered structure with a flaky (plate) shape, having a golden or copper-red hue. Powder used as a pigment in the production of various colors. Besides printing is used in construction (inlay), in the manufacture of pencils, decoration frames and moldings. For the production of offset printing inks used bronze powder BPO (used for offset printing). It has the following characteristics:

- content of copper (Cu) - 84-85%;
- content of iron (Fe) - 0,2-0,3%;
- fat-content - 0.2-0,3%;
- residue sieve - 1,6-2,0% R0063;
- SWR - 1970-2100 g / cm².

In an industrial scale bronze powder BPO released and transported in drums with a capacity of 60 kg. On the subsequent sale of goods packed in a darkened vacuum packaging of 100g of product.

Working with bronze powder requires caution and strict adherence to safety standards. Strongly not be exposed to the powder in the respiratory tract. Since BPO bronze powder easily scatters from the air flow, it is necessary to minimize the effects of drafts. In addition, it should be noted that the metal powder may be a source of allergic reactions, swelling and cramps.

Bronze powder BOD

For the production of metallic decorative paints and varnishes oil-based “metal effect” used bronze powder bronze BOD. The dimension of the powder particles to 20 micrometers. Powder bronze BOD has the following characteristics:

- Content of copper (Cu) - 84-85%;
- The iron content (Fe) - 0,2-0,3%;
- Fat content - 0.2-0,3%;
- Sieve residue - 2-6% R01;
- SWR - 1150-1700 g / cm².

Depending on the copper content% pigment changed color from golden to red. Physically, this is a fine powder containing bronze, brass and copper.

To avoid losing the presentation of decorative coatings for normal operation, apply additional varnish.

Bronze powder is packed in drums BOD capacity of 60 kg should strictly comply with all necessary safety regulations when handling bronze powder:

1. Work is performed in a protective mask to avoid product entering the lungs breathing.
2. Do not allow to bronze powder BOD flew from the air flow.
3. Use protective equipment for the skin, as the metal powders are allergens, and can trigger swelling and cramps.





Rolled bronze

Modern printing industry commonly uses inks containing metallic pigments. Some of them are in wide use apply the term “gold”, as when printing an effect of the presence of the noble metal. In particular, it uses bronze pigment shades and regulated by the presence in the mixture% copper.

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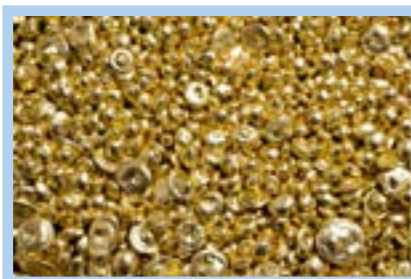
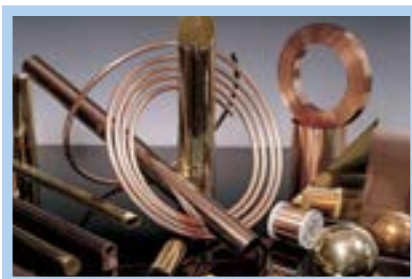
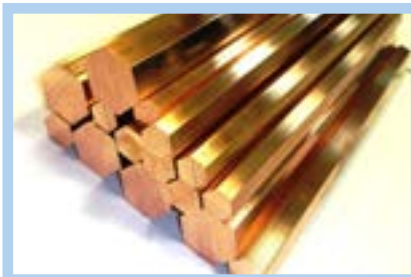
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- content of iron (Fe) - 0,2-0,3%;

fat-content - 0.2-0,3%;

-residue sieve - 1,6-2,0% R0063;

- SWR - 1970-2100 g / cm².

In an industrial scale bronze powder BPO released and transported in drums with a capacity of 60 kg. On the subsequent sale of goods packed in a darkened vacuum packaging of 100g of product. Working with bronze powder requires caution and strict adherence to safety standards. Strongly not be exposed to the powder in the respiratory tract. Since BPO bronze powder easily scatters from the air flow, it is necessary to minimize the effects of drafts. In addition, it should be noted that the metal powder may be a source of allergic reactions, swelling and cramps.



Bronze ribbon BrB2

Bronze ribbon BrB2 - long steel solid rectangular cross section, which is produced by cold rolling. Beryllium strip is made strictly according to GOST 1789 "Ribbons and strip of beryllium bronze."

Beryllium tape thickness produced 0.9 - 6.0 mm to 300.0 mm and a length of 5.0 m. Moreover BrB2 bronze ribbon 0.1 mm wide made from 10 mm to 160 mm thick to 0, 6 mm - 300 mm wide. Tape length in one roll should be more than 6.0 m.

Classification:

- Accuracy of manufacturing bronze ribbon BrB2 is: "P" - high, "I" - normal;
- In a manner of manufacture "D" - cold;
- On the section of the form: "OL" - rectangular;

- As "M" - soft;
- The length of "MD" - dimensional, "KM" - brief dimensional, "ND" - off-gage.

The chemical composition of tape mark BrB2 must meet the requirements specified in the standard GOST 18175. BrB2 - beryllium bronze, which contains about 2.1% beryllium, nickel, about 0.5% and less than 0.5% of impurities.

Tapes must be twisted into coils. The folded roll internal diameter of 150 mm or more. Rolls strapped tightly with string according to GOST 16266, GOST 3282. Weight wire coiled coil should not exceed 80 kg.

Bronze Ribbon BrB2 resistant to corrosion, has good strength properties, high elasticity performance and has excellent electrical conductivity. Metal free to machine: milling, drilling, punching, cutting and welding. Good quality characteristics of the tape made of bronze make it a popular and necessary in many industrial sectors.

Widely used bronze ribbon BrB2 in modern energy and instrumentation for the manufacture of various parts and products, conductive springs. Use a bronze ribbon in solving many technical problems in industrial engineering, shipbuilding, automotive industry, aircraft industry.



Bronze pipes

Bronze pipe - prefabricated hollow cross-section with a constant wall thickness of the segments or in coils, produced by cold, hot rolling technology for the creation of pipelines, transportation of various fluids, a bronze tube is also used as a product for subsequent machining. Different ductility, strength. This product characteristic durability, corrosion

resistance, thermal conductivity. Its quality depends on the grade bronze alloy. Bronze pipe is easy to process; welded, soldered, drilled, cut, because demand in most areas of modern industry.

According to the method of production, Alloy brand, a bronze pipe is classified into types: horizontal molding and extrusion. Bronze pipe grades BrAZhMts 10-3-1,5, 04.04.10 mash is made in accordance with the requirements of the chemical composition of GOST 18175.

Bronze pipe is somewhat better as compared with copper, mechanical properties. Not deformed in the cold state, is resistant to high temperatures and to corrosion in aggressive chemical environments. Bronze pipe is increasingly used for the manufacture of bushings, bearings, tube sheets, which are important components in the aerospace, shipbuilding, chemical industry.

Pipe bronze BrAZHN 10-4-4

Bronze pipe made of a double or multi-component alloy of copper with various other metals (silicon, tin, beryllium, aluminum, and so forth, except for nickel and zinc). The chemical composition of bronze pipes must meet the requirements set forth in GOST 1208-90. Depending on the mix pipe, its geometrical dimensions are between:

- The diameter of the bronze pipes from 42 to 280 millimeters.
- bronze tube wall thickness: 5 to 60 millimeters.
- The length of pipe above the bronze GOST is not standardized.

The most popular pipe bronze, bronze pipe BraZHN 10-4-4.

Bronze pipes manufacturing technology of this material involves the use of pressure equipment. This is due to the absence of the chemical composition of tin. Self is a semi-finished product for further use. In pressing, stamping and machining can be applied as apost-processing. In most cases, the semi-finished product is used as blanks for the manufacture of various machine parts and tools, such as separators for rolling bearings. On the initial blank should be bundles, shells, bubbles, cracks and slivers. Presence of local defects (dents, risks, etc.), in the event that they do not take the tube at the reference sweep for limiting the size of deviation set forth in the Standard. Commercially available cutter cut tubes which have a circular, flat oval or oval shape. The main advantages of bronze pipes BraZHN 10-4-4 is a high level of corrosion resistance and ductility. These qualities, along with high strength have made this type of pipe is very popular in the industry. In the case of non-compliance of physical and mechanical properties of bronze pipe design parameters defined in the design of vehicles and their components, bronze pipes BraZHN 10-4-4 can be subjected to further heat treatment.

The marking of pipes coming from the factory to indicate the dimensions and the material from which it is made.

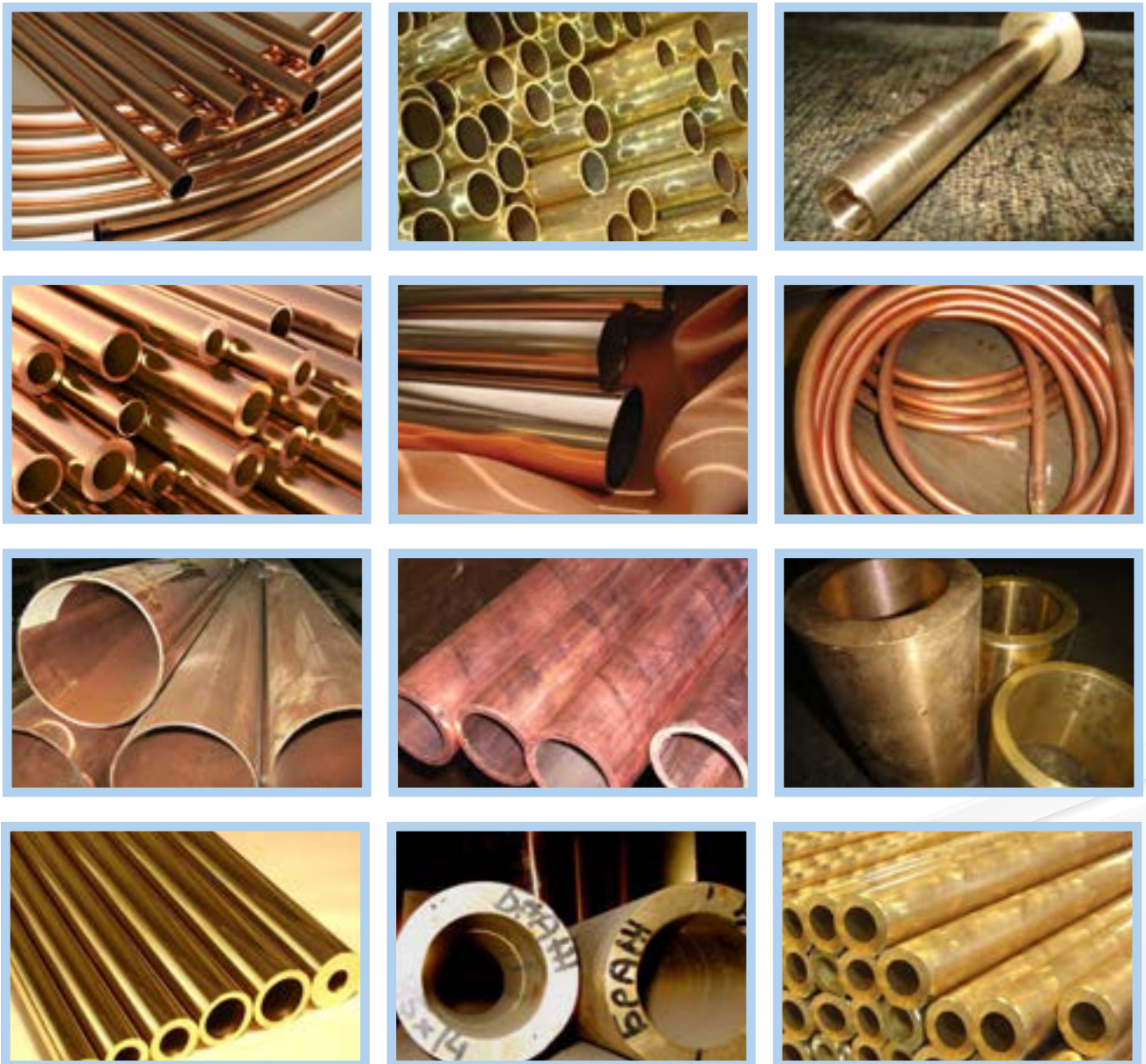
Bronze pipes BrAZhMts 10-3-1,5

Bronze is a conglomerate of several chemical elements. Compound components such as copper, silicon, beryllium, aluminum, tin, many times improve the qualitative

characteristics of the starting metals. From the resulting bronze alloy produced a very large range of various materials. Thus, for example, a bronze tube BrAZhMts 10-31,5
It is well known that the bronze alloys are highly resistant to corrosion. They possess strength and ductility. This characteristic of the material provides high durability pipes. According to the requirements of GOST 1208 bronze BrAZhMts 10-31,5 pipe must meet the following criteria:

- Outer diameter of 42 - 280mm;
- Pipe wall thickness 5 - 60mm.

More pipe BrAZhMts 10-31,5 bronze is used as material for the production of rings, the other parts. Produced bronze pipe in two ways. This is a hot and cold deformation. The inner and outer surface of the pipe must be straight and smooth. It must be free from voids, captivity, cracks, delaminations and bubbles. Good antifriction properties proven bronze, its corrosion resistance and durability allow the use of systems BrAZhMts 10-31,5 coolant supply, transportation fuels and chemicals for the manufacture of separators. The industry used different types of bronze pipes: Pipe bronze extruded according to GOST 1208 Barometric round and shaped. Application of such pipes is very extensive.



Bronze foil

The product is a flat copper alloy metallurgy rolling, may comprise aluminum, beryllium, cadmium, lead, chromium, zirconium, and other elements depending on the purpose of the material. The chemical composition of bronze foil may be tin and Tinless. Bronze tin foil containing more than 4% Sn, is characterized by low shrinkage. Aluminum bronze can include up to 8% Al, is flexible, easy punching. Beryllium bronze contains up to 2% Be, has high elasticity, but somewhat higher in cost. Silicon bronze has a lower cost. The differences are characterized by rolling method. The foil is available in two types:

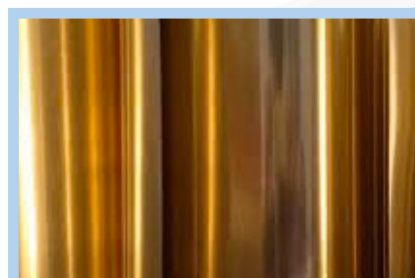
- Hot, soft is indicated in the letter M mark;
- cold, hard, designated in the letter of Mark T.

Stamps bronze alloys shall comply with GOST 613, 5017 - for the bronze and tin 493, 18175 - for bronze Tinless.

Usually offered assortment - a thickness of 0.01 to 0.5 mm.

Let out on the basis of various alloys, bronze foil is an anti-friction property, wear resistance, elasticity, thermal conductivity, excellent resistance against corrosion, has good processability and biological inertness, aesthetic.

Due to its properties is widely used in engineering, typography, in electrical engineering. Bronze foil is used in the manufacture of electronic parts, components and parts requiring good thermal conductivity in printed circuit boards. Bronze foil is popular among designers and artists for the production of jewelry and art objects.



Bronze rods

Bronze rods according to GOST 1628 - semi-finished product is a solid cross-section along the entire length, in coils or as a straight length. Bronze rods are manufactured from various grades of bronze, thus have certain differences in chemical composition and characteristics.

BrOTsS 555 - the cheapest on the market popular types of bronzes. Rods are manufactured in accordance with GOST 24301, its chemical composition corresponds to GOST 613. Hardness (now and then - Brinell) - 70kgs / mm² (700 MPa). Used for the manufacture various anti-friction components, bushings for bearings, valves. Braze 9-4 ideal ratio life and financial cost. Resistant to abrasion. bars Production takes place in accordance with GOST 1628, the chemical composition according to GOST 18175. Hardness - 100kgs per mm² (980MPa). Applying the same as that of the rods of BrOTsS 555.

Brophy 10-1 has high anti-friction and strength properties. From Brophy 10-1 brass rods manufactured in accordance with GOST 10025, the chemical composition of GOST 613. Hardness - from 80 to 90 kg per mm². Dimensionality in agreement. It is used for crowns worm gears, spindle, and push nuts, reinforcement of friction units, parts of screw actuators with high load.

BrAMts impressive 9-2 different mechanical and anti-friction properties. GOST for bars of BrAMts 9-2 for the manufacture of - 1628-78, the chemical composition - 18175-78. Hardness: Pressed to - 95 kgf / mm² for drawn - not less than 115 kgf / mm². Such bronze rods are used for the manufacture of anti-friction parts, and valve components, operation of which will be held in a pair at t up to 2500 degrees, fuel oil and fresh water. BrAZhMts 10-3-1.5 has a high resistance to corrosion at high pressure and t. Bronze rods are manufactured in accordance with GOST 1628. The chemical composition regulated by GOST 5017. Hardness of 130 to 200 kg per mm². It is used for the manufacture of valves and various anti-friction parts. Brophy 7-0.2 indispensable for the work in friction under conditions of very high loads. Standard production of bronze rods bronze of this brand - 10025, GOST chemical composition - 5017. The hardness of the bar - 75-85 kg per mm².

Bronze wire rods BrOTsS 5-5-5

Industrial semi-finished products of bronze are widely used in various fields of modern production, as they compare favorably with products from other materials cost, physical and mechanical properties and high manufacturability. Bronze alloys are resistant to corrosion, have a high rate of mechanical wear, allowing their use in the manufacture of consumable products for friction mechanisms in mechanical engineering. The use of bronze bushings, sleeves ensures the safety and durability of the basic units of friction mechanisms.

Modern metallurgy produces a sufficiently large range of semi-finished bronze for different purposes, but the rods bronze BrOTsS 5-5-5 favorably with those of similar products of other brands and bronze forms of delivery. The peculiarity of the chemical composition

of the alloy, namely the presence of a certain amount of tin, significantly improves the sliding characteristics of the friction parts.

5-5-5 bronze rods BrOTsS easy to process, exhibit low shrinkage during molding and good antifriction and anticorrosion characteristics. These qualities provide the alloy its widespread use in many industries.

They are made of bronze rods BrOTsS 5-5-5 as the Hot-way (pressed, kata), and cold-process (drawn).

This product is in demand and is widely used in the machine-building enterprises in the automotive industry, electrical engineering and instrumentation, as well as in aviation and chemical industry.

In our range of rods with a diameter 4 - 220 mm.

Bronze bars BrOF10-1

Bronze rod BrOF10-1 long steel solid round section of the wrought copper alloy. Marking Brophy 10 - 1 is phosphorous-tin bronze, which contains about 10% tin and about 1% phosphorus. Besides the main alloying elements in the Brophy 10 - 1 also includes a small amount of impurities.

Made of bronze rods BrOF10-1 various diameters (from 5.0 mm to 110 mm) by continuous casting followed by drawing in rolling mills or pressing. continuous casting method provides a bar BrOF10-1 virtually no defects. Continuous casting surpass casting in the form of their properties. The cold-rolled or drawn bars are made semi-solid, soft, hard or extra hard. After rolling rod BrOF10-1 may have shallow dents, traces of a spiral (helical) line. As a result, etching or heat treatment can occur on the surface of the rods dark or light spots. According to GOST 10025 "rods tin-phosphor bronze" bronze bars BrOF10-1 must not have foreign inclusions, voids, bundles, cracks and large burrs. Followed up to 15 mm in diameter inclusive unwound in coils and bars BrOF10-1 diameter up to 35 mm are knitted into bundles weighing up to 80 kg each.

Bronze rod of the brand has a number of advantages, it has a high strength, low friction, high resistance to oxidation, vapor resistance, good resistance to corrosion and abrasion, high thermal and electrical conductivity, good resistance to wear, resistance to air and solutions of organic acids, ductility. Bronze BrOF10-1 lends itself well to soldering, welding, cutting and handling pressure.

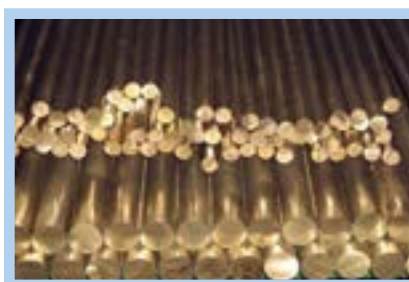
Products made from bars BrOF10-1 brand, provide long-term operation of various mechanisms and technical units. Bars bronze BrOF10-1 widely used in modern engineering in the manufacture of highly loaded parts of screw drives, spindle, and push nuts, valves, plugs of various configurations, wreaths worm gears. It is also used in shipbuilding BrOF10-1 bars, rocketry, aviation, automotive, construction, etc. Industries.

Bronze rod BraZH 10-3

Because of the good mechanical strength and high corrosion resistance of the system copper-aluminum-iron are widely used in industry. Bars bronze BrAZh10-3 is one example.

As is known, bronze rods, aluminum-iron bronze (Braze - the share of aluminum and iron 9-10% 3-4%) can be produced in any way continuous casting or pressing. Cast bronze BrAZh10-3 rod has a tensile strength of 40 kgf / mm.kv., And at the same extruded rod, the figure is not less than 60 kgf / mm.kv. If cast bronze bars BrAZh10-3 has a Brinell hardness of about 125, then extruded rod hardness up to 180 Brinell units. Elongation cast bronze rods and extruded have the same - about 15%. Thus, the hardness and strength at nepreryvnolityh rods Braze slightly lower than that of the pressed and ductility and anti-friction properties are substantially similar. But the cost of cast bars are somewhat lower. Rod BrAZh10-3 bronze in the cross section can be round, square, hexagon. Rods of continuous round bronze Braze can have a crack to a depth of 1 mm, encircling the surface.

Excellent mechanical characteristics bars bronze BrAZh10-3 make it easy to handle them on lathes, drilling, milling. Turning and milling bar provides a perfectly flat, smooth surface. Bars bronze BrAZh10-3 a billet for manufacturing elements of threaded connections and fittings for various purposes, shafts and spindles, valves and machine parts for water and gas systems. High corrosion resistance bronze Braze allows bars bronze BrAZh10-3 in shipbuilding.





Bronze circles BrAMts 9-2

Bronze Circle (bar) is a type of bronze rolled. BrAMts 9 - 2 - is Tinless, copper alloy, processed by pressure, the main alloying element which acts as aluminum. Its production is carried out or go Hot-pressed and cold-pull techniques. The chemical composition and the brand tinless bronze wrought alloys, which include BrAMts 9 - 2 are determined by GOST 18175 and GOST 1628.

Chemical composition:

- Copper - base
- Aluminum - 0.8 - 10%
- Manganese - 1.5%

Impurities:

- Iron - 0.5%
- Silicon - 0 to 1%
- Phosphorus - up to 0.01%
- Lead - up to 0.03%
- Zinc - up to 1%
- Tin - 0 to 1%

All impurities up to 1.5%

Casting and technological properties.

Melting point - 1060 °

hot working temperature - 750 - 850 degrees

annealing temperature - 650 750 degrees.

Physical characteristics circles BrAMts 9 - 2.

At $t = 20^{\circ}$.

The density of the material - $7630 / \text{kg} \cdot \text{m}^3$

Thermal conductivity - $71.4 \text{ W} / \text{m} \cdot ^{\circ}$

Toughness - $6 - 8 \text{ kg} \cdot \text{m} / \text{cm}^2$

Tensile Strength - $53 \text{ kgf} / \text{mm}^2$

Elongation - 12%

Electrical conductivity - $0.1 - 0.13 \text{ 1} / \text{th}$ (See)

At $t = 100$ degrees.

Temperature coefficient (linear expansion) - $17 \text{ 1} / \text{deg}$

The specific heat of the material - $461 \text{ J} / \text{kg} \cdot \text{deg}$

The thermal conductivity is much lower than those of copper and brass.

Mechanical properties.

At $t = 20^{\circ}$.

Circle semisolid GOST 2618:

- Tensile strength - 540 MPa;
- Elongation at break - 12 - 15%; Extruded Circle:
- Tensile strength - 470 - 490 MPa;
- is the relative elongation at break - 20%;
- The coefficient of friction with lubrication - 0,006;
- Coefficient of friction without lubrication - 0.18.

Aluminum bronze BrAMts 9 - 2 has a high resistance at alternating load.

Followed BrAMts 9 -2 are used for the production of shafts, propellers, gears, bushes, parts for hydraulic installations for the manufacture of parts of vessels in the chemical industry. In the form of semi-finished products of this brand are produced bronze circles, rods, wire. The wire is used for welding of copper, brass, copper - nickel alloy with aluminum-manganese bronze, for manual and mechanized welding on steel. Welding wire is manufactured in twisted bay or wound onto a reel. Followed BrAMts 9 - 2 are available cross-section of 16 mm - 160 mm, length - 3000 mm. Cold-circles are rare, available only on request.

Bronze Circle BrAZhMts10-3-1,5

Bronze - Alloy, which is based on copper. By alloying elements shared the bronze into several types:

- Silicon;
- Tin;
- Aluminum;
- Beryllium;
- Phosphorous.

Bronze hire diverse, both in brand and manufactured by the form. One of the commonly used materials - bronze circle BrAZhMts10-3-1,5 includes:

- Aluminum - 10%;
- Iron - 3%;
- Manganese - 1.5%.

The production of the alloy produced by the method: pressing, cold forming and continuous casting. Bronze has excellent heat resistance, erosion and cavitation resistant.

Selection of the proper diameter bronze circle depends on its further use: the instrument parts in the chemical industry, pipelines, heating systems, jewelry, interior decor.

Bronze Circle BrAZhMts10-3-1,5 not only has good resistance to static load and fatigue, but also resistant to harmful acidic environment. For this reason, the alloy does not replace components in creating cryogenic engineering and chemical plants. The alloy has the following characteristics:

- Hardness - HB 10 -1 = 125 -140 MPa;
- Melting at 1045 degrees .;

- The coefficient of friction: dry running - 0.21, with the use of lubrication - 0.012.
The range is very wide rolled bronze pipes, plates, wires, strips and others.

Bronze Circle Braze 9-4

Braze 9-4 Tinless relates to a deformable bronzes and copper alloy, aluminum (8 - 10%), iron (2 - 4%) at a density of 7500 kg / cu. m and the initial melting temperature of 1040 degrees. Not subject to corrosion from the weather and sea water, resistant to organic acids, solutions, salts of sulfuric acid and alkalis. It has high strength and durability that allows the use of bronze Braze 9-4 for the manufacture of gears, valves, nuts, jackscrews, transporters plain bearings and other mechanisms.

Harvesting for the production of these items is a bronze circle Braze 9-4, produced by pressing. GOST 1628 provides for the release of the rod diameter from 16 mm to 160 mm. Circle 9-4 bronze Braze increased precision and diameter respectively allowed to produce 16 - 50 mm 16 - 30 mm. In this circle Braze 9-4 has the following characteristics:

- Tensile strength - 55 kgf / mm²;
- Elongation - 15%
- Brinell hardness (HB) - 110 - 180.

It produces a range of bronze Braze 9-4 as random length pieces:

- From 5 to 40 mm - 2 - 5 m;
- From 40 to 80 mm - 1 - 4 m;
- From 80 to 120 mm - 1 - 3 m;
- Over 120 mm - 0.5 - 2 m.

The parties unmeasured rods allowed the presence of truncated products, but not more than 10% of the batch weight. Thus unacceptable length less than 1 m at a rod diameter of 40 mm and less than 0.5 m at a diameter greater than 40 mm.

Ready for shipment bronze circle must not contain non-metallic inclusions, delaminations and voids have. The curvature of the rod to each meter length should not exceed diameters:

- From 5 to 40 mm - 4.0 mm;
- From 40 to 120 mm - 6.0 mm;
- More than 120 mm - 10 mm.

For delivery circle with a diameter up to 35 mm it is tied in bundles weighing up to 80 kg, but in agreement with consumer packs of weight can be increased up to 500 kg.





Bronze sheets

The bronze alloy is used in the production of a large number of technological raw materials, for example for the manufacture of bronze sheets, thanks to a sufficiently strong structure, which is also characterized by flexibility and mechanical strength, so necessary for the automotive, aviation, shipbuilding, engineering, architecture, construction.

This material has excellent thermal and electrical conductivity, over resistance corrosion even in corrosive conditions of the sea water, resistance to weather changes, in addition bronze sheet is used as a decorative building material finishes. It has demand electro communications, as elements of electric motors, transformers, generators, strip conductors, various connectors, connectors, used in the telecommunications industry. Sheets bronze used in the production of various transport, in the aerospace industry, particularly in the production of propeller blades, engine parts, leading shafts nonmagnetic apparatus, fittings, rudders, guides antennas generators.

With the use of different bronzes, using different brands (BrKMts, BrH et al.), Produced

bronze sheets. Depending on the type of bronze, they are: silicon, tin, aluminum, beryllium, amenable to cutting, drilling, milling, rolling, forging. By hardness distinguish soft, semisolid, solid, very solid sheets. Stamps BrKMts, BrH are widely used in the production of bronze sheets. BrH1, BrH0,8T according to the norm TU 48-21-779-85 thickness of 10 to 150 mm, length and width of 600 - 3000 mm, most state g / k. bronze sheets also produced using the brand BrH0,8Sh TU 48-21-588-97 thickness of 1.35 - 25.0 mm, length and width of 600 - 2000, the state of soft, h / k, g / k. Mark BrH1Tsr, the norm TU 48-21-5066-82 thickness 12,0 - 20,0 mm, width 135 - 350 mm, length 2000 - 4000, the state of x / k, g / k.

Bronze perfectly amenable to soldering, suitable for use in air, chemical, water-aggressive environment, strong thanks to a special mechanical working, cold and hot rolled. bronze sheets are not only mechanical strength but also excellent moldability. It is also a very popular material in engraving works: manufacturing indexes, plates, signage, and more.

Bronze sheet BrH 1

Today, one of the most popular types of non-ferrous sheet metal is a bronze sheet BrH1. Sheets made of bronze BrH1 brands are widely used in the automotive industry, mechanical engineering, shipbuilding and aircraft construction, electrical engineering, instrument making. Bronze Rolled easily machined - cutting, milling, drilling, rolling, forging. Due to its chemical composition, physical and mechanical properties, a bronze leaf BrH1 widely used for the manufacture of electrical parts of welding machinery, welding electrodes themselves.

The chemical composition of bronze sheet is in accordance with GOST 18175 and must comply with the brand BrH1. According to the standard BrH1 bronze consists of chromium and 0.4-1.2% Cu 98,5-99,6%, impurities not exceeding 0.3%.

BrH1 sheet has the following characteristics:

- Modulus of longitudinal elasticity of bronze - $1.12 \cdot 10^5$ MPa;
- Coefficient of linear thermal expansion of the bronze - $17 \cdot 10^{-6}$ 1 / Grad;
- Bronze density - 8900 kg / m³.

Bronze BrH1 has several advantages:

- It has excellent thermal and electrical conductivity;
- It has good heat resistance;
- Resistant to many types of corrosion;
- It has a high strength and wear resistance.

BrH1 sheet is manufactured by hot rolling a thickness of 10 mm to 25 mm, length 600 mm and width up to 2000 mm. The surface sheet should have a clean, smooth surface. Allowed small scratches, the risks small burrs and other minor defects on the surface, does not go beyond tolerances.

Bronze sheet BrH 1Tsr

The large group of bronze alloys can distinguish brand containing alloying elements (cadmium, magnesium, silver, chromium, zirconium) in an amount of from 0.3% to 1%.

Such bronze alloys have an electrical conductivity and thermal conductivity as good as that of pure copper, while possessing high yield stress, greater hardness and wear resistance, a large fatigue limit. They are able to work at higher temperatures (in comparison with pure copper) due to the increased temperature of the onset of recrystallization. Thus, if a Brinell hardness (HB) of pure copper at higher temperatures of 100 grams. up to 400 gr. decreased respectively by HB = 110 to 30, the hardness of the chromium-zirconium bronze, however, remains above HB = 100. Thus, for chromium-zirconium bronze characterized by high heat resistance combined with high electrical conductivity.

Chromium-zirconium bronze made on a sheet of bronze BRH1Tsr. Excellent electrical conductivity of the sheet causes its frequent use as a substrate in the manufacture of various products for electrical purposes - strip conductors, electric connectors of contacts, including a variety of connectors, structural components of electric machines and transformers.

Notably the region in which the most commonly used BRH1Tsr bronze sheet is moving production of power electrical contact among them the contact rings on the rotors of synchronous machines and asynchronous motors with rotors wound rotor and plate collector DC machines. For these products BRH1Tsr bronze sheet is an ideal material due to its high wear resistance and preservation performance at elevated temperatures.

Bronze Leaf BRH1Tsr available in the following states:

1. Do not heat-treated. This hot-rolled sheet bronze BRH1Tsr, cooled naturally.
2. Heat-treated (hardened). In this case, the bronze sheet after preheating BRH1Tsr quenched in water. "M" is usually marked by Tempered sheet letter.
3. Hardened followed by cold deformation. Cold-sheet bronze BRH1Tsr has increased tensile strength and yield strength, along with increased hardness due to quenching. "T" Such a list is usually marked with a letter.

Bronze sheet BrH0,8Sh

Bronze alloys are materials for a wide range of products, and is a type of sheet bronze BrH0,8Sh. Any Bronze sheet is inherent not only good mechanical strength and high tensile strength. Low alloy chrome sheet bronze BrH0,8Sh has almost the same low electrical resistivity, as well as pure copper. If it is equal to that of copper $m\Omega \cdot 0.02$ m, then the chromium bronze index ranges 0.02-0.04 $m\Omega \cdot m$. For comparison, the tin and aluminum bronzes resistivity five times higher than that of chromium bronze. The thermal conductivity of sheet bronze BrH0,8Sh is also close to the thermal conductivity of copper. If it is equal to that of copper $0.9 \text{ cal} / \text{cm} \cdot \text{c} \cdot \text{C}^\circ$, then chromium bronze, this value is in the range of 0,6-0,8 $\text{cal} / \text{cm} \cdot \text{c} \cdot \text{C}^\circ$. Tin and aluminum bronzes have a thermal conductivity is several times lower than chrome. The high thermal conductivity of chromium bronze promotes intensive removal of heat from friction units, especially

the live (movable electrical contacts). It should be noted that the electrical resistivity and the thermal conductivity depends on the bronze material and is influenced by refining technology (resistivity - to decrease, and the thermal conductivity - upward). High electrical and thermal conductivity in combination with corrosion and wear resistance cause that BrH0,8Sh bronze sheet is widely used in electrical engineering and industry. In the manufacture of rotating electric machines sheet bronze BrH0,8Sh serves as the material for the manufacture of plates of DC machines collectors, slip ring rotor synchronous machines and asynchronous machines with wound armature. The electrical industry is a sheet bronze BrH0,8Sh workpiece for the manufacture of strip conductors, various electric connectors, elements of transformers. This product is also in demand in the machine tool, automotive, aviation, shipbuilding and instrumentation.

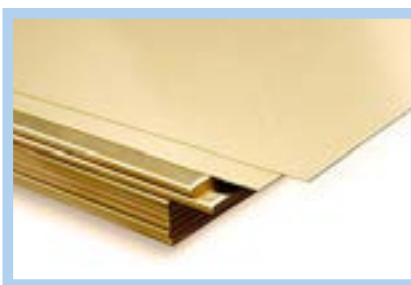
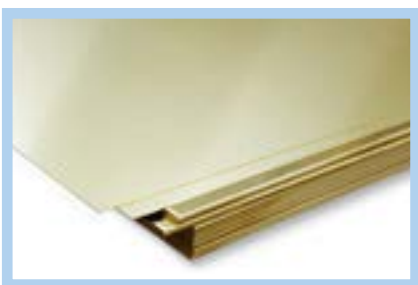
Bronze sheet BrH0,8T

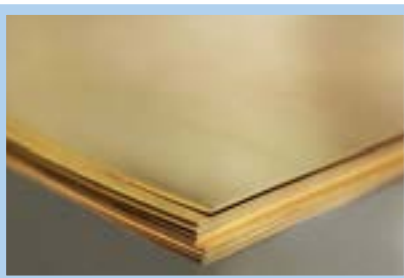
Copper-based alloys with alloying additives (such as tin, aluminum, iron and some other metals) are called bronzes. Marking bronzes denoted by the letters which mean major alloying elements, and numbers that indicate their contents. By the use of bronze divided into wrought and cast alloys. The chemical composition of GOST marks defined:

- Casting. Tin GOST 613, GOST 493 Tinless.
- Wrought. Tin in ISO 5017, GOST 18175 Tinless.

For example, a Bronze sheet BrH0,8T belongs to a class without tin, handled the pressure, heat-resistant low alloyed bronze. It has low resistivity. The main alloying element in the alloy chromium. Also, the high thermal conductivity of this alloy. Used bronze sheet BrH0,8T often for the manufacture of parts in various industries. BrH0,8T bronze sheet is discharged in the form of semi-finished flat rectangular cross section of uniform thickness greater than 0.1 mm, a width of 10 mm (for lanes) and up to 2500 mm long by 500 mm to 6000 mm.

Sheet Bronze other brands can be used in the manufacture of various types of labels, signs, signage, a comfortable material with engraving. The high level of resistance to atmospheric agents, allows the use of bronze to create monuments of art for home decoration, etc. Bronze used in the fields of automotive, shipbuilding, aerospace, manufacturing cars and even missiles. The good electrical conductivity allows the use of bronze for the manufacture of electrical components, parts of welding machines.





Bronze plate BrB

BrB2 Bronze - is an alloy composed of copper as the base material, to which is added with beryllium alloy smelting. Bronze plate BrB2 - a semi-finished product, which is made more likely by the rental of beryllium bronze (no tin), the chemical composition of bronze - CuBe2Ni (Co) . The production of these slabs GOST 18175. Plates produced rectangular shape and thickness of 25 mm or more. Such plates have good ductility and elasticity perfectly amenable to machining. Due to its composition bronze plates BrB2 resistant to corrosion, cannot be influenced by the sea water. Bronze BrB2 has low electrical conductivity, electrical resistance to gentrification of $0.1 \text{ m}\Omega \cdot \text{m}$, and after - $0.07 \text{ m}\Omega \cdot \text{m}$. Bronze plate BrB2 have high strength and wear resistance, have high springy properties. They are used in the manufacture of resilient components that have an appointment with increased responsibility and parts with high wear resistance. In the automotive industry, these plates are used for the manufacture of rails, wedges, gears and so on. In the shipbuilding industry are producing screws, rudders, shafts. Plates are provided with appropriate labeling. Present in labeling the letter D - means that the plate is made by hot molding, PR - that the slab has a rectangular cross section. They ate no precise manufacturing data, the plate is marked with the letters X.

Also bronze plates BrB2 used widely for the production of extruded and molded parts, because they are well cut and amenable to forging. Depending on their thickness, these slabs are cut and not cut. If bronze plate having a thickness of less than 40 mm, and its length is greater than 500mm 2, the supply plate in such a truncated form of a tolerance width and a length of 40 mm. Plates that have a thickness greater than 40 mm, not supplied edging, but leave allowance of up to 150 mm in length and 75 mm in width.



Bronze strip BrB2

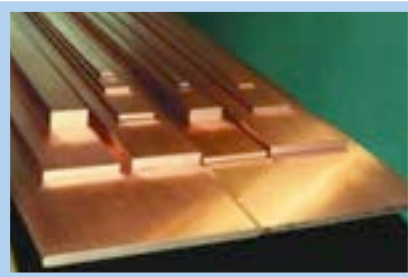
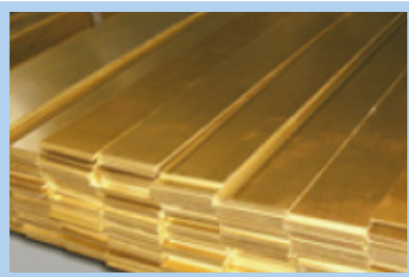
Strip bronze BrB2 inherent in it a unique blend of high-strength, elastic properties, electrical and thermal conductivity, as well as high resistance to fracture and corrosion resistance. Solubility Be copper decreases with decreasing temperature, leading to thermal hardening BrB2 bronze strips. Optimum properties observed in alloys containing from 2 to 2,5% Be. A further increase in the proportion Be strength has little effect, and ductility of the alloy is greatly reduced. Cool band bronze BrB2 quenching need to very quickly (typically it is quenched in water). If cooling in the temperature range 500 ... 380 ° C, unsharp, it leads to the disintegration of the supersaturated solution having a partial intermittent, thereby forming plate perlite shaped structure. This pattern of decay is harmful for the following reasons:

- The alloy becomes brittle, since the collapse of intermittent localized along the grain boundaries;
- Aging the alloy formed is a continuous disintegration of the supersaturated solution during hardening Be copper, leading to a decrease in strength, the primary hardening when tempered alloy lower than its reduction from continuous decay with aging of the solution.

The resistance value of micro plastic deformation in bronze BrB2 band is very high. This value defines the limit of reversible and irreversible plastic deformation at a given value of the applied voltage and, therefore, contributes to their relaxation. All this determines the high relaxation resistance of this type of non-ferrous metal - the main characteristic that determines its elastic properties.

The band bronze BrB2 demand in the electrical industry, as well as in the manufacture of elastic elements, springs. After hardening heat treatment, it acquires a high strength and excellent springy qualities, and good resistance to creep and resistance to corrosion. It also has an excellent wear resistance, high electrical and thermal conductivity, has no tendency to brittleness and can operate at temperatures ranging from -200 ° C to +250 ° C. From the bronze band, easily amenable to mechanical working, you can get stamped parts and complex profile shapes, creating long-lasting metal (corners, holders), fasteners (washers) and details of hardware (hinges).





Bronze wire BrAZh 10-1,5

The alloy of copper with aluminum is superior to common tin bronze in strength and heat resistance. Aluminum bronze perfectly handled the pressure. Of course, they are not without drawbacks, such as poor corrosion resistance in superheated steam. To solve this problem, the alloys are subjected to doping with iron, nickel, etc., and additional strength achieved aging at a temperature of 250-300 c. for three hours after hardening.

When the aluminum content of the alloy is higher than 7%, the ductility of aluminum bronzes is significantly reduced. This drawback is also eliminated by adding iron bronze structure significantly improves anti-friction and mechanical properties of the alloy.

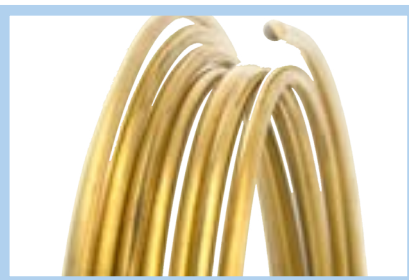
One of the most common materials in the non-ferrous metal wire is a bronze BrAZh10-1,5 brand. BrAZh10-1,5 bronze wire has a high specific strength. Produced by the pressure in the cold and hot material. By thermal properties BrAZh10-1,5 relates to heat-resistant type bronzes thermal conductivity - 0.14-0.17 cal / cm * s * Castle.

According to the type of wire cross section is divided into two types:

1. Wire circular cross-section.
2. Wire square.

Wire BrAZh10-1.5 bronze is corrosion resistant, flexible, durable plastic and tensile material with excellent electrical conductivity. Mass it is demanded in electrical cable production, wires and coils, as well as in transport engineering.

Trading bronze BrAZh10-1,5 wire supplied in coils or coils.





Hexagonal bronze BRaZH 9-4

BRaZH - bronze Tinless, which includes, in certain proportions - aluminum (8-10%), copper (84-90%), iron (4.2%) and 2% impurities - silicon, lead, zinc, magnesium and others. The alloy has excellent casting-technology, good sliding and mechanical properties. Scope BRaZH Alloy 9-4 - gears, bushings, valve seats. The alloy is easily processed and pressure are widely used in foundries.

Hexagonal bronze BRaZH 9-4, is produced in the form of bars with a cross section of a regular hexagon. Fabricated in accordance with GOST 1628 compression method. The advantage of products that are manufactured from this bronze - a relatively low cost of production and a long service life. BRaZH alloy rods with dimensions of 4.9 - 17, 19, 22, 24, 27, 32, 36, have been used in automatic lathes, for the production of nuts, bolts and bushings, etc. Standard 1628 specifies requirements for manufacturing Braze bronzes. 9-4, as agreed with the customer is allowed to change the chemical composition of the brand. The diameters of 16 -160 mm rods have a tensile strength of 55 kgf / mm², elongation 15, Brinell hardness HB 110-180. The same Standard specifies the procedure for the acceptance and execution of a document on the quality, which shall include:

1. Trademark provider.
2. Test results (in accordance with the user).
3. Symbol bar.
4. Batch number.
5. The mass of the party.

Note: Weight of the party should not be more than 3000 kg.

Tests are carried out in accordance with GOST 6507, GOST 4381, GOST 7502, GOST 26877, GOST 2060, GOST 14019.

Hexagonal bronze BRaZH 9-4 bound in bundles no more than 80 kg each, but at the request of the customer can be linked to whip up to 500 kg. Each beam is attached a metal or plywood label in accordance with GOST 14192. On these labels apply

abbreviated names, such as BRaZH9-4 - BZH.

Transport can transport all kinds, and storage is done indoors or under the eaves, which protect against rainfall, on the shelves, racks or trays.



Bronze Ingots

One of the varieties of bronze materials - bronze ingots. This preform is a bar which is used in the production as raw materials.

Chushka bronze cast in the form of a parallelepiped with applied cutting grid, like chocolate bars, which makes the process of dividing into small pieces more comfortable. Produced in accordance with GOST: 614, 1020, 17328.

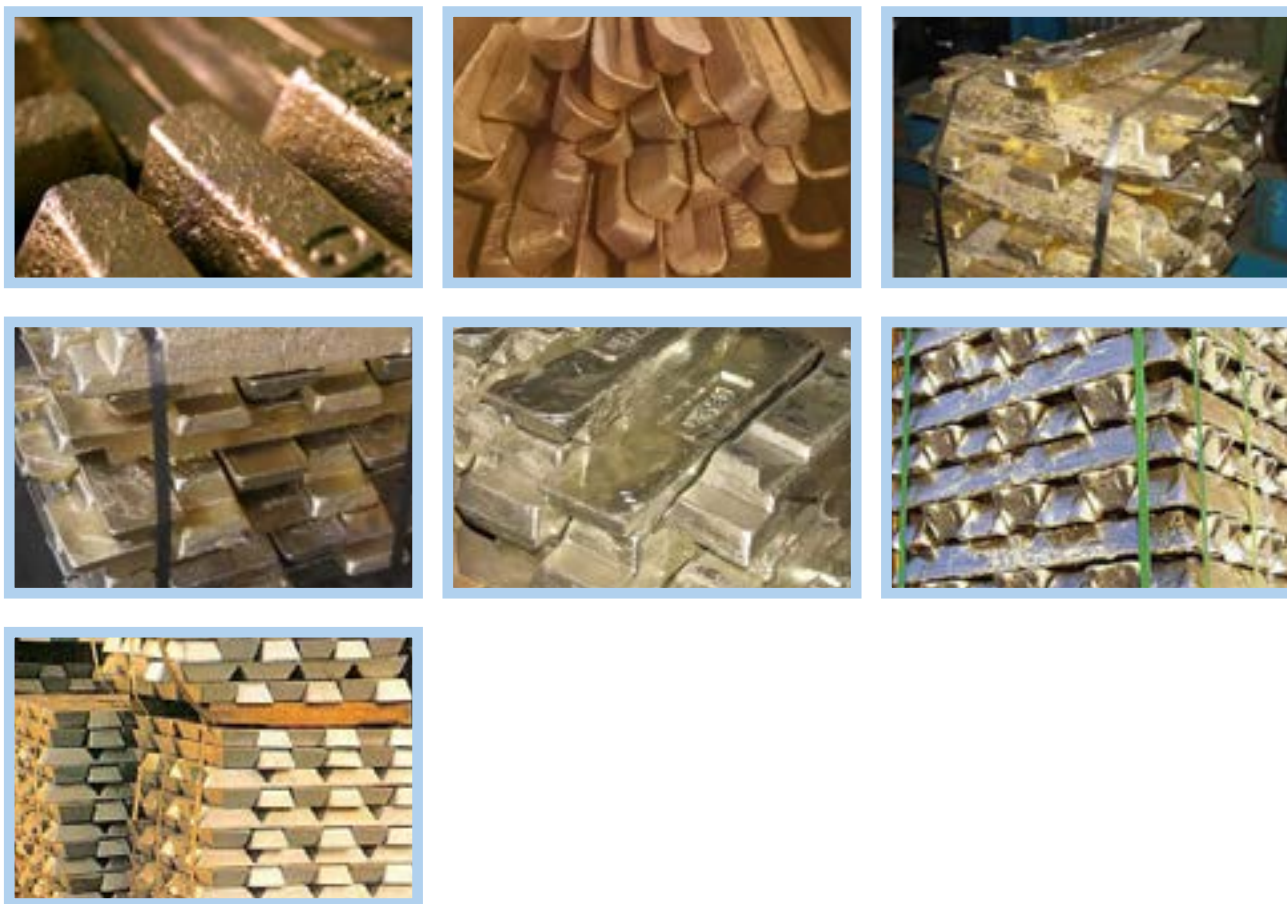
When casting of bronze ingots used a different type of bronze:

- Braze type aluminum bronze contains the iron that makes the material more durable and pliable to simultaneously machined.
- BrAZhMts, made with an admixture of manganese, for greater stability to temperature and corrosion.
- BrOTsS in an alloy consisting of copper, tin, zinc, lead. This type has good machinability.
- BrKMts copper alloy with manganese and silicon part, due to the latter has a special resistance to compression.

This is just basic manufactured on a large scale brand.

Chushka bronze is the raw material, its application is very diverse. Castings go into production cars, railway transport, shipbuilding, aircraft industry. Used for the manufacture of parts, starting with the bearings, and the last elements of high-tech equipment.





Aluminum bronze ingots

Among the bronzes, aluminum bronzes are among the most popular and sought after in the industry. They are widely used to create parts of friction units, worm gear wheels, bearing supports, nuts, flanges, springs to manufacture. Another area of application of aluminum bronzes - is the production of coins and jewelry. Aluminum bronze has high strength properties. This is due to the fact that aluminum is included, the content of which can be up to 15.6% in the alloy. The optimal content of Al in the alloy is between 5% and 8%. Aluminium bronze on technological grounds are divided into wrought and cast alloys, produced in accordance with GOST 614 and GOST 493, respectively.

Basic properties. The choice of the type sometimes aluminum bronze is made in view of its properties and requirements to the material. The main characteristics, which should pay attention to are: electrical and thermal conductivity, heat resistance, weldability, cavitation and erosion resistance, mechanical strength, resistance to corrosion fatigue, creep strength, toughness, and others. Compared with aluminum bronze tin bronze, the following should be noted their advantages: the fluidity, a high strength, high heat resistance, and the anti-corrosion resistance.

Disadvantages aluminum bronze:

- When there is a significant shrinkage of crystallization;
- Ability to form columnar crystals of large sizes;
- Substantial oxidation that occurs in the molten state, which may lead to fracture of slate;
- By pouring molten foaming occurs;

- The difficulty of soldering and brazing.

To eliminate these drawbacks, apply alloying aluminum bronzes lead, nickel, iron, manganese and other metals. Aluminium bronze is used as a deformable (BrA5 and BrA7) as a foundry (BrAZhS7-1,5-1,5; BrAZhN11-6-6; BrAMTs10-2) and universal (BrAZhN10-4-4; BrAZhN10-4-4; BrAZh9 -4 BrAMTs9-2; BrAZhMTs9-3-1,5). If the latter group are used as bronze casting, by labeling them add the letter "L". The least durable and most plastic of aluminum bronzes is BrA5, followed BrA7 and BrAMTs9-2. They are typically made from tapes, rods sheets. Aluminum bronze BrAZh10-4-4 brand has the greatest tensile strength and relatively high strength and heat resistance. All aluminum bronze ingots produced weighing up to 35 kg.

Bronze BrAZH 9-4

Bronze is classified BrAZh 9-4 tinless bronzes pressure treated. In another way, it is referred to as CuA19Fe3. Manufactured in accordance with GOST 18175, bronze BrAZh9-4 alloyed aluminum (not to exceed 10%) and iron (not more than 4%), also contains impurities (Mn impurity should not exceed 0.5% of lead - 0.01%).

Aluminium allows bronze buy additional corrosion resistance, good anti-friction properties. Bronze Iron improves the strength, but the ductility is slightly reduced. The material also shows heat resistance, has a high density of castings, a good conductor of current. In addition to these properties, different acceptable price.

The disadvantages to a considerable shrinkage, lack of resistance to superheated steam, the getter liquid melt, the formation of columnar crystals, resulting in alloy brittleness. Bronze BrAZh9-4 melts at 1040 degrees and has a linear shrinkage of 2.49%. The coefficient of friction with lubrication BrAZh9-4 equal to 0.004, without lubrication - 0.18. The density of 7500 kg / m³.

Recommended cast bronze continuous method, then processed by quenching in water or oil - which can further increase strength. To improve the strength of the same bronze is aged. Comes BrAZh9-4 bronze in form of ingots / billets. It is used for the needs of the aerospace, mechanical engineering, to create various parts of engines, chemical industry, defense and oil. Well this shows itself in different nodes bronze manufacturing equipment friction. It is perfectly suited for the manufacture of sliding bearings, can withstand heavy loads and work at high speeds.

Bronze BrAZhMts 10-3-1,5

Bronze BrAZhMts 10-3-1,5 classified as bronze Tinless, handled the pressure. Digital copper alloy marking denotes the percentage of the major alloying elements - aluminum, iron and manganese. The composition of the chemical elements of the brand can be found in GOST 18175. Sampling for examination of the chemical composition shall be in accordance with GOST 24231.

As seen from the marks of the alloy include Cu (82.3 - 88%), Al (9 - 11%), Fe (2 - 4%), Mn

(1 - 2%). In addition to these metals composed allowable impurities:

1. Si (0.1%),
2. P (0.01%),
3. PB (0.03%),
4. Zn (0.5%),
5. SN (0.1%).

The percentage of impurity in the brand does not exceed 0.7 percent.

Bronze BrAZhMts 10-3-1,5 has the following foundry and processing properties:

- treated at 750-850 deg .;
- It melts at 1045 ° .;
- annealed at 650-750 ° .

Because the physical properties of the alloy should be noted that it is quite resistant to deformation in the cold state. And changes its form in a hot state without problems. In the temperature interval of 750 degrees Celsius is quite durable, resistant to corrosion, erosion, cavitation.

The above properties of the brand cause the area of its application. Most often it is made of equipment items to work with the chemical. reagents, parts of cryogenic equipment, tubular capacitors board. Also from this material are manufactured welding electrodes for the aluminum-iron bronze.

In the form of this product bronze brand can be found in the following forms:

- Pipes. They are produced by compression or molding. The most common shape is round, but can be more complex cross-sectional shape.
- Rods. They have a circular cross-sectional shape. Most often, produced by pressure treatment. Casting is used for the manufacture of large-diameter bars.
- Ingots. Available in a variety of geometric shapes and masses, depending on customer requirements.



Beryllium bronze BrB2

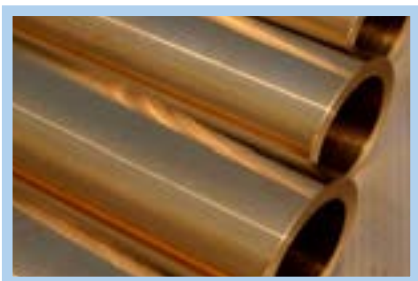
In everyday life, we are often faced with bronze BrB2. Because this material is carried out a lot of details that are responsible value, including the elements of precision instruments, working for wear parts, a variety of bearings. Very widely used in electrical beryllium alloys, such as spring contacts, switches or connectors in telecommunication equipment.

By itself, beryllium bronze BrB2 refers to the precipitation of hardening alloys, the most commonly used of which are bronze BrB2 (high), DHS (copper-nickel-beryllium) and

ICD (copper-cobalt-beryllium). The latter two are also commonly referred to low alloy beryllium bronze.

According to GOST 18175-78, BrB2 beryllium bronze is an alloy consisting of up to 98% copper and up to 2% of beryllium. The alloy is characterized by high hardness and high tensile elasticity, resistance to wear and corrosion resistance (resistance in humid and warm climate allows the use BrB2 in tropical conditions). Rating beryllium bronze BrB2 explained, inter alia, the fact that this material is processed and roller spot welding, arc welding is complicated due to the wide temperature range of crystallization.

We offer several kinds of products from BrB2 bronze - a ribbon (GOST 1789), the sleeve (GOST 18175), rods (GOST 1628), pigs. Currently, beryllium bronze BrB2 considered one of the best materials for sliding bearings, used in marine or brackish water with abrasive slurries and corrosive substances, beryllium bronze BrB2 can be used to make almost any part of the high-precision and reliable equipment.



Bronze BrAMts 9-2

Due to its high technical characteristics bronze BrAMts 9-2 is widely used in industrial production. In its structure, the alloy belongs to the group of bronze containing no tin. Here, the main alloying element is aluminum. To improve the strength of the alloy used a complex heat treatment. After quenching, artificial aging treatment is performed. Alloy is held for three to four hours. As a result of such processing bronze becomes necessary for further use characteristics.

In the composition of the copper-based alloy further contains 9% aluminum and 2% magnesium. Plus bronze BrAMts 9-2 includes a small amount of other impurities. The material has a high strength and low coefficient of friction. Many sites use machines bearings, which are manufactured on the basis of this brand bronze. The alloy is widely used in the manufacture of components and parts in internal combustion engines and hydraulic drives.

The large volumes of bronze BrAMts 9-2 is used for the production of electrical products. Among other characteristics of the alloy should be noted that 9-2 bronze BrAMts pressure can be easily processed. Due to its high adaptability, the alloy used for the manufacture of various types. Metalworking machines, casting machines, rolling mills many industries, “incarcerated” on the use of this mark bronze. Products made of an alloy used in the aviation industry, utilities and other fields of human activity.



BROF Bronze 7-0,2

Bronze - two or compound alloys of copper (Cu-like base) and alloying elements. Bp marked with the letter, followed by the letters corresponding to the alloying elements: O-olovo (Sn); A-Aluminum (Al), B-beryllium (Be), K- silicon (Si), H-nickel (Ni), Mts-mapganets (Mn), T-titanium (T), F-zhelezo (Fe), F -focfor (P), C-cvinets (Pb), D-zinc (Zn). Following written figures -% -s content of alloying elements (Brophy 7-0,2 bronze containing 7% Sn-and P-0,2%, respectively).

The most used is tin bronzes according to GOST 5017 having good machinability, sliding characteristics, suitability for welding and soldering: bronze Brophy 7-0,2 (CuSnS), BrOF4-0,25 (CuSn4), BrOF6,5-0,15 (CuSn6), BrOF2-0,25 (CuSn2), BrOTs4-3 (CuSn4Zn3), BrOTsS4-4-2,5 (CuSn4Zn4Pb3), BrOTsS4-4-4 (CuSn4Zn4Pb4). The corrosion resistance of them have BrOF4-0,25, BpOTs4-3, BrOTsS4-4-2,5, BrOTsS4-4-4 but bronze Brophy 7-0,2 better than the rest is cut, is springy properties, higher durability and stability corrosion.

Tin-phosphor bronze, thanks to its mechanical and chemical characteristics, are widely used in engineering and other industries. Of them make bushings, gaskets for heavy machinery, gears, corrosion resistant nuts and bolts.

According to GOST 10025 assortment of bronze rods is diameters from 5 to 110 mm and lengths of 0.5 to 2 m. The pressed (forged) bronze BROF 7-0,2 produced more than 40 mm in diameter and up to 95 mm, and drawn or cold rolled from 16 to 40 mm inclusive. Products less than 35 mm in circumference twisted in a bundle with the number of bars from 3 pieces, but up to 80 kg, however, on request of the beam weight can be up to 0.5

tonnes, and bars less than 15 mm is possible to pull up the bay. Rods are transported, usually in closed packages bodies to 1250 kg with their fixing wire or ribbon on the pallets or bars.

Bronze BrOF 10-1

There are several classifications of bronzes. Most in the classification is based on the type of main alloying elements - there are aluminum, chromium, manganese bronze, etc. Also bronze can be roughly divided into tin bronze and Tinless. By the method of further processing one bronze attributed to the deformable technological properties which enable the production of rolled and forging and casting. Bronze BrOF10-1 relates to the casting of bronze and tin is produced according to GOST 613 and GOST 614.

Chemical composition: tin - 9.11% phosphorus - 0.4-1.1%, impurities not exceeding 0.9%, copper - the rest. Thermal conductivity - $49 \text{ W / m} \cdot \text{K}$, melting temperature - 934 deg density - 8.76 g / cm^3 , a resistivity $> \text{mO} \cdot 19 \text{ m}$, the casting temperature - 1150 deg.

Bronze Bar (ingot) - a semi-finished product, which is usually not the final production of the product. Bronze BrOF10-1 ingots produced by casting in the form of small plates with pinches to facilitate separation of smaller fragments. In the future, pig used for remelting.

Tin-phosphor bronze casting BrOF10-1 has high mechanical, corrosion, casting, and anti-friction properties. Its use ensures reliability and durability, which makes a wide range of capabilities in the application:

1. Bearing alloys (in particular - monometallic bearings and plain bearings and bushings and liners).
2. Wheels worm gears.
3. Spindle and push nuts.
4. Units valve friction.
5. High load parts in screw drives.
6. Production of anti-friction materials.

According to GOST 614 produced commodity BrOF10-1 bronze ingot size 570h120h60 mm, weighing 28-30 kg.





Bronze for monuments

Bronze is one of the most common materials for the manufacture of monuments. This is due to chemical and physical properties that make the master, is made a monument, it is easy to create sophisticated shapes with elegant details. In the manufacture of monuments in bronze is used as a raw material in bars.

In the production sites often use a tin foundry bronze ingots. This type of bronze should comply with GOST 614. BrO6Ts6S2h is a popular bronze monuments mark. pig weight should not be more than 42 kg, the shape and size can vary depending on the specific order.

Permissible number of components and standards of impurities consisting of:

- Tin - 5.0-7.0%;
- Zinc - 5.0-7.0%;
- Lead - 1.0-4.0%
- Antimony is not more than 0.5%;
- The iron is not more than 0.5%;
- Aluminum is not more than 0.1%;
- Total impurities not more than 1.0%

Bronze different wear resistance and increased corrosion resistance, is not sensitive to overheating and frost resistant. The disadvantage is the cost, because of the presence in the composition of the price slightly higher than the tin. But the casting of bronze

tinless turns with greater shrinkage and loose. Bronze for monuments is not susceptible to external stimuli, natural, moisture, wind, etc.

In the bronze patina may occur over time. Many art lovers believe that it does not spoil the monuments and other items made of bronze, and even gives them a certain charm. If necessary, to get rid of the patina with strong acid solution (sulfuric acid, hydrochloric acid, sodium hydroxide solution). But do not forget that the constant exposure highly concentrated formulations bronze she may darken. You can also clean the brine or simply wipe with soap and water, if desired monuments of bronze.



Silicon bronze

When the content of silicon up to 4% silicon bronze has good casting properties and ductility. Usually it is with the addition of manganese or nickel, and sometimes aluminum, zinc, tin or iron. With its high resilient and mechanical properties, and as a corrosion-resistant and wear-resistant, is of great interest to the industry. Bronzes of this type are soldered perfectly hot and cold solder perfectly handled the pressure and welded with steel, bronze and others. Silicon bronze surpass tin on corrosion resistance and mechanical properties, are non-magnetic and hardy, do not give a spark when striking. When the content of silicon up to 4% silicon bronze has good casting properties and ductility. Usually it is with the addition of manganese or nickel, and sometimes aluminum, zinc, tin or iron. With its high resilient and mechanical properties, and as a corrosion-resistant and wear-resistant, is of great interest to the industry. Bronzes of this type are soldered perfectly hot and cold solder perfectly handled the pressure and welded with steel, bronze and others. Silicon bronze surpass tin on corrosion resistance and mechanical properties, are non-magnetic and hardy, do not give a spark when striking. High-strength to dry gases and alkaline media, so are used to produce gas, chemical waste pipes. This bronze is also used for the production of spring parts operating at elevated temperatures (not deformed). Semi-finished products in the form of wire, strip, bars, sheets used in general mechanical engineering and marine shipbuilding, for the manufacture of pipes, screens, meshes, smoke filters, evaporators, in engine construction. They stand in the sea and fresh water.

Nickel in silicon bronze after quenching and tempering of the alloy increases the hardness of up to 300%. The same actions have chrome and cobalt. These bronzes are used in the manufacture of parts critical applications. When the tin content of up to 0.5% rise corrosive properties. The presence of 1% zinc in the alloy facilitates the melting process. The high aluminum content in the alloy increases its hardness and strength, but the quality of the hydraulic lost. lead and zinc are added to improve the fluidity and decrease the porosity of the alloy, which in turn reduces the cost, but the disadvantage of the alloy is more prone to absorb gases. to dry gases and alkaline media, so are used to produce gas, chemical waste pipes. This bronze is also used for the production of spring parts operating at elevated temperatures (not deformed). Semi-finished products in the form of wire, strip, bars, sheets used in general mechanical engineering and marine shipbuilding, for the manufacture of pipes, screens, meshes, smoke filters, evaporators, in engine construction. They stand in the sea and fresh water.

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Tin bronze OCS

An alloy composed of copper and tin, called tin bronze. There are also more complex bronze with the addition of other alloying metals (zinc, nickel, phosphorus, lead and others.)

Marking. There are foundry (GOST 613) and deformable (GOST 5017) tin bronze. Alloy Marking BrOTs implies the following metals: Br - copper, O - tin, C - lead, C - zinc.

On the basis of GOST 163 tin bronze OCS is divided into several types. Depending on the percentage of base metals, as well as the presence of impurities, the alloys are marked:

BrOTs3-12-5 (rebar production);

BrOTs5-5-5, BrOTs6-6-3, BrOTs4-4-17 (making anti-friction parts -porshni, bearings);

BrOTs3,5-6,5 (production machinery parts).

Features and properties. Thanks to the addition of tin, the alloy has excellent casting

properties. Typical low shrinkage, little fluidity in the molten state, improved resistance to corrosion at all temperatures, excellent mechanical characteristics. Castings foundry bronzes do not give shrinkage cavities, have a high density, resistance to mechanical and chemical influences.

In practice, the production of tin bronze is used by 9% to 11% tin. The cast alloy has a resistance of about 20 kg \ mm² and elongation of 10%. These rates affect the mechanical properties of bronze - at the same time hardness and brittleness of the alloy.

Methods of production. The casting tin bronze OCS (BrOTsS5-5-5) produced by continuous centrifugal casting or chill casting, tin content of 5-6%.

Wrought alloys (BrOTsS4-4-2,5 and BrOTsS4-4-4) is treated with pressure, that is, produce a way of stamping or pressing.

Form and packaging. OCS deformable tin bronze often manufactured in the form of ribbons, tubes, wires of different sections of the sheet. For the production of anti-friction parts from brand BrOTsS5-5-5 produce hollow round billet and guides. But this is only a small part of the form in which the bronze is supplied.

Application. The alloy is used in mechanical engineering and engine construction, for the construction of communications technology for the production of decorative products.

From alloy BrOTsS produce:

pipe fittings, motor bearing inserts;

fittings;

parts for engines operating on friction;

sleeve piston in engine,

crowns worm gears at speeds up to 10 m \ s.

Bronze BrOTsS 5-5-5

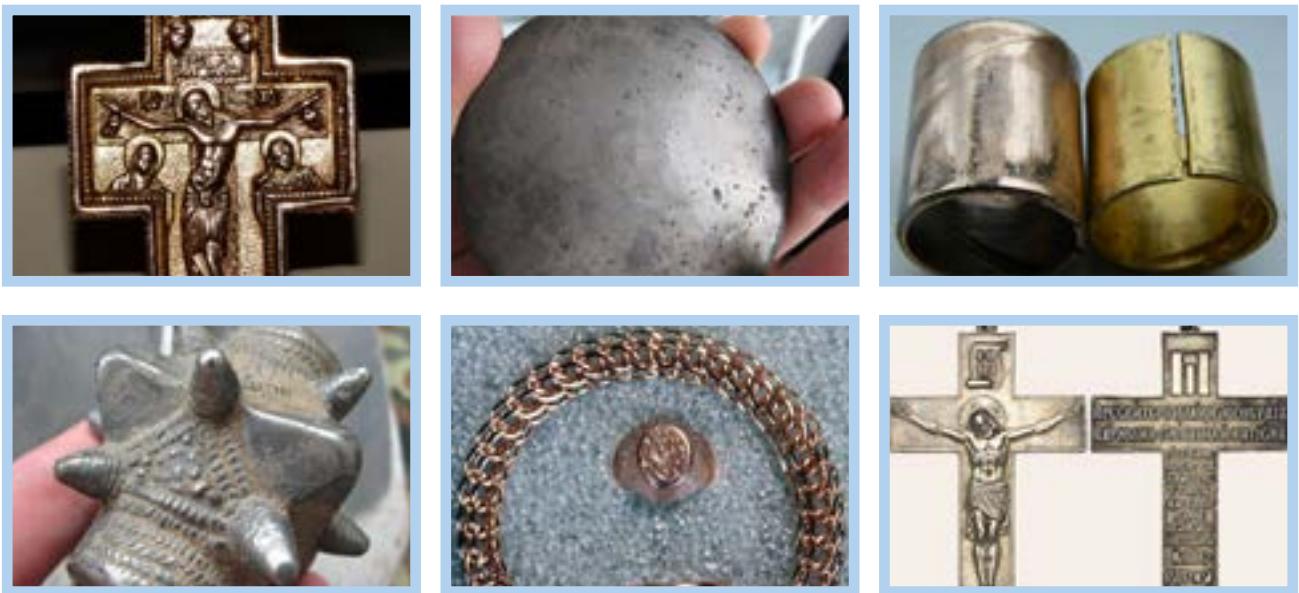
The chemical composition of bronze BrOTsS 5-5-5 is an alloy of copper, tin, zinc and lead. This composition was the result of a long process of development work. Much of nonferrous metals individually, in pure form are used in industrial production. This is due to their poor mechanical properties and a high activity by reacting with the atmospheric oxygen. Copper, in its structure, and is not resistant to plastic material deformation. Plus, even at low ambient humidity the surface rapidly oxidizes.

Bronze BrOTsS 5-5-5 has a high resistance to abrasion and aggressive environmental influences. Among the aggressive factors are heat, humidity, and chemical agents. This set of actions occurs in the operation of river and sea vessels. In particular, the bronze produce pipes and elements of stop valves for boilers, steam generators and desalination plants. When assembling internal combustion engines used in bronze inserts this brand. The main function of these inserts - provide smooth sliding shaft and resist abrasion.

According to the current classification are considered bronzes copper-based alloys. The alloying materials are used tin, aluminum, iron, lead and other elements of the periodic

table. The main alloying material specifies the name of the alloy. Bronzes are tin and Tinless. According to the accepted rules marking BrOTsS 5-5-5 bronze, an alloy that contains 85% copper, 5% tin, 5% zinc and 5% lead. alloys are divided into structural and casting in turn. Bronze rolled corners of the first type, pipe and other profiles. At the same time, many brands of this group are used for molding.

Bronze BrOTsS 5-5-5 has universal properties. Due to their high strength and heat resistance of the alloy used in the manufacture of pipes of different diameters. At the same time, sufficient fluidity allows the use of this mark Bronze casting parts. Details have different purposes and require further processing on turning and milling machines. The alloy is marketed in the form of ingots, rods of different diameter round billets and slabs for the production of sleeves.



Bronze castings

Bronze is an alloy consisting of copper and improve its properties alloying elements, most of which is used - tin, aluminum or lead. In the presence of tin bronze and pewter are divided into Tinless. Depending on the method followed by the bronze divided into wrought and cast alloys, which are made of cast bronze. Casting may be tin bronze, these include BrOTsS3-12-5 marks and other BrOTsS5-5-5 contain tin, zinc and lead in the percentage figures indicated in the same sequence, i.e. BrOTsS3-12-5 includes 3% tin, 12% zinc and 5% lead, and another stamp BrOTsSN3-7-5-1 contains 1% nickel. Tinless bronze BrA9Mts2L brands BrA9ZhZL, and the other containing a percentage of aluminum and BrSZ0, BrSuZNZTsZS20F containing lead.

Depending on what class of accuracy want to get castings, using various molding methods. Simple and cost-effective way - in the form of casting sand and clay, but in view of the active gas formation in the casting process, it is - the rudest. The roughness of the product more than 0.3 mm. It used this method rarely, and only for the manufacture of very large workpieces.

Casting using a cast models allows to obtain a sufficiently high precision product with a

wall thickness of 0.5 mm and weighing from a few grams. It is made of bronze casting of complex forms, including art works. Centrifugal casting is used in the manufacture of bushings and other products made of bronze, which require high strength and density of the metal. Under controlled pressure-volume molded parts with minimum tolerances to reduce the labor intensity of production. Another method of casting - in a metal mold - releasable form of the metal, which can be used repeatedly. It is used for the manufacture of mass-produced parts of simple shapes. One of the most promising currently considered gasified using technology that is vaporized during casting models. Bronze castings are widespread from heavy engineering to products of high aesthetic value.



Chromium bronze BrH

In industry, the term “bronze” means copper alloys (in excess) with a wide range of alloying elements -. From aluminum to chromium and other exception is the group of copper-nickel and zinc alloy, hereinafter referred to brass. Nomenclature bronzes contains the symbol “Br”, then the letter indicated by the alloying element and its percentage composition in the form of numbers. Independently among numerous family bronzes are alloys in which the content of doping substances does not exceed 0.3-1%. With the same characteristics and thermal conductivity of copper that they are far superior in terms of its hardness, strength and endurance limit. Furthermore, this group of alloys can be operated at higher temperatures. BrH chromium bronze containing 0.5 - 1% chromium, refers to such materials. A distinctive feature of chromium bronze - increased corrosion resistance. The presence of chromium in the alloy essentially raises the heat resistance of

the copper alloy, causing the main directions of use:

1. It is used in the manufacture of the moving contacts. Chromium bronze BrH in products used as a spring contact reinforcement, as bears high elastic properties. - In transport, a current collecting wires has excellent tensile strength and abrasion.
2. It is used for welding electrodes machine.
3. Production of heat exchangers.
4. Perfect in the production of both anti-friction material.
5. Welding wire chrome bronze usually applied as a filler metal.

BrH chromium bronze has the following chemical composition: iron - 0.08% Cr - 0.4 -1% copper - 98,5-99,9%, zinc - 0.3%, other impurities up to 0.5 %.

Casting and technological characteristics of chromium bronze BrH:

- Melting point - 1073 m .;
- Annealing temperature - 650 gr .;
- Heat treatment is carried out at - 700 - 950 gr.
- Hardness of bronze BrH: deformed alloy - HB 10 -1 = 115 MPa, annealed alloy - HB 10 -1 = 60 MPa.

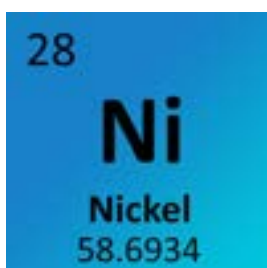
Comes chrome bronze BrH in the form of wire, rods, bars, plates, sheets





NICKEL

General information



Nickel was widely applied in various fields of industry. It is divided into several types: primary, semi-finished, nickel alloy. Each of these has a number of marks. They differ in chemical composition that defines their technological properties. Requirements for primary nickel GOST 849-97 sets. Nickel is the following marks: O-H, H-1, H-1y, H-2, H-3 and H-4. Most often they are used for the manufacture of steel and alloying alloys. These grades differ in the percentage of nickel. More than just a nickel-H 0 - its share is 99.9%. In order to nickel present in such amounts using electrolysis. The brand H-1 Nickel has submitted fewer - 99.93%. The H-3, for example, nickel should be at least 98.6% of the total weight.

Primary nickel is most often comes in the form of cathodes sliced / sheet sizes 1030h870h12 mm, and granules (typical for the brand H-3). Semi-finished nickel used for the production of wire, sheets, strips, rods and other products that are used in machine building and instrument making. The quality of these products each adjusts its GOST. For example, GOST 13083-77 - is the technical requirements

for the production of rods, GOST 6235-91 - for sheets and strips. Among the semi-finished nickel identify several brands: NP0Evi, NP1, NP1Ev, NP2, NP2E, NP3, NP4, NPA1, NPA2, NPAN. Mark NP0Evi, for example, is used for the manufacture of anodes and other components of electronic devices. Also it is used for the production of thin nickel ribbon (0.05-2 mm), which is widely used in manufacturing various equipment. Nickel mark NP1 is used for the manufacture of wire, which is later used for details of special purpose. These stamps nickel is also present in high purity (98,6-99,9%). They differ mainly impurities which determine their physical properties such as melting point, hot-working temperature, annealing, casting, and the coefficient of linear shrinkage.

Demand for nickel is increasing annually, and this is not surprising. It is no secret that the scope of the use of nickel becomes larger every year. In particular it concerns the manufacture of stainless steel. This process uses about two thirds nickel production worldwide. Due to their properties, nickel and widely used in engineering, electronics, power, manufacturing equipment for transportation as well as in the manufacture of glass. It should be noted that the use of nickel is more than 300 sectors. From producing nickel wire, sheets, strips, rods and powders.

The main advantages of nickel:

- Nickel is highly resistant to mechanical stress;
- a high level of heat resistance;
- protects against aggressive chemicals.

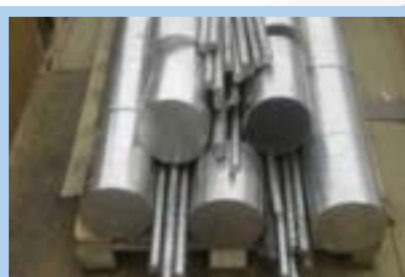
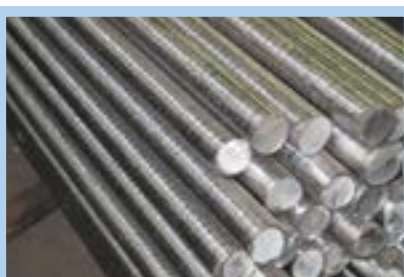
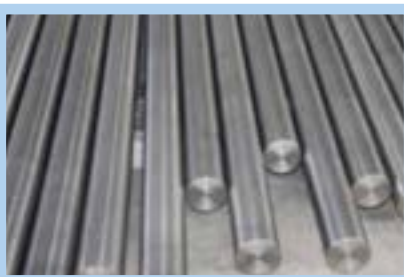
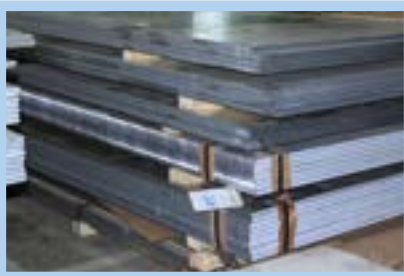
Let us consider a few key aspects of its production. There are several ways:

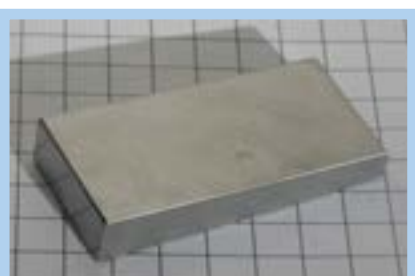
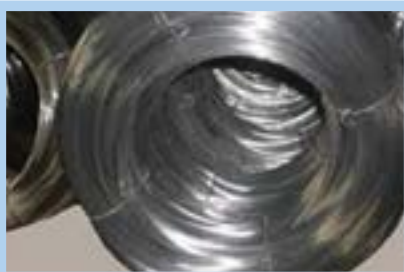
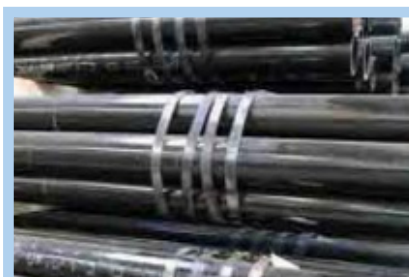
- carbonyl, whereby one of its stages, this semifinished copper-nickel, and the level of sulfide compounds in the initial ore is very high;
- aluminothermic method of Ni ore, while using the standard formula - $3\text{NiO} + 2\text{Al} = 3\text{Ni} + \text{Al}_2\text{O}_3$;
- recovery of coal dust, when they receive a nickel-iron pellets.

Industrial use of nickel:

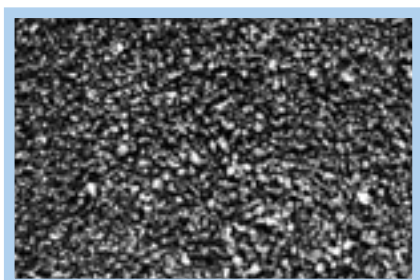
- Nickel is used in medicine, in particular, it relates to the manufacture of braces;
- Nickel compounds are used for the production of precision mechanisms and instruments for measurement;
- Nickel prevents corrosion, therefore, finds its application in the nickel plating of metals;
- Production of coins and jewelry;
- manufacture of dyes, coatings;
- aviation and space industry.

NICKEL MANUFACTURING FACILITIES



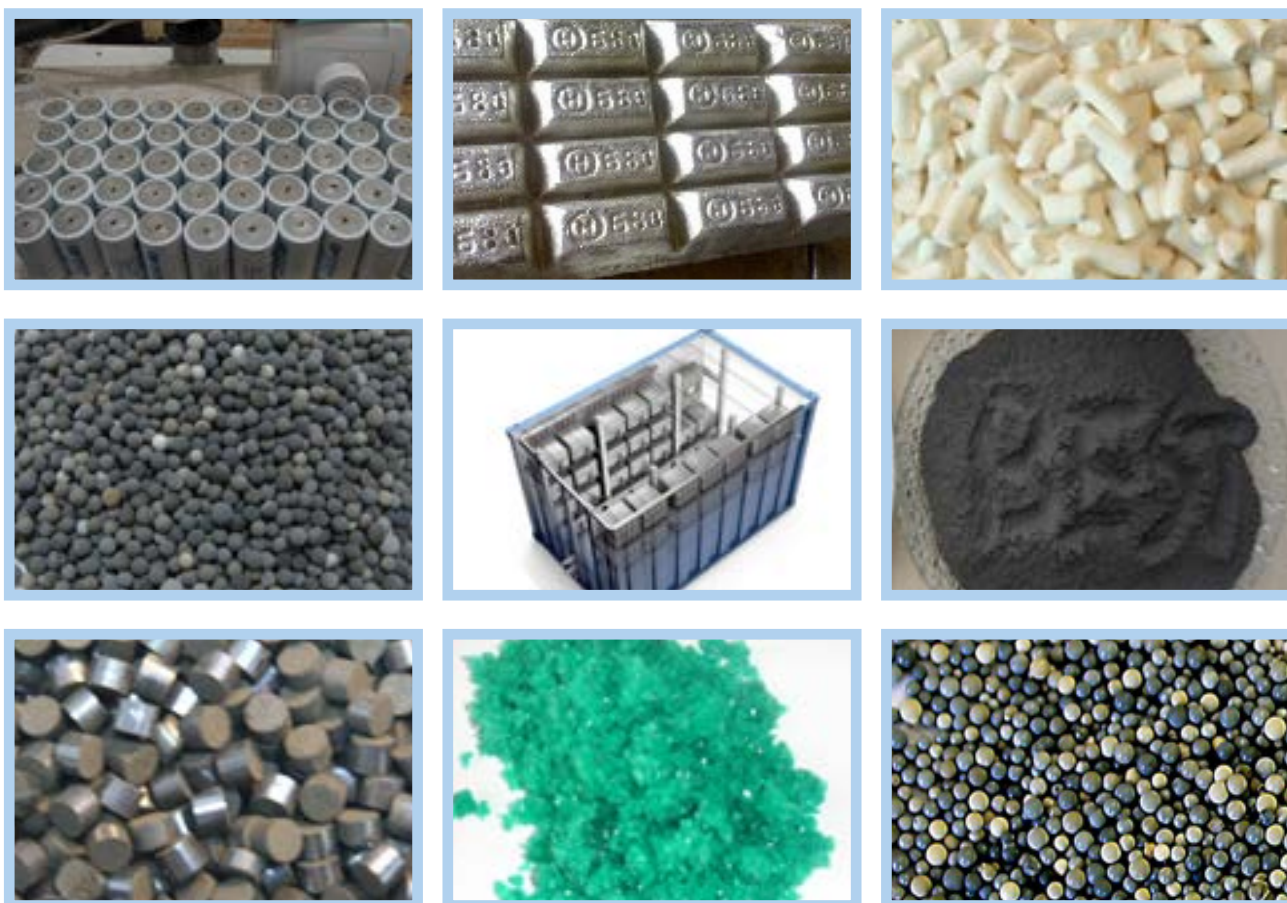


Rolled Nickel



Nickel catalyst

In everyday life, when we buy, such as margarine, we do not even guess that its production is necessary to conduct hydrogenation. Upon chemical definition, hydrogenation occurs when organic compounds are added to hydrogen. In this process, various chemical components, but the most important are the catalysts can be used. In industrial production using them are made different fuels for engines, paraffins, alcohols and other products. In the metallurgical industry nickel catalyst, and any kinds can be used in the hydrogenation process low phase and hydrogenation, which occurs in the gas industry. There are different types of this product, but the most popular is the nickel catalyst U-NI-B and U-NI-A, as it has many advantages. Firstly, these catalysts are used in industrial production in the manufacture of benzene rings, oximes, carbonyl groups, nitriles, and other important components. nickel catalyst and can operate under normal and under high pressure, which is not typical of other catalysts. Secondly, the nickel catalyst is very easy and fast to manufacture. For other catalysts, the manufacturing process is very complex and time consuming. Reagents for its manufacture are commercially available. It is surprising that the process of cooking is so simple that it can prepare almost any person without special education. Third, you do not need a lot of money as a nickel catalyst can be manufactured from inexpensive reagents. Fourth, nickel catalyst maintains its activity for a long time. But in this case it should be stored in a special solvent in which no oxygen. Nickel itself is a pretty scarce commodity, because it is very popular in the steel industry. This metal has many advantages, since it is not afraid of no protection. Whether it is gas, fresh water or sea water, different chemical solutions. This nickel is almost never goes bad, since he also is not afraid to corrosion.

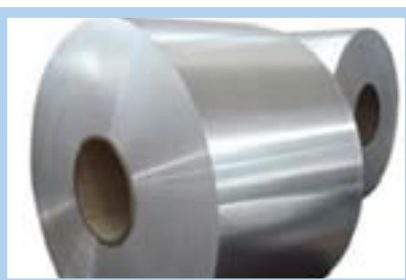
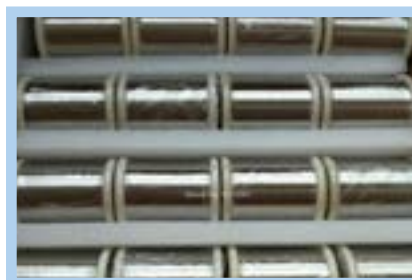
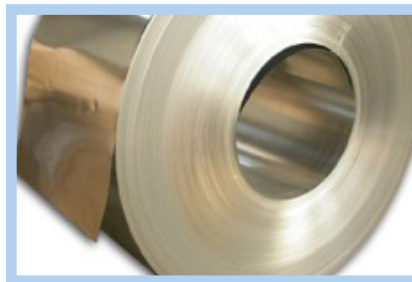
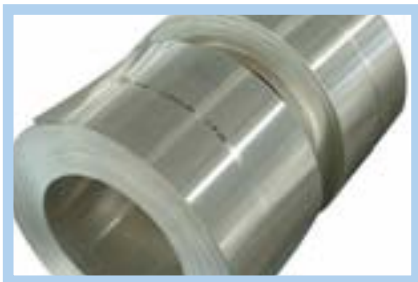


Nickel tape

Universal production quality of these products make possible its wide application. Mainly nickel tape is used in mechanical engineering, instrument and electrical engineering. Nickel strip often made of pure nickel, nickel alloys or cobalt-tungsten. The alloys have a high heat resistance, has a positive effect on the compliance of the products of these conditions of use. High electrical resistance, which has nickel belt, allows using it in electrical work. Our company offers you to buy a nickel tape of high quality at a reasonable price. Nickel belt, as well as all our products are manufactured in strict accordance with GOST. According to industry standards, the tape of nickel is marked with the letter "H", another letter in the designation of the finished product - "P", which means "semi-finished". Nickel belt made of an alloy with a nickel content of 99.9% marked as "NP1". The most common material for the tape is an alloy containing 99.5 mass fraction of nickel. "NP2" This nickel tape marked designation. If necessary, you can order any brand of tape, depending on its intended use. Our company will produce desired metal in the shortest possible time. All products in our offer we have the necessary certificates. We produce and sell nickel ribbon thickness of 0.05 to 2 millimeters. Belt width can vary - from ten to three hundred millimeters. The length of the finished product ranges from two and a half to thirty meters. If you need a nickel tape with other parameters, just call our operator and inform. Individual approach to every client - is the main principle of our work, so we are always ready to offer you products with the desired characteristics.

Every client we are ready to organize the delivery of any commodity, whether

nickel tape or other types of metal, in the right place and time. It is sufficient to inform about the need to deliver our manager when ordering. You can always get competent advice on all questions regarding our products by phone.



Nickel strip

Nickel rolling occupies a leading position in comparison with other types of metals. It is used in various alloys, which, depending on the added impurities acquire new properties and quality. Almost half of the nickel alloys used in electronics. Also nickel makes corrosion-resistant, heat-resistant, heat-resistant products.

A thin strip of nickel GOST 6235 used in the engineering industry, primarily for creating electric heating elements which in use maintain constant electrical performance.

Nickel strip, which is used in various fields of industrial industry, according to the method of manufacture is hot-rolled and cold-rolled. As nickel strip can be soft and hard. Nickel strip made of different grades of nickel. Product specifications of the nickel as nickel

bands depend on the impurities of other metals present in the alloy. Impurities lead, antimony, zinc, bismuth slightly impair the mechanical and technological quality alloy. The worst impurity is sulfur as sulfide film forms, it makes Nickel fragile.

Hot rolled and cold-rolled strip of nickel GOST 6235 is a multiple dimensional, dimensional and random length in the range from 400 to 2000 mm. You can step back a little from the required parameters, if the party bands with appropriate dimensions is required to the customer, and he accepted it with us.

When viewed from the surface of the nickel strip must be free of defects that impede visual inspection. Traces of unburned lubricant darkening colors are acceptable. Edge products should be smooth, without burrs and undulations. Nickel strip should not have any bundles. Soft nickel strip under bending 180 degrees does not crack or break. This demonstrates the good quality of the product. Each band has a nickel stamp or Attached label with lot number and grade of nickel, from which the product is made.

Symbols.

Strip DPRNT 0,1h300 NB NP2 GOST 2170-73

Strip DPRNM 0.5 × 20 TO NP1 GOST 2170-73

Strip DPRNM 0,5h25 ON NP2E GOST 2170-73

Strip DPRNM 0,20h280 NB NP3 GOST 2170-73

Strip DPRNM 0,4h20 ON NP2 GOST 2170-73

Strip DPRNM 0,5h220 ON NP4 GOST 2170-73

Strip DPRKM 1,5h20 NB NP2E GOST 2170-73

Tape DPRNT 0,2h120 ON NP2E GOST 2170-73

Strip DPRNT 0,1h220 ON NP2 GOST 2170-73

Strip DPRNM 0,8h53 NB NP1Ev GOST 2170-73

Strip DPRNM 1,0h12 ON NP2E GOST 2170-73

Strip DPRNM 0,05h45 NB NK0,04 GOST 2170-73

Strip DPRNP 2,0h300 NB NP2 GOST 2170-73

Strip DPRNM 1h280 ON NK0,2E GOST 2170-73

Strip DPRNM 1,5h220 ON NP2E GOST 2170-73

Strip DPRNP 0,3h84 NB LMWH GOST 2170-73

Strip DPRHH 0,5h60 ON NP2 GOST 2170-73

Strip DPRNM 0,3h150 NB NMg0,1 GOST 2170-73

Strip DPRNM 1,8h45 NB NP2E GOST 2170-73

Strip DPRNP 0,5h30 ON HB3 GOST 2170-73

Strip DPRNT 0,1h25 ON NP2 GOST 2170-73

Strip DPRNT 0,05h20 NB NMg0,05v GOST 2170-73

Strip DPRNM 0,2h300 ON NP2E GOST 2170-73

Strip DPRNT 0,15h90 NB NMg0,08v GOST 2170-73



Strip DPRNM 0,2h120 NB NP2 GOST 2170-73

Strip DPRPP 0,1h30 ON NV3v GOST 2170-73

Strip DPRNM 1x12 AT NP2E GOST 2170-73

Strip DPRNM 2h220 NB NVMg3-0,05v GOST 2170-73

Strip DPRNT 0,3h25 ON NP2 GOST 2170-73 Strip DPRPT 0,3h20 NB NVMg3-0,08v GOST 2170-73

Strip DPRNM 1x12 NB NPOEvi GOST 2170-73

Strip DPRNT 0,6h12 ON NKA0,07 GOST 2170-73

Nickel strip NP2

The strip is made of nickel NP2 nickel suitable type and is a type of nickel metal rolling in our wide range. Nickel strip NP2 comes us in full compliance with the standards industry. If you choose this type of product should pay special attention to the fact that it.

The surface should be free of contaminants that may hamper visual inspection. In addition, the surface of all the tapes in the party should not be damaged, cracks, dents, scratches, scale, as well as bundles and bubbles. GOST admits the presence of small darkening, pockmarked and tarnishing, but only in those cases where the nickel belt is not designed for the manufacture of semiconductor components and electronic devices.

We supply nickel strip may be made on samples agreed with the customer product. All tapes in the party are cut perfectly smooth, burr-free and torn, wrinkled edges. According to GOST, sickle tape may not exceed three millimeters per meter of its length, however, at your request, we will put the tape with enhanced accuracy - no more than two millimeters per meter length.

Produced nickel strip in three states of the material - a soft, semi-solid and solid. The value of tensile strength, depending on the type, ranges from 390 to 540 MPa. Tape nickel produced batches. The total mass of the party less than two tonnes. Finished nickel tape marked in batches, with the required characteristics such as the lot weight, chemical composition of feeds, the results of tests carried out and the symbol products.

If you need a strip nickel NP2 brand, just call us. Qualified manager formalize your order and answer all your questions regarding our product range. Tape nickel can be delivered to us by truck at any convenient place and time. We practice an individual approach to each client, so it is always ready to make a nickel ribbon with the required parameters. Strict adherence to standards enables us to manufacture and sell products is not inferior in quality to foreign analogues.

Numerous industries and the national economy have been applied to products from the nickel metal-roll. Always in demand NP2 nickel strips, which are used in the chemical industry, in particular, physical and chemical laboratory of the Institute, which conducted the research. Nickel strip uses in its manufacturing sector, engaged in the manufacture of paper, as well as the electrical and petrochemical industries.

NP2 Nickel strips are for the manufacture of various parts for automobiles, tractors and airplanes. Nickel strip engineering industry often used for the production of electric elements having high emissivity and thus having stable performance. Nickel strips have high heat resistance and heat resistance, resistant to atmospheric corrosion. Nickel strips do not interact and does not collapse under the influence of hot solutions of alkali and some concentrated acids. On the air of nickel oxide products form a protective film, which protects it from corrosion. Knowing the properties of nickel products, it becomes clear the area of its application. Nickel strips have biological inertness, so used in medicine and food industry. The aesthetic appearance of the products nickel allow their use for decorative purposes. NP2 nickel strips consist of 99.5% of nickel and small amounts of other metals, iron, manganese, silicon, zinc, bismuth, arsenic, copper, phosphorus, lead, magnesium, antimony and other metals in varying proportions. Excess sulfur degrades the properties of the nickel alloy, it becomes fragile and brittle.

Our organization offers a wide range of nickel rolled products, including nickel strip NP2 and other brands. Compliance with technology standards in the manufacture of products made of nickel is a guarantee of the highest quality. We only offer the best product to their customers, always fulfilling the conditions of transactions in full.

Nickel strip NP3

One of the most sought after in the industry is the metal nickel. The pure metal and its alloys have corrosion resistance to different conditions from normal atmospheric to corrosive acid and alkaline. Alloys of nickel, chromium alloy, copper, silicon, molybdenum, have a relatively high thermal stability in oxidizing environments. This is largely determined the scope of the use of nickel and products of its alloys. Mark NP3 nickel is used more often as a raw material for steel. From doing this brand tape, wire, sheets, rods, and the nickel strip NP3. These products are for the manufacture of parts of mechanical engineering. In the field of instrument making products of nickel are used as components in the manufacture of instrumentation. Apply a nickel bands in the manufacture of electronic equipment. Nickel is used in batteries of nickel-cadmium batteries. NP3 nickel stripes are manufactured by hot rolling or cold deformation. Hot nickel strips have a length of 400 to 2000 mm. Length may have tolerances of 15 mm. The thickness of the strips should meet GOST standards, which identifies the various items thickness tolerances. Cold rolled strips NP3 nickel should have variations in length within 10 mm, and their length is in the range from 400 to 2000 mm. To nickel NP3 band had a perfectly smooth surface, the exact width and thickness, using precise and professional carvers rolling equipment.

Nickel bands are in the annealed (soft) state neotozhzhennom (solid) or semi-solid state. At the final stage of the manufacture of nickel stripes on both sides cleaned with steel brushes. Visual inspection of the strip nickel should be no visible defects, which could affect the characteristics of the product. Exactly cut edges and smooth surface without the foreign inclusions, bundles, color change indicates compliance

technology. Buy products of nickel rental can be issued a request on our website or through the organization of managers by phone. Our staff will answer all your questions.

Nickel strip NP4

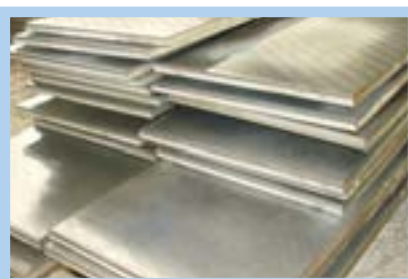
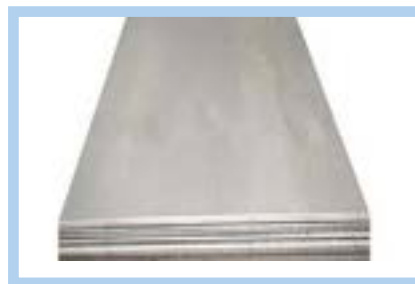
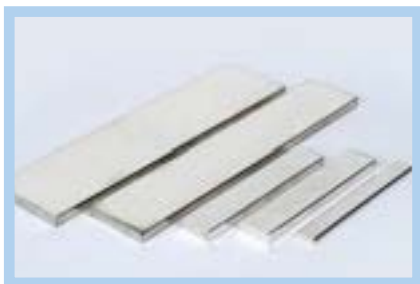
Modern industrial industry dictates the demand for nickel and its alloys. The leaders in nickel alloys consumer electronics and electrical engineering list. Nickel alloys are used for welding wire, high voltage electrical components and heating elements. Corrosion-resistant, heat-resistant and heat-resistant nickel alloys are in demand in the chemical industry. Engineering uses the product of nickel alloys for engine components, batteries. Oil and gas industry has been applied nickel alloys in the production of equipment for heat treatment of petroleum fractions. The energy of nickel alloys are used in the design of structural elements of turbines in the gas turbine power plants. Nickel alloy goes to the production of piping components. In many areas of industrial industry used a nickel strip NP4. A thin strip of nickel NP4 is often only an intermediary in various technological cycles.

The chemical composition of the band Nickel NP4 contains 99.0% of chemically pure nickel. The remaining components are nickel alloy impurities - iron, silicon, manganese, magnesium, copper, carbon and sulfur. The admixture of sulfur beyond the statutory standard degrades the quality of the nickel alloy, making the product brittle and brittle.

Nickel strip made by cold and hot deformation. Along the length of the band Nickel is from 400 to 2000 mm and has a dimensional, off-gage, a multiple dimensional length. nickel strip thickness of the product must comply with GOST, which spelled out specific allowable deviation from the standard. Band nickel can be made by us that long to the customer, if it is agreed in advance the size. Visual inspection of the band Nickel should not have bundles, dents, inclusions of foreign metals and other defects. The presence of unburned grease, darkening is quite acceptable. If soft strip nickel is not torn and not crack during bending, it is an indication that the band Nickel made in compliance with all technical standards.

Supplied party products of nickel, including nickel bands, be sure to have the supporting documents, which contains the information about the number of games and nickel stamp indicating dimensions.





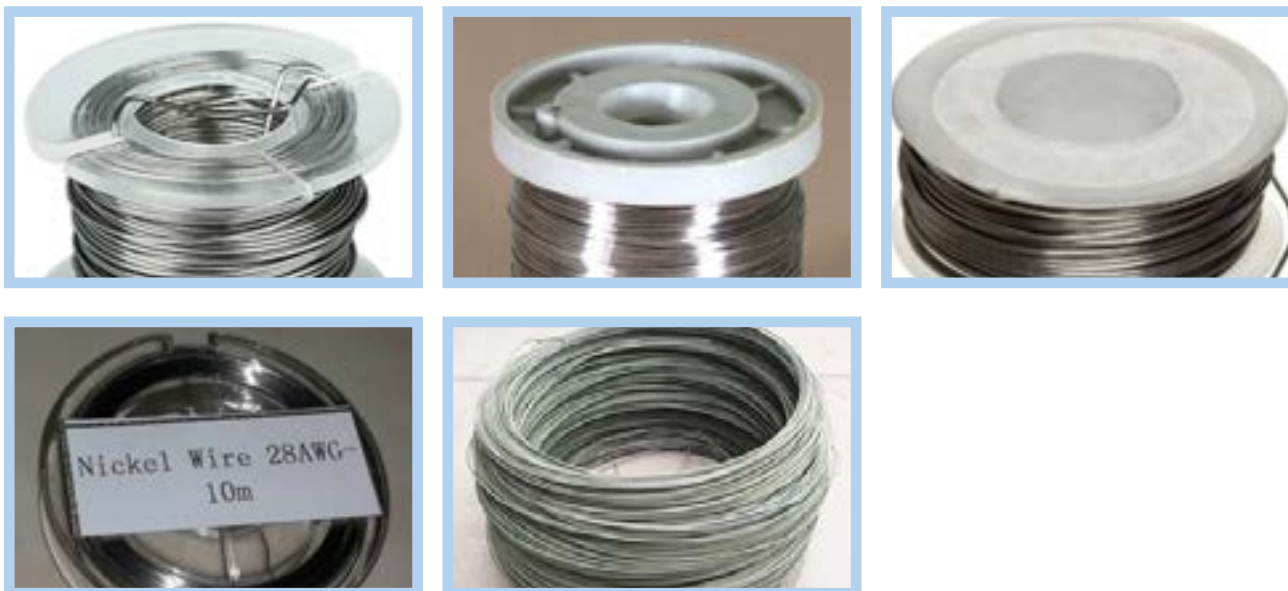
Nickel wire

Products made of pure nickel in large quantities are used in various branches of modern industry. Hard, durable metal that is perfectly polished and amenable to forging, found application in our daily lives. Finer nickel wires have sufficient tensile strength. Products made of nickel resistant to the influence of water, air and certain acids. All these qualities have made nickel demand universal material. Our company sells a huge list of rolled nickel, in particular nickel wire.

Nickel wire GOST 2179 is used for mechanical engineering and instrument making. She goes to the production of cores for small pulse transformers, contactless relays, chokes, magnetic amplifiers. Nickel wire used in magnetic screens operating in weak magnetic fields.

Among the benefits, which has nickel wire, it can be called a high-temperature strength, heat resistance, which make it possible to use the wire in aggressive liquids and gases, hot solutions of some acids and alkalis, maintaining the temperature up to 850 degrees. Nickel wire is irreplaceable in electrical engineering and electronics. From it makes cathodes and grids used in microwave devices and vacuum tubes. Nickel wire goes to the application of a thin layer of nickel on the surface of parts, nickel plating protects against corrosion.

Plastic nickel wire easily gives different kinds of mechanical processing: welding, rolling, forging. It can be used in the medical and food industries, as well as in everyday life. Nickel wire has increased strength. High-quality nickel wire must have a surface with no visible flaws and cracks. Minor deviations from the standard diameter and roughness are quite acceptable. Nickel wire is manufactured on high-tech equipment; the product has a high quality. All products sold by our company has all the necessary certificates.



Nickel thread 0.025 mm

Our proposed nickel thread 0.025 mm has a quality certificate and test report. Validity of the documents, a rapid response to the order, readiness for individual approach, fast shipping in stock - our obvious advantages over competitors.

Nickel thread 0.025 mm only in accordance with GOST 2179-75. Nickel thread is used in various industries. The grids of tubes in cathodes, in television and radio, electroforming, nickel thread is present in the computer technology. Also nickel yarn is used as a nickel source in a vacuum sputtering as catalytic mesh in household appliances, etc. To generalize the above, a nickel thread often required in cases when it is necessary it is important to prevent occurrence of galvanic couple with nickel nodes. Nickel thread most often made from the following brands: NP-2, NP-1. It is available in two types: soft and hard. Nickel filament with a diameter smaller than 0.09 mm is produced only solid type product with a diameter of 0.09 mm produced in both cases. The wire is marked according to the notation of GOST 2179-79. This standard is designed for round wire of the silicon and nickel simple.

According to the mandatory requirements, nickel thread should have a clean, non-porous surface and bundles. As part of the Standard allows very small diameter error, residual grease, a little roughness. More often nickel thread of very small diameter made in accordance with the specific wishes of the customer, as such microwires used in high-tech and high-precision areas. A method for manufacturing a wire thickness and directly affect its mechanical properties. At the same time resistance varies 420-830Mpa range; for the annealed wire elongation - within 18-26%.

Highly qualified specialists of our company will provide you with all the information necessary to help make the right choice when buying a wire. If you want to issue the individual order with its specific parameters, this task is not difficult for our company. We satisfy all the needs of our customers and we appreciate your trust.



Nickel wire NP2

One of the most popular on the market today rolled kinds of nickel wire is nickel NP2, the implementation of which our organization has been successful. Nickel wire has a number of qualities that make it possible to use it in a variety of industrial sectors as an effective material.

Wire, as well as other articles of nickel, used in microelectronics - including hardware components to make microelectronic devices and mechanisms. The wire used in electrical and micro welding. Nickel wire used those kinds of industries that are engaged in manufacturing high-precision parts used in radar, navigation, medicine, television. Nickel wire used in many other areas of the industry: the design and creation of home appliance, computer technology. The wire is used in television and radio. Wire of nickel is widely used chemicals for various chemical processes. Indispensable wire nickel in the manufacture of electrodes for various purposes. Since the nickel wire is quite ductile and strong, and has an attractive aesthetic appearance, it is used in a variety of decorative products.

It is made by cold deformation of wire. As material nickel wire can be hard and soft. In precision manufacturing nickel wire is normal, increased and high precision. It comes nickel wire on spools, in coils or coils.

Acceptable price of nickel wire makes it available for use in many industries. To purchase the nickel wire and other products of nickel please contact us through our company website or by telephone. We are open to negotiations and are always ready as a single shipment, and long-term mutually beneficial cooperation.



Wire of nickel-aluminum

One of the trading positions offered in the market by our company, is a nickel-aluminum wire. We have successful experience in the field of non-ferrous metals and offer its customers high-quality products at reasonable prices, well-established service system, prompt registration of all documents.

Nickel-aluminum wire consists of seven main core conductors which is placed in an aluminum bag. Conductor, which is in the center of the core is made of aluminum, and six outer conductors - nickel. Our proposed nickel-aluminum wire has a certificate of conformity.

According to the specifications, nickel-aluminum wire has the following chemical parameters:

Elements content, %		
Fe	Al	Ni
0.2	22-28	Other

The chemical composition can be compared with a very strong solid solution of aluminum and nickel, created on an ad hoc basis Ni₃Al compound. Wire of nickel-aluminum necessarily stored in such conditions that avoid corrosion and dirt on it. Before you start applying a wire of nickel-aluminum gasoline passes degreasing procedure. Poor adhesion of many common materials with conventional substrates, as well as significantly different temperature gradients led to the creation of such a method, when the substrate is initially applied underlayer, which is characteristic of a remarkable adhesion, and then sprayed the main material. Nichrome wire and nickel-aluminum is currently considered the most suitable materials for the spacer layers. Use wire of nickel-aluminum underlayer styling spray on various steel surfaces. For example, it is applied in the automotive industry to plug into the derailleur, and top coated with bronze. Such a method is advantageous subcoating other ways. Plugs in which the underlayer is of nickel-aluminum wire, have

twice the wear resistance. This contributes to greater uniformity of the coating. The name "Alyunik 7/1" happened under the abbreviated name of the materials from which the wire is made of aluminum and nickel. A fraction indicates the number of strands in the wire.



Alumel wire NMtsAK 2-2-1

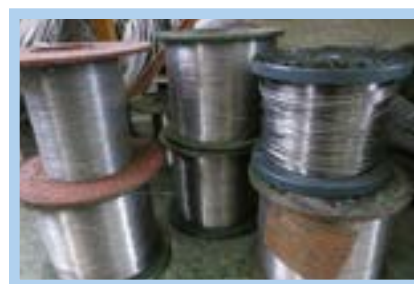
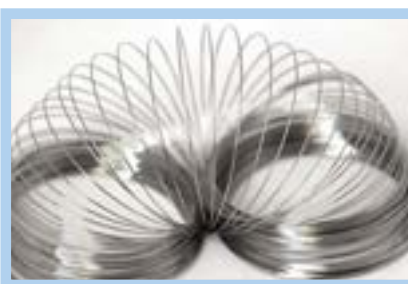
2-2-1 alumel wire NMtsAK thermoelectrodes used as a negative in the manufacture of thermocouples and, in pyrometry to produce compensation wires. Tape alumel actively used in scientific and technical sphere, in the automobile and aircraft industry. Most often it is used in the development of sensors alumel-chromel. With alumel reduce the size of the sensor, which promotes high-precision measurements. Alumel wire diameter ranges from 0.2 mm to 5.0 mm. Tape alumel NMtsAK 2-2-1 is: nickel - 93-96%, aluminum - 1,8-2,5%, manganese - from 1.8-2.2%. Thanks nickel alumel wire has extraordinary plasticity, high heat resistance (alumel melts at 1430 ° C) and corrosion resistance to the action of aggressive environment. One of the major drawbacks is the high cost, due to high costs of production. Tape alumel prone to the ravages of sulfur at high temperatures, which manifests itself in the form of corrosion and embrittlement. To avoid this, added to the alloy slightly larger amount of silicon, thus reducing the amount of aluminum.





Chromel wire NH9,5

NH9,5 chromel wire (chromel grade T) is used in the production of thermocouples, and can also be used to create the electrodes. From Standard 492 it implies that NH9,5 chromel wire has the following composition: chromium (9.00 - 10.00%), manganese (0.30%), silicon (0.40%), iron (0.30%) copper (0.25%), lead (0.002%), cobalt (0.60 - 1.20%), sulfur (0.01%), carbon (0.20%), aluminum (0.15%), arsenic (0.002%), phosphorus (0.003%), antimony (0.002%), bismuth (0.002%), nickel (balance). Melting point chromel ranges 1400 - 1500 ° C. According to GOST R.8.585-2001 wire Chromel NH9,5 used in thermocouples TCA, TCA THKn and pairs with other alloys. Thermocouples TCA designed to determine the temperature between -40 - 900 ° C paired with konstantanom -200 and - 800 ° C paired with Copel. Thermocouple TCA, where in addition to use chromel alumel, applied in a temperature range of -200 - 1200 ° C. Chromel wire NH9,5 corresponding to GOST 1790-77, has a diameter of 0.2 - 5 mm and is divided into three classes of tolerance (two classes for high temperatures and low for one class). Also wire Chromel NH9,5 by this standard shall have a standard allowable value of the ultimate tensile strength and regulated electrical resistance of one meter for each envisaged dragged diameter. NH9,5 chromel wire whose cross-section diameter of not more than 0.3 mm, is supplied to the coils, and the wire having a diameter of 0.5 mm, - in the form of skeins.





Nickel foil

Industry has been applied a number of different metals. Are no exception and nickel products including nickel foil. Pure nickel is very ductile and malleable, resistant to corrosion in water and in the air, which allows the use of products made of it as a protective coating.

The nickel foil is used in different spheres of human activity: in mechanical engineering, chemical industry, construction and medical industries as well as in those branches where needed materials that tolerate thermal stress: in turbine designs, engines, furnaces, combustion chambers, heat exchangers, various heating installations. The nickel foil is used to charge the battery. The nickel foil as the membrane heating element can be used in photovoltaic systems, fuses, transformers and capacitors. From it makes special flexible flat cables, which are used in modern automotive engineering. Having high resistance and not oxidized at high temperatures, nickel foil is used as a heating element.

At normal temperatures, nickel foil resistant to distilled water and sea water, alkali, acids, and other organic substances.

A thin nickel foil enables the development of more efficient and compact products, and by saving resources allows to spare the environment. Nickel foil meets all the requirements and standards of many branches of the industrial industry, which allows to continuously expand the scope of application of the nickel foil.

When viewing the surface of the foil should be noted that it should be free of cracks and stratifications. The edges of the rolls should not have dents and dirt. Small injections, small scratches on the surface of the foil caused during transportation, it is quite acceptable. A slight darkening of the surface of the foil does not change its reflective properties.

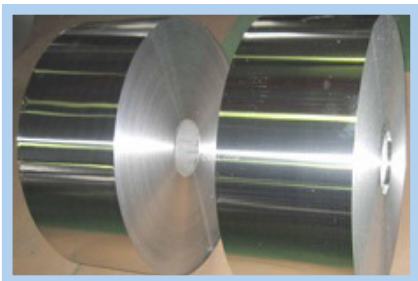
Nickel foil comes in lots, each of which has a box packing list, specifying the brand and size of the foil, the batch number and the number of coils / sheets in a box.

Nickel foil NP2 and NV3v

Products made of nickel found their niche in various areas of modern industry. They particularly need electrical, chemical, textile industry and food industry. Nickel is used for the production of medical instruments; it is used in research practice. Nickel-plated

plate is in the capacitors. In many industries, effectively used foil and nickel NP2 NVZv according to GOST 2170. Since nickel foil is resistant to corrosion in water, salts of alkaline and neutral solutions, it covers the surface of other metals, which need protection. Nickel plated other metals makes the process of plating. When plating is used foil or nickel NP2 NVZv it together with the sheet metal is rolled in hot form. When rolling the joint metal diffusion occurs (the interpenetration of the molecules of one metal to another), and the result is protected from corrosion monolithic material. Damage to the surface of the steel foil, increases the reliability and durability of iron sheets, of which make great tanks, which transported and stored various chemicals. Nickel foil has minimum magnetic properties. Excellent mechanical properties of thin foils allow you to do it from the larger number of precise details, which in turn reduces the amount of consumable material. The foil is characterized by high electrical and thermal conductivity. Without nickel foil and its products is complete, nuclear power, television equipment, radar equipment.

Nickel foil includes 99.2% nickel and small amounts of impurities. Foil nickel amenable to all types of cold forming, and from it you can do any form of semi-finished products by thermoforming.



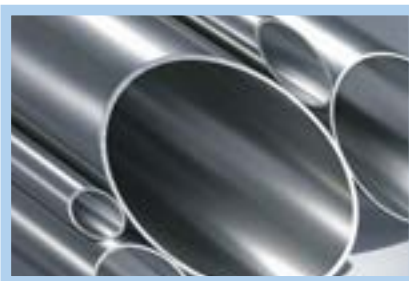
Nickel tubes

Modern humanity, probably would not be able to carry out many tests and experiments to invent new drugs and medications, if not used in the work nickel tubes. There are strict regulations, which lists all the requirements for quality nickel tubes - GOST 13548. Pipes on it are made relatively thin, but at the same time and durable. Due to their size, nickel

tubes are widely used in the manufacture of electronic devices. They are popular in the nuclear industry in the reactors, radar devices, television. In the chemical industry, nickel tubes used for pumping a variety of chemicals (alkali). Capacitors produced from these and other useful devices.

What is useful nickel tubes in the chemical industry? Firstly, they are used in special devices for the exchange of potassium, they are useful for the study of film boiling ethanol and freon, the liquid-phase fluorination. Nickel tubes are indispensable even during the production of nuclear fuel. Among the metals nickel not only reacts with the reactive uranium. All other metals amenable to reaction and melt.

If you decide to use nickel tubes in its manufacturing process, you should be sure to know what requirements apply to them. Firstly, the pipe cannot be shorter than 500 mm. Secondly, it is made only in the solid state. Both the surface, both internal and external, should be flat and smooth. In some cases, it is assumed that the surface may be matted. Third, it must always be straight - its curvature cannot be more than 5 mm per running.



Nickel sheet

The nickel sheet is one of the types of metal. The most common is to use a nickel sheet with "NP2" marking. Also, they have a stroke, and other kinds of sheets of nickel grades NP1, NP3 and NP4. We produce nickel sheet in full accordance with GOST 6235. In accordance with established standards, the thickness of the sheet may vary from five to twenty millimeters. GOST sets and also the width of the sheets - it can be from five hundred to eight hundred millimeters in increments of one hundred millimeters. sheet length can be from five hundred to two thousand millimeters. The nickel sheet may be either cut length (millimeters times one hundred), and off-gage. Our company produces nickel sheet in two ways - hot-rolled and cold-rolled.

If you choose a nickel sheet, carefully inspect the surface - it should not contain any dirt or damage. The sheet edges must be burr-free, smooth. In addition, the surface of the sheet produced by cold-permissible seaming presence of a small scale at which the cleaning

sheet thickness does not exceed the limit values of thickness deviations. On the surface of cold-rolled sheets may sometimes darkening, as well as traces of unburned when the lubricant manufacture. Choosing a nickel sheet, pay attention to the fact that it should not be stratified. The edge of the sheet should not be wrinkled, have waves, or “ragged” appearance. Sheets dispensed batches, each of which contains the finished products of the same thickness, length and width. If the party consists of three sheets or less, the control check takes place each of them. As for the mechanical properties of the product, the hot-rolled nickel sheet should have tensile strength of 370 MPa. Soft nickel sheet has the same value as the tensile strength, but in solid sheets, it is 540 MPa.

We offer our customers purchase the sheets of the different grades of nickel. You can always ask any question about our product by phone the manager of our company. If necessary, we will arrange delivery and unloading of rolled metal products. Buying from us any good, you can be sure of its highest quality. Our company practices an individual approach to each client, so we are always ready to manufacture products for you with the desired characteristics you.

Nickel Sheet NP1

Nickel sheet grade NP1 - one of the most sought after in the semis industry. We produce it in full compliance with the requirements of GOST 6235. The standard specifies the chemical composition of the sheet of nickel, as well as its physical and mechanical properties. NP1 grade nickel sheet is made of different thicknesses, depending on the application - from five to twenty millimeters. The width of the sheets of nickel may range from fifty to eighty centimeters. Nickel Sheet NP1 produced a length of fifty centimeters to two meters. The percentage grade nickel NP1 characterized in that it comprises at least 99.9% nickel. The remainder of - this impurity generally metals such as cobalt, copper, cadmium, iron, and zinc.

Select the nickel sheet is a snap, enough to know a few basic requirements that apply to this product with current regulations. The surface of all the sheets in the party must be flat, without delamination and blistering. Nickel Sheet NP1 should be cleaned of contamination that may hamper the visual inspection process. The edges of each of the sheets in the party should not be torn, crumpled or burrs. After the inspection and quality control of the nickel sheet NP1 latticed packed in wooden boxes. For each batch issued a document containing its number, weight, nickel brand and results of tests carried out. Transportation and storage of sheet nickel do not require special conditions.

We produce nickel sheet NP1 with different parameters, depending on the wishes of the customer. Unchanged remains a high quality of our products, which is not inferior to expensive imported analogues. You can always contact us by phone and order a nickel sheet NP1 you with the necessary characteristics. Skilled managers will help you place your order, prompt payment and advise on all types of our products.

Nickel Sheet NP2

Sheet NP2 nickel grade is only one type of nickel products, which provides our organization. Nickel are marked with "NP2", according to GOST contains at least 99.5 percent of the nickel in its structure. The rest of the mass fraction falls on impurities such as lead, copper, magnesium, zinc, cadmium, and other elements. NP2 nickel sheet should be made in accordance with the standards the industry, with a thickness of five to twenty millimeters. The width of the sheet varies depending on their destination, and is from fifty to eighty centimeters. The length of the finished product can be both dimensional multiple of ten centimeters and unmeasured - from two centimeters to fifty meters.

Choosing sheet nickel NP2, pay very close attention to its surface. Guests are not permitted on the surface of the product cracks, dents, chips, scratches and other defects. Damage on the sheet surface is said that during the production was significantly impaired any of technological components. Nickel sheet must be in accordance with GOST, smooth edges, without burrs. In addition, high-quality nickel sheet has no bundles or bubbles. We offer our customers only the highest quality products, because I carefully observe the technology at all stages of delivery. Products packaged in batch, each of which comprises a sheet size and the same chemical composition. On each of the sheets is stamped or glued paper label with lot number, brand of nickel.

Sheet nickel packed parties in wooden latticed boxes. Its transport and storage does not require any special conditions. We offer you delivery and handling of any product from our range in the shortest possible time.

Nickel sheet NP3

Sheets of nickel - one of the varieties of the nickel metal-roll. Made Prices nickel NP3 in accordance with the requirements of GOST 6235. The material for their production is a nickel grade NP3, containing not less than 99.3% nickel. The proportion of impurities shall not exceed 0.07%. Used sheets NP3 nickel grade in various fields of mechanical engineering and instrument making. Our company pays special attention to the organization of continuous quality control at all stages of delivery. That is why we have provided lists of nickel did not inferior to the quality of the products of foreign manufacturers. If you choose nickel sheets, we recommend special attention be paid to inspection of their surface. It should be flat and smooth, not have impurities which may interfere with visual inspection. The surface of the sheets must not be damaged - cracks, scratches, chips, dents. The presence of any of these defects suggests that before poor quality nickel sheets made with serious impairment of the process. The edges of all sheets must not be torn or crumpled appearance, and burrs.

nickel sheets are available in various thicknesses - from five to twenty millimeters. The width of sheets varies from five hundred to eight hundred millimeters, and their length may be adjusted from fifty centimeters to two meters. When this sheet length can be both dimensional (multiple of ten centimeters) and the off-gage.

Nickel sheets should withstand tensile strength from 370 to 540 MPa, depending on the hardness of the material.

We manufacture and sell sheets of nickel grade NP3 various thicknesses and sizes. Since the main principle of our work is an individual approach to each customer, our organization is always ready for you to make lists of nickel with the necessary characteristics.

Finished sheets of nickel packed parties in latticed wooden boxes. Their transportation and storage does not require special conditions. If necessary, we will deliver your order at any convenient place and time. It is enough to tell that you require delivery services to our manager when ordering. In addition, in our phone, you can find out the prices for all kinds of products from a wide range of rolled metal and semi-finished products, as well as to clarify the method of payment of the goods.

Nickel sheets NP4

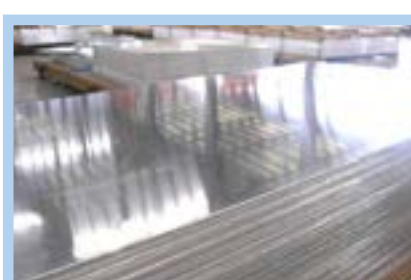
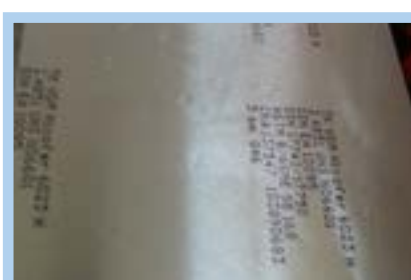
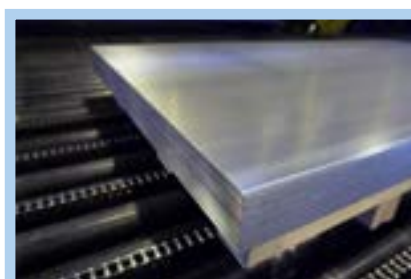
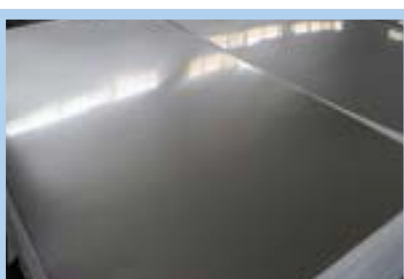
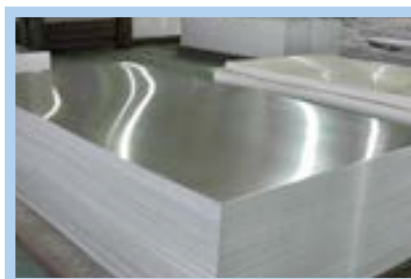
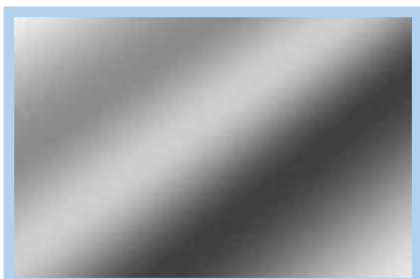
Nickel Sheets of nickel grade NP4 are one of the types of products in our wide range of semi-finished rolled metal. Nickel sheets are widely used in electric and mechanical engineering.

Our organization delivers NP4 nickel sheets in full compliance with requirements of GOST 6235. The nickel content in the material from which the sheets are produced nickel is at least ninety-nine percent. The thickness of the sheets varies from 5 to 20 millimeters, and their width may be 500, 600, 700 and 800 millimeters. The length of the nickel sheet varies from 500 mm to 2 meters, it can be dimensional (multiple of 10 centimeters) and the off-gage. Limit deviations of all parameters are regulated by GOST, and their violation is considered a sign of poor quality, defective products.

If you choose the nickel plates, special attention should be paid to their surface and edges. High-quality products are manufactured in compliance with all technological processes, cut off smoothly, without burrs, crumpled and torn edges. On the surface of the sheets should be no obstruction which would interfere visually inspected. Nickel sheets may not be bundle. Each batch of sheets must contain the finished products of the same size with the same chemical composition, mechanical and physical characteristics. The party is marked as follows: lot number indicates the number of sheets in it, the results of the tests carried out and the total mass of the party.

Nickel sheets after they pass quality control, packed in wooden latticed boxes. Transportation sheets do not require special conditions.

We practice an individual approach to each customer, so it is always ready to produce for you NP4 nickel sheets according to specified parameters. If necessary, we will arrange delivery of the goods you have chosen at any convenient place and time. Qualified manager not only quickly formalize your order and tell you about how to pay it, but also give advice on matters relating to our products



Nickel powder

Our company has successfully been supplying nickel powder for the past several years. Sam nickel powder is manufactured in compliance with all standards and requirements specified in GOST or TU. It is the most widely used in modern industry: used in industry, in the manufacture of parts, magnets, electric contact, in the reduction of various components and for other purposes. Nickel powder is of two kinds, depending on the production method, the carbonyl - PNA and electrolyte - PNE. For more information, you can get acquainted with each brand in the subheadings. Here we only pay attention to the parameters that are characteristic of nickel powder. Nickel powder has three main characteristics: chemical composition, bulk density and particle size distribution. Let them in this article for an example.

Electrolytic powder must meet the following indicators on the chemical composition:

Item	Chemical composition, %							
	Ni+Co	Impurities, max						
		C	Fe	Co	Si	O	Cu	S
PNE-1	99,5	0,02	0,10	0,20	0,03	0,10	0,06	0,008
PNE-2	99,5	0,02	0,20	0,50	0,03	0,10	0,08	0,010

By bulk density carbonyl nickel powder has to be as follows:

Item	Subgroup on the bulk density	Bulk density, g/cm ³
PNK-UT1, PNK -OT1	1	3,0-3,5
PNK -UT2, PNK -OT2	2	2,51-2,99
PNK -3T3, PNK -OT3	3	1,91-2,5
PNK -UT4, PNK -OT4	4	1,41-1,9
PNK -1L5	5	1,01-1,4
PNK -1L6	6	0,81-1,0
PNK -1L7	7	0,61-0,8'
PNK -1L8	8	0,45-0,6
PNK -2K9	9	1,3-1,7
PNK -2K10	10	1,2 and more

After producing the nickel powder passes obligatory tests. According to standards, the finished sample is divided into two parts, the first part and then goes to the test, and the second placed in a jar and stored for warranty. Each bank designated manufacturer, number, date and title

After checking the nickel powder must pass marking stage - each drum / bag attached label, which comprises: a packaging unit number, the product and the brand name of the net weight of one package, the release date. Sorted nickel powder by the parties, which consist of a powder of the same brand. All the powders are made by one document.



Carbonyl nickel DNA

Carbonyl nickel is produced as a fraction or as a powder. Our company supplies nickel carbonyl fully complies with all requirements. This type of product is widely used in industry and other industries.

We sell carbonyl nickel as a fraction (DNA) and marks DNK0 DNK1. They are distinguished by the percentage of nickel in the alloy. Carbonyl nickel marked DNK0 containing 99.95% nickel, and products marked DNK1 - 99.92%. The remaining weight fraction separated impurities, such as copper, magnesium, lead, tin, manganese, zinc, iron and other impurities.

Our company is engaged in the supply of metals and metal for a long time. That is why we have a highly qualified staff who carefully observe the rules of technology at all stages of delivery.

As is known, most likely used in the production of nickel alloy, stainless steels, and for manufacturing a wide range of different alloys. We understand the needs of their customers and always offer them the highest quality products at reasonable prices. Carbonyl nickel, offered by us, in no way inferior to the performance of similar products of foreign manufacturers.

If you want to buy a carbonyl nickel as a fraction, please contact our company. A skilled manager will answer all your questions and help you place your order. Buy carbonyl nickel can be in cash or bank transfer.

We supply nickel carbonyl in special drums, each weighing - two hundred and fifty kilograms. It is worth noting that this type of product from our wide range of non-flammable and non-explosive, so it is easy to transport and store. If necessary, we are ready to organize the delivery of the goods at any convenient time and place. Just inform our manager about the need to deliver the order.

We value each customer and an individual approach to their needs, so ready to satisfy all your wishes regarding lot size or the characteristics of the finished product.



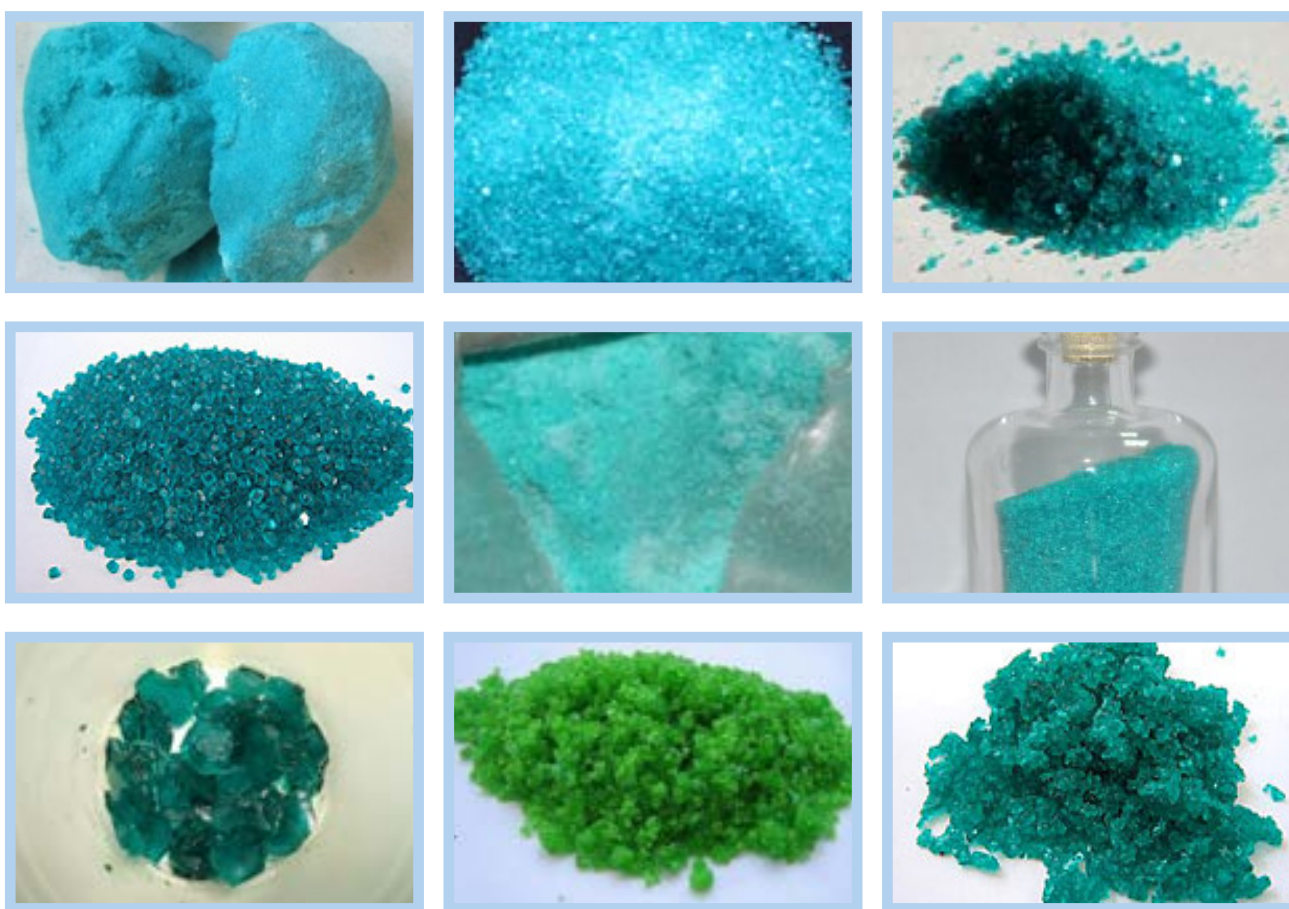
Nickel sulfate

Nickel sulfate - a type of our products. It is a crystalline solid with a bright emerald color. The crystals are readily soluble in water and in air erode.

Our company supplies nickel sulfate heptahydrate in full compliance with the requirements of GOST 4465. In accordance with established standards, nickel sulphate contains from 97 to 98 percent nickel. The remainder of the mass fraction falls on water-insoluble substances, chlorides, nitrogen, potassium, sodium, magnesium and calcium. The structure also includes elements such as iron, cobalt, copper, cadmium, lead and zinc. Importantly, the nickel sulfate with cobalt content of less than 0.0005 percent additionally marked by "without cobalt." Nickel sulfate heptahydrate, depending on its chemical composition, is divided into clean, pure for analysis and chemically pure. Nickel sulfate refers to toxic substances, however in contact with the mucous membranes of the respiratory tract and skin of the person he is irritating. This nickel sulphate in contact in water flow or air environment does not form toxic compounds. This substance is not flammable, explosive and flammable. Of course, when in contact with nickel sulfate, all employees must have personal protective equipment (gloves, protective paste for hands, masks). Our company has nickel sulphate heptahydrate produced under strict quality control at all stages.

After production of the finished product take on the analysis, which determines its chemical composition. The use of modern equipment at this stage allows us to guarantee the highest quality of goods.

We are always ready to offer you a nickel sulfate in the necessary volumes to you at a reasonable price. In order to make a booking, just call us. For all types of products we offer delivery in the shortest possible time. Just inform our manager about her need when ordering. Nickel sulphate should be stored indoors in the original container, with the need to avoid contact with direct sunlight. This type of product is packed in glass jars, as well as paper and plastic bags. Transportation is carried out by all types of covered transport in compliance with safety regulations, in wooden crates or pallets.



Nickel Powder (surfacing)

Nickel Powder for welding is a fine nickel produced by spraying or recovery, or carbonyl or electrolytically. Powdered nickel is used to restore the geometric dimensions of parts deposition method. Often various metals coated with nickel, in order to make them more aesthetically pleasing appearance. Nickel powder is able to prevent abrasion, mechanical, cavitation wear and fatigue failure. It is also used to generate anti-corrosion coatings and to prevent impacts under oxidizing and other corrosive environments. In our company, the nickel powder is produced in full accordance with GOST.

We produce nickel powder with the addition of other metals. The additives may act as copper, iron, tungsten, cobalt, or chromium carbide. All manufacturing processes are under strict quality control, so all of our products meet the standards established in the steel industry. Each batch of the finished powder is carefully checked by our experts on compliance. The analysis identified the powder level of humidity, its hardness and grain size. Finished products are packed in sheet steel from banks, and then - in wooden boxes.

To order the powdered nickel, simply call us. Qualified manager formalize your order and answer all your questions about our products. We are always ready to deliver the ordered powdered nickel or any other product at your convenience time and place. We practice an individual approach to each customer, so it is always ready to produce for you a nickel powder in the right amounts and at a reasonable price. Nickel powder is non-flammable, so its transportation and storage does not require special conditions. Of course, in the process of direct deposition workers should use personal protective equipment (gloves and masks) as well as nickel refers to toxic materials in powder form.



Carbonyl nickel powder NCP

Carbonyl nickel powder is a type of our products. It is made in accordance with the requirements of GOST 9722. This semi-finished product is used in such industries as powder metallurgy, and other industries. Depending on the chemical composition of the nickel carbonyl powder are divided into four groups - Y, O, 1, and 2. The division is also practiced according to types of bulk powder density. Marking "L" stand for easy nickel powder, the letter "T" - heavy, "K" - coarse. All these goods are further subdivided into subgroups.

We supply nickel powder in full accordance with the industry quality standards. All our products pass the necessary certification, so we guarantee our customers the highest quality at a reasonable price. In accordance with GOST, nickel powder may contain a small amount of impurities, which depend on the powder grade. The nickel content is strictly controlled by our specialists by constant sampling.

Nickel powder, depending on the grade, composed of particles of different sizes. Some brands of this size up to 20 microns, with a mass fraction of particles with a size greater than this value can range from 15 to 20 percent of the party. Coarse nickel powder consists of particles with sizes of from 70 to 100 microns. In the batch may contain up to 20 percent of other particle sizes. Standard also specifies the value of the bulk density of the powder, depending on the brand, it can range from 0.45 to 3.5 grams per cubic centimeter. Thus, for example, a carbonyl nickel powder with labeled 1L5 has a bulk density in the range of 1.01 to 1.40 grams per cubic centimeter.

We offer our clients the delivery of any kind of product in the required time and place. You simply call us, and qualified manager will answer all your questions about our products. Carbonyl nickel powder is packed in tight plastic bags and then into paper bags or in other types of containers, according to your preferences. It should be noted that this type of product is not flammable and explosion-proof, so its transportation and storage does not cause any difficulties.

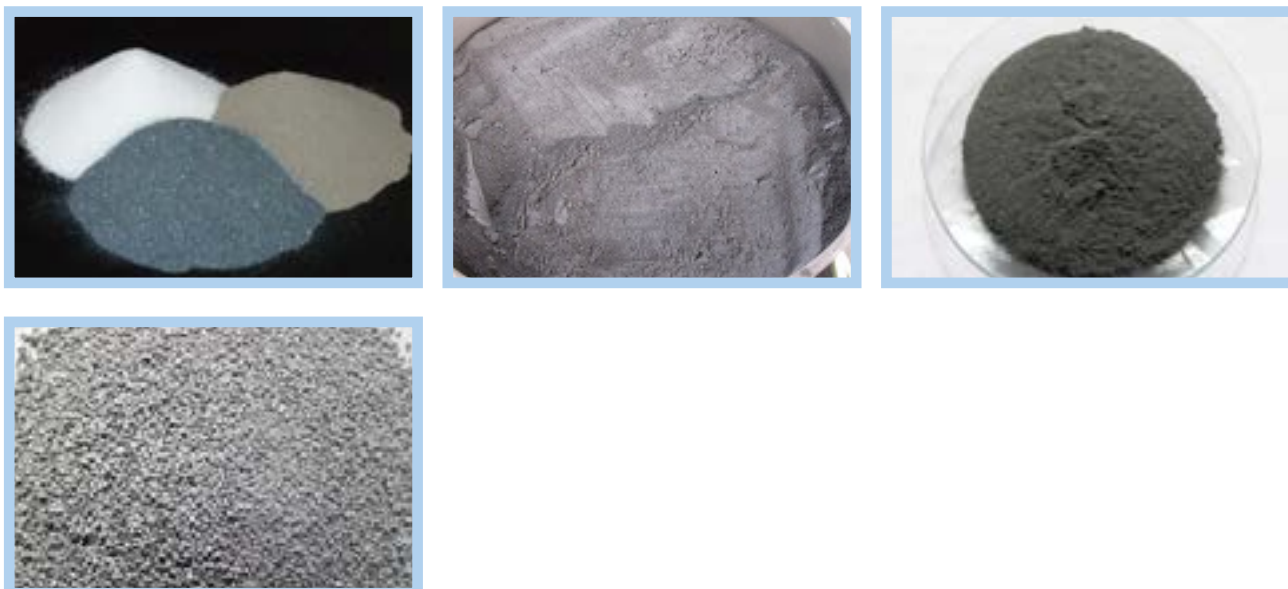


Electrolytic nickel powder PNE

GOST 9722 is most commonly used in powder metallurgy, to repair damaged or depleted surfaces of the parts, in processes for the manufacture of magnets and electrical contacts. Nickel powder as often used in the chemical industry, such as creating special types of rubber, in batteries.

Electrolytic nickel powder itself PNE produce electrolytically using aqueous solutions of nickel salts. The final stage of production of drying, heat treatment and screening. For nickel powder fractions is not a strict uniform particle size, particle size varies from 0.01 microns to 0.5 mm.





Nickel bars

Successfully working in the metal market for many years, our company can offer its customers different products. Metal and its products are always in demand. Steady demand in the market rental uses of nickel. Sheets, strips, tape, wire and foil of nickel have been successfully applied in modern conditions of various industries. There was an exception nickel rods according to GOST 13083, which is used in many industries. More often nickel is used in a special rod and electrical vacuum engineering. Qualitative nickel rod made of pure nickel grades H1, H2, of the semi-finished nickel NP2 and NP3 and nickel alloy and silicon NK 0.2. Also rods made from different alloys using a nickel base metals and other impurities, which is economically more advantageous than the use of other materials.

Hot-rolled or drawn round bars Nickel made strictly in accordance with GOST 13083. The nickel rod is dimensional and random length. Pulled random length rods have a half to four meters, while rolled bars have different lengths - of up to three meters, which depends on the diameter of the rods nickel. Thin Drawn bars are usually supplied in coils. Dimensions nickel rods may be issued to the customer the desired size, and if so agreed. Nickel rods made of cold or hot-ways and have a circular cross section. Nickel rods may have a soft or solid state and normal, enhanced or high precision manufacturing.

When viewed from the surface of the nickel rod should be smooth and clean, free of cracks, voids, foreign inclusions, bundles. Minor surface defects, browning and minor deviations in diameter, that do not affect product quality, it is quite acceptable. Deliver nickel rod parties with the accompanying documents, which indicate the nickel grade, precision, a method for manufacturing the rods, the size of the rods, the number of delivered party.

Nickel rods NP2

Nickel - an expensive metal, which has a number of advantages. It is resistant to the effects of high temperatures and corrosion. This viscous solid metal, perfectly amenable to polishing. In air at normal temperature coated dense oxide film which protects it from corrosion. Nickel is the primary element of superalloys that can withstand heat up to several hundred degrees, the effect of certain acids and alkalis.

Because nickel is produced a wide range of industry solutions, such as nickel rods of different brands and sizes. One type of nickel rods, which appear in our range, are nickel rods NP2 brand.

NP2 Nickel rods used in instrument making, mechanical engineering, electrical engineering. The main area where NP2 nickel rods are used, is the chemical industry. Most nickel rods are used in chemical and physical laboratories of scientific research institutes.

Mark NP2 nickel, which are made of nickel rods, obtained by melting of nickel. Nickel rods meet GOST 13083 and may be unmeasured pull a length of 1.5 to 4 m diameter to rolled to 60 mm in length from 1 to 3 m and rolled with a diameter greater than 60 mm and lengths from 1 m to 0.7, 5 meters. It is worth noting that if the customer requires a different length of nickel rods, we can make shipment of required sizes.

Nickel rods NP2 easily to different types of mechanical treatment: they can be rolled, forged, extruded, stamped. Nickel rods must be free of cracks and free of foreign inclusions and dirt. Edge - just cut. Defects nickel rod surface must be within the permissible limits.

We offer a large selection of products from the alloy of nickel NP2 brand that can satisfy the needs of any customer. All our products are certified realized.

Nickel rods NP3

A sought-after metals in modern industry is nickel. Pure nickel used as a protective and decorative coating on the surfaces of articles. Nickel dishes and produce devices that exhibit high corrosion resistance, are used in the chemical industry, for storing alkaline and acidic solutions. Along with the use of pure metal, efficient use of recognized and various nickel alloys - nickel alloys acquire a number of advantages over a pure nickel.

One type of nickel products are nickel rods NP3. These rods are made of semi-finished nickel respective brands. Nickel rods are used in special mechanical engineering, in the electric industry, instrument making. Resistance to atmospheric corrosion and corrosive environment of certain acids and bases, nickel rods made popular in the chemical laboratory of various industries.

Round rods nickel divided by the method of production of hot-rolled and drawn on. Nickel rods are dimensional, multiple-dimensional length random length. Nickel rods make the size according to GOST, but if the customer has other requirements to the size of nickel rods, we can make products the required parameters.

Nickel rods are only straight curvature of products is not allowed. The appearance of the goods must comply with and do not have major defects, which could affect the quality of the products. Deliver rods nickel parties, with supporting documents, which have all the information the amount of bars, method of manufacture, brand nickel and so on.

For many years engaged in the supply of the Russian market of rolled metal products, our company has established itself as a reliable supplier of high-quality products only. Among the wide range of products of nickel rental we can offer our customers the nickel rods NP3, are in constant demand in the Russian market.

Nickel rod NK2, 0

Plastic and durable metal nickel has a high corrosion resistance. It is used for alloying metals. Part of the nickel superalloys, it is used for the production of catalysts, nickel in the process. Nickel melts at a high temperature, and has high catalytic ability. These properties allow the use of nickel metallurgy, electrical engineering, mechanical engineering, instrument making, medicine and other industries.

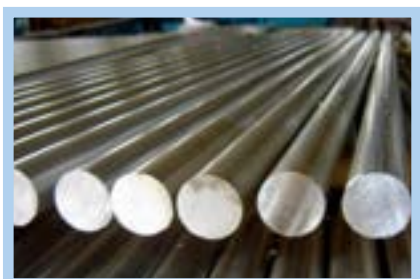
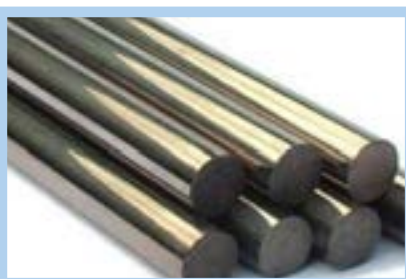
For all the merits of pure nickel, some of the metal alloys have more sophisticated properties. In the industrial market demand NK2,0 nickel rod. It is used in several industries as special materials. First of all, a nickel rod NK2,0 characterized by high corrosion resistance in normal atmospheric conditions and in corrosive conditions of some acids and alkalis. Rod Nickel NK2,0 can be machined. Made rod nickel NK2,0 different ways and can be pressed, roll or pull. The cross section of the bar is in the shape of a circle, oval, rectangle or square.

Rod Nickel NK2,0 can be different lengths and diameters, in accordance with GOST 13083-77. However, in agreement with the customer, the size can be individual.

Nickel tubes should have a smooth surface, free of dirt or flaws. The fracture nickel rod should not have voids, foreign inclusions. Store, as well as similar products are made of metal - away from moisture, chemicals. During transport and storage, try not to be disturbed.

Our company specializes in the supply of quality products from different metals and alloys. We provide all the necessary certificates, in particular, nickel NK2,0 bars that confirm the quality of our products.





Nickel ingots

Nickel is very popular in the steel industry. It is a solid metal silver. This metal is very durable, reliable, easy to polish. It is in the form of pure and various alloys. Nickel raw materials, can be produced in different forms. These can be bars, ingots, cathode sheets. The most popular nickel ingots. The metal is, firstly, easy to transport, and secondly, it is convenient to recycle.

According to state standards, in nickel ingots, in order to achieve the desired technological properties, allows for the addition of manganese, chromium, silicon, aluminum. These bars can be used for the manufacture of various devices for electrical devices for mercury rectifiers, electronic tubes for parts for aviation and tractor engines.

We draw your attention to the fact that nickel ingots have many advantages. This metal can be easily soldered, using different kinds of soldering. It is very resistant to corrosion, because nickel oxide surface film protects himself nickel. This metal is not afraid of any environment: be it water, air or gas. Even in sea salt water it will not corrode. He also is

not afraid to solutions of acids, alkalis. Nickel is resistant to all types of gas.

Nickel ingots NP1

Among the products in the manufacture of which uses nickel, many industries are using semi-finished nickel NP1. What can be made of this metal? NP1 Nickel is mostly used for production of ribbons, rods, sheets, bars, billets. These materials are very popular in the nuclear industry, the device reactors. Also NP1 nickel in the form of billets is often used for the transfer of chemicals like lye. With their help, you can produce capacitors, and other useful equipment. The nickel chemistry lab NP1 in the form of billets is useful to you in special exchange devices. Also NP1 nickel used for the production of electronic equipment. Pipe blanks from nickel simply used even in the development of uranium. Since among the metals as it does not react with the reactive uranium. All other metals amenable to reaction and melt. It is very resistant to corrosion and is not afraid of the emergence of any environment, whether it be water, air or gas. Nickel NP1 includes impurities such as iron, carbon, silicon, manganese, phosphorus, copper, palladium, magnesium, antimony, zinc, bismuth and cadmium. It begins to melt at a temperature of 1455 degrees. The hot treatment can begin at 1140 degrees. Casting of the metal can be started at a temperature of 1550 degrees.

If you have used in the production of nickel NP1, we are ready to put it to you in the required amount in the stipulated time frame.

Nickel NP2

Among the metals that are used in the steel industry, is very popular nickel. This is because it is very durable, reliable. Nickel is easy to solder, since it lends itself to any type of welding. Because the material is formed on the surface of the nickel oxide film, the metal corrosion is almost impossible. He is not afraid of the water environment, whether it is fresh or salt water. It also cannot be exposed to the gas.

Nickel may be pure or semi-finished forms. Among the semi-finished nickel is very popular is nickel NP2. If you decipher the name, the letter "N" indicates the kind of metal, the letter "P" - semi-finished. The number 2 is its chemical composition. Nickel NP2 is composed of 99.5% pure nickel with impurities of iron, manganese, silicon, copper, arsenic, antimony and other metals. As can be manufactured from such product as nickel NP2? These may be sheets and strips and bars, wire mesh and even. If the wire is used for the production of such an alloy, nickel NP2, you should know that she is not afraid of fire, nuclear safe, as well as non-toxic. It can be used as a material for various devices and mechanisms.

NP2 Nickel is used to make electrical, medical, navigation devices, as well as in the manufacture of microelectronics. It is often used in their work many research institutes, chemical and physical laboratories. NP2 Nickel is also used in the process of nickel plating, when the metal thin layer is applied on any kind of metal. Thus, the metal is protected from the damaging effects of chemical or physical. Nickel-plated parts are used in the process of production machinery, medical, musical instruments, household appliances.

This metal alloy has many advantages, it is very hard, this alloy is very easy to various types of processing. It can be boiled, punch, grind, roll.

Nickel NPA 1

Nickel belongs to the group of hard metals are very durable and reliable. It is not afraid steps acids does not react with many chemicals, unlike other metals. In the metallurgical industries it is in pure form or in the form of semi-finished product. One of the known semi-finished products is nickel NPA1.

NPA1 Nickel is mainly used in the manufacture of anodes for electroplating. This metal is produced mainly in the form of ingots and rolled sheets, which may be of different sizes. Best way 10h200h1000 mm. The sheets have a strictly rectangular cross-section.

According to state standards, nickel NPA1 in its composition contains impurities - iron, carbohydrate, silicon, manganese, copper and magnesium. Please note that nickel sheets which may be of different sizes. Best way 10h200h1000 mm. The sheets have a strictly rectangular cross-section. According to state standards, nickel NPA1 in its composition contains impurities - iron, carbohydrate, silicon, manganese, copper and magnesium. Please note that nickel sheets allowed cracks and small bundle surface.

Nickel NPA1 made without special packaging. In exceptional cases, it is made to order according to customer's request. The maximum allowable weight of the package is 1250 kg. Nickel can be transported NPA1 any covered transport. It should be stored indoors.





Primary nickel

Modern industry offers a choice of primary nickel in accordance with GOST 849 the following brands:

- H0, H1 - includes a nickel-cobalt were respectively not less than 99.99% and 99.93%. Primary nickel these marks produced by electrolysis in the form of sheets;
- H2, H3, H4 - includes nickel-cobalt is not less than 99.8%, 99.6%, 97.6% respectively. These alloys are obtained by pressing in the production of nickel and melting the waste them, as well as the method of fire refining. This type of primary nickel delivered to consumers in the form of cathode sheets, granules, ingots, scrap.

Primary nickel ingots should be free of burrs and any inclusions in the slag. Also, the ingots produced a weight not exceeding 25 kg. If you want to meet the needs of the customer may stipulate in pre-order the size of the individual cathode sheets. Primary nickel has a set of properties, due to which has been successfully used in machinery, electronics, instrumentation and many other fields. The composition of stainless steels is required to turn on the primary nickel for greater chemical resistance of the alloy





Nickel cathodes

A very ductile and malleable metal, nickel is perfectly treatable. Nickel oxide in the form of a thin film completely covers the surface of nickel fine and protects the metal from further oxidation reactions. Everywhere Nickel is used as an important element in alloys. It gives the alloys a high viscosity index and increased chemical resistance. Any stainless steel part necessarily consists of nickel. Nickel perfectly soldered hard and soft solders.

In modern industry Nickel cathodes are used everywhere. Their characteristics and are directly dependent on the quality of the incoming impurities percentage. Mechanical and technological properties possessed by nickel cathodes degrade most sulfur impurities, zinc, lead, bismuth, antimony. For example, sulfide film formed sulfur begins to melt at a temperature of 645 degrees, which causes fragility rolled. In accordance with the standards of nickel cathode plates produced as specified sizes. Thickness may vary from 2 to 20 millimeters. Their width - in the range of 500 to 800 millimeters. The length of the plates can be from 500 to 2000 millimeters. Nickel is mainly produced by electrorefining. Most nickel cathodes are processed into semi-finished nickel following brands: NP1, NP2, NP3 and NP4. For the manufacture of special purpose products take NP1 nickel grade, where only 0.1 percent of impurities. The machinery and instrument most frequently used nickel cathodes NP2, in which the impurities present are not more than 0.5%. Nickel cathodes NP3 and NP4 used in less technologically advanced areas.

Our company supplies nickel cathodes on the market of non-ferrous metals for many years. We appreciate each client, constantly improving the level of service is always ready to provide individual attention to each. We quickly make out the necessary documents, provide customers certificates for all products, flexible approach to pricing, promptly carry out the shipment of products.

The cathode of a nickel-4H

Our company offers its customers a nickel cathode (cathode plate) 4-H and other brands. Nickel high ductility, is of particular strength and resistance to corrosion. This metal has a high melting point and catalytic ability. Due to its properties Nickel is widely used in machinery, instrumentation, medicine and other fields. He remarkably amenable to all types of welding and soldered hard and soft solders.

According to GOST 849-97, nickel H-4 is produced by several methods: the waste processed

sheet or produced fire refining. Nickel H-4 has the following chemical composition:

Item	Ni+Co, min	Incl. Co, max	Impurities, max		
			C	S	Cu
H-4	97,6	0,7	0,15	0,04	1

The most important impurities in the sulfur is considered nickel, lead, bismuth, zinc, antimony. It is used for the cathode of a nickel alloying of hard alloys and steels. The cathode is a nickel plate of a certain thickness and dimensions. we also provide nickel in the form of pellets, bars. Ingots, in turn, are weighing up to 25 kilograms, they must be free of foreign bodies and remove burrs. The cathode may be nickel is cut in accordance with the requested dimensions. By purchasing a nickel cathode in our company, the customer can be assured of the quality of products and properly executed documents. Each package is provided with necessarily special label bearing the name of the product, the nickel grade, seat number and the party, gross and net weight, standard. Supplied on a long-term storage the nickel cathode is marked with indelible paint. If nickel is supposed to be transported by road, the manufacturer may agree with the buyer without the transport packaging boxes. Transporting a nickel cathode can be any kind of transport. GOST 849-97 allows defects among a certain number of products. Nickel cathode, offered by our company, provided all the necessary documentation. Please contact us.

Nickel cathode N-1

Depending on the set of chemical elements nickel raw materials supplied several grades: nickel cathode H-1, H-1y, H-2, H-3, H-4, H-0. The composition of the product must conform strictly to the table:

Element/ grade	H-4	H-3	H-2	H-1	H-1Ay	H-1y	H-0
Ni+Co	97.6	98.6	99.8	99.93	99,95	99,95	99,99
Co	0,7	0,7	0,15	0,1	0,1	0,1	0,005
Bi	-	-	-	0.0006	0.0003	0.0001	0.0001
Pb	-	-	0.01	0.001	0.0005	0.0005	0.0003
Sb	-	-	-	0.001	0.0005	0.0005	0.0003
Sn	-	-	-	0.001	0.0005	0.0005	0.0003
Cd	-	-	-	0.001	0.0005	0.0005	0.0003
As	-	-	-	0.001	0.001	0.001	0.0005
Zn	-	-	0.005	0.001	0.001	0.001	0.0005
Cu	1.0	0.6	0.04	0.02	0.015	0.01	0.001
Fe	-	-	0.04	0.02	0.01	0.01	0.002
Mn	-	-	-	-	-	-	0.001
S	0.04	0.03	0.003	0.001	0.001	0.001	0.001
P	-	-	-	0.001	0.001	0.001	0.001
Si	-	-	0.002	0.002	0.002	0.002	0.001
Al	-	-	-	-	-	-	0.001

Mg	-	-	-	0.001	0.001	0.001	0.001
C	0.15	0.1	0.02	0.01	0.01	0.01	0.005

The sign “-” means that the guest is not stipulated, this impurity. Nickel cathode H-1 is produced only by means of electrolysis. When ordering the material, the buyer can agree on the content of zinc. According to GOST 849-97, nickel H-1 can be made in the following forms: a plate, cathode sheets and strip. If necessary, it is possible to stipulate size plates and sheets. Nickel cathode be transported by vehicles of all kinds, thus it is necessary to take into account the rules of carriage of goods accepted for each type of vehicle. For a long time Nickel cathode N-1 can be stored only in the room closed. According to GOST 849-97, Nickel cathode N-1 in the plates must be complete, the bundle is not allowed. The surface of the sheets must not contain the build-up of salts. The cathode may be nickel nodules on the surface of the nickel is not more than 10 mm. This may deepen total of five pieces on a square area of 25 mm side. A common area with depressions should not exceed 20 percent. In each batch of nickel cathode may contain the maximum number of defects. The total weight of defective sheet by weight of the batch should not exceed five percent of the brand H-1. Our company offers high-quality nickel cathode H-1 and ensures a high level of service. Successful experience in the field of non-ferrous metals allows us to provide qualified support when choosing a product.

Nickel cathodes H-3

Our organization has over the years offers on the market of non-ferrous metals nickel cathodes H-3 (cathode sheets). We pay attention to each customer and try to take an individual approach to your needs. We guarantee the timely execution of all necessary documentation and delivery strictly on time.

The cathodes of nickel are used in many areas of industry, in apparatus construction, mechanical engineering, medicine, etc. Electrical and This large nickel popularity is due to its unique properties. H-nickel cathodes 3 are defined plate size. Nickel is also supplied by us in the form of ingots of 25 kg, pellets, strips. The size of the cathode sheets may be stipulated in advance, but it is only when a sufficiently large volume order.

In accordance with GOST nickel H-3 should have the following chemical composition:

Grade	Content, %				
	Ni+Co, min	Impurities			
		Co	C	S	Cu
H-3	98,6	0,7	0,1	0,03	0,6

The most undesirable impurity, impairing the properties of nickel, sulfur is considered. sulfur inclusions very dangerous for nickel-based products, because sulfur forms a sulfide film on the surface character. The film begins to melt at 645 degrees, resulting in an undesirable brittle sheets. If formed on the surface of the film, it may be cleaned with electrorefining. In this case, the sheet should be placed into the electrolyte and the anode connected to a circuit position. At the cathode in this procedure pure metal must be formed. Nickel cathodes can be delivered by any mode of transport. In addition, each package is required to be labeled in accordance with the standard. If you need nickel

cathodes, please contact us.

Nickel cathode N-1y

At constant non-ferrous metal market demand is the consumer nickel cathode H-1y. In every field of human activity, which require protective coatings with anti-corrosion properties, nickel is used. More often nickel steel surfaces, but common nickel products from other materials, as well as non-metallic surfaces: ceramic, glass, polymer. In addition to its amazing durability, nickel plated, shiny and smooth to the touch, it gives aesthetic pleasure during the entire period of operation.

Due to the ease of processing nickel it is widely activated in the process of production of stainless steel, as well as in areas such as electronics, mechanical engineering. Manufactured nickel cathode H 1y electrolysis using as cathode plates. If necessary, a nickel cathode may be formed in accordance with the customer ordered size. According to GOST 849-97, nickel cathode H-1y must have the following chemical composition:

Carbon	< 0.01
Silicon	< 0.002
Sulfur	< 0.001
Phosphorus	< 0.001
Copper	< 0.015
Arsenic	< 0.001
Cobalt	< 0.1
Magnesium	< 0.001
Zinc	< 0.0010
Tin	< 0.0005
Cadmium	< 0.0005
Bismuth	< 0.0003
Nickel + Cobalt	> 99.95

The proportion of cobalt should not exceed 0.1 percent, wherein the total proportion of nickel and cobalt - more than 99.95 percent of the total weight. As shown in the table, a nickel cathode H 1y may contain allowable amount of impurities. The edges of the sheets of the cathode is required to cut off from all sides. Having agreed on this issue with the consumer, the manufacturer may cut a nickel cathode and only bovine spongiform dendritic edge. Thus trimmings H 1y cathode edges can be supplied to the consumer when prior approval of nickel in the form of H-2, H-3 and H-4. Nickel cathode sheet can have salts on the surface coating. It is also not allowed to bundle marks nickel plates H-1y. Nickel cathode with traces changes, paint, oil conveyor belt, discoloration is not defective.

Nickel cathode H-2

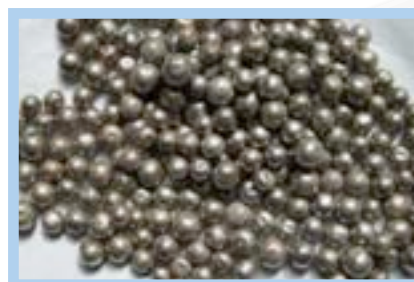
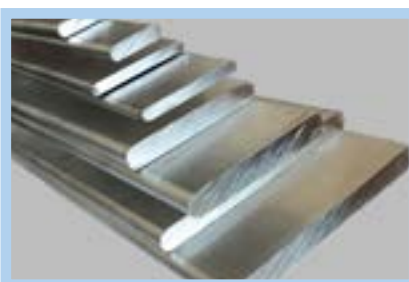
For many years successfully working in the non-ferrous metals market, our company offers its customers a nickel cathode of different brands. Due to its ductility, high strength

and excellent corrosion resistance to the nickel used in many industries. Very popular as a raw material Nickel cathode uses in engineering and medicine. Nickel cathode - is the cathode sheets are universally feedstock uses modern industry.

Main characteristics such valuable for industry, primarily dependent on the inclusion of impurities that exist in the nickel. If there is an impurity in an excessive amount of sulfur, the material becomes too fragile, it is simply unacceptable. That is why there is a standard that must be met by a nickel. Nickel and cobalt included in the nickel cathode H-2 in an amount of not less than 99.8 percent. In accordance with standard nickel cathode H-2 has the following composition:

Content, %								
Ni+Co, min	Co	C	Fe	Cu	Si	Zn	S	Pb
	max							
99,8	0,15	0,02	0,04	0,04	0,002	0,005	0,003	0,01

Transporting Nickel cathode can be any kind of transport. Short-term it can be stored even in the open air. For long-term storage is necessary to put a nickel cathode in the enclosed space. It is necessary to products purchased for long-term storage is required to mark-resistant paints. On the marking label specified batch number, product brand, Mass. Nickel cathode N-2 can be supplied in the form of trim edges of the sheets of the brand H-1. According to GOST 849-97, admitted in a certain number of defects. Our company provides its clients with high-quality products with a full package of necessary documents. We will promptly carry out the shipment of the goods and issue documentation. In addition, we are always ready to make changes in the parameters of the product according to your wishes, if it allows its guests. Buying Nickel Cathode N-2 in our company, the customer can qualify for an individual approach, flexible system of discounts, pleasant service by qualified specialists, timely shipment of goods.





Nickel granulated

Our company offers its customers high-quality granulated nickel grades H2, H3, H4. Our highly trained specialists working for a long time in the field of non-ferrous metals, perfectly oriented to the market situation and are ready to take an individual approach to each client's needs. Thanks to well-established system in our company by purchasing granulated nickel you spend minimal time on paperwork and shipment of goods. Here you see a flexible pricing policy and professional advice. If you get a granular nickel in our company, you can be sure in the efficiency of delivery and guaranteed quality products.

Nickel is used today in a variety of industries: mechanical engineering, medicine, electrical engineering. Produced from granulated nickel oxide ore mine fuse. Pre ore is dried to a moisture content of 14-15 percent. The fuel used coke, flux is required marble and sulfur as raw materials in favor pyrite. Next, granulated slag and output. Cleaned gases output dust into the atmosphere. Fainshteyn with a nickel content of 78 percent is sent to the firing. His crush, grind, and then burn sulfur in a fluidized bed. Next, a mixture of potassium and sodium salt obtained is treated with calcine and gentle sulfuric acid leached copper. After the second firing sulfur calcine remains. nickel oxide, obtained in this process is sent to electrofusion, the result is a granular nickel.

In order to ensure product safety, nickel granular packed in fabric bags and then into nylon bags. On request, allowed to pack the granulated nickel in special containers of different sizes, if their regulations provide for the carriage of bulk and general cargo. Each party is provided with all the necessary documentation. Nickel granulated according to GOST

849-97, characterized by the following chemical composition in percent by weight:

Grade	Cu	C	Co	S	Ni+Co
	max				min
H-3	0,6	0,1	0,7	0,03	98,6
H-4	1,0	0,15	0,7	0,04	97,6

Nickel H-3 (pellets)

Our company provides industrial and manufacturing enterprises metal products, non-ferrous metals, alloys, non-ferrous metals, we offer our customers a nickel H-3 (pellets) of high quality. We have the most favorable conditions of supply, high quality certified products, a flexible system of discounts.

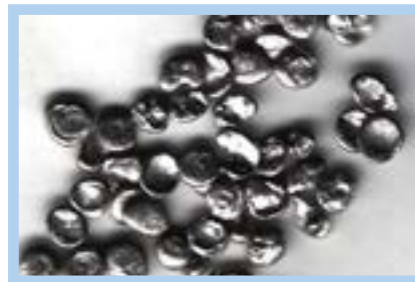
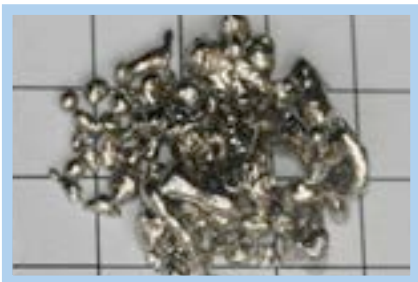
According to GOST, nickel H-3 was prepared using the fire refining, waste from the processing of sheets by melting again trim nickel residues. This Nickel-H 3 serves as ingots of different masses, sheet cathodes and scrap pellets.

The Standard stipulates that an H-3 Nickel on a set of chemical elements must comply with the following data:

Grade	Content, %				
	Ni+Co, min	Impurities			
		Co	C	S	Cu
		max			
Nickel H-3	98,6	0,7	0,1	0,03	0.6

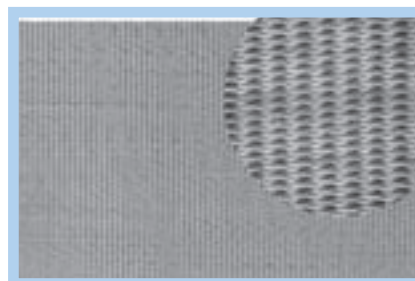
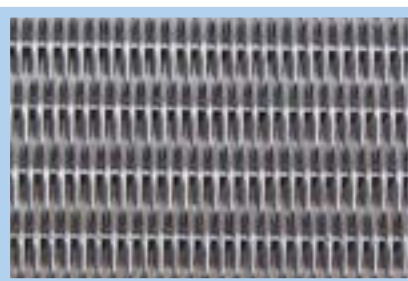
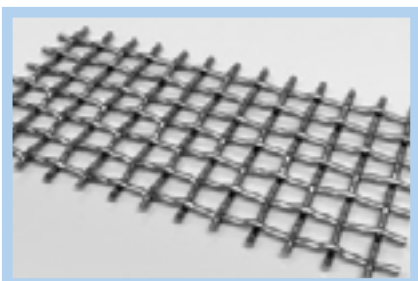
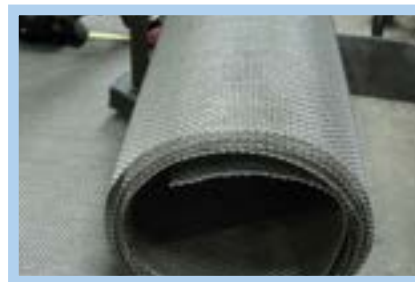
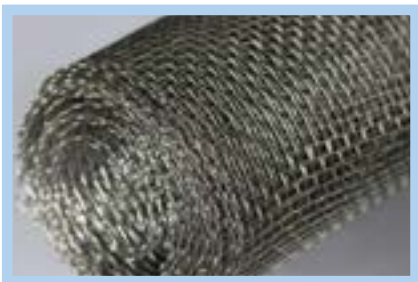
In agreement with the buyer nickel H-3 may have a total amount of nickel and cobalt is not less than 98.7%. When this cobalt should be no more than 0.5%, Cu not more than 0.55%, sulfur less than 0.025% (which is considered the most undesirable impurity in nickel raw material), carbon is not more than 0.03%. If nickel H-3 comes in ingots, each weight must not exceed 25 kilograms. Perhaps pre-specify the size of the cathodes, ingots. Nickel H-3 may have a mark on the surface patch, discoloration, paint residue, oil or transport belts - not considered defective products. Labelled Nickel H-3 in accordance with GOST. For each top sheet attached special label with the designation of the brand, weight, batch number.





Nickel grid NP2

Filtering is the process, without which man cannot do. Filtering is necessary for water treatment, drug, drugs. It is also very important during the production process in the metallurgical, chemical and food industries. It is also very much needed in the mining industry, while oil production, construction. But the backbone of any filtering - a grid. They come in different types. It may be made of metal, fiber or even of silicone. One of the most practical is the grid nickel NP2. The main task during the manufacture of any grid has maximum protection from further devastating impacts during operation. This is due to the fact that during filtration it is always in contact with water, chemicals and other liquids. Popular with manufacturers it uses mesh nickel NP2. According to state standards, mesh nickel NP2 GOST 6613 is made with square cells. It is used for cleaning and filtering any liquid and gas. Grid nickel NP2 GOST 6613 is of three kinds. This grid normal precision, accuracy and control. If you choose this product you will never regret buying it. But we want to warn you that the grid should be protected from mechanical damage. It cannot be broken, beat, stab, as this may damage. It is important to know also that the mesh nickel NP2 is non-toxic to humans and does not cause allergic reactions.



Nickel alloys

Abundant nickel alloys, the total amount used in the industry more than a few thousand. Here are the main ones.

ALNI alloys - an iron-nickel-aluminum (20-35% nickel, 11-18% aluminum). They have high

magnetic properties and are used for the production of molded magnets, ceramic-metal method or the electric spark method (due to the hardness and friability). Can be alloyed with cobalt, silicon (AlNi alloys)

Alumel - aluminum-silicon alloy, manganese and cobalt, remainder nickel (aluminum 1.8-2.5%, 0.85-2% silicon, 1.8-2.2% manganese, cobalt, 0.6-1%). Alloying zirconium and boron. It is used as the negative electrode in the thermocouple Chromel-alumel and as compensatory wires.

Invar - iron-nickel alloy (Ni 34.5%, 65.5% iron) has a low coefficient of thermal expansion and is used for the production of parts and measures the length of the controlling apparatus. It has a variety of (superinvar) with a particularly low coefficient of expansion.

Inconel - superalloy is nickel-chromium-iron (15% Cr, 9% iron). It may be alloyed with titanium, aluminum, molybdenum. It serves as construction material in the manufacture of jet engines.

Constantan - Cu-Ni (Nickel 39-41%, 1-2% manganese, copper else) has a low dependence of conductivity on temperature. Used for the production of resistors, measuring instruments (with the exception of high-end precision instruments).

Kopel - copper-nickel alloy (43% nickel, manganese, 0.5%) is similar to constant. Nickel alloy with a maximum thermal electromotive force in the thermocouple with chromel is used in a negative thermos electrodes thermocouples and compensation for the production of wires.

Kunial - an alloy of copper-nickel-aluminum. There kunial A (12-15% nickel, 2.3-3% aluminum) and kunial B (5.5-6.5% Ni, 1.2-2.8% aluminum). nickel alloys Inox and durable, and kunial B also freeze-proof, so used in cryogenics. Common names: MNA6-1,5 and MNA13-3.

Manganin - nickel alloy with a predominance of copper and 2.5-3.5% addition of nickel, manganese (11.5-13.5%). It has a very low electrical conductivity dependent on temperature (but at room temperature). Used in the production of standard resistors and measuring instruments.

Melchior - nickel copper alloy (mostly) 5-30% corrosion-proof and is used in shipbuilding. Alloys with a high content of nickel used for the production of dishes and so forth.

Monel - nickel alloys with copper alloyed with manganese, iron. It has good corrosion resistance to alkalis and acids, heat-proof, durable. It is used in the textile, petrochemical, medical and chemical industries. Nickel silver - an alloy of copper-nickel-zinc (Ni 5-35%, 13-45% zinc). It has high aesthetic qualities, is used to make dishes, due to its satisfactory electrical conductivity, used in electrical engineering. Also used in the production of MEDINSTRUMENT and much more.

Siliceous nickel produced in the form of tapes and bands. Used for the production of parts of electrical appliances and devices.

Nickel manganese is used for production of nickel grid control mercury rectifiers.

Nimonic - heat-resistant nickel alloy (nickel alloys Group) with the addition of chromium, titanium and aluminum. Alloying cobalt, molybdenum. Produced in the form of tubes, sheets, rods, forgings. It used as a structural material in the manufacture of jet engines.

Nitinol - nickel-titanium alloy (Ti 55%, nickel 45%). It has a memory effect.

Nichrome - a class of heat-resistant nickel alloys (nickel, 65-80%, 15-30% Cr). Alloying aluminum, silicon, rare earth metals. Nichrome has a high electric resistance is used, whereby, as a material for the production of heating elements, as well as for the manufacture of components operating at high temperature.

Permalloy - class nickel alloys with iron. Possess high permeability, low coercivity, and low hysteresis loss. Supplied as a Tape 0,003-0,5 mm. Used in communications technology, electrical engineering.

Platinum - iron-nickel alloy (42-46% nickel, 0.15% carbon, balance iron). 46n alloy used in soldering with ceramics. It is used for the production of bimetallic copperplated ribbons and wire used in the manufacture of electronic devices.

Nickel Silver Lead - manufactured in strip form and is used in the watch industry.

TB alloy - made in the form of wire. It is used for the manufacture of compensating wires.

Alloy TA - is also produced in the form of a wire and is used for the manufacture of compensating wires.

TD-nickel - nickel alloy with a highly doped oxides of thorium.

Hastelloy - class nickel alloys with molybdenum, chromium, iron. Corrosion-proof to acids. It produced as castings, wire, rods, sheets. Mainly used in the chemical industry.

Chromel - nickel-chromium alloy, and has certain heat-proof thermoelectric properties, thus used as a positive thermoelectric electrode thermocouples and compensating for manufacturing wires. Elinvars - class of iron-nickel alloys, the elastic properties of which have a weak temperature dependence, which allows their use for the production of parts, where necessary (for example, membranes, springs).

Below grade nickel alloys. MN0,6; MN16; MN19; MN25; MN95-5; MNA13-3; MNA6-1,5; MNZH5-1; MNZHK5-1-0,2; MNZHMts10-1-1; MNZHMts28-2,5-1,5; MNZHMts30-1-1; MNMts 60-20-20; MNMts 68-4-2; MNMts3-12; MNMts40-1,5; MNMts43-0,5; MNMtsAZh3-12-0,3-0,3; MNTS12-24; MNTS15-20; MNTS18-20;

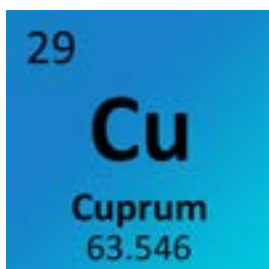
MNTS18-27; MNTSS16-29-1,8; N70M28; N70M28F; NK0,2; NMZhMts28-2,5-1,5; NMts1; NMts2; NMts2,5; NMts5; NMtsAK2-2-1; NH9; NH9,5; H15N55M16V; Cr20Ni80; HN55VMTFKYU.





COPPER

General information



Electrical products manufacturing involves the use of materials with high electrical conductivity and resistance to oxidation reactions. The most popular raw material is copper in its pure form or in alloys. Copper is used almost everywhere, though, as any non-ferrous metal, has a high market value. In various industries (automotive, aviation, instrumentation) found parts of copper alloys. This saves copper, due to which lower

the cost of the final product, the main of which are brass and bronze. The distinguishing feature of a copper alloy is the increased corrosion resistance and strength achieved using zinc as an alloying element. Another group of alloys includes a bronze alloy element. Aluminum, beryllium, silicon, etc. Often, non-ferrous metals, the derivatives are used as components of chemical reactions to obtain products scarce. In particular, copper is used for the production of butanediol (BDO), obtained by organic synthesis. The essence of the process - the condensation of acetylene (calcium carbide) and formaldehyde (methanol). As component acts copper (copper-bismuth catalyst), providing purified product yield in the range of

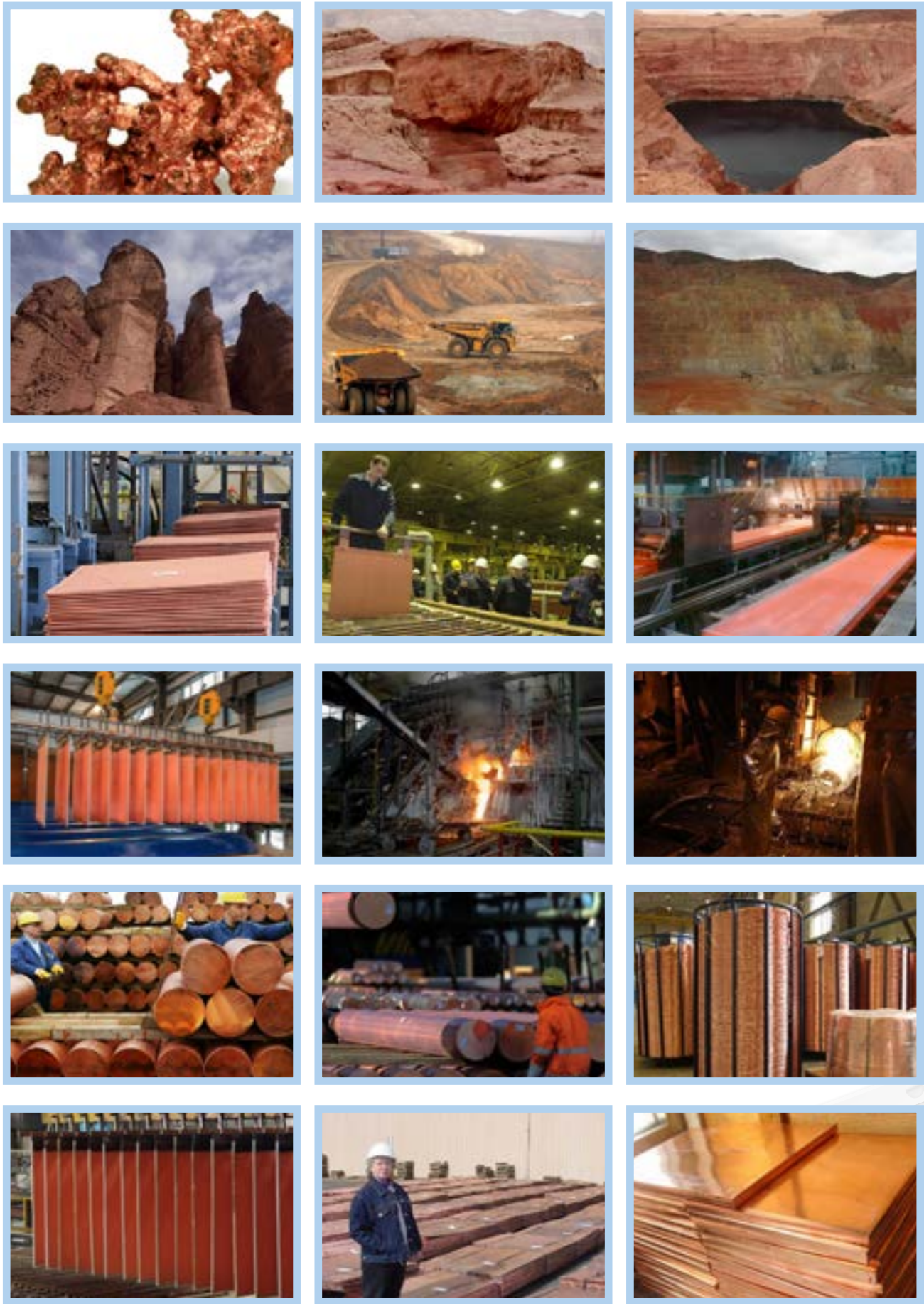
90% to accelerate the chemical process. Widespread practical application of powder materials found in the national economy. His purity chemical composition stands out ultrafine copper powder PMU (99.999%).

Modern technology allows the process to obtain copper and finely divided copper powder having a particle size less than 7 microns. Using the products of deep processing of copper demand in the automotive, aviation, chemical industry and instrumentation. Popular ultrafine copper powder, as a component in the production of a wide range of hardware, paints and fluids.

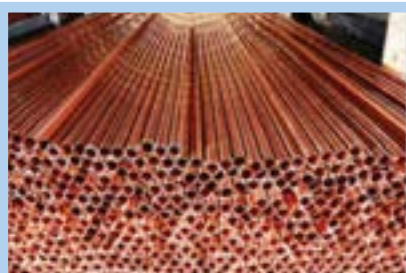
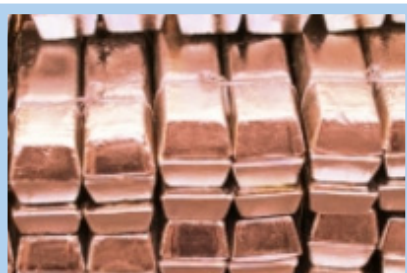
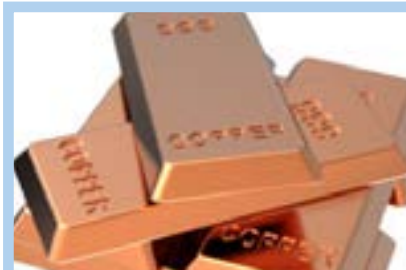
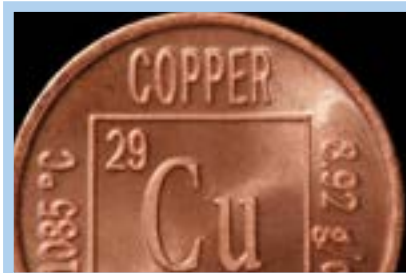
Grade	Receipt	Content		Application
		Cooper	Cooper+silver	
M00b	Melting cathodes in vacuo, an inert or reducing atmosphere.	99,99		High purity alloys, semi-finished products for the electronics, industrial, current conductors
M0b		-	99,97	
M1b		-	99,95	
M00	Cathodes melting	99,96		Rolled, high Tinless bronze, handled the pressure and semi-finished products of copper-based alloys, the current conductors
M0		-	99,93	
M1		-	99,90	
M1p	Melting of copper cathodes and copper deoxidation Lomas	-	99,90	
M1f		-	99,90	
M2p		-	99,70	
M3p		-	99,50	
M2	Fire refining of copper waste	-	99,70	Copper alloys normal quality, casting alloys, rolled metal
M3		-	99,50	

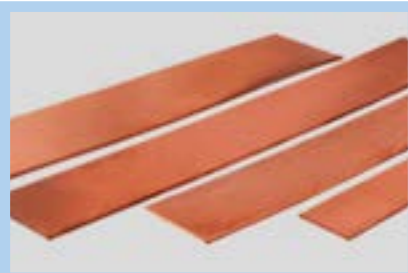
Alloying element in labeling	Element name	Indicated in the Periodic System of Elements
A	aluminum	Al
N	nickel	Ni
Sn	tin	Sn
Z	zinc	Zn
Pb	lead	Pb
Fe	ferum	Fe
Mn	manganese	Mn
Si	silicon	Si
P	phosphorus	P
T	titanium	Ti

COPPER MANUFACTURING FACILITIES

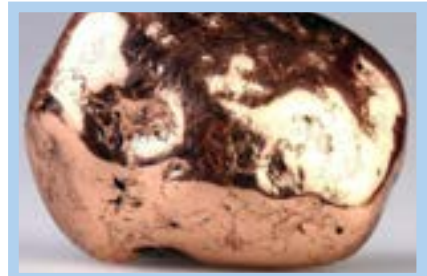
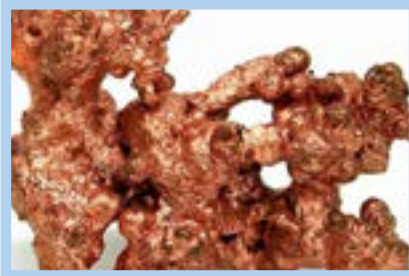








Rolled Copper



Oxygen-free copper

A variety of copper properties ensures its mass consumption in various fields of production. Excellent corrosion resistance, high electrical and thermal conductivity, good ductility. Most of all consumed copper ($\approx 70\%$) is used in the electrical field; about 15% is spent on building construction; on the engineering needs and parts of machines and mechanisms accounts for about 5%; 8% goes to other areas, including arms, transport design. For manufacturing various grades of copper used in different areas of production. The electrical engineering and electronics, which demand the highest levels of conductivity, oxygen-free copper is used. This high purity copper, wherein the copper content of $<99.9\%$. Prepared by the method of its cathode, that is, during electrolysis, and then melted under vacuum.

It should be noted that the oxygen-free copper has the following distinctive quality in comparison with the conventional copper:

- High electrical conductivity;
- High uniformity;
- great clear coat capacity for cold deformation.

Due to the improved properties, oxygen-free copper is recommended for use in electric vacuum technology:

- vakuumnye capacitors;

Manufacturing of conductors;
Manufacturing of electronic devices;
Manufacturing of switchgear.

It is also important to its use in the space industry in the manufacture of superconductors, linear accelerators, electron beam welding equipment. In addition, oxygen-free copper has found its application in the areas of:

- microelectronics;
- priborostroenie;
- nuclear power;
- building;
- jewelry.

Specificity of copper different labels are not determined by the interest component of copper (difference > 0.5%), and the interest component of certain impurities. Marking copper high-purity oxygen-free:

- M00b (Cu-OFE, OFE-OK)- Cu = 99,9988% - 99,9991%; O₂ = 0.0001% ; P = 0.0003%.
- M0b (Cu-PHC, OF-Cu)- Cu = 99.97% ; O₂ = 0.001% ; P = 0.002%.
- M1b (Cu-OF, Cu-OF1)- Cu = 99.95% ; O₂ = 0.003% ; P = 0.002%.

Oxygen-free copper M0b

M0b anoxic copper is high-purity copper, where the copper content is no less than 99.99%, the oxygen content - 0.0003%, other impurities - not more than 0.004%. It has important technological features: electrical conductivity (0.01707 - 0.01719 mO / m); thermal conductivity (386 - 390 W / m * deg); uniformity of structure; resistance to embrittlement (hydrogen). According to these indicators, oxygen-free copper grade M0b quite a bit inferior to silver. Classification of copper on marks made by its chemical composition and is defined in IEC 859 - 2001. Production of copper especially determined by the content of impurities and oxygen content. Copper high purity (M00b and M0b brand) - copper is oxygen-free, wherein the oxygen content of no more than 0.0003%. The basic method of producing oxygen-free copper is remelted in an inert cathode, a reducing atmosphere or in vacuo. It comes oxygen-free copper copper often in the form of bars, wire rod, bars. Oxygen-free copper is widely used in various fields of electrical engineering, where the high electrical conductivity of the material is required, but is also used in the following areas: -aviatsionnaya and space industry; -priborostroenie;

- Atomic industry; -E industry; manufacture of medical equipment; manufacture of vacuum technology. Oxygen-free copper grade M0b used in the manufacture of: - Optical telecommunication cables, including submarines; - Switches; - Winding transformers; - Printed circuit boards; - Of coaxial cables and waveguides; - Electrical distribution systems; - Electronic devices.

Copper oxygen-free highly pure bullion. Application. Use of oxygen-free copper due to its resistance to hydrogen embrittlement and low content of chemical elements, volatile in vacuo at high temperatures, i.e. harmful impurities when used in the electronics industry,

and others. spheres.

High purity oxygen-free copper is used in electronic vacuum devices, electron tubes, which allowed only the absolute minimum of volatile impurities that can stand out from the copper in a vacuum and high temperature combinations. Also, for such complex products as the cryogenic and optical devices require high-quality oxygen-free copper.

Some other examples of application:

- * magnetrons
- * Vacuum Capacitors
- * Gaskets for vacuum equipment
- * Databases or bases for semiconductors and substrate
- * Military equipment, and others.

Purity copper. Currently used oxygen-free copper “conditional” is divided into pure and high-purity oxygen-free copper. Pure oxygen-free copper - guaranteed content of Cu + Ag least 99,95-99,97% with the stated conductivity of at least 100% IACS (M0b, Cu-OF). High-purity (high purity) oxygen-free copper - guaranteed the Cu content is not less than 99,99% of the stated conductivity of not less than 101-102% IACS (M00b, Cu-OFE).

Purity is determined by the copper content of the main substance, expressed as a percentage and is defined as the difference between 100% and the amount of controlled impurities. Controlled impurities - a list of items in the sample measured to determine the purity. Standards for determining the purity of copper. Controlled impurities can be determined by different standards or specifications. In Russia, the most well-known standard is GOST 859-2001 (14 elements - O / P / S / Zn / Bi / Pb / Se / Te / Sn / Sb / As / Ni / Fe / Ag). In European and other countries are technical condition grade Cu-OFE (16 elements - O / P / S / Zn / Cd / Bi / Pb / Se / Te / Sn / Mn / Sb / As / Ni / Fe / Ag - GOST 859 -2001 + Cd, Mn) or others.

Controlled impurities from GOST 859-2001 and Cu-OFE are the most difficult to remove and affect the characteristics of the products of copper, used in critical areas at high and cryogenic (low) temperatures as well as under vacuum. Controlled impurities can also be determined by technical and other terms and conditions agreed between the customer and the manufacturer. As a rule, it depends not only on the list of controlled items, but also to limit the content of some of them.

859-2001 GOST and technical conditions for the brand Cu-OF / Cu-OFE describe the requirements for pure and high-purity oxygen-free copper. According to the list of controlled items from these standards and requirements to them is guaranteed by the purity of the copper not less than 99,9% and 99,99%, respectively. Individual results can be higher than 99,99%, but is guaranteed not less than 99,99%, or no more than 100 ppm of impurities.

According to standard technologies and standard list of controlled impurities

(GOST 859-2001 and Cu-OFE) is almost impossible (at least in one process cycle) to achieve results above 99.99 (5-7)%, ie the amount of impurities on the standard list less than 30-50 ppm.

The products supplied. Characteristics. The chemical purity. For copper ingots purity of greater than 99.99% There is no generally accepted standards, at least we are not yet known. The manufacturer sets its own specifications describing your list of items for which is determined by the purity (100% - the amount of the described controlled impurities). As a rule, the proposed reduction of the list of elements of the standards GOST 859-2001 and Cu-OF (E) or even another list that does not include the elements that affect the characteristics of the products of the copper used in critical areas at high and cryogenic (low) temperatures, also in vacuo.

Sometimes counting the purity of the metal is proposed standard, which includes more than 60 metals. But again, do not include the highly important harmful elements / impurities are non-metals. The proposed standard - purity of 99.999% (+) under the list of controlled impurities GOST 859-2001 and the standard Cu -OFE (16 elements - O / P / S / Zn / Cd / Bi / Pb / Se / Te / Sn / Mn / Sb / As / Ni / Fe / Ag).Methods of analysis - laser mass spectrometry, atomic emission spectrometry. A typical analysis - 99,9991-99,9993%, which limits the analytical laboratory. It is important not only to absolute purity, expressed as a percentage, but the restriction on specific impurities that have different effects on the characteristics of copper.

Samples can be as high purity 99,9994-99,9997% and above. Purity is not changing, the result of measurement expressed as a percentage. These purity values are in the aisle analytical methods to measure features, and if it is possible to measure stably Oxygen (O) is less than 2 ppm and sulfur (S) less than 3 ppm, which is very difficult analytical methods available purity measurement.

Also on the standard metal test showed no less than 99.999%. The structure of the copper. In the specifications of the products of copper not only influenced by the chemical purity and crystalline structure. Typical of our copper ingot consists of several (limited / small amounts of) single crystals grown together - usually below 1-3 + 2-7 above.

Characteristics of copper are determined by the quality of the copper. The quality of copper is determined by its chemical purity and structure. "Good" copper quality characteristic is its electrical conductivity or resistivity. Measurements of the electrical conductivity of copper delivered results showed the order of 104-105% IACS. Conductivity brands M00b (GOST 859-2001) and Cu-OFE is declared at the level of 101-102% IACS.

The difference in conductivity of copper IACS will lead to a significant difference

in performance at low temperatures - specific (volume) resistance can vary by tens and hundreds of percent. Surface resistance (reflection ratio) may vary depending on the frequency at ten percent or more.

In view of the above it about the elements limit (the content of specific elements) and the structure, even characteristics of one copper of 99.999% purity and another copper of 99.999% purity can be substantial differences, and reach up to ten percent or more, depending on the characteristics and conditions (low temperatures). The copper is second only to silver, we offer electrical conductivity and thermal conductivity of copper is close to silver. The shape, size and packaging. Ingots have a frustoconical shape close to a cylindrical shape, i.e. the lower diameter less than the upper sides slope of about 1%.

Dimensions ingots (D - diameter, H - height):

1. D70-95mm * H80-160mm weighing 3-8kg
2. D87-95mm * H100-140mm weighing 6-8kg.

A typical / basic size at the moment - Bar D87-95mm * H110-140mm weighing 5-8kg. The ingots are packed in double polyethylene (inner vacuum) two ingot in a wooden box.



Copper wire rod

Copper rod represents a kind of non-ferrous metal, which is produced by continuous casting and rolling. Today, the demand for it is growing rapidly due to the broad scope of application. Thus, the copper rod is a main component for producing building ropes, various kinds of electrical wire, which can be used for communication lines, television and radio communications. Copper rod can also serve as a lightning rod, as well as in other areas of the economy: automotive, boat-, aircraft and so on.

The main advantages of this material is its good thermal and electrical conductivity, ductility, fracture strength. Copper rod production is strictly regulated by the current regulations, according to which this type of product to classify into groups A, B and C. For its production of copper used such brands as M0, M00, M1. In addition, the copper wire is often made from copper scrap via melting, casting and rolling. Copper rod is produced with different diameters from 8 mm to 18 mm and is realized wound on special riots. High-quality copper products are distinguished by the absence of any foreign matter and smooth surface without any burrs and chips. For copper rod storage without losing the quality in the production process the product surface is coated with special wax, which acts as a preservative. Thus, the copper rod can be stored up to 3 months. Our company has many years of experience and sells wholesale and retail of various non-ferrous metal products, including copper rod high quality of different types and diameters. This type of product meets the requirements of GOST and has corresponding to the quality certificates. We guarantee a mutually beneficial terms of cooperation, convenient form of payment and timely delivery of products ordered by you.



Copper rolled metal

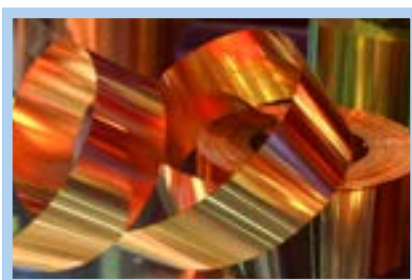
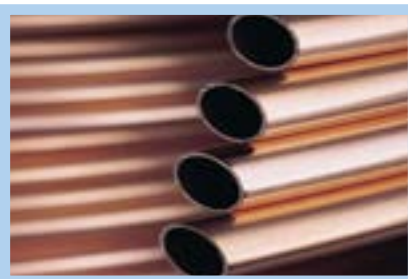
Among other non-ferrous metal copper metal is the most popular to date. This can be explained by the wide scope of application of copper and copper alloys because of advantages they possess. Today, at least quite difficult to find a single device or a device in which there was not at least one copper parts. Copper metal is actively used in electronics, electrical, automotive, aircraft, machine tools, instrumentation, defense industry and in many other areas. It is an indispensable material in the manufacture of all kinds of electronics, plumbing, heating equipment, air conditioning, ventilation, water, gas, etc.

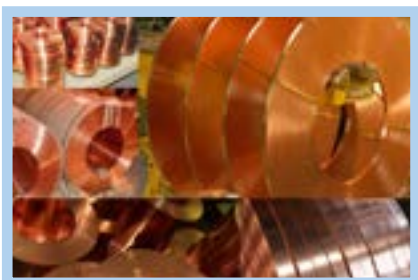
Conventionally, copper metal can be divided into these types of products such as copper sheet, copper pipes, bars, wire, profiles and other products made of copper. From copper rod made various parts for appliances: nuts, bolts, bushings, pins, etc. Copper wire is used for the production of specialty wire ropes, as well as a variety of cables. Copper sheets are very good as a roofing material.

Also worth mentioning is made of copper solders, which represent a material used for welding of various metals and their alloys, such as steel or stainless steel. Sometimes copper solders replaced silver in the process of repair of jewelry, as well as refrigerators and geysers. Copper solders differ among themselves, his composition. Depending on the alloy of the doping component, which may be phosphorus, nickel or zinc, and emit corresponding solder: copper-phosphorous, nickel-copper and copper-zinc solder. They come in different form of wire, bars, rods, strips, etc.

Another type of semi-finished copper - copper ingots, which is an intermediate / raw material for further production of various products of the copper in the mechanical engineering, metal-working industry. From it smelt parts of electric motors, transformers, various copper profiles, fasteners and so on.

Copper metal represents a material which is easy to any manipulation with them, for example, grinding, stamping, drilling, cutting, stamping welding. And it lends itself to recycling.





Copper seam roofing

With all the variety of modern materials, copper folded roof has a special place. As, in fact, a type of metal roofing, it combines the priorities of modern manufacturing processes and unique properties of metal which is copper.

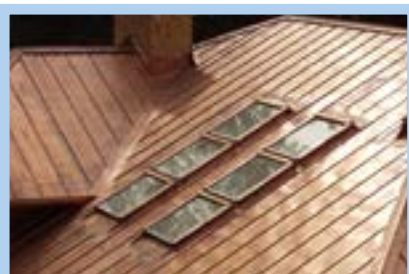
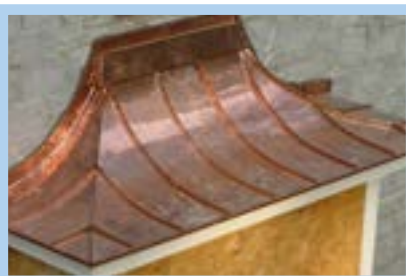
Unlike other materials, the time for which the destructive, copper with age becomes only stronger and more invulnerable. By changing its color from golden-red to brown, with time it becomes green and covered with noble patina. This makes it resistant to corrosion. The service life of the copper roof is 100-150 years, and the history of known copper coating to stand for at least three centuries, without losing the high protective properties.

The strength of such a roof lends itself method of joining sheets. Thanks rebate - a special kind of joints, roofing copper sheet is securely fastened to each other, ensuring the integrity and durability of the coating.

A number of exceptional features that distinguish copper standing seam roofing, making it one of the most reliable and technologically advanced roofing materials:

- The extraordinary lightness of copper sheet is much easier installation procedure.
- to adverse natural factors of stability makes it advisable to use in areas with unstable and rainy climate.
- ductility material of construction of the folded roof mount attaches copper durability and stability.
- Stability to high and low temperature regimes surrounding environment, which is different copper standing seam roofing, allows you to use it as in the northern regions and in the south.
- The material is characterized by high fire safety.
- Due to the fastening seam, the roof has an excellent tightness.
- Environmentally friendly and bacterial resistance of copper will save your roof from fungus and other biological invaders.
- Large architectural variability.

By choosing this material, you will not only emphasize their high social status, but also to invest in a strong, time-tested coating that will reliably protect your home from the elements.



Copper metal roofing

The roof is made of copper metal is one of the most popular types of roofing. Being durable, it is up to 150 years without requiring special maintenance and repair. Gradually oxide copper metal coated with a noble patina, which is both its corrosion protection. It needs no painting, no clean-up, as its natural color, even changing over time, is quite aesthetic.

Also, copper is relatively ductile metal, which allows it to stack in rather complex configurations roof. Copper metal is not exposed to high and low temperatures - it does not melt from the heat and does not crack in the cold. Modern production allows to produce copper metal roofing as a natural color with the "new" shine and artificially "made old" to varying degrees. Classical copper and oxidized roof initially has a reddish hue natural copper, eventually acquiring a brown matte color. Patinated copper metal turns bright green (the color of aged copper).

Copper metal has several varieties:

- Spanish dune;
- Scales;
- Volumetric scales;
- Hexagon;
- Surround the diamond.

Copper is a profiled metal sheet of copper 0.6 mm thick and 530 mm wide, along the length

of the roof. Mounted on copper metal crate so that the roof surface is not perforated (of course, it is important for the integrity of the roof). Assembling the “castle”, at the toe of the mounting lug with the slot creates an absolutely hermetic coating. Installed by professionals, installers copper metal roofing does not require repair for all the years of operation. Roofing copper is a standard of quality in construction. Copper metal domestic production produced from both domestic brands M1 according to GOST 859-2001 Copper and copper imports.



Copper shingles

Types of surfaces of copper roofing:

- classic copper roof - performed smoothly in Catania brilliant classical performance;
- oxidized roof - dark brown copper, artificially aged, which later continued under the influence of environmental change color;
- roof patinated copper - malachite color, also artificially made old;
- tinned copper for roof tiles - obtained tinning process, gray - matt finish.

A copper plate as the material for the roof, resistant to alkalis and acids. Formed patina on the surface layer prevents the penetration of oxygen and other substances on the surface, which doubles its service life. Copper shingles on the service life of 150 years is enough durable roof.

Copper roof is divided into several types. Seam roof - the guarantor of the complete absence of leaks. By rationality is the easiest installation method. The thickness of the sheets of 0.6 to 0.8 mm and high quality. The sheets are connected by a special technology-folds of seams, is a single or double bend in the field of tile compound. Pfalz double bend provides a more reliable fastening of the roof. Mounted copper tiles only whole crate to increase the service life as a whole.

Copper shingles - manufactured by pressing the sheets of copper, betraying her texture tiles. Mounted on a solid crate overlapping the next sheet and attached

with screws to the roof. Overlap width 250 mm length of the profile. The advantage is the easy replacement of parts of the roof during repairs.

Copper sword - a type of tile with the elements in the form of a diamond-shaped or square shapes. Such a sword or scales often cover domes of Orthodox churches and temples. Checkers are bonded by a special system of locks, reflux in the upper part of the lock member and the lower straight portion, which is tightly fastened when installing. Copper tile, with such a mounting, completely eliminates leakage.

Copper gutters - are an integral part of the roof to drain water during rain and melting snow. It consists of gutter pipes, angles, funnels, clamps, connectors and headers. All elements are connected to each other by a mechanical method or adhesions.

Brass spotlights - panel for filing space under the roof, often with partial perforation, so copper shingles has a finished appearance.



Copper roofing sheet

One of the most durable and reliable construction materials for roofing is copper sheet roofing. It has qualities such as strength, ductility, resistance to corrosion. All properties are maintained regardless of the temperature conditions and the weather. Thanks to the flexibility and ease of processing of the copper sheet is widely used for the manufacture of roofs, domes, towers. Corrosive processes occurring on the copper surface, tend to fade over time. Gradually, there is an oxide film that protects the metal from the environment. Over time, the sheet metal roofing copper changes color from red (its natural original color) turns dark brown and then green. It looks such a roof is very nice, but the color change process takes several years. In industrial conditions to achieve the desired color of the oxide film can be much faster. Apart from the standard classical, oxidized and patinated (emerald green) copper roofing, manufacturers offer a bronze-colored, gold, tin and so on. This is achieved by alloying of copper with aluminum, silicon, nickel

and other metals. It is made of sheet copper High quality metal containing a minimum amount of impurities. This category includes marks M1, M2, M2P, and others. Production is carried out by hot and cold rolled products (products are marked with the letters D and E). The resulting copper roof may have a smooth surface or a beautiful structured pattern. Manufacturers made normal sheets length and width having increased dimensions in length and width dimensions are increased in width or in length only. In turn, is measuring length or a multiple dimensional. Rollers cold sheet thickness ranges from 0.4 to 12 mm, hot from 0.3 to 25 mm. The choice of parameters depends on the purpose for which will be used roofing sheet copper and depends entirely on the wishes of the customer. Copper roofing, manufactured in compliance with all rules and regulations, will never require maintenance, the service life is at least 100 years.

KME copper roofing

Types of roofing materials produced by KME technology:

1. Classic - the classic copper product smooth rollers. It is the most popular material for sales statistics on copper products market.
2. Oxide - for both sides of this type are oxidized copper surface. The result is roofing copper KME, having a dark brown color. A special feature is that the color of the product is given in a natural way.
3. Patina - an exclusive product manufactured by KME technology. A layer of oxide (patina), which is produced in industrial conditions, the KME copper roofing, in their chemical qualities identical patina that forms on the metal in 20-25 years. Patina is applied to the metal only on one side.
4. Tin - both sides of the metal exposed solderability. This KME copper roofing has a matte-gray tone, able to blend in with many materials. As well as the product oxide over time changes its color to a darker.
5. Brass - Copper roof KME, which is an alloy of copper and zinc. Initially, the surface has a noble red-gold color, which changes over time to the classic dark green.
6. Brontse - a promising material, which is an alloy of copper and tin. A feature is the increased resistance to wear and corrosion. On sloping surfaces formed after the time characteristic of the standard copper patina. However, compared with the classic type of copper products KME copper roofing Brontse oxidizes much more slowly.
7. Gold - a material with a gold surface. It is an alloy of copper and aluminum. Like bronze has high mechanical durability. Initially KME copper roofing Brontse has a golden color, but under the influence of natural factors becomes more bright and matt, while preserving golden hue. A special feature is the fact that even under the influence of the time of its color metal does not change.

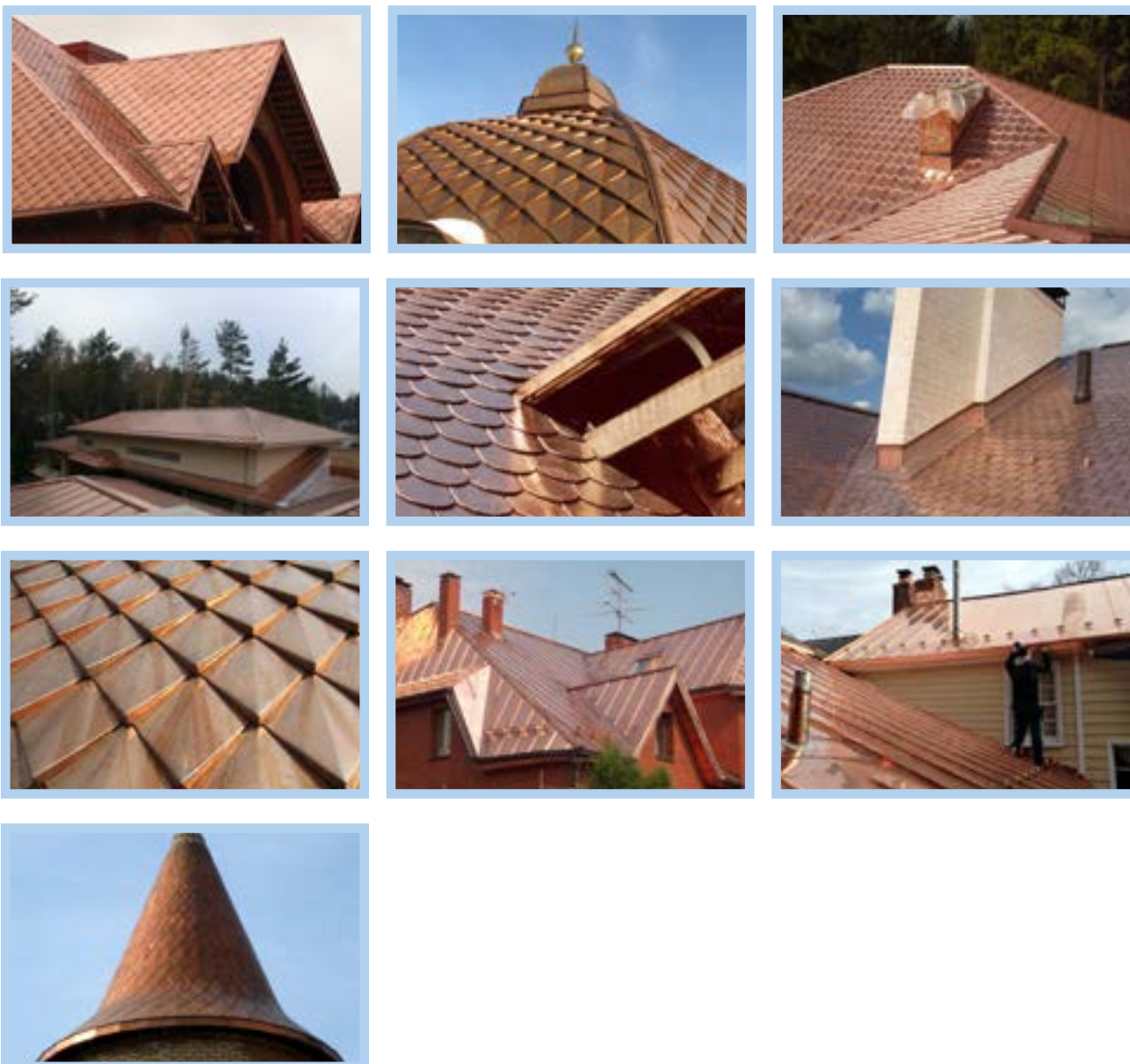
Copper roofing TECU

Among all currently existing materials for roofing is to provide one that can rightly be considered the most durable - a copper roof. Due to physical and chemical properties of the metal material is characterized by the many advantages, including good flexibility,

water resistance, environmental friendliness, beautiful aesthetic appearance, as well as the ease and convenience during installation. Besides the traditional red and yellow copper-colored copper roofing can have different shades due to its characteristic patina that forms over time. However, the use of modern technology possible to accelerate the process, so you can immediately get a patinated copper. This made it possible to embody any, even the most original and exclusive architectural solutions. This material is used to cover roofs and facades of different residential and non-residential buildings, historic buildings, religious temples, etc. Today copper roof TECU production of German concern KME is one of the most popular on the market of copper roofing. It meets European quality standards and is allocated a number of advantages, such as resistance to corrosion, temperature extremes, durability, fire resistance, and many others. In addition, copper TECU roof may be subjected to complete processing on the expiration of its service life, and therefore is environmentally friendly. Copper roofing can create true harmony in the architecture of any structure thanks to the variety of colors that offer manufacturers. Copper roofing TECU produced as sheets, strips or roof panels which are secured thanks to special folds. If necessary, a roof repair material should not require replacement as easily weldable. Today copper roof TECU - an indicator of prestige and status in society. This brand has the best price-quality ratio in the market of roofing products.

Copper roofing M1f GOST 495

Always copper sheet was quite popular material in the production. Popularity is explained simply. It possesses anticorrosive properties, has good strength, ductility, and is harmless in human use. Copper sheet according to GOST 495-92 of the brands manufactured M1 copper M1r, M2, M2P, M3, M3R according to GOST 859. Basically, the market is represented by mark M1, the copper content of which is not less than 99.9%. According to the method of rolled copper sheet is hot-rolled and cold-rolled. The cold-rolled sheets can be produced in a soft, semi-solid and solid state. Furthermore, the material is classified by the degree of dimensional accuracy: normal sheet width and length, sheets of high accuracy of width and length, sheets of high accuracy to the width and length of high accuracy. Copper sheets, cold rolled produced width 600-1000 mm, length 1500-2000 mm. Sheets of hot rolling can to a width of 3000 mm and a length of 6000 mm. Cold-rolled sheet thickness ranges from 0.4 mm to 12.0 mm, hot rolled from 3.0 mm to 25.0 mm. Where is the copper sheet is used? Often the product is used to make roofing, general construction works. This is due to the possibility of manufacturing a roof of any shape and durability of its service. Plus, copper does not require further processing and painting. Also, the copper sheet in demand in the food industry. The most striking example can be considered a manufacturer of kitchen utensils from it. Copper sheets are used in instrument making and mechanical engineering. Order copper sheet, you can apply through our website.



Copper roll

Roofing made of copper a reliable and environmentally friendly by applying more than one hundred years, has now become even better and moved into the category of the prestigious roofing material. And it kind of (color, texture) and versions of the forms (sheets, copper roll, tiles) provide for roofing masters and developers a wide field for various design decisions. Especially popular now enjoys among consumers copper roll. This type of packaging has undeniable advantages over copper sheets. Actually, it is easy to install (on the bay width of 60, 67, 70 and 80 cm, according to the calculations roofers, cut required length to cover), this type of assembly minimizes the amount of waste. And this is very important, taking into account the cost of this type of roof. Coils are available in rolls weighing up to three hundred kilograms. The thickness of the copper sheet can range from 0,55-0,60 mm to 1 mm. Copper roll is supplied on pallets (or boxes). Each bay is further wrapped in plastic packaging film and is attached to a wooden pallet with a metal strap. This method of packing ensures safe transport of the material to the place of the future installation. Already at the construction site before installation, roofers copper

roll is cut to the desired length and rolled on Fold the machine. While rolling on the machine, metal edge of getting a certain shape, which allows you to fasten two identical sheets to each other and to prekremit crate. The resulting copper sheet is attached to the crate fasteners - klyaymerami. In our time, it is widely used mobile klyaymery that allows escape from the strain of roofing sheets during their heating sunlight (klyaymery attached to the sheathing with copper nails). After the sheets are joined together by special crimp tool (machine).

Roofing made of copper M1f GOST 1173

Among the wide range of roofing copper is the best option roofing copper M1f brand because of its special qualities. Copper roofing M1f produced in Russia according to GOST 1173. This standard establishes a process procedure of production of cold-rolled coils from the general-purpose copper. Stamps copper determine its composition and, accordingly, the area most appropriate use.

The chemical composition of grade copper M1f determined by the requirements of GOST 859-2001. Copper M1f brand different from other brands of copper roofing, manufactured according to GOST 1173, the lack of oxygen in the composition on the background of high phosphorus content. The percentage of phosphorus content may range from 0.012% to 0.06%. When this phosphorus content of the copper roof M1f received favorable performance relative to other types of roofing medi- natural process of the formation on the surface of the roof of the oxide film (The patina) proceeds more slowly, and the patina layer becomes more smooth.

Copper roofing is classified M1f for standard sizes. According to the thickness of the roofing sheet:

- 0.5 mm;
- 0.6 mm;
- 0.8 mm.

According to the width of the roofing sheet:

- 600 mm;
- 670 mm.

The technical and operational characteristics, whereby the copper roof is used for all types of roofs:

- Low corrosivity;
- An even layer of patina that forms over time on the surface;- Increased moisture resistance;
- Strength and durability, ensuring low operating costs;
- High plasticity of the material;
- Long life (150 years).

Supplied roofing copper rolls often then already in place roofer copper strips cut the desired length. Rolls are sold by weight, the price is set for 1 kg.

Depending on the thickness of the sheet copper roof weighs M1f:

- 1 m² = 5.34 kg (0.6 mm in thickness);
- 1m² = 7.12 kg (0.8 mm in thickness).

Patinated copper TECU (oxidized copper)

One of the most aesthetic materials for roofing - patinated copper TECU on a roll.

The main characteristics of metal - an alloy of purity and perfect accuracy of the finished product. The chemical index of the copper not less than 99.9%. The rolls are made on the exact parameters, which ensures high quality and performance of works on the roof device. Patinated copper TECU has a standard tape thickness of 0.6 mm, ensures a good margin of safety and long-term operation.

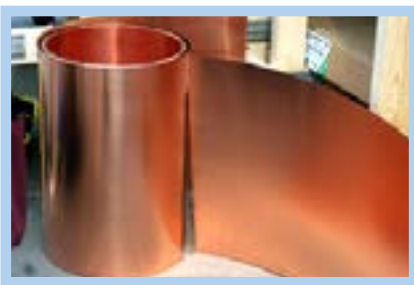
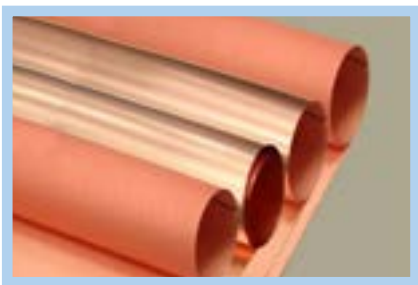
The main useful properties of copper. Outdoors under the influence of oxygen and moisture, it forms a patina on the metal surface. The oxide film that can protect the copper from all sorts of harmful environmental influences.

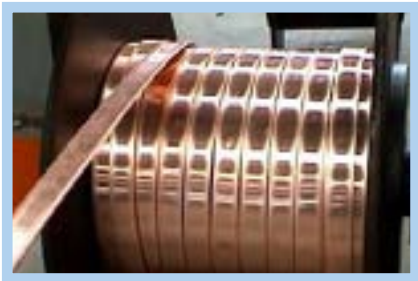
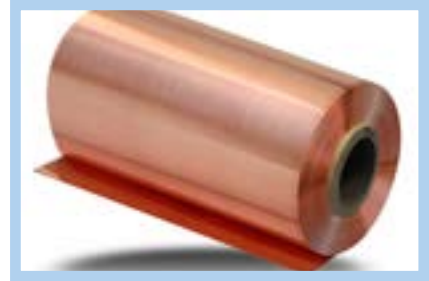
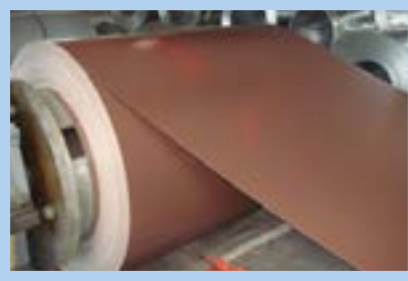
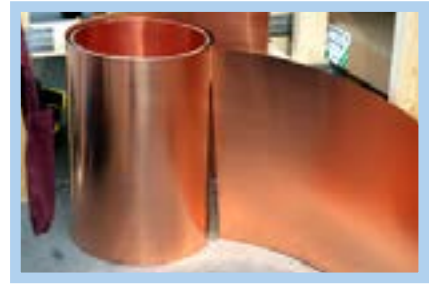
The advantages of copper roof.

- Oxidized copper roof has a high durability and weather resistance. From corrosion protection metal oxide layer.
- Patinated copper TECU has an unlimited service life.
- Copper tape is easy to process. If necessary, oxidized copper is easily bends and stretches.
- Oxidized copper roof cost effective when constructing roofs. This type of material does not require roof repair Lifetime.
- Patinated copper roof TECU - ecologically clean, natural material. Copper is not harmful to humans and the environment.

Under the TECU brand offers a wide range of products for roofing.

- TECU Classic has a distinct copper color, patina occurs within 7-15 years after installation.
- TECU oxide. Oxidized copper, obtained by pre-oxidation of the classic double copper. It has a smooth dark brown. After mounting the patination process continues.
- TECU Patina. Full patina formation occurs in the plant. As a result, the roof has the same form as after 10 years of natural processes.
- TECU Tin. Copper goes tinning process on both sides. It has a matt gray color and high protective properties.
- TECU Bronze. The alloy of tin and copper red-brown.
- TECU Gold. Copper and aluminum alloy of gold color.





Other rolled copper

According to GOST 859 rolled copper is determined by nine major brands, different percentage entering the main element. The most commonly used M00 (99.99%), M0 (99.95%), M1 (99.90%), M2 (99.70%), M3 (99.50%), M4 (99.0%) . Behind the main label indicate the sign indicating the way to obtain the metal:

- "B" - OFC
- "P" - deoxidized copper
- "K" - cathode copper

The designation "E" indicates the possibility to apply for rental in electrical engineering. Conventionally rolled copper can be divided into flat and round.

1. Rod.

According to distinguish the shape of the cross section round (CR), Allen (SH), square (HF) bars. Based on the state of the material all rolled copper, including rods, divided into mild (M), a semi-solid (R) and the solid (T).

Methods for producing copper rod:

- Pressed (Hot)
- Drawn (cold-).

Nominal Diameter 3-50mm drawn bars, dimensions of pressed rolled up 20-150mm.

Length: multiple dimensional (CT), off-gage (ND), in coils (BT).

It is used in electrical engineering to create conductive materials, instrumentation, metallurgy, construction, mechanical engineering, as well as for the production of seamless pipes. Used in the manufacture of dies and typographic preform for nuts,

washers, screws, etc.

2. Wire

Copper wire is produced of the following brands:

- "MM" - soft copper
- "MEM" - soft enamelling
- "IMB" - soft OFC
- "MT" - solid copper
- "MFE" - a firm enamelling
- "MTB" - solid OFC
- "MC" - for overhead lines

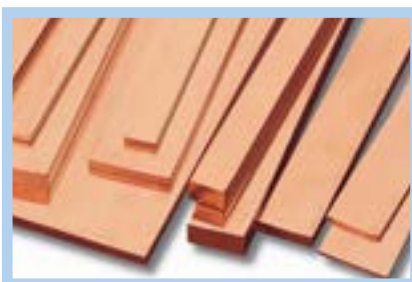
Depending on the brand of copper thread manufactured with a diameter of up to 16mm 0,0125mm.

The starting material for the production of copper wire rod acts as classes A and B, or other semi-finished products made from copper grade of not lower than M0. This rolled copper for use in ready-made or intended for further manufacture of wires, cords, cables and other electrical products. From several separate but interconnected wires twisted copper wire produced. Copper wire, ropes and cables of copper is often used in ground systems, lightning protection or potential equalization, as well as in the automotive, telecommunications and electricity industries.

3. Copper pipe

Pipe rolled copper is characterized by a wall thickness, outer diameter and length. Nominal outer diameter can vary from 6mm to 267mm, and the nominal wall thickness 0,5-3,0mm.

Along the length of the copper pipes are manufactured in lengths measured length (CD) or the free bays (BT), the ordered layering (BU) and the flat spiral (BS) winding.



Copper wire

Properties of copper wire can use it in many industries. This wire is resistant to corrosion and high temperatures. Due to the thermal conductivity of copper wire used in mechanical engineering, thanks to the flexibility - in telecommunications. The ability to conduct electricity allows its use in electrical appliances. There are two types of copper wire - MM (soft copper) and MT (solid copper). There is also a separate type of wire, which is used in the narrow direction - MS. This wire is used for the communication lines. Next, another wire is divided into several types, depending on the material. For example, there is a wire type IMB and MTB. Made wire, oxygen-free copper, which adds to the overall letter abbreviation B. Also wire distinguished by its softness. According to this criterion, it is divided in the PMM and PMT. We supply wires of different diameters and types. For example, the diameter of marks MM, MT and IMB MTB from 0.2 mm to 16 mm. Enamelled copper wires (MME and MTE) is made with a much smaller diameter, typically 0,125-2,8 mm. The copper wire used to make thin ropes, cables, different windings. Large diameter - in electrical, mechanical engineering. Fine copper wire is considered to be 2 mm or less. The production uses a different material for the manufacture of different types of wire. MM copper wire, for example, often made of copper M1. The reason for this is to use a wire MM in electrical appliances, cords, wires. We supply copper wire in the coil, the bay or on order in the correct winding. A thin wire is most often sold in coils. Larger diameters - in coils with specific weight. Copper wire has a significant advantage over steel and aluminum wires in its operational capacities.

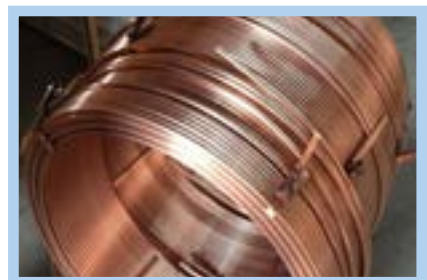
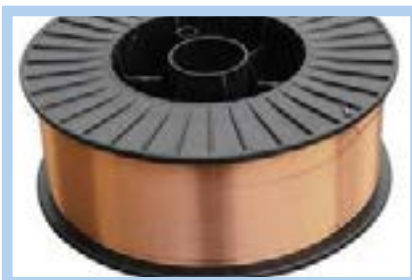


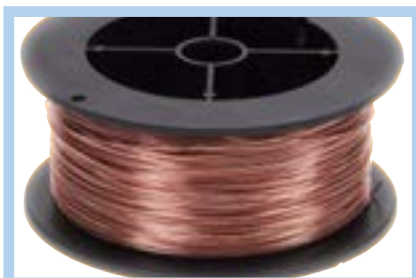
Copper welding wire

Manufacturing designs and products made of copper often requires welding. Such work can be made in different ways using wires and electrodes. The technical properties of seams and joints are presented fairly high expectations. They should as much as possible match the properties of the connected parts. Preferably the welding process in which welding is used a copper wire.

Copper filler wire is used for welding work in the manufacture of a copper and alloys containing copper. Also, the copper wire is used for welding weld bronzes Cu-Sn, Cu-Si. In this regard, and is used for various kinds of wire. Depending on the type and composition of the impurities of copper, it may have different characteristics. The production rate of copper wire installed in ISO 16130. It specifies the particular production, product specifications, allowed the chemical composition, particularly transport, control, storage.

Copper welding wire is the most popular in the manufacture of microelectronic products with silicon crystals. It can also be used for operations that require weld cast iron and steel or produce welding on low-alloyed or not alloyed steel. Often used copper welding wire for welding galvanized parts in the automotive industry. In particularly critical pipelines are put out of aluminum bronze pipe, which are highly resistant to corrosion. At these sites for joining pipes by welding is also often used copper wire welding. Also with the help of a wire make repair of plain bearings, guides, propellers. Copper wire for welding of high quality homogeneous, with a shiny surface, clean and dry. It must be free from defects in the form of bundles, sinks, cracks. Packaging wire produced in cardboard containers in the form of skeins or on a special reel.





Tinned copper wire

Tinned copper wire represents the non-ferrous metal product, often with a circular cross-section, or in the form of a rectangle. Made of high-quality copper with a solid protective tin coating over its entire surface. The need for such a coating caused by the physical feature of the copper itself, which over time may be subject to oxidation processes, so this product to give greater strength and durability used process called “tinning”. Tinned copper wire has useful properties such as corrosion resistance, high conductivity, good ductility and fracture toughness. It can properly serve for many years without any changes in appearance and its properties. Such characteristics of the material and define its scope. So, tinned copper wire is actively used in the electrical industry for the manufacture of a variety of devices and installations, as well as the production of conductive cords, wires, cables and much more. Furthermore, it can be used for other purposes. Wire is divided into two main types, namely: tinned copper wire soft (grade MML) and tinned copper wire, solid (Brand MTL). In addition, the release also wire for overhead lines MS communication wire OFC (IMB), soft (MME) and the solid (MFE) wire for enamelling (MME). Available tinned copper wires of different diameters from 0.02 to 9.42 mm in coils or wound into coils. A prerequisite for this is the lack of large bends and kinks throughout.



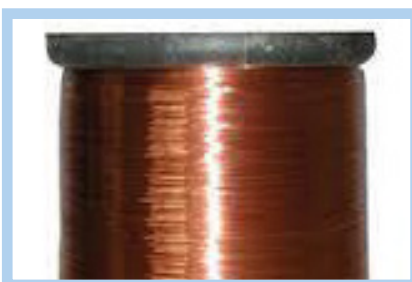
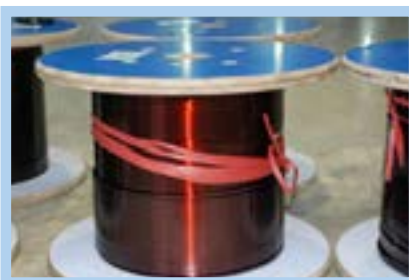
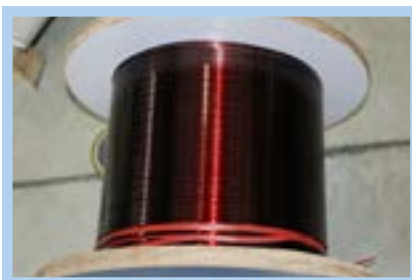
Wires copper winding

Copper wire wrapping made of primary copper. The most commonly used copper wire M1 or M2. Copper has high moldability, flexibility, conductivity, resistance to corrosion. These properties allow the use of copper wire in many sectors - mechanical engineering,

power engineering, for winding electric motors, transformers, coils contour, as well as the different devices. Copper conductors are classified depending on the insulating material (thickness and cross-section shape), which is reflected in the alphanumeric labeling. There are the following types of windings:

- Cotton (B);
- silk (W);
- rayon (HQ, K);
- glass fiber (C);
- asbestos fiber (A);
- enamel lakostoykaya (EL);
- vinilfleks (EV);
- heat-resistant enamel (ET);
- polyurethane enamel (EVTL).

Insulation winding copper wire determines its performance characteristics. For example, paper insulated wire is used at temperatures not exceeding 105 degrees. The most common is copper winding wire enamel, characterized by low thickness, high physical and mechanical properties, electrical conductivity and thermal shock resistance. Also, copper wire wrapping insulated by oil and synthetic varnishes - brand PEL, PEVTL, PETV and others. Winding wire PEL is characterized by high electrical insulation, which does not change when exposed to high temperatures and considerable humidity. They are used in the manufacture of coils and frames for electrical appliances. Diameter copper wire is 0.02 to 2.5 mm. PETV brand wire characterized by high resistance to aggressive media. This allows their use in the winding of electrical machines and devices without additional coating. Wires copper winding enameled, brand PEVTL often produced with a diameter of 0.05 to 1.6 mm. Polyurethane insulation does not require pre-cleaning of the surface, it is widely used in radio engineering and instrument making. There is even a silver-copper wire, but it is mainly used for medical purposes, for the manufacture of various types of medical equipment and, for the prophylaxis treatment of a wide range of diseases.



Copper wire electrical

Copper wire for electrical marking MM available in a soft state may have a different diameter. This material has the advantages of weight in comparison with other types of materials, which determine its great scope. It is characterized by excellent heat and electrical conductivity, ductility, and resistance to high temperature extremes and humidity. Copper wire electrical easy to use, since it is easy to cut and bend, and lends itself to any type of soldering and welding. Ease of use, durability and manufacturability of electrical copper wire allows it among the most optimal materials for use in the power industry, construction, machinery, textile and footwear industries, etc. From it are made different wires, cables, rivets, fuses, decorative elements, the transformers and more. Copper wire coils produced in electrical or coils of different diameters and lengths, and may have a circular or rectangular cross section depending on its scope. Very often, in the manufacture of this type of use of the wire coating of pure silver which gives other useful properties similar product. In particular, silver-copper wire, excepts for good conductivity, and has a glossy surface and ideally, which is especially important, is resistant to corrosion. Therefore, it is advantageously chosen for the manufacture of high-microwires, in the textile industry. Copper wire production carried out exclusively in accordance with the legislation of the GOST standards and technical requirements.



Enameled copper wire (enameled wire)

What is the enameled copper wire? This enamelled copper wire coated in order to make the wire insulation and waterproofing. Made from electrical copper grades. As a coating, the most commonly used specially developed coatings based on modified polyetherimide resin. These coatings have many valuable qualities such as good elasticity (coating does not peel off when bending wires), mechanical stability, excellent dielectric properties, resistance to high temperature resistance as well as resistance to transformer oils, and solvents. All these qualities make enamelled copper wire indispensable in various fields of electrical engineering. Enameled wire occurs in which polyamide resins are used as

insulation. They serve as a cover layer applied over polyetherimide resins. This enameled wire becomes significantly more resistant to high temperatures, abrasion, resistant to various aggressive chemicals.

According to GOST, enameled wire must withstand temperatures up to two hundred forty degrees Celsius. Industry produces enameled copper wire with a variety of diameters from six hundredths of a millimeter to two millimeters and a half or more. When this isolation, according to the standard should retain elasticity when winding the wire on a cylinder of 60 mm diameter (wire diameter 2.5 mm) and 100 mm (2,5 mm). When transporting the copper enameled wire to be wound on the reel one segment. The main area in which the enameled wire is used - Electrical Engineering, where enamelled copper wire is most often used in the form of windings on the coils (eg, transformers). As an independent conductor, enameled wire, almost never used.

By the material of which is made of copper wire, enamel, special requirements, since the presence of impurities sharply reduces the electrical conductivity. The species, which require high purity, oxygen-free copper is used the increased purity.



Copper square

Rod copper square copper square, has been widely used in various fields of national economy. It is used as a blank for fabricating the different parts and as a structural material. It is made of copper copper box brand: M1, M2, M3, M1R, M2P, M3R, in accordance with GOST 1535. The chemical composition of copper GOST 859.

Classification of copper rod are subject to:

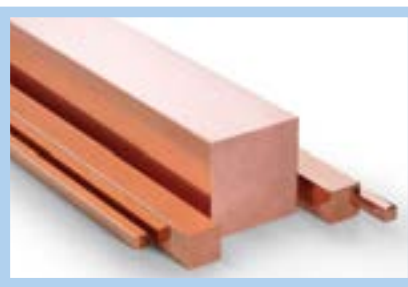
- 1) production method. -Medny Rod can be: T - Hot (pressed), D - cold-(drawn).
- 2) The state of the material. M - soft, T - firm, L - semi-hard.
- 3) Accuracy of manufacturing. N - normal, P - increased.
- 4) length: MD - Copper long, ND - Random length and KM - dimensional fold.

Thanks to its technological and operational properties, copper square is used in many

industries and areas of the economy. Copper Square is used for the manufacture of HVAC equipment parts, decorative elements, valves, typographic stamps, and more. Due to its manufacturing quality copper square is in high demand, it has a number of advantages and features:

- Workability;
- durability;
- Excellent anti-corrosion properties;
- plastic material;
- High electrical conductivity.

Buy Copper Square you can have, it is possible to supply all sizes: side from 5 to 41 mm (1 mm steps).



Copper profile

Copper profile - is the material, the initial semi-finished product from which subsequently produce finished products, components, assemblies, which must be technologically presence of copper parts.

Copper is classified as non-ferrous metals, has a corrosion resistant, high thermal and electrical conductivity. This material is environmentally friendly and safe for humans, relatively strong, ductile and easy to process. These qualities allow wide use of copper in various industries.

All kinds of profiles obtained by rolling copper rod rolling mills in two ways -private hire and drawing. Produced so the copper profile, called, respectively, extruded and drawn. Drawn profiles are cold-rolled and hot-rolled. In their production, as the feedstock used by such brands copper: M1, M1r, M2, M2P, M3, and M3R M1f with a chemical composition corresponding to GOST 859.

All varieties of the profile are made with different boundaries and tolerances are elevated, high and normal accuracy. The geometric cross-section profiles of diverse, it all depends on the customer, but is limited by the technical conditions and the possibility of rolling mills. Mainly produced copper profile section of a corner, brands, I-beams, channels, beams, rails and other.

The length depends on the cutting product ordering conditions and may be from one to six meters. There are “continuous” products. Continuous copper profile produced with a small size and cross-section are supplied in coils for easy transportation.

Profile on the appointment and on the quality of the copper can be:

- For the production of electric motors M1 brand;
- Electro-profile brand PPE;
- Collecting stamps RMB;
- Pin MLF brand profile for use in contact devices.

Excellent electrical conductivity of copper, abrasion resistance, durability, ability to resist hostile environments. These and many other qualities allow wide use of copper profiles in the energy, electrical engineering, mechanical engineering and construction.

Profiles of copper M1

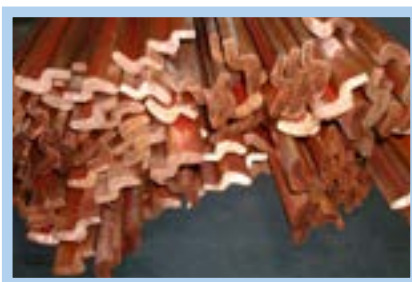
Copper is one of the most essential metal in construction. From it makes a lot of different materials. For example, profiles of copper, in fact about them and will be discussed.

Copper is a good thermal conductive material is released, electrical conductivity, high resistance, moldability and durability. Profiles are made of different grades of copper, in particular M1, produced in various GOST and TU. Is produced with a variety of indicators of accuracy and strength: normal, high, high. Profiles have a very wide range of applications, are used in electrical engineering, power engineering, mechanical engineering, electrical conductors are doing, tire tips shunts. they are used for the manufacture of inductors in electrical engineering. As for the manufacturing process, the copper profiles are often manufactured from copper rod. Various different ways of processing. Profiles are available in pull molded forms. Another copper profiles are divided into cold and hot. Their length may be from 1 to 6 meters.

There is also a whole, and there are hollow profiles. Solid brass profiles are manufactured by extrusion. Solid widely used in electrical engineering. Hollow profiles of copper are produced by pressing and pulling. Hollow, thanks to its good thermal conductivity and electrical conductivity is often used for the manufacture of cooled electrical conductors.

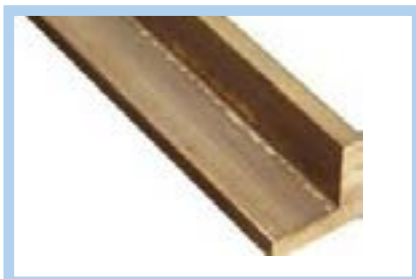
Profile Copper M2

Profile copper M2 represents non-ferrous metal products, which are made of copper wire rod at rolling and drawing mills copper M2 mark. Copper profile is a semi-finished product for the production of various functional parts and tools for vehicles, appliances and devices in various industries: machine-building and machine-tool construction, electrical engineering, etc. Profile copper is used most widely in the form of connection, contact, or other structural materials. Profile has many advantages due to the properties of copper as ductility, durability, good electrical conductivity, durability and others. Classify copper profile depending on the method of its production, at the same hot- and cold-isolated profile. Further, such profiles may have different accuracies based on this, the profiles distinguish normal, high, and high precision. Also, there are copper hollow profiles which have cavities inside a whole. The main advantage of the rolled metal production is its wonderful electrical and thermal conductivity, which allows it to actively use in the electrical field of industry (for the production of terminals, switches, switches, distribution of tires, etc.) as well as for the production of electronics cooling systems. Today, copper profile is available in various lengths from 1 to 10 meters or continuous length in coils (coils). Exhaust profile copper intended for recycling can be reprocessed.



Copper angle

One type of rolled copper, which is used in various industries - copper profile. Metal fairly easy to process, so the profile geometry can be different. This ordinary copper area, and parts of complex geometry. Profiles of different geometries differ manifold, fittings, trolley, and contact, trapezoidal. The material of which is made of copper profile - copper rod. Because she practices drawing and rolled in a rolling mill produced the desired profile cross section. Most often, in order to produce the copper area used copper grades M1, M2, M3, and M1r, M2P, and other M3R defined GOST 859. The special properties of acquiring a profile made of oxygen-free copper. It has more uniform properties across the area of the product is easier to process. Depending on customer requirements copper area it can be made normal, elevated or high accuracy. Length usually ranges from 1 to 6 meters. But we need the profile can be made of desired length. Classification of copper corner is also produced along the length of the faces. They can be equal and unequal. Finished products must not contain bubbles, sinks, dents, cracks, and other non-uniform education, reducing the quality of the product. Copper angle - profile, which is most common in electrical engineering as a structural material. In the construction of the copper profile is used for roofing as an element of decor. Also in the construction of the copper corner used to create a window and door systems.



Copper rod

Copper rod is produced under the current GOST 1535 copper grades according to GOST 859 (M1, M1p, M2, M2p, M3, M3p). Circle made of copper is used in electrical M1E and the rest of the brand bar more frequently used in the engineering and metalworking industries.

The material has good ductility and resistance to aggressive environments, copper rod can be easily processed by drilling, milling and punching. This kind of rolled metal products produced using cold and hot deformation technologies. Production of cold - drawn rods

is that produced solid (the T), semi-solid (R) and soft (M). There are also very solid and enhanced plasticity of copper rods. Hot metal is produced by pressing, marked with the letter D, with properties similar to a mild cold-rolled. Available copper rod of different cross section and precision manufacturing: diameters from 20 to 180 mm - a method of pressing, and diameters from 3 mm to 50 mm - by cold deformation. In cross-section: round (CR), square (HF) and Allen (SH). Precision manufacturing accuracy: normal (N), elevated (P) and high (B). Also produced rod to be processed in the machines marked AB. This rod should meet the following requirements: -on the surface should not be a different kind of contaminations, deformations (cracks, delaminations); allowed dents, bulges, and other defects, with the removal of which will correspond to the diameter of the rod permitted deviations according to GOST; -copper rod may have tint color, solid and semi-solid marks, tolerance of technical grease; -to not depending on the grade rod on it should not be present non-metallic inclusions; - allowed deviation from the cross-sectional shape within the GOST - 1535. Copper rod is transported in the bays and beams.

Copper rod M1

Copper rods are manufactured in accordance with GOST 1535. For the production of them often is copper grades M1; M2; M3, which corresponds to the chemical composition of GOST 859. The bulk of the market takes a copper rod M1.

It is made by pressing a copper rod, hot deformation, cold deformation. The main advantages of copper bars: plasticity; corrosion resistance; durability; high electrical and thermal conductivity; It is a relatively easy to process. Articles made of copper because of its performance characteristics have been widely used in various industries and sectors of the national economy. Rod copper M1 is used in many areas: instrumentation, manufacturing equipment, structural components, parts, and so on; space and the aviation industry; and Metallurgical and metal-working industry; mechanical engineering; to the energy industry to create a heat-conducting structures, conductors, elements of buildings and so on; copper bar parts used in the manufacture of HVAC equipment, decorative items. Labelled copper rod M1, as well as all long products, indicate the brand, method of manufacture, material condition and other parameters. 1) A method of manufacturing: - D - drawn (cold-); - G - pressed (Hot). 2) Accuracy of manufacturing: - N - normal; - P - increased; - B - high. 3) cross-section form: - KR - round; - HF - square; - SH - hexagon. 4) The state of the material: - M - soft; - P - semi; - T - solid. 5) Length of the product: - ND - Random length; - CD - fold measured length; - BT - coils. Also, copper rod M1 may differ: - AB - for processing on automatic machines; - L - soft state copper rod increased plasticity; - P - semi-solid state of increased plasticity of copper rod; - Y - solid state of increased plasticity of copper rod. For example, DKRVT ND 15 AB M1 GOST 1535-91 indicates that the copper rod cold-M1, with a circular cross-sectional shape, with high precision manufacturing, solid, with a diameter of 15 mm, random lengths, for processing on automatic machines.

Copper rod M2

Rod copper M2 - a material that is semi-finished product in a number of industries. Made of copper corresponding to the brand - it is his feature. It is easy to give in stamping, cutting, pressing, drilling, milling. Basically, this material is widely used in machine building and metal, as well as in other areas. Recycling copper rod, manufactured items, components and parts used in the aviation industry, automobile and shipbuilding. M2 copper rod used for manufacturing parts such as nuts, bolts, washers, gears, valves, sleeves, shafts and so on. Due to the high strength and workability of copper produced from her reducers, valves, locking mechanisms, as well as elements of the gas and water supply systems. Rod copper is widely used in instrumentation, energy, electrical engineering. From it produce conductors, current collectors, housing elements and the conductive structure. Production is controlled in accordance with GOST 1535. Depending on the grade of copper rods designated labeled M1, M2, M3, M1r, M2P and M3R. By rod production method of the following types: Hot (F), cold-(X), extruded and drawn. Depending on the cross section is indicated as follows: cylindrical bars indicated by CD square - HF and hexagonal shape - SH. At the bar may have a different precision manufacturing. Depending on the characteristics of the element may be normal, elevated or high accuracy. They are designated by the letters N, P and V. As the copper metal rod can be: semi-solid (denoted by the letter P), hard (marked T), soft with high ductility (indicated by A), semi-solid with high plasticity - P, and a solid high ductility - W. depending on the size of the copper rod M2 can be ND - off-gage type or CD - dimensional type fold length.

Copper rod M3R

For the production of copper rod used about twenty kinds of copper grades. The most commonly used: M1, M1r, M2, M2P, M3, M3R. In most cases, the copper rods M3R manufactured for specific customers and are a bit more expensive than their production of other grades of copper. The price depends on many factors: the mode of production, the chemical composition of copper rod type and size.

The chemical composition of grades of copper GOST regulates 859. Stamps copper are determined not only by the content of copper (differences, which make up about 0.5%), but also the content of impurities. In most cases, use the classification of grades of copper content of oxygen. For high-purity copper refers M1 mark containing oxygen - 0.001%. Stamps M2, M3 - general purpose copper containing oxygen 0.08 - 0.05%. The copper grades M1r, M2P, M3R contains large amounts of phosphorus and 0.01% oxygen.

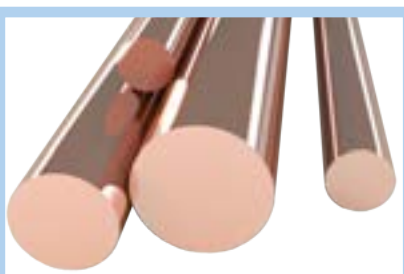
Copper rods M3R method for production can be:

- Cold-deformed and hot-deformed;
- Extruded and drawn.

By type cross-section are:

- Hex;
- Round;
- Square;

Brass rods M3R tolerance and precision marked letters "B" - high, "P" - high, "H" - normal. The main factors that allow the use of copper rods M3R as a versatile material in various industrial productions are its performance, corrosion resistance, and environmental safety. Brass rods M3R, thanks to its physical and mechanical properties, are used in the engineering and metalworking industries. They are easy to drilling, cutting, milling, pressing and stamping. In aviation, automobile and shipbuilding copper rods M3R act in the production of semi-finished components and assemblies of parts. From copper rod produced nuts, bolts, valves, washers, bushings, shafts and gears. Articles made of copper (valves, gears, locking mechanisms) are used in gas and water supply systems.





Circle copper M1r

Copper is produced from rolled copper brands: M1 M1r, M2, M2P, M3, M3R GOST 859. Relatively cheap, and meet the requirements for most engineering problems, is a copper rolled M2 and M3. For the production of cryogenic components, cables and wires, round copper used M1. This grade copper is produced by the technology, it prevents enrichment with oxygen. What increases the value of the brand by approximately 20%. Often, for the manufacture of products / components used round copper M1r, M2P, M3R. This category refers to the circle copper M1r. The main characteristics that distinguish the circle copper M1r are the stability of its physical properties at high temperatures, good corrosion resistance combined with high electrical conductivity and resistance to wear. In accordance with GOST 1535 copper rods are divided. According to the method of production - Hot or cold-worked. In precision manufacturing is normal, enhanced, or high production accuracy.

As the material accordingly is soft, semi-solid or solid. According sectional size can be from 3 to 150 mm. In the manufacture of off-gage length is made a multiple dimensional length and coiled. By brand used copper - M1 M1r, M2, M2P, M3, M3R. In a special execution conditions are: for processing on automatic machines, having a soft, semi-solid or solid state of increased plasticity. These data indicated in its callout, for example: circle copper M1r - DKRVT 10 ND M1r. Indicates: D - cold-; KR - circular cross section; B - high accuracy; T - solid state; 10 - mm diameter .; ND - random length; M1r - grade copper. Circle copper M1r perfectly amenable to mechanical processing: punching, drilling, milling, cutting and pressing. All this makes the circle almost copper demand in many industries, such as engineering and metalworking, ferrous and nonferrous metallurgy, electric power, glass and porcelain, medical.

Copper circle M1f

What is copper circle M1f - a rod made of copper respective brands. Brass wheels are made of copper marks M1, M1E, M1r, M1f, M2, M2P, M3, M3R, and many others. In our

case, we consider the range of M1f copper and numeral 1 denotes purity copper and F - the fact that it played havoc with phosphorus. Like other varieties of rods, copper round M1f should be carried out according to GOST diameters from 3 mm to 100 mm and more. The length of the bars in this case is of one to four meters in diameter from 40 to 80mm, from two to five meters in diameter up to 40mm, from one to three meters in diameter from 80 to 100mm, one-half to two meters with a diameter of 100 mm. By all parameters measured copper circles are classified according to the following scheme: section-form: KR (round); -state Material: T (solid), M (mild), II (semi) annealed; -Shipping Manufacturing: pressing or hot deformation (D), drawing or cold deformation (D); manufacturing -accuracy: N (normal), P (high), B (high). Brass wheels are widely used in the fields of industry, such as metal processing, instrumentation, machinery, metallurgy, electrical engineering, for the manufacture of structures and components of individual products. copper M1f properties (lack of oxygen and increased phosphorus content) allow to apply copper M1f circle where corrosion resistance is important, since the film forming process of the oxide (patina) therein occurs more slowly and evenly. In general, brand M1f spread is relatively small, and copper circle M1f we deliver on order.

Copper circles M2f

Today the market offers a wide range of high-quality non-ferrous metal products. Very popular brass circles of different diameters. Make circles of copper from copper grades M1, M1r, M2, M2P, M3 and M2f. Brass M2f circles are made of phosphorus deoxidized copper, and can be obtained by cold-or hot-way. Depend on the production method of mechanical properties of copper, it may be soft or hard. Produces copper circles M2f by pressing, pulling, hot or cold forming. The marking of rolled section provides information about the chemical composition, method and precision manufacturing, sectional shape, length. Copper circles M2f have high ductility and corrosion resistance, thermal and electrical conductivity. They are easy to handle, weld. They can be used in virtually all areas of production. Circles of copper used to create HVAC equipment parts, aircraft and machinery, typographical dies, valves, electrical appliances, architectural elements and heating systems. Copper circles M2f widely used in electrical engineering, mechanical engineering, construction, energy and metallurgy. They are an excellent semi-finished product for the production of nuts, washers, shafts, gears, valves, various components and assemblies. Plastic copper lends itself well to pressing, stamping, milling, drilling and cutting. Brass wheels are highly resistant to corrosion, aggressive environments and temperature extremes. Therefore, copper parts of them have a high reliability and durability. Bundling M2f copper circles with a diameter of less than 35 millimeters in bundles weighing no more than 80 kilograms. Drawn bars less than 18 millimeters are permitted to connect to the bay weight not exceeding 140 kg.

Cooper circles M3

The circles are copper semi-finished product for the manufacture of many products: shaft, nuts, washers, valves, gears, various components and assemblies. All wheels are made of copper from copper following marks M1, M2, M3, and M1R, M2P, and correspond

M3R GOST 1535, while the chemical composition of copper GOST 859. Circles MZ manufactured copper from copper mark M3 - copper is a general purpose, with oxygen content to 0.08%. Classification of copper range is depending on the parameters: - The mode of production. Followed copper can be both hot-and cold-formed, labeled D and E, respectively. - As of the material can be solid, semi-solid and soft, marked, respectively, T, P, M - length. Unmeasured, dimensional fold and in the bays. Marking - NM, KM, following copper BT.

Also differ in their cross-section and can be between 3 and 200 millimeters. If necessary, under the order, we can recommend to buy copper and a larger diameter. All production of rolled copper, including copper circles, have excellent production and performance properties. Main application fields: mechanical engineering, shipbuilding, metallurgy, metalworking industry, energy (for electrical purposes are most commonly used copper circles M1E). Often, instead of a circle M3 copper grade copper rod used the M2, where the need for a more friendly material in its chemical composition, for example in Khimprom. Copper rental has excellent processing properties, which makes it quite popular already for many years: a good electrical conductivity, almost not subject to corrosion, long service life, flexibility, easy to recommend copper mechanical working.

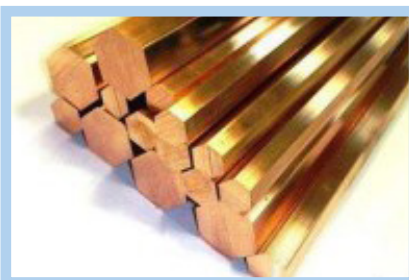


Copper hexagon

Copper hexagon - solid profile hexagonal regular shape, used in the manufacture of hot and cold technology (compression) strain.

For the production of copper rods used the corresponding chemical composition set GOST 859-2001, all brands have high operational and technical characteristics, which allow the use of copper rod in a variety of industries. Copper hexagon is relatively easy to give ingive in various ways machining. The compliance allows the use of copper brass hex for the manufacture of various products: gears, washers, valve. Articles made of copper have a high electrical conductivity of which may be manufactured various products in electrical conductive structures. Brass rods in accordance with GOST 1535-2006 have

different varieties, which are displayed in their labeling: DSHGNT 10ND M1 GOST 1535-2006, gdeD - A method of manufacturing (D - and cold-G - Hot); SH - Allen key (KR - round, HF - square); H - precision manufacturing (H normal, increased P-, B-High); T - the state (M-soft, semi-solid P-T-solid); 10 - cross section in millimeters; ND - off-gage length (CD - dimensional fold); M1 - grade copper. Next may be referred to special conditions (for AB-processing machines, OK - cheroots, A - diameter tolerance deviations with symmetrical tolerances A- soft state of high plasticity, C increased accuracy in curvature, etc.



Pipes made of copper

Reliable operation of heating, water supply is directly related to the quality of tubes used. To date, often being replaced traditional steel pipes for pipes of copper plumbing. It should be noted that copper pipes are in great demand and are the leader in luxury materials.

Considering the water pipes made of copper, it is necessary to identify the most common ones:

1. The copper pipes for water and gas according to GOST R 52318, which can be of two types:

- Copper grade M1f GOST 859;
- Copper Cu-DHP grade according to EN 1057.

2. permissible to use pipes made of copper M1 according to GOST 859 brands without high-temperature heating, but not allowed to use other brands of copper pipe.

Today, for the production of copper tubes and fittings frequently used copper CU-DPH in accordance with DIN 1412, which have a high level of corrosion protection. Pipes quickly amenable to welding and soldering, for a long time retain their technological properties and have a long service life.

It is advisable to all pipes copper water supply with thermal insulation, it is conducted in accordance with SNIP 41-03. Even if it is "cold" pipe, it will protect against condensation. In comparison with conventional steel pipes, copper pipes for heating and water supply systems have a number of positive features in the installation and operation:

- The thermal expansion coefficient of copper is seven times lower when compared to the polymers;
- The thermal conductivity of the copper pipes is higher than steel;
- High resistance to UV radiation;
- Copper pipes for plumbing in the water does not corrode;
- Easy to bend and cut;
- Have a low coefficient of roughness, which increases the bandwidth.

Copper pipe GOST 21646

The use of copper and its alloys for the manufacture of pipes began in the 19th century. All the advantages of this unique material is available: a high thermal conductivity levels, excellent durability, copper is not oxidized and does not form rust, allowing the internal surface of the pipes do not become clogged and do not corrode even when exposed to highly corrosive environments. That is why the copper pipe gets its widely used in various fields.
 The pipe is used in complex heat exchangers. Modern copper pipe withstands high temperature and hydraulic load, ensuring correct operation of the heat exchangers. For standardization and quality control of copper pipe is made in strict accordance with GOST 21646. Increased requirements for strength and other parameters of the pipes due to their specific application, which ensures safe operation of complex and expensive equipment in the future. For copper pipe must withstand maximum loads without breaks, bruises and cracks, tensile residual stresses have not, it must not break during flattening. To meet all the requirements of the limits of allowable loads, the copper pipe is thoroughly tested by hydraulic pressure, flattening deformation, load at break, etc. Monitors for the presence of internal and external defects. Cracks, voids, etc. Strict chemical composition of copper and brass alloys in the manufacture of pipes as per GOST 21646 provides a full set of distinctive strength and plastic-deformation properties inherent in these products. And only passed all the required tests, copper pipe reaches the consumer.

Copper tube GOST 16774

Copper tube in accordance with GOST 16774 - a cold-(Drawn) tube of square or rectangular cross-section. It is made of copper the following brands: M1; M1r and M0b (chemical composition must comply with GOST 859). Thanks to the excellent performance characteristics of copper tube is widely used in various industries and the national economy: mechanical engineering; instrumentation; construction, manufacture of HVAC equipment; production of decorative products; manufacturing of windings for starters.

The operation of a copper tube has a number of advantages over other similar materials: a wide range of applications; high thermal conductivity and electrical conductivity; ease in handling; plastic; high anti-corrosion properties.

Available in copper tube in the following sizes. Height - 6.0; 5.9; 5.1; 5.0; 4.5; 4.0 (mm). Width - 12.5; 11.8; 11.6; 11.2; 10.9; 10.0; 9.5; 9.3; 9.0; 8.6; 8.5; 7.5; 7.4; 6.0; 5.9; 5.1; 5.0 (mm). Length - 200 m in the drum.

Marking, which is indicated by a copper tube without fail, include the following notation:

- 1) The purity of the alloy - M1 or M2.
- 2) cross-section form - KV or PR - rectangular or square.
- 3) The manufacturing method - D - pull.
- 4) Accuracy of manufacturing - H or P - normal or elevated.
- 5) State of the material - M - soft.
- 6) Dimensions in mm.
- 7) The length of pipe. The copper tube must meet the following requirements:
 - Tightness. During tests copper tube must withstand a pressure of 2.9 MPa and 6.9 MPa for tubes with a wall thickness of 1 mm and 1.3 (1.5) mm, respectively.
 - Elongation - at least 35% at break.
 - Tensile strength - at least 200 MPa.
 - Resistivity from 0.0175 to 0.0195 Ohms x mm² / m (Ohm x m).

Copper pipe profile

Copper pipe is a profile view of the pipe, widely used in various industries. Advantages of copper profile pipes: - long life; - Practically not exposed to corrosion, do not react; - Do not require painting. Painting of copper pipe profile is exposed only for aesthetic purposes, in general, it is resistant to external influences uncoated. Copper tube profile is used in mechanical engineering, as waveguides in specialized devices for many other purposes. Pipes are classified according to several criteria. It can be annealed and annealed. Annealed copper pipe profile is subjected to further heat treatment. After heat treatment, the copper tube changes their strength characteristics, it becomes softer.

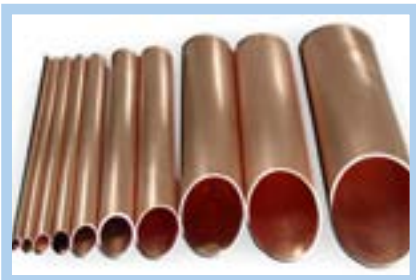
Depending on the shape of the pipe are square, oval, flat oval, rectangular. Because of this diversity is relatively more expensive than copper pipe profile of rectangular cross section, as the process of its manufacture (shaping) the most complex.

Also, by the presence of coating pipes are uncoated and coated with plastic. The plastic helps protect against condensation, and also provides additional protection for pipe coating from damage. This copper pipe last longer.

Copper pipe rectangular

Copper rectangular tubes are manufactured in accordance with GOST 16774. The main purpose - is the production of wire windings of electrical machines for starters, with liquid cooling, as well as they used in heating systems, water pipelines, in the climatic equipment, decorative elements and structures, and so on. Made of copper pipe rectangular copper brands: M1r; M1; M0b with the chemical composition according to GOST 859. A method of manufacturing drawn (cold-). Currently rectangular copper pipe is widely used in many branches of industry, construction, housing and utilities, engineering, electric power thanks to its many advantages: - plasticity; - Resistance to corrosion; - Durability; - Good thermal and electrical conductivity; - Ease in handling; - Aesthetic appearance. Copper pipe is rectangular and has to be sealed to withstand pressure of 2.9 MPa at a wall thickness of

1 mm; 6.9 MPa for a thickness of 1.3 mm and 1.5 mm. Available in the following sizes and dimensions: length of at least 200 meters in the drum; height of 4-6 mm; 5-12,5 mm width. Labelled rectangular copper pipe letters OL, also indicate the manufacturing method, the accuracy of manufacturing H or P (normal and high), a condition of the pipe length (drum BR, MR-dimensional, not shorter than a predetermined NC). For example, the copper pipe is rectangular, brand M1R, cold-mild, the size of 5x8 mm with wall thickness of 1.5 mm on a drum - DPRHM 5,0H8,0H1,5 BR M1R GOST 16774-78.



Copper-nickel pipes

Copper-nickel tubes are useful in many types of marine engineering services in heating circuits, refrigeration, fuel wires liquid fuel gas supply. If necessary, a copper-nickel tubes easily and securely connect the high-temperature soldering. Produces copper-nickel tubes of high quality alloys and, despite the high cost, in high demand. The main advantages of copper-nickel tubes - durability (service life of 40-80 years); Corrosion; They refractory; withstand operating temperatures of 250 ° C and a pressure of 200 atmospheres; resistance to damage hydraulic and vibration; easy installation. Nominal size of the copper-nickel pipe is from 6 to 260 mm, wall thickness from 1 to 10 mm, length from 2 to 6 meters. The composition and the percentage of impurities for copper-nickel tubes defines the brand of copper-nickel alloy. They are made of copper-nickel alloy pipe often, brand MNZH5-1, corresponds to GOST 17217-79, which applies to cold-pressed and tubes that are used in the shipbuilding industry. These copper-nickel tubes have excellent mechanical properties that are not amenable to deformation in hot and cold conditions. The alloy contains MNZH5-1 supplements of iron and manganese, so it is not prone to cracking and is strong enough so you can use pipes in offshore pipelines. Quality control of the copper-nickel tubes is carried out at all stages of production, they are subject to rigorous quality control. Tubes delivered in coils of 15 m and 30 m. Coils are packed in a plastic film that allows the transport pipe without damage and deformation, while maintaining the initial operating parameters.





Copper pipes and fittings GOST R 52318

Copper pipes and fittings have been widely popular materials for laying of communications in Europe since the mid-19th century. We have the same copper pipe and related accessories long regarded as an elite and expensive material used infrequently, as the country became favored. These materials have gained well-deserved popularity and are increasingly used in various construction sites for installation of water pipes, heating communications, the installation of HVAC equipment and many other industrial sectors.

They are made of copper tubes and fittings in different ways according to GOST R 5231 copper grades M1r M1f and chemical composition of which must comply with GOST 859. The first method is based on the drawing. The basis of this process is the deformation of the metal tube blank when pulling through the channel having the entire length of the narrowing. The second method is based on the box office. This process takes place during the passage of the metal deformation between rotating rolls. The third method is based on the compact. This process consists in extruding metal located in the vessel through the outlet.

The material can be produced in a soft, semi-solid and solid state. In soft state copper pipe manufactured with an external diameter of 6 to 22 mm, semi-solid from 6 to 54 mm, in a solid from 6 to 267 mm. In agreement with the customer, copper tubes can be supplied in coils free of winding, layering orderly winding and helical winding. As mentioned above, copper pipes and fittings are in demand by builders. Copper in demand mainly as a copper tube for plumbing, namely a copper pipe for water supply. All this is due to the material immunity chloride compounds, in our country, which is treated water. And because copper pipes for water supply will last a long time. But this is only part of the capacity of copper in Europe, for example, natural gas pipelines communications often made of copper.

Choosing copper pipes and fittings, it should be remembered that the copper pipes for drinking water are different, for example, from the pipes, which are intended for use in heating systems. It is important. Where you can buy high-quality pipes? You can use the services of plumbing stores. They are, without a doubt, there is a copper pipe, fittings, associated materials. However, in general, the pricing policy of shops is often overstated. Therefore, it is best to copper pipes and accessories purchase in wholesale businesses that are proven. For example, we!



Copper pipe for underfloor heating

The system “warm floor” is a low-temperature and therefore has a number of advantages over other (high-temperature) heating systems, as for space heating needs coolant (water) with a lower temperature than in the radiators. The benefits include, firstly, the savings due to less water heater. Secondly, the heating surface is comfortable for human’s temperature. Third, the location of the winning system, which does not spoil the view of the room (which is not true of the radiator).

“Warm floor” system may seem disadvantageous due to the high cost of materials, copper pipe for floor heating is quite expensive, but calculations show that the cost of mounting the stage are in fact much less savings achieved during the several heating phases.

Care should be taken when selecting materials for the floor heating. First of all, copper pipe for floor heating must be of high quality, t. To. It is laid “forever”, the error at the stage of planning can lead to the fact that all the advantages of the system described above will be reduced to zero.

Copper pipe for underfloor heating has a number of advantages over its “opponents” (plastic and plastic pipes):

- The thermal conductivity coefficient of copper is much higher than other materials, which means increase in the proportion of heat transfer from the coolant to the heated environment;
- Copper pipe for floor heating is not oxidized and does not rust over time (as we know,

copper nails were used even when plating wooden ships);

- Easy to achieve the desired shape (after copper pipe for underfloor heating is needed as a straight and curved).

When installing floor heating is used as a copper pipe for water supply and sanitary copper tube. Assembly takes a decision on the choice of one or the other option on site at the customer, because each version is unique both in size of the room, and on the thermal load. The important factor is to calculate the heat load space, because it is better to perform a few simple operations, to calculate all the heat losses and to take into account sources of heat radiation than after pouring screed and the completion of the installation of the system is constantly adjusted.

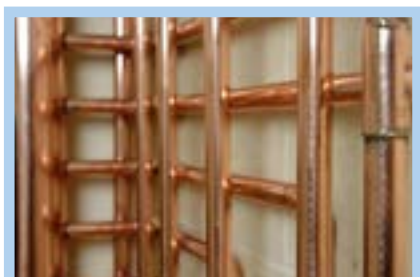
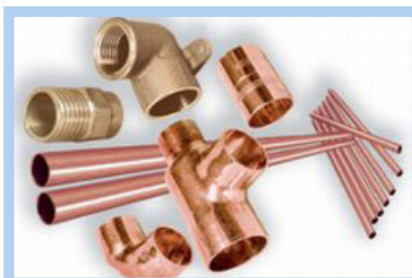


Copper pipes for water supply

GOST 52318 applies to copper water pipe of circular cross section, which is used in systems like the hot and cold water. This pipe has features that allow you to use it in a variety of industries. Since copper, from which it is made, has a set of properties. Copper pipes are durable and highly resistant to corrosion. The advantage to the durability of copper, copper on the surface of the pipe may be covered with a dense protective film which additionally protects the pipe from corrosion and damage.

The smooth inner surface allows the use of water pipes of smaller diameters. The strength of the pipe allows the operating pressure to 100 bar, at a temperature of 250 ° C. Copper pipe plumbing is resistant to temperature changes, loses its plasticity and becomes brittle, even at sharp temperature drops. It is because of the plasticity of copper pipes for water use in seismic areas.

It is worth noting another advantage - Copper plumbing pipes can hold bacteria and microorganisms; they have some antibacterial properties. This makes drinking water safe, which is not true of the steel water pipe. If we talk about the cost, the more expensive copper water pipe steel and plastic, but when you consider the durability of copper, the benefit to the person.



Copper pipes for heating

Basically, the remarkable copper pipes for heating is that when used in heating systems, you further reduce your costs for maintenance, t. To. They operate in almost require no maintenance. Worth noting pipes for heating are universal, and there is a clear gradation in the use of copper pipes, they are used in water, gas, refrigeration systems.

Copper pipes have the following advantages:

- Resistant to corrosion;
- Long-lasting;
- Strong;
- Easy to install.

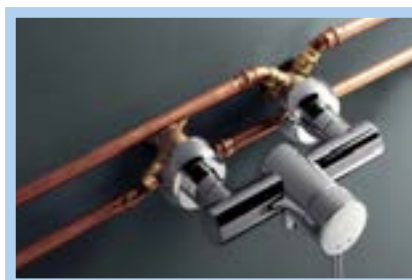
Produce domestic copper pipes for heating and water according to GOST R 52318. heating pipes are made of copper often mark M1 or cleaner.

What is the optimal copper as a material?

- Copper has a lower thermal expansion coefficient than plastic.
- The high thermal conductivity of copper.
- Manufactured from her copper pipes have a bactericidal effect.
- Compared to plastic, copper ultraviolet no effect.
- Ability to use small-diameter, - high bandwidth due to the low roughness coefficient (copper tube 3/8 bandwidth corresponds inch plastic tube). Buying copper tubes and fittings, we must not forget about the quality of the purchased components, especially with regard to the fittings, they are “working points” of the entire system. If you have chosen as the material of copper plumbing pipes, you should consider the following points:
- Firmly fix them.
- The design must take into account that the copper pipe can be deformed - lengthened by heat, with a tolerance gap makes it.
- The quality of the installation performed by determining the life span of the whole system.

- Copper plumbing tube should be used in isolation, cold - to prevent the formation of condensate and hot - to reduce heat loss.

Buy Copper pipes for heating and other applications you may have by filling in the online application form.



Copper pipe GOST 617

Copper has such important properties as ductility, corrosion resistance, a large operating temperature range, high thermal conductivity and conductivity, resistance to harmful substances. In the domestic market there are many brands of tubes of both domestic and foreign producers. Large assortment of pipe covers various areas of application and the absence of the aging of the material allows, is not worried about the reliability of engineering systems. Copper pipes are resistant to the radiation of the ultraviolet spectrum, and have resistance to oxygen diffusion and gas tight. Like any other metal readily recycled. Copper pipes are characterized by the major three states of hardness: soft, semi-solid, solid. Also, in accordance with GOST 617, yet isolated two intermediate states: soft and hard enhanced ductility with increased hardness. Copper pipe $\frac{1}{4}$ inch, mainly used for refrigeration, air conditioning systems (as $\frac{1}{2}$ inch copper pipe), and often for liquid fuel, for example. For water supply systems because more bandwidth is used $\frac{3}{4}$ of copper pipe and copper pipe $\frac{3}{8}$, slightly more in the course of $\frac{5}{8}$ copper pipe.

When the interaction of copper and chlorine, which is contained in the water, on the inner surface of the pipe creates a protective layer, because of it on the inner walls of the pipe do not occur and "grow" organic or organic deposits. During the installation of heating systems, please note that contact with the aluminum of copper is not desirable, because between them will be interaction that can lead to failure of the element. Due to the properties of the pipe material of copper easily to different technological methods of connections, whether it's rolling, soldering, welding, cold pressing or any other method.

Copper tubes annealed

Copper tubing is widely used for the installation of water supply systems, heating, air conditioning. Their high popularity and deserved recognition is due to long service life, which is guaranteed by the supplier. Annealed copper tube provides a simple workflow assembly and installation of different systems, saving labor costs and saving time. Make unannealed copper pipes in accordance with the requirements of GOST 617 brands of copper M1, M2, M3, M1r, M2P, M3R. The standard specifies the form and condition of pipe manufacturing accuracy. Produced unannealed copper tube outer diameter of 3 to 360 mm in a 2.5 meter straight lengths or in coils 25 and 50 meters. Produces two types of copper pipes - unannealed (solid) and annealed (soft). Applicable copper pipe annealed to create risers and long highways and annealed tube for complex communications with a large number of bends and branches. Annealed copper pipe has the following specifications: the maximum operating temperature - 250 degrees, the maximum system pressure - 200 atmospheres, has a low coefficient of linear expansion, a tensile strength of 280-300 MPa.

By way of production of annealed copper pipe is drawn, cold-rolled and compressed. When mechanical action (pressing, rolling) copper pipe partially loses plasticity, but it becomes harder and stronger. Unlimited lifetime makes copper tube ideal material for hydraulic systems, actuators, heat pumps, air-conditioners. Also our guest, annealed copper pipe is regulated by the international standard EN 1057, it meets domestic standards.

Copper pipe seamless

Copper seamless pipes are widely used in European countries in various fields of civil engineering, ranging from water supply and heating, gas supply finishing so in France and Austria, almost 100% of gas pipes are made of copper. In the CIS countries began to use copper pipes after the collapse of the Soviet Union, mainly in heating and water supply.

The popularity of that pretty quickly gaining a copper water pipe, due to the unique properties of copper, resulting in the pipe going through on the term of operation the buildings themselves, they are practically not subject to aging and corrosion. In accordance with GOST 617, the latest version of which was approved in 2006 copper seamless pipe can have the following symbols in the labeling: A - corresponds to a method of manufacturing of cold; T - tube is made of pressing means; KR - which means a circular cross-sectional shape. In manufacturing precision of wall thickness and diameter of the pipe can be marked: N - normal; P - high on both counts; And - in the case of high accuracy in diameter; K - increased wall thickness. As the material can be labeled with the letters M, P, T, A, F, H - which means, respectively, soft, semi-hard, hard, soft increased ductility, high strength semi-solid and solid rugged. Further affixed in millimeters outer diameter, wall thickness and length, if the length LP is put off-gage designation indicates whereupon copper mark - M1, M2 or M3 specific designation itself and GOST. For example, seamless copper tube labeled Standard M2 GKRNT 6h1h1000 617 is pressed is round, with a normal accuracy in thickness and diameter, having a solid state, a copper tube of 6 mm in diameter (1/4

copper tube in inch system), with a wall thickness of 1 mm, a length of 1 m and is made of copper M2 mark in accordance with GOST 617. The copper pipe Builders often indicated diameter in inches, so copper tube 1/4 corresponds to 6 mm in the metric system, a copper tube 1/8 - 3 mm copper tube 9 8.3 mm, respectively.

Copper pipe annealed

In the subsequent heat treatment after rolling copper pipes are divided into unannealed and annealed. The mechanical treatment (rolling, forging, etc.) Copper loses ductility becomes more rigid and strong. Copper pipe is obtained whose strength is 340-450 MPa, and the elongation not more than 6% at break. To return to the original copper plasticity using a joke. The product is heated to 600-700 degrees, and then slowly cooled (tempering). This results annealed copper tube. The strength of its lower strength unannealed pipes - about 220 MPa, but before the break it can be elongated half. In the annealing process, we obtain the unique properties of the material. With sufficient wall thickness annealed copper pipe can withstand a sufficiently high pressure, extreme temperatures and corrosive environments. Such pipes are very easy rollers bend. Because of these properties tube copper pipe has been widely sold and used in the installation of air-conditioning systems, as well as for the installation of domestic water supply and heating systems. With its virtually unlimited service life annealed copper pipe is used for the manufacture of hydraulic drives in a variety of techniques, as well as for the production of highways in heat pumps, air conditioners and refrigeration systems. Domestic industry produced two kinds of annealed pipes - copper pipe in a plastic shell, most chassis tube without coating. For the proposed works with aggressive media pipe is complemented by an inner protective coating. Pipes made of copper such brands - M1r, M2P, M2, M3. Comes segments of length 25 and 50 meters, collapsed in the bay.

Copper pipe thick-walled

Pipes made of copper nowadays widely used for gas and water supply systems, heating systems, for the production of oil pipes, compressed air pipes, a wide range of household appliances, automobile and mechanical engineering. The distinctive features of the copper pipes may include: strength, thermal conductivity, durability, formability, and corrosion resistance aggressive chemical compounds.

In the industrial use of the following types of copper tube:

- Copper pipe, thick-walled and thin-walled;
- Rectangular and square;
- capillary;
- waveguide;
- usual round profile.

Enough wide circulation in industrial applications received thick-walled copper tube. It is used where it is necessary to withstand the high pressure of liquids or gases. For example, it is possible to use in gas pipelines, oil pipelines, a fluid supply system at a pressure in heat exchangers. Called thick-walled pipe, wherein the ratio of external to internal diameter

ranges from 6 to 12.5. In accordance with GOST 617 thick-walled copper pipe can have the following geometric dimensions:

- An external diameter of from 3 mm to 360 mm;
- Wall thickness - 0.8 mm to 10 mm;
- The length of the copper thick-walled pipe is manufactured in lengths or coils. If we talk about the production of copper thick-walled pipes, then there are two main ways of production: Seamless (cold-worked) and welded. In the process of cold-copper thick-walled tube is made by drawing or drawing, cold rolling, pressing. Welded thick-walled obtained by welding longitudinally coiled blanks.

Copper thin-walled pipes

Copper thin-walled pipe is manufactured in accordance with GOST 11383. The chemical composition of copper pipes for the production of standard determined in accordance with GOST 859-2001. Copper thin-wall tubes are used in heating systems, drinking water supply communications, conductive products, air conditioning systems. In industry, used in the manufacture of parts in the fields of: engineering, instrumentation, automotive, metallurgy and metal processing.

The main technological properties of copper pipes:

- High thermal conductivity;
- Electrical conductivity;
- Good corrosion resistance;
- environmental Safety.

Copper thin-walled tube made of copper marks M1, M2, M3 (marking indicates the purity of the alloy, and the percentage of impurities in its composition). Thus, M2 is a copper tube is made of copper with a general-purpose oxygen content to 0.08%.

Classification of copper tubes depending on size:

- The outside diameter ranging from 1.5 mm to 28.0 mm, with a pitch of 0.1 mm to 4 mm in accordance with the standard;
- by wall thickness ranging from 0.15 mm to 0.70 mm in steps of 0.5 and 1 mm according to the standard.

According to the material of the tube divided into hard and soft. In the manufacturing process a thin-walled copper tube is annealed and subsequently subjected to slow cooling, resulting acquires a certain flexibility.

The form of product delivery:

- Straight lines, often at 3 meters;
- In coils, length according to GOST at least 10 meters.

The magnitude of the tolerances considered in the production of copper tubing M1 (M2, M3) can be normal or high precision manufacturing.

Pipes made of copper GOST 2624

GOST 2624 applies to copper capillary tube of circular cross section.

Scope:

- Apparatus- and instrumentation;

- Refrigeration.

Requirements to be met by copper tubes according to GOST 2624:

- The tube must be made of copper brands such as M1r, M2, M2P, M1 with a chemical composition according to GOST 859;
- Can be made in a soft, solid state;- Absent from the surface of the liquid, salt, captivity, shells, scales, bubbles, delamination, tears, cracks, nicks, dents;
- Allowable rate sweep marks on the tube 1m - 2;
- The absence of dust, oil and scale;
- Tightness of the tubes.

According to its production characteristics of the copper tubes are divided into:

- Cold-deformed (D);
- With round (CR) section;
- With normal and high accuracy;
- The state of material in the manufacture of soft (M) and strong (T);
- Measuring the length (MD) and in coils (BT);
- Production of two groups (A and B).

Pipes made of copper GOST 2624 in size are divided into 2 groups:

- Group A. The inner diameter of 0.35 to 0.60 mm; outside diameter from 1.20 to 2.50 mm; Minimum cut length - 10000 mm.
- Group B. The inner diameter of 0.60 to 0.85 mm; outside diameter from 1.80 to 2.10 mm.

Considered tubes have anti-corrosive properties, high thermal conductivity, are indispensable for air conditioning systems and refrigeration systems, characterized by high plasticity, easily welded, fully comply with sanitary norms, durable. Pipes made of copper GOST 2624 easily tolerate changes in temperature do not react chemically aggressive environments. Temperature range of applicability of these tubes from -200 to +250 degrees.

Copper capillary pipes Group B

Copper capillary pipes GOST 2624 are made of copper with a chemical composition according to GOST 859. The material for the production of these tubes - high-quality oxygen-free copper M0b or usual marks M1, M2, M3.

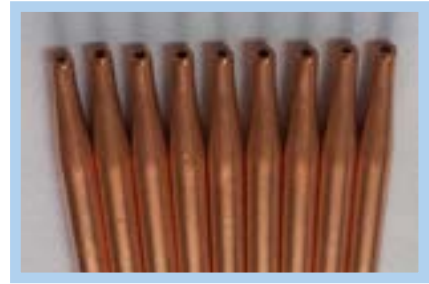
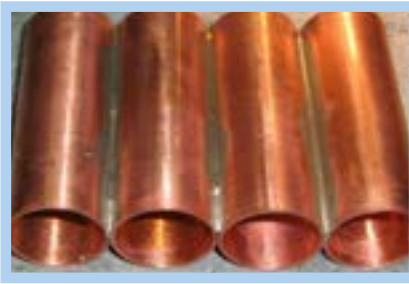
Subdivided capillary copper tubes in the group A and group B. Depending on which group metal varies scope: - Group A general-purpose tube, for instrumentation (working environment: air, oil, petrol). - Group B. Tube chokes between the evaporator and condenser in freezers (working environment: refrigerants). Pipes Group B produced by hot deformation or cold deformation with an internal diameter - from 0.6 to 0.85 mm; external diameter - of 1.4 to 2.1 mm. Requirements to be met by capillary tubes, copper group B. The product must not be deformed in bending by 90 degrees around a mandrel diameter of 3 mm (GOST 3728). The outer and inner surfaces must be free of scale, blistering, salts, cracks and other visual defects. Copper tubes should not be more than 1.7 mg of dry matter in its channel. Measuring the throughput capacity of the tubes are

held at room temperature (GOST 9932). The ends of the tubes must be flattened over a length of 10 to 15 mm. Such tubes are delivered bays (over 100m), and measuring lengths of about 3 meters. Weight bays should not exceed 50 kg (in agreement weight can be increased), and the mass of the party shall be no more than 500 kg.

Copper capillary pipes Group A

What is Copper capillary pipe? Yes, a pipe made of copper, but has usually a very small inner diameter. Hence the name “capillary”. Industry produces copper capillary tube groups A and B. In this article we will be considered a tube of A. copper capillary tube is manufactured in accordance with GOST 2624. Outside the diameter ranges from 1.2 to 2.5 mm in accordance with GOST. Implemented in coils, wherein the length of tubing, the wall thickness is less than 0.4 mm, should be at least 10 meters (100 meters for tubes having a wall thickness greater than 0.4 mm). The ends of the tubes must be flattened before full contact of the wall for a length of 10 mm to 15 mm. The series, which is wound around the tube should be correct and does not hinder unwinding. Symbols for the tubes consist of: manufacturing method, such as sectional, precision production, condition, size, brand, and GOST. For example: The handset FKRHT 2,10h0,85h9000MD M2 2624-77. Copper capillary tube is made from copper grades M1r, M2P, M2, M3, group A tube may be made of brass L96. Copper capillary tube is used in areas such as refrigeration systems, chemical industry, power generation, shipbuilding, instrument. Pipes Group A recommended use for general purposes, for example, for the manufacture of measuring instruments. They can be used in environments such as air, fuel, oil, etc. Pipes Group B are recommended for use in refrigeration equipment as chokes between the evaporator and the condenser. They are used in refrigerants environment. Copper pipe is resistant to many corrosive influences, has excellent thermal conductivity, is relatively cheap and does not require any additional regulation, and therefore, is widely used in all of these areas.





Flat rolled copper

In an industrial scale rolled copper is most commonly used in mechanical engineering, the automotive industry, in special metalworking, as well as in the production of railway and electric transport. Due to the excellent processing properties of copper marks used in the production of rolled products, and the latter can be used in the chemical and petroleum industries. In the industrial market of non-ferrous metal rolled copper flat products represented by the following types:

- Copper belts. Flat Rolled steel supplied in rolls / coils.
- A standard size sheets 600h1500 mm, the plate thickness of 0.5-50 mm.
- Strips. Flat-rolled copper strip with 0.4-6 mm thickness and a width of 40-100 mm.
- Foil Roll Technology. Thin flat steel of rectangular cross-section.
- Plates rectangular, normal and high accuracy in length and width.
- Ingots of rectangular and trapezoidal cross-section.
- Anodes. Supplied in the form of spheres, plates.
- Solders. Delivered in the form of rods, bars, strips.

The given types of products most often made of copper alloy grades M0, M1, M2, M3, and their modifications. The technical and operational characteristics depend on the percentage of impurities in the composition (oxygen, zinc, phosphorus and the like. D.). To connect the sections of rolled metal products by rolling copper solder is used as solder. Certain additives and their quantity in percentage of alloy solder influence its technological properties. For example, to exclude the flux processing, which leads to additional costs, you can use copper-phosphorous solder, which itself already has a good property of flux. For lowering the melting temperature of the solder used copper and zinc, wherein the zinc content by percentage will depend on the desired strength and ductility.



Copper tape GOST 1173

Copper tape - a thin strip having a rectangular cross section. The purity of the copper in the product regulates GOST 859-2001, which defines the basic mark M1, M2 and M3. Tape length varies from 10 to 30 meters, the thickness in the range 0.05-3 mm. Made of copper tape can be by cold or hot deformation. Knowing the characteristics of the material can be selected for any tape manufacturing process. One of the most important criteria which are purchased for the production of copper tape, is its precision manufacturing and characterization of the strength condition.

Use coppertape with roofing, production of transformers, motors, HVAC equipment, power capacitors, the device grounding and shielding. If the roof has a complex configuration, the roofing copper tape can accurately repeat all the twists and turns. Over time, copper roofing tape coated with a patina that protects the roof from adverse environmental conditions.

Flexible tape of copper foil is used to recover conductive layers in different equipment, with electrical work, protective screens and grounding. The thin foil is able to protect against electromagnetic radiation circuits and devices in the range from 30 MHz to 1 GHz. The most commonly used copper foil brand M1 0.012 millimeters thick and more. Also it is used in the manufacture of printed circuit boards, flexible copper cable and batteries. Copper foil is widely used in the production of heating films in the aviation and automotive industries.

Tape Copper M2

Tape Copper M2 - a thin strip having a rectangular cross section. Copper, which is made from tape, has 99.8% purity. The remaining impurities comprise 0.2% sulfur, nickel, iron, lead, antimony, tin, arsenic and bismuth.

Copper tape is classified as material:

- soft ribbon (M);
- semi-solid tape (P);
- firm tape (T).

On sale occurs following marking copper tape:

- With the high accuracy in thickness and width (B);
- With the high accuracy in thickness and increased accuracy in width (C);
- with high accuracy in thickness and an accuracy of the normal width (W);
- C enhanced accuracy in thickness and increased accuracy in width (W);
- C enhanced accuracy in thickness and high accuracy of width (A). Besides copper tape is:

- off-gage (ND);
- increased length (LE).

From tape made: electrical products, radiators, caps, cables, decor.

Copper tape is inferior in quality M2 M1 ribbon, since it contains more impurities, and that it restricts the scope of use for electrical purposes compared with M1 tape. The standards, which produces copper belt M2: GOST 1018-77, GOST 1173-93, GOST 20707-80, TU 48-21-5055-84.

Tape copper electrical

Made of copper electrical tape according to GOST 1173-93, is used for the manufacture of its printing plates, various capacitor plates, electrically conductive coils, cooling plates, etc. Its use is particularly justified in those cases where a sufficient electrical conductivity. The main properties that characterize the copper electrical tape are:

- High corrosion resistance;
- Good thermal conductivity;
- Harmless to humans during processing and further use;
- Ease of processing, electrical tape copper is easily bending, stretching, other types of machining.

Electrical Tape copper produced most cold-deformation of copper M1 brands M1p GOST 859, supplied in coils and stretches of random length. Often the following varieties:

- Soft (M), a semi-solid (R) and rigid (T);
- Normalized depth of extrusion (GW), the normalized deflection (GHG) emissions;
- Designed specifically for power capacitors and transformer windings (CO);
- Elevated, normal and high-precision manufacturing.

The most popular and useful are copper tape M1 hard or soft, and M2P M1R or semi-solid. High-quality copper tape produced clean, free of defects, which may lead the belt

thickness deviation beyond. Hem edges and large burrs are not permitted. According to GOST possible browning discolouration and minor burrs, do not hinder its intended use.

M1 Copper tape

Copper tape M1 - a semi-finished product in the form of rectangular strips with definite dimensions is manufactured from a suitable type of copper. M1 indicates the code that is used during its manufacture copper purity of at least 99.9%. Depending on the processing technology of the material M1 copper tape available in soft, semi-solid and solid states. Another important indicator is the dimensional accuracy - produce tape normal accuracy, enhanced and high.

Consider marking. The letters M, P and T indicate the status of the material - the film is soft, semi-solid or solid. The letters H, K, P, I, P, A, G, C, is used to refer manufacturing precision. For example, a copper tape with the letter H, has a normal thickness and width accuracy, and with A greater accuracy in thickness and a high width. Copper tape used in the manufacture of power capacitors and transformers is marked with KO.Sold M1 copper tape wound in coils. Bay tapes are packaging allows to ensure the safety of the material. Winding paper wrapped and sealed in a wooden box filled with chips, the variant of the package in a synthetic material.

On receipt should control the quality and quantity of the goods. The quality of products is determined on the surface of the eye. The surface must not be dirty and have mechanical damage. The edge should be smooth, without burrs and chips. Keep the product in a dry environment, do not interact with the active chemistry.

Soft copper tape M1

Copper Tape M1m M1 and manufactured in accordance with GOST 1173 of raw material corresponds to GOST 859 (M1 copper grade). The letter "m" denotes that the tape is soft, with a copper tape having a thickness less than 0.10 mm is produced only solid. Scope - General purpose tape. Copper is used in the production of copper strip M1, pure enough oxygen content of from 0.05 to 0.08%, the concentration of arsenic and antimony of less than 0.002%, and the base metal - 99.9%. The tape has high ductility, corrosion-resistant and has a high thermal and electrical conductivity. Most manufactured by cold rollers, is a rectangular plate with a thickness of 0.1 to 6 mm, hot rolled, its thickness can be up to 25 mm.

When testing for compliance with GOST M1 copper tape should be tested for bending around a mandrel with a diameter equal to the thickness of the tape. The tape of less than 5 mm thick should not deform to bend in contact side, and for the bands from 6 to 12 mm norm is to achieve parallel sides. When using copper tape M1 poorly resist solutions of acid salts, ammonia and ammonium chloride, as well as mineral acids, it is characterized by low strength and durability. Good thermal and electrical conductivity and makes it difficult to roller spot welding. The best way to connect products from copper tape - brazing and soldering. When selecting the tape should pay attention to the thickness and width, and then compared with the figures in the GOST. Also, the surface of the tape itself

must be free of blemishes or defects.



Copper plate GOST 1173

Plates made of copper are used in various industries. Especially copper plate widely used in electrical, electronics, mechanical engineering, precision mechanics, shipbuilding, seawater desalination plants, food industry, construction, production of decorative designs, etc. Use cases are caused by the properties of the copper. Copper has a high thermal and electrical conductivity, high plasticity, handled well, has high elastic properties. Copper resistant to the action of moisture, and has good corrosion resistance in various media. Stove can stably operate at extremes of temperature from -200 ° C to + 250 ° C.

Most copper plate is made rectangular (OL) with a thickness of 25 to 150 mm, a width of 150 to 2500 mm and a length of 600 to 4000 mm. The tolerance on length and width depending on the size ranges from 0.2 to 5 mm, flatness - less than 2.3 mm per meter. Plates are classified:

- As of the material (semi-hard, hard and extra hard, which is reflected in the marking of the letters P, T and G);
- For the manufacture of precision (normal accuracy in width and length and increased accuracy that is marked by the letters M and L);
- A method for machining (not machined and milled, as indicated in the marking letters H and F). By agreement is possible to supply plates with etched surface;
- According to the method of manufacture (hot-rolled and cold-rolled, that is marked

by the letters D and E). The board can be made of the following copper alloys and grades (GOST 859-2001) MSr0,1, BrSr, M1UN, M1rO M1, M1r, M2, M2P.

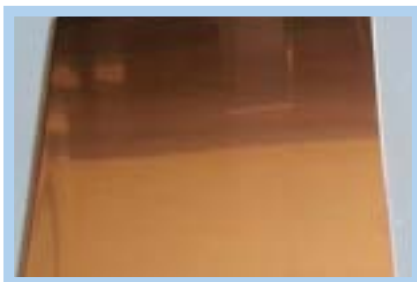
The copper plate is marked in accordance with GOST 1173-2006. The symbol indicates a method of its manufacture, the cross section shape, precision manufacturing, condition, size, copper stamp, special conditions and the designation of the above Standard. For example, when ordering a hot slab of solid grade M1 copper rectangular section 25 mm thick, 1000 mm wide and 1500 mm in length normal manufacturing precision in thickness and width will be identified as follows: Plate GPRNT 25h1000h1500 M1 GOST 1173-2006.

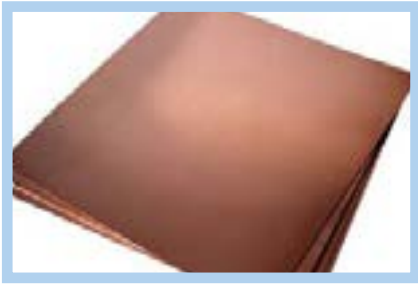
Copper plate M1

Copper Plate is flat rolled copper type rectangular cross-section with a thickness of 25 mm. Produced in accordance with GOST 1173 of copper GOST 859. We have supplied a copper plate the following brands - MSr0,1, M1rO, M1, M1r. Copper has many advantages: high thermal conductivity, good corrosion resistance, ductility, ease of machining, a material harmless to human and environment. Depending on the method of production of copper plate can be hot and cold rolled, milled and milled, dimensional and multiple dimensional width, dimensional and multiple dimensional length random length. In size copper plate is produced from a width of 150 to 2,500 mm and lengths from 600 to 4000 mm. The thickness varies from 25 mm to 150 mm.

The surface of the copper plate should be free of any contamination that may hamper the visual assessment of its condition. According to GOST allowed discoloration, darkening and traces of lubricant technology, because they do not affect the properties of the claimed plate and do not create difficulties in the further use of the material. Single surface defects should not reduce the thickness of the copper plate after cleaning. Not a defect traces of scale, roll, having the form of a fine mesh. In accordance with GOST copper plate is manufactured cut to length and width, but in consultation with the consumer holiday plate is not circumscribed, with markings on the nominal size. The main production of copper plates is conducted without etching of surfaces, but at the request of the customer can issue plates with pickling and mechanical surface treatment.

Used copper plate widely: in the oil and heavy engineering, shipbuilding, chemical industry. From it are made products and small parts for the food industry, various designs mold, electrical etc.





Copper strip GOST 495

Copper strip is a solid profile with a rectangular cross section, the characteristics of which correspond to GOST 495 and produced from copper grades M1, M2, M3 with a chemical composition according to GOST 859. Electrical copper strip is produced according to TU.

It produces copper strip hot-rolled or cold-ways. High-quality metal GOST has a flat smooth surface, hem edge and expressed no burrs. Depending on the method of processing a copper strip of copper is hard and soft. Copper strip has good mechanical, corrosion resistance, high electric conductivity.

Copper in the form is widely used as a conductive material in electrical engineering, for the manufacture of parts in machinery, as the material for the roof, it released from wind instruments, it is used for production of various decorative products. This demand is due to the practicality of the material: thermal stability, oxygen barrier, low linear expansion during mechanical and thermal processing, ease of mechanical working.

Mostly used in industrial copper semi-solid strip with normal manufacturing accuracy of width and thickness. Delivery is carried out in intervals dimensional, multiple-dimensional, random length and coves. We have supplied strip of different thickness, length 500-2000 mm, the multiplicity of measured length - 500 mm. The band random length thickness of 0.4-2.0 mm is available in coils.

Cooper band M1

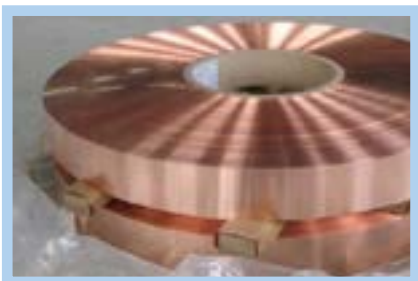
Cooper band M1 has been widely used in mechanical engineering, electrical engineering. It is used in the development of highly efficient heat removal systems due to its excellent thermal conductivity. Brass bands are used as decoration elements in construction.

Production of copper from a cold-rolled strip takes place marks M1 Cu (r) and M2 (r), M3 (p) by rolling the blank into a long strip of rectangular cross section and must comply with GOST 495-92. On the strength characteristics of the copper strip may have a hard, soft or semi-solid state. Also brass band is classified in terms of accuracy of geometrical sizes: normal accuracy on both counts, the accuracy of the normal width and increased thickness, normal accuracy in thickness and increased in width accuracy, high precision on both counts.

Standard sizes of copper GOST 495-92 band are as follows. A copper strip across the width is made from 40 mm to 600 mm, and the thickness of 0.4 to 60 mm. The length of

the strip usually ranges from 500 mm to 2000 mm, and the strip produced but random lengths.

What is the difference M1 copper grade of M2 or M3? Compared with them, the M1 copper grade is better due to the percentage of the base metal. Therefore, M1 copper strip has a high ductility, not exposed to corrosive media, and as has already been announced, and has high electrical conductivity.



Copper foil GOST 5638

Copper foil is used in many industries, but more often than not it is used in instrument. This foil is used mainly for industrial purposes, in the home, for example, are used less frequently. It is used in the production of flexible copper cables and batteries; it can help shield blocks instruments to reduce electromagnetic radiation.

As for the instrumentation, copper foil - the main raw material for the production of heating films, which are used in aircraft and automobile industry. It can be found in flexible printed circuits, with the help of shielded communication and antenna cables. It is made of copper, copper foil two brands - M 1 and M 2 in accordance with GOST 5638, according to which the copper foil:

- Made of cold deformation process;
- It has a rectangular cross-sectional shape;
- There is increased accuracy;
- Available only in solid form;
- Its off-gage length.

As is known, devices have several strip layers, one conductor of which, it is used to create it copper foil. Distinguish its brands:

- 1) PME - electrolytic copper foil;
- 2) FMEO - electrolytic copper foil oxidized;
- 3) FMEOSH - electrolytic copper foil oxidized increased roughness.

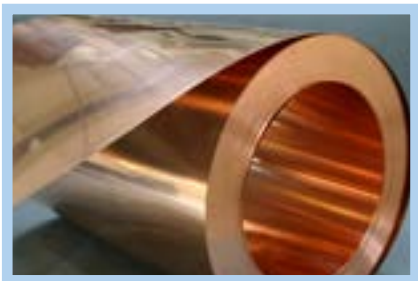
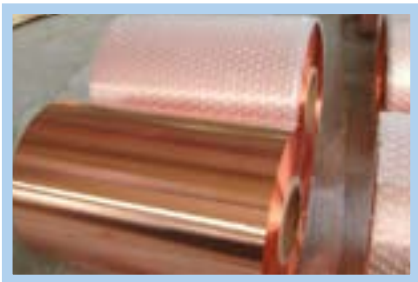
Foil, with specially treated copper rough surface often occurs in lithium ion batteries. On

such a surface subsequently applied graphite layer, which produces excellent adhesion results. Also, the foil may have a rough surface of the copper on both sides, it is used for a bunch of battery cells. Typically, the copper foil is supplied in rolls or sheets, which is very convenient for transportation.

Copper Foil M1

Copper Foil M1 is used for various industrial purposes. It is used in many areas of industry, especially in instrumentation. It is used as a material for shielding electromagnetic radiation in the telecommunications and antenna cables in the manufacture of batteries, a flexible copper cable, copper foil is used as a component in the production of heating films windings of transformers, electric motors, radiators, heating coils.

According to the accuracy of the copper foil manufacturing is highly elevated and normal accuracy. Also distinguish foil deflection normalized or normalized depth of the extrusion. Copper foil has a general-purpose grade M1, M2. Its thickness is ranging from 0.1 mm to 1 mm, and its width from 30 mm to 300 mm. As the metal foil of copper is subdivided as a soft, semi-solid or solid. Copper foil of small thickness is always made in a solid state. By cutting, copper foil is unmeasured and increased length.



Copper sheet GOST 495

Always copper sheet was quite popular material in the production. Popularity is explained simply. It possesses anticorrosive properties, has good strength, ductility, and is harmless in human use. Copper sheet according to GOST 495-92 of the brands manufactured M1 copper M1r, M2, M2P, M3, M3R according to GOST 859. Most market represented brand M1, the copper content of which is not less than 99.9%.

According to the method of rolled copper sheet is hot-rolled and cold-rolled. The cold-rolled sheets can be produced in a soft, semi-solid and solid state. Furthermore, the material is classified by the degree of dimensional accuracy: normal precision sheet width and length, sheets of high accuracy of width and length, sheets of high accuracy to the width and length of high accuracy. Copper sheets, cold rolled produced width 600-1000 mm, length 1500-2000 mm. Hot rolling the sheets can have a width of 3000 mm and a length of 6000 mm. Cold-rolled sheet thickness ranges from 0.4 mm to 12 mm, hot rolled from 3 mm to 25 mm. Where is the copper sheet is used? material often used to make roofing, general construction works. This is due to the possibility of manufacturing a roof of any shape and durability of its service. Plus, copper does not require further processing and dyeing. Also, the copper sheet in demand in the food industry. The most striking example can be considered a manufacturer of kitchen utensils from it. Copper sheets are used in instrument making and mechanical engineering.

Copper sheet M1

We supply copper sheet following brands: M0, M0b, M1, M2, M3. The difference lies in the purity of raw materials used in the formulation. So M2 copper sheet is made from pure copper 99,0-99,7%. The remainder being impurities: silver, zinc, bismuth, iron, sulfur, lead, antimony, arsenic, nickel. Impurities bismuth and lead are harmful and most of their content is subject to special control by the OTC.

Today, copper sheet M1 has found its application in various industries. Copper sheets of the brand in demand in electrical engineering and manufacturing, in the production of radio equipment, pipelines. The roofing business is very popular roofing copper sheet, which does not require any treatment during their operation. Roofing copper sheet perfectly amenable to stretching and bending, making it a great building and finishing materials.

The great popularity enjoyed by copper sheet, due to its physical and chemical properties:

- Softness;
- Ductility;
- Plasticity;
- High thermal conductivity;
- Large electrical conductivity;
- Does not chemically react with water.

In view of the strength properties of the sheet material distinguished hard and soft copper, each of which is marked T and M respectively. Produced sheet requirements of GOST

495-92, the chemical composition is determined by GOST 859-2001, OTC preparation of samples is conducted in accordance with GOST 24231-80.

The main volume is consumed sheet copper sheet cutting 600h1500 mm with a thickness of 0.5 to 50 mm. On special request, contact can be made on an individual cutting demand.

Copper sheet M1r

Copper sheet - a traditional building material, which is used in the repair and construction for decades. Due to their resistance to environmental influences, copper has good corrosion resistance.

For the production of copper sheets used raw materials of different brands: M0, M1, M2, M3 and several others. The number in the mark indicates the purity. For example, copper mark M0 must contain copper not less than 99.99%, and a mark M4 - 99%. Harmful impurities in the copper are considered to lead and bismuth - copper they make fragile, it loses elasticity, can crumble. The most applicable are trademarks of M1 or M0. Given that M0 a rare stamp, the copper sheet M1 - the best option to use.

Copper sheet itself is plastic, lightweight, environmentally friendly material which is easy to work and therefore can be used in different areas:

- For the construction of various building structures (eg, facade work);
- In the production of HVAC equipment;
- For the manufacture of conductors;
- As a roofing material.

It produces copper sheet in different ways, which determines its durability, appearance and brand. The main methods of manufacturing copper sheet: cold and hot. Ready material may have two degrees of strength: normal and high.

Unlike other building materials, copper sheet not need to be painted or otherwise treated. It can be easy to mount, for example, put on the roof, fix and leave for a certain number of years. For the first few years of copper will change its color from fiery red to dark brown, almost black. After that, it will begin to acquire a greenish patina as a surface veil (patina, formed by the oxidation of copper), which will be protected from the effects of the environment.

M2 Cooper sheets

Copper sheets rather successfully used in the construction, chemical and electrical industries. Copper has excellent corrosion resistance and also has excellent ductility. In addition, copper is quite durable and is combined with other materials because of its aesthetic appeal.

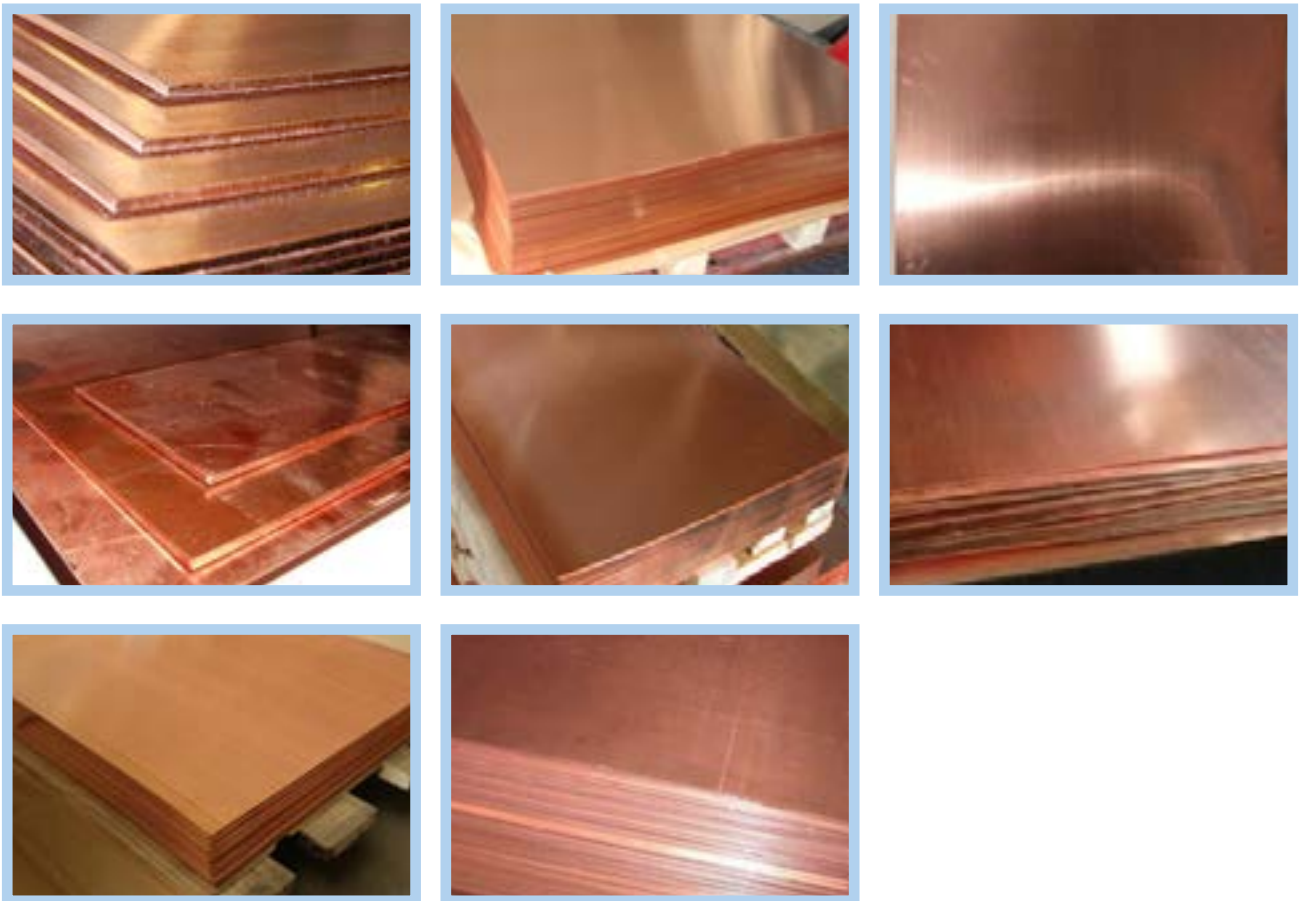
The production used more frequently following grades of copper: M1, M1R, M2, M2P, M3, M3R. All of them are regulated by GOST 859-2001. Stamps copper, which are used in the electrical industry are still in their labeling the letter E. The difference lies in the purity of the material:- M1 - purity level of 99.90%;

- M2 - purity at 99.70%;
- M3 - purity at 99.50%.

The remaining percentage of impurities occupy: bismuth, arsenic, iron, nickel, oxygen, zinc, phosphorus, antimony, tin, sulfur, lead, and silver. Standard dimensions of the copper sheets up 600h1500 millimeters, though, if you need another size, you can always order it from us. By manufacturing technology copper sheets are fixed (T), semisolid (R) and soft (M). Besides copper sheets are separated and another manufacturing method - be it cold (R) sheets or hot (H) of the plate.

More Sheets specified by tolerance and precision:

- Sheet standard tolerance on length and width (L);
- An increased tolerance for length and width (M);
- An increased tolerance for the width (K);
- An increased tolerance of the length (I).



Copper ingot

One kind of rolled copper products is a copper ingot. In fact, this semi-finished product, intended for further processing into a variety of industrial products. By itself, copper bullion - is intermediate between the copper ore and the final product. Copper ingot cast into the melting-rolling shop of by a gas mixer. Producing high quality refined copper ingot, as a circular cross section and flat. Ingot casting temperature is 1145 - 1185 ° C. For the production of ingots, in accordance with GOST 193 used copper

following markings: M1 M1r, M2, M2P, M3, ICD alloy. At the same time added to the labeling of the following abbreviations: - CB - vertical continuous ebb; - SS - horizontal reflux with removal of the top surface layer; - CH - with horizontal outflow of stored surface layer. Copper Bar - a metal of high quality, featuring high corrosion, thermal conductivity, electrical conductivity. Copper has established itself as a very ductile metal, it is easy to work mechanically - grinding, pressing, stretching, milling. This allows its use in various fields, such as engineering, the production of various parts. Copper is used in the manufacture of fittings, valves, profiles, fasteners, and tires. An important advantage of rolled copper is its high electrical conductivity. This quality has been used in the field of instrumentation, energy and electrical industry. Electrical conductivity of copper is higher, the smaller the various impurities. Copper Bar marks M1 is most suitable for the production of high-frequency transformers, wiring and motors. All current collecting structure of urban electric transport and rail transport are made of copper. Among the other sectors of application - medicine, jewelry industry, crafts.

Copper MB (vacuum copper)

Copper is one of the well-known and very popular metal that has found widespread use in the production, including in electrical engineering. It is valued due to a number of its technical properties, such as ductility, a large electrical and thermal conductivity, good strength. This material is resistant to many corrosive media: organic acid, alcohol, phenolic resins and others. However, it is very readily soluble in nitric acid and sulfuric acid. The peculiarity of the metal is that it oxidizes even at room temperature, so to obtain high purity copper and its melting is carried out in vacuum to give material - copper MV. Classification Metal Standard 859-2001 grades regulated, whereby copper vacuum must be less than 0.01% of oxygen impurities. It is used for manufacturing devices in the electric industry. In accordance with the two types of material can be distinguished production Technologies: • Oxygen-free copper - oxygen content of 0.001%; • Refined copper - 0.01% oxygen. Especially copper MB is its low resistivity, which for copper is $0,01707 \text{ m}\Omega \cdot \text{m}$ MB * m, the brand M0 - $0.01718 \text{ m}\Omega \cdot \text{m}$. Another important characteristic of the material is almost complete absence of oxygen and hydrogen in the composition of the metal. Since these elements lead to the appearance of blisters and cracks, or so-called "hydrogen disease." This effect occurs when metal articles of copper operating at temperatures above 200 ° C, thereby reducing the life of the product lines. Therefore, products which are operated at high temperatures, should be made of oxygen-free or refined grades. CF Copper is not "running", as the production technology requires a large resource consumption, this type of product is manufactured for a specific customer.

Copper MK

Copper alloys nowadays are very popular and wide scope due to excellent material characteristics such as electrical and thermal conductivity, ductility, fracture toughness, wear resistance, and many others. According to current regulations, which regulate the chemical composition of copper alloys and technology of their production, this type of metal-roll and share on various brands. MK Copper represents a copper alloy, the main alloying component of which is silicon. It low alloy copper grade, which is often referred to as bronze. This relates to a copper alloy with refractory materials that are used in industry for the production of any heat-resistant parts, such as all kinds of electrodes for spot and seam welding of various light alloys and collectors motors etc. Such a material, such as copper MC due to inclusion of silicon in its structure has not only heat resistance but also high elasticity, hardness, resistance to aggressive alkaline media. The greater the percentage of copper in the alloy of the doping component, the higher its hardness. However, it is due to the large hardness copper MK has a lower heat and electrical conductivity, respectively, over a limited area of application. Our company sells copper MK of high quality at affordable rates. We have years of experience in manufacturing, and apply only to the modern equipment, allowing us to achieve the optimal balance of price and quality. The company ensures mutually beneficial financial terms of cooperation, convenient form of payment products ordered by you, prompt and timely delivery. The presented products meet all applicable standards GOST, as evidenced by the corresponding certificates of quality.

Electrical copper M1E

In the electrical industry copper M1 brands use more often. It goes further testing on the electrical conductivity, then it is assigned a code M1E - Electrical. Mark is classified in accordance with GOST 859-2001. Also, these products need to select high-quality rolled copper grade M1:

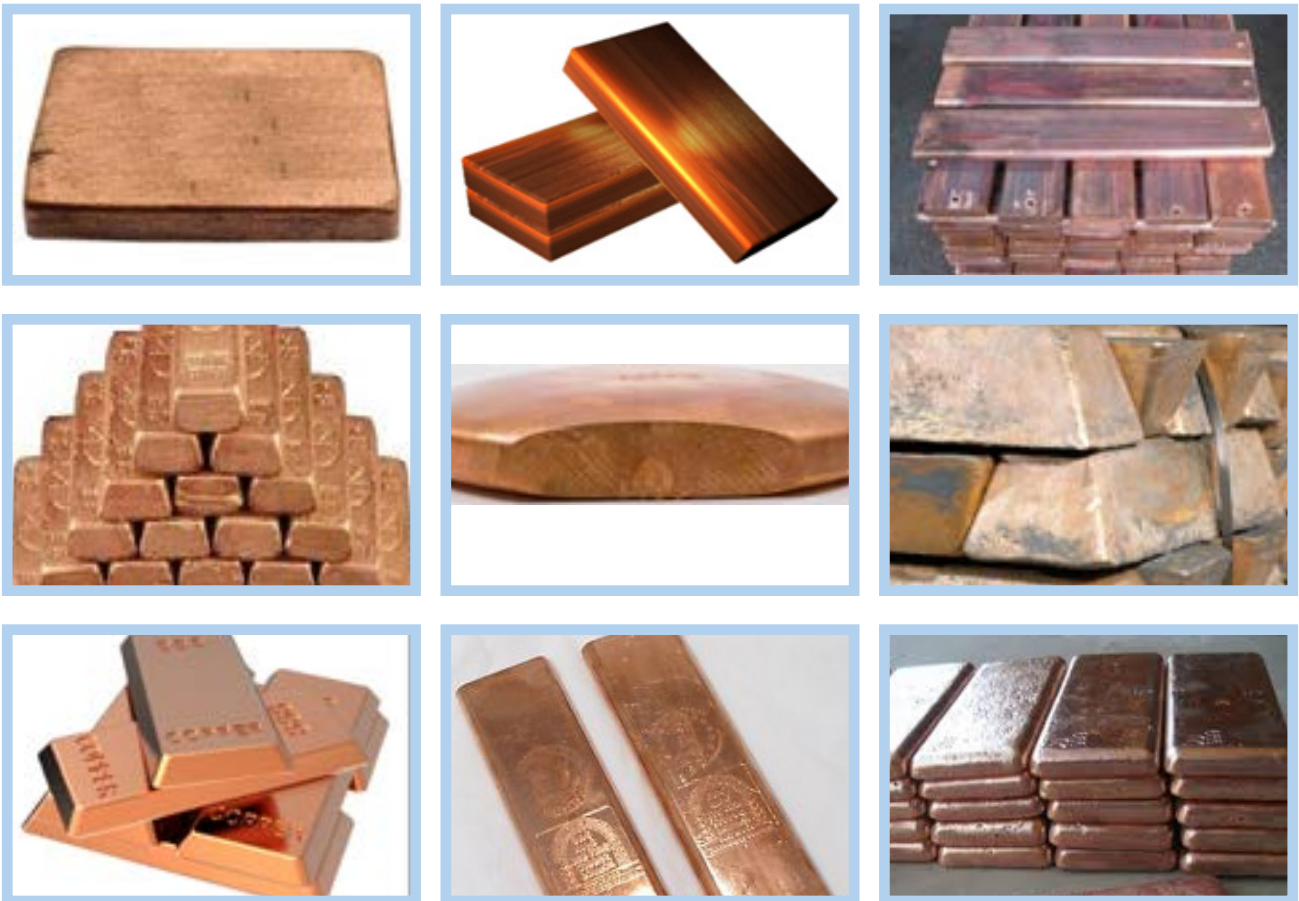
- Rods - GOST 1535-91;
- Tapes - GOST 1173-93;
- Wire and tires - GOST 434-78;
- Sheets and bands - GOST 495-92.

In most cases, electrical copper M1E used to current conductors and busbars, busbar systems and switchgear. The chemical composition of the material. Brand 99.9% consists of copper, as well as admixtures include silver, iron, nickel, sulfur, lead, etc. The total oxygen content of impurities shall not exceed 0.01.%. According to GOST 434-78 Electrical copper M1E for the manufacture of electrical components available in two states:

- Cold soft alloy;
- Cold-hard alloy.

Depending on the condition we obtain different mechanical material properties. Electrical copper M1E has the following mechanical characteristics. For a “soft” limit

of copper short-term strength of 200-260MPa for “solid” - 290Mpa. The hardness of the material, respectively, will be “soft” copper - 55MPa, “solid” - 95MPa. Also worth noting is that the elongation at break for the “soft” copper was 42% for the “solid” - 6%. Electrical copper M1E used for the manufacture of tires and wire of copper wire rod and bars. At the wire surface and the tire is not allowed defects that exceed the size of the control deviation. Deviations in color caused by the oxidation of the metal material or the use of lubrication technology. Electrical copper M1E represented a large product range, which can meet the requirements of many different industries.



Copper ingots

Modern technological civilization is based on copper and its alloys. All electrical products are impossible without copper, in the form in which they exist. And for different environments require different copper. Therefore, steel industry produces a variety of forms of copper: copper ingots, cathodes, ingots.

Today, electrical engineering is used as a virtually pure copper brand M00b, wherein the content of any impurities do not exceed one thousand per cent and up to phosphorous and other brands. Phosphorous copper ingots, so-called master alloy, trademark MF-9 and MF-10 are used in industry in the manufacture of both the copper and various copper alloys. Phosphorus copper has a high hardness.

Copper is the second metal electrical conductivity after silver and cheaper. Its high plasticity allows processing by pressure. Oxygen makes copper much more fragile, so

the industry, producing copper ingots brands M00b, M00 and M0, takes care of its low content. Since copper ingots brand M00b is practically free of oxygen, and in the marks M00 and M0 its content is not more than 0.001%. Plus, a high copper content (M00b and M00 - 99.99%, M0 - 99.97%) make these marks indispensable in the manufacture of magnet wire (especially a small diameter) for transformers, generators, motors and other products.

Yet gained the widest application copper ingots marks M1 and M2. High resistance to corrosion makes it quite sufficient strength manufacturability of parts of the copper of these brands. Water pipes, kitchen utensils, fittings - that's what little is made of the data marks. The impossibility of the growth of bacteria on the surface of copper makes it indispensable in medical technology. A feature retains its physical properties at very low temperatures (reaching temperatures of liquid helium), makes copper ingots mark M1 is almost the basic material in the manufacture of cryogenic equipment. Industry also produces copper ingots brands M1r, M2P and M3R (able to withstand temperatures up to 400 ° C).

M1 copper ingots

Copper ingot M1 brand used in the production of rolled copper, current conductors, parts of cryogenic equipment, and more. The chemical composition of grades of copper GOST defined 859-2001. M1 comprises Copper at 99.95% of copper, 0.003% of oxygen; 0.002% phosphorus, plus other impurities. Permissible content of impurities in the material to 0.01%. The main property of the M1 copper - high conductivity, as the proportion of impurities is negligible.

M1 Copper has a specific electrical resistance at 20 ° C equal to 0.01724 mΩ * m. Subject to appropriate quality copper M1 is characterized by good resistance to corrosion and temperature extremes, excellent ductility. At 20 ° C copper M1 has the following properties: - thermal conductivity - 387 W / (m * deg); - Density - 8940 kg / m³; - Specific heat capacity - 390 J / (kg * deg). Casting and technological characteristics of the material: casting temperature from 1150 ° C to 1250 ° C, melting point - 1083 ° C, while linear shrinkage of 2.1%. The hardness of hard and soft alloy according to GOST 1173-2006 is HB 10-1 = 45 MPa and HB 10-1 = 95 MPa, respectively. The coefficient of friction with lubrication is 0.011, no - 0.43. Subject to manufacturing technology copper M1 elongation δ is 30%. M1 corresponds Copper Cu-ETP1 marks, Cu-ETP, E Cu57, Cu-FRTP, SE-Cu, Cu-FRHC, E-Cu, E Cu58, produced according to different standards.

CH ingots produced in (non-removed layer top surface) or CS (remote layer) horizontal casting. Pig should be smooth. Distortion along planes be within 0.8% of the length. The surface of the copper ingots must be clean, free of mechanical flaws and unnecessary inclusions, with rounded upper edges of at least 5 mm (possibly removal of the cutter).



Copper cathode

Copper cathode according to GOST 859 has several brands, different amount of impurities included in the composition:

- M00k - Mass fraction of copper in this alloy can be varied by agreement between the manufacturer and the purchaser. However, in the manufacture of M00k total mass fraction of impurities should not exceed 0.0165 percent, including oxygen;
- M0k - Mass fraction of copper above 99.97%;
- M1k - Mass fraction of copper of 99.95%;
- M2k - Mass fraction of the foundations of not less than 99.93%.

Impurities:

- aluminum, nickel, iron, zinc, silver (they reduce the thermal conductivity and electrical conductivity of the material);
- bismuth, lead, antimony (negatively affect the processing and the physicomechanical properties);
- oxygen, arsenic, sulfur, phosphorus and selenium (lower elasticity and corrosion resistance).

In many areas of the industry uses copper cathode. Often it is used in the production of semi-finished products in the form of wrought copper ingots and copper rods for the production of various steel. Copper cathode - a raw material for copper wire, perhaps, the main area of application. Due to the low resistivity and high thermal conductivity of copper cathode used in the production of wires and power cables, elements of transformers and electric motors, in the radiators and air conditioners, computer fans, as well as in the production of a plurality of alloys:

- The most common alloy of copper - bronze;

- melhior has up to 55% of the copper in its composition (from it produce the dishes, decorations, coins);
- neyzilber (nickel, copper, zinc and the cathode) is used for the manufacture of a medical instrument and artistic products;
- medno-nickel alloys are highly resistant to degradation by moisture, they are used for the manufacture of products for the marine industry;
- brass (up to 50% zinc) are widely used in machinery, manufacture of household goods and the chemical industry. From it makes cartridge cases, pipes, pipes for radiators of motor vehicles, commemorative medals, processing equipment, and more.

Cathode copper m2K

The main characteristics of a high conductivity copper, and thermal conductivity. The higher the content of Cu in the metal, the higher the degree of electrical conduction, so pure copper valued more than the low-purity copper. A cathode manufactured using copper electrolytic refining according to GOST 546-2001 and used for the production of cast, wrought products, as well as alloys. Most often used in copper cathode production of wire, sheets, tapes and strips. The processing of Cu occurs in specialized smelters where copper is melted and poured in the form of ingots. Then, the ingots are subjected rental to further create the necessary products. Also, using a copper cathode obtained alloys to which is added a certain number of alloying elements. Cathode copper must comply with a certain brand of metal; they are specified in ISO 859-2001. The chemical composition are the following brands of copper cathode: M00k, M0k, M1k, m2K. These marks differ in the level of the metal content of copper, oxygen, phosphorus and other impurities. On the level of data items dependent properties of the metal itself and cathodes application in industry. Most copper content in the metal has a stamp M00k - 99.8%, the oxygen content - 0.1% phosphorus - 0%. Brand m2K has a low content of Cu - 99,93%, O - 0,03%, P - 0,002%. Thus, it is seen from the percentage chemical composition of metal elements in the copper m2K cathode has a lower degree of electrical and thermal conductivity compared with M00k, M0k, M1k. However, m2K grade metal production is less expensive, so manufacturing cost of the specified mark is lower than when using copper cathodes with a high copper content. M2K is used for cable production, electrolytic copper powder, tires for cars, and also for the manufacture of pipes. In addition, due to friction and resistance to corrosion of the copper cathode production goes on and solder alloys, which are used in mechanical engineering.

Copper cathodes M0k

Electrochemistry called cathode electrode connected to the negative pole of the current source. This concept is related to the process of electrolysis. During this

process, the cathode reduction reaction occurs. Electrolysis to overestimate the value of the industry is difficult. This method provides purified metals, alkali and a number of other important substances and compounds.

Consider the copper cathode. This metal has a very high purity copper cathode M0k grade contains not less than 99.97% pure copper.

What is so good this metal? The following are the main advantages:

- Very high corrosion resistance of copper;
- Cathodic copper has a high electrical conductivity (low resistivity);
- Excellent thermal conductivity;
- Cathode copper is characterized by good mechanical strength (valid for copper at all important in electrical engineering).

Today in Russia according to GOST there are more than 10 grades of copper. Each of them has its purpose. Copper cathodes, and this brand M00k, M0k, M1k and m2K, obtained during the electrolytic refining. During electrolysis, the purified metal is deposited at the cathode. Copper for electrical industry obtained melting the cathodes, that is, all the same copper electrodes. This marks M00, M0 and M1. The numbers after the letter "M" shows purity copper. Stamps with the highest content of pure metal - M00k and M00b (second - oxygen-free).

The main specifications and technical documentation - GOST 546-2001 "Copper cathodes. Specifications" and GOST 859-2001 "Copper. Stamps". Below is the percentage of impurities in the cathode copper M0k mark according to GOST 859-2001.

Iron - up to 0,001%;
Nickel - 0.001%;
Sulfur - up to 0.002%;
Phosphorus - up to 0.001%;
Arsenic - 0.001%;
Lead - up to 0.002%;
Zinc - 0.001%;
Silver - up to 0.002%;
Oxygen - 0.015%;
Antimony - 0.001%;
Bismuth - 0.0005%;
Tin - 0.001%.

Copper cathodes M00k

Copper cathodes obtained by electrolytic refining. This method allows you to get the metal suitable for technological purposes. Pure copper is deposited on the titanium cathode, runs a four-flushing of sediment, and then has a very high purity of up to 99.99%. The most common and popular in the industry, according to the normative

content of impurities, copper brand: M00K, M0K and M1K. Thus M0K copper cathodes have impurity content of not more than 0.001% (bismuth, sulfur, oxygen, nickel, etc.). The characteristics of copper cathodes M0K have: a reddish color, high heat and electrical conductivity, low chemical reactivity and high corrosion resistance. Copper has the advantages over other metals - ductility, high strength, density, workability. One of the most important indicators of cathode copper is its thermal and electrical conductivity (close to the conductivity of silver). The chemical composition of copper cathodes grade IOC complies with GOST 859-2001. Most are made of copper cathodes in the form of individual plates - (4...6) h860h1000. One side of the sheet has a smooth structure and the other roughened. Cathodes are cleared from the electrolyte and are packed in batches of 1500 kg. Each of the parties is marked: the date of manufacture, brand copper cathode, series and number of baths, packing number. Technically refined copper is used for processing into semi-finished products in the form of ingots for rolling, wire rod and so on. For alloys, the melting process to copper cathodes refiner is added to the required number of alloying elements. Copper cathodes used in the production of electrical cables, tires for automobiles, the copper powder in the manufacture of pipes, in various heat exchangers in engineering, etc.

Copper Cathodes M1k

Copper is a soft, ductile, easily amenable to forging, rolling and other methods of plastic deformation, reddish - yellow metal. Its distinctive properties of high electrical and thermal conductivity. According to its characteristics inferior to copper only silver, but the various impurities such as iron, aluminum, lead, bismuth, and so forth. Impair its electrical conductivity. For example, 0.02% of aluminum electric resistance increases by 10%. High purity copper with a content of impurities not more than 0.1% is obtained by electrolytic refining, which is the final product - copper cathodes. Standard 546 - 2001 defines the technical conditions of GOST 859 - 2001 chemical composition of copper cathodes. In accordance with the latter, depending on the presence of impurities, copper cathodes are the following brands: M00k, M0k, M1k and m2K.

Covered copper cathodes M1k contain the following, %: • $\geq 99,95$ • Copper Bismuth - 0,001 • Tin - Nickel • 0.002 - 0.002 • Iron - 0,003 • Zinc - Arsenic • 0.003 - 0.002 • Phosphorus - 0,002 • Antimony - 0,002 • Lead - • Silver 0.003 - 0.003 • Sulfur - 0.004 • Oxygen - 0,020 unique properties of copper dictate its scope. Basically, it's electrical. Copper cathodes used as the raw material for further manufacturing of wire tire rod, electrolytic copper powders. At the beginning of copper ingots are melted in the desired shape. Further, by rolling the final products obtained. Alloys based on copper, brass and bronze, resulting from application of various alloying elements have higher mechanical properties.



Copper powder

Now, with the volume of production of this type of products is constantly increasing every year, as copper powder, which is explained by the increase in demand. It represents the collection of microparticles of copper, which are often spherical in shape and size of which can vary depending on its grade and use. A powder often by spraying of copper in two ways: physical, chemical, or mechanical (crushing and grinding of large materials, dispersion and melt granulation). In modern conditions the copper powder has found its application in various fields of national economy, including electrical engineering, instrument making, mechanical engineering, automotive, electronics and chemical industries. This type of product is practically irreplaceable in the production of all kinds of paints and varnishes in the press object of this metal in the manufacture of tires, solar cells, nanotechnology and other areas of production. The process of manufacturing of copper powder itself of the production technology in our country is strictly regulated by GOST and TU. The finished product can have in their composition

of impurities and clots. Copper powder is marked depending on the physicochemical properties of the material. Thus distinguished:

PM - copper powder unstabilized;

ICP-1, ICP-A - copper powder stabilized;

PMS-K - copper powder stabilized konopatochnaya;

PMS-H - copper powder stabilized low dispersion.

Implemented by copper powder in a metal barrel, sealed plastic bag or double-PET. In addition, copper powder requires special conditions during storage and transport, namely, it must be protected from accidental moisture and reactive materials and acids. At the same temperature for storing powdered copper should not exceed 25 degrees Celsius.

Copper nanopowder

Nanopowder technologies are used for the purpose of the progressive miniaturization of microelectronics and reduction of production costs, the production of which use conventional expensive metal powders. Copper nanopowder - a powder of copper nanoparticles, the chemical composition of which varies from the technical specifications, which adheres to the manufacturer, and the purpose of the finished product. The size of nanoparticles often ranges from 20 nm to 100 nm. Depending on the average particle size of the copper nanopowder passport contains a reference to the arithmetic average particle size or size range. In addition to the classification of the size of nanoparticles of copper nanopowder from different manufacturers vary in their chemical composition. The amount of copper contained in the powder ranges from 90% to 98-99%. In the case of 90 percent of copper in the remaining 9% - copper oxide accounts for only 1% - by impurities and gases. Impurities shall not be more than 2% by weight. High-purity copper nanopowder will be considered with the content of impurities is less than 0.3%.

Suitable powder of copper nanoparticles in the electrical industry, in mechanical engineering and instrument making, the production of cars and aircraft, in pharmacology and cosmetology, in the chemical industry. Here are just a part of the use of examples: -in an effective catalyst, characterized by high selectivity (eg, methanol synthesis); -in the manufacture of electrically conductive metal coatings and non-metals; -to manufacture electroconductive paste used including microelectronics; -in a raw material in the manufacture of copper composite nanomaterials; -like additive in drugs and cosmetics; -to reagent restorative action (for example, as an additive for lubricating mechanical equipment - such lubrication ensures self-healing worn and / or damaged parts).

Copper powder superfine PMVD

Superfine copper powder is clearly a very real copper dust. Copper is thus not ultrapure. Most often, the content of the metal powder in the order of 99.9%, the remainder of the powder comprise impurities other metals -. Iron, lead, tin, etc. In order to finely divided copper powder PMVD not oxidized, losing its properties, it is supplied in bottles of different capacities. Most often it is glass bottles of 2.5 kg. When wholesale purchases bottles stacked in boxes of 20 pieces. The box thus contains 50 kilograms.

A powder superfine copper PMVD spray. For this purpose, in a plant in special pots produced injecting a fine spray of molten copper. Going at high speed, it faces a transverse cooling jet. This can be water, steam or any gas acceptable. The gas stream at the same time should not be a large amount of active oxygen, otherwise the copper is oxidized, acquiring a green shade. Flour copper superfine PMVD has a color from light to dark brown. It used it for the most part in metallurgy, electrical engineering and chemical industries. Also it can be used to make certain types of paints and certain types of building materials. Supplied us superfine copper powder is of high quality. In its structure there are no foreign bodies or lumps - it would show a lack of quality.

Ultrafine copper powder PMU and others

Copper soot mark designated IMC. This powder brand manufactured by the method of melt-spraying. Ultrafine copper powder - a product of manufacture using the latest technology. It consists of oxygen-free copper having a stable isotope composition of natural and non-layered structure. This kind of powder is non-toxic and non-radioactive, contains not contain precious metals. Sale copper ultrafine powder is performed using the PET bottles (200) and in glass flasks. Each batch of copper soot is made of one main batch of the starting material. Flour copper ultrafine IMC characteristics: -Degree purity of the bulk of 99.999%. Is the mean mass of a particle size not greater than 7 microns. Copper particles of soot are spherical. Is the chemical purity, which determines the ultrafine copper powder 99.996% oxygen-content in the ultrafine powder 0.06%. Is the specific radioactivity, which has a brand powder PMU - 1.1. -By The content of isotopes of copper ultrafine powder PMU - CU65-30.91%, CU63-69.09%. Nowadays ultrafine copper powder brand PMU is widely used in various industrial fields: automotive and aviation, electronic, chemical, instrument. ultrafine copper powder is used in the manufacture of various products from metal and special inks.

Soot (particles of 1-500 nm) are an artificial product, the use of which modern industry is promising. Developed revolutionary methods of obtaining the material, which are divided into chemical and physical. Especially popular obtaining powders in the atmosphere of inert gas and air, the technology of electric explosion, plasma chemical synthesis and others. These powders are produced by a number of specifications and useful armor protection, filters, structural and lubricants, pastes, abrasives and others. In particular Superdispersed extremely popular raw material to create fine abrasive pastes due to the high viscosity, strength, hardness, heat resistance, adsorption

capacity. These parameters are significantly higher than the less dispersible powders. Widely applicable ultrafine tungsten-based materials. This is because ultrafine tungsten powder differs extraordinary hardness. Ultrafine WO_3 -based materials are produced for a variety of specifications. Ultrafine carbide consists of a spherical particle size of $<1\text{ }\mu\text{m}$. Equally distributed diamond powder and ultrafine powder alumina. Get data powders from natural and synthetic raw materials for a variety of standards.

Natural ultra-fine diamonds, for example, correspond partly to GOST R 52370-2005, and ultrafine powder Al_2O_3 (corundum) partly satisfies the requirements of GOST 28818-90. Apply and bronze soot marks PBU. According to the norm, this material is an alloy of copper (92%) and tin (8%). The powder is packed in a plastic or other containers of various capacities.

Electrolytic copper powder

This powder is produced by electrolysis, which is why it got its name. According to GOST 4960, there are several brands of this product: PM - stabilized powder; ICP - 1, PMS - PMS and A - B - stabilized powders; PMS - K - stabilized konopatochny; PMS - N - stabilized low dispersion. Mass fraction of copper in each of them should be not less than 99.5%.

Controlled impurities: iron, lead, arsenic, antimony, oxygen, metal sulfates compound calcined residue obtained by treating with sulfuric acid. PM. Here the minimum possible impurities, it possesses the special properties of flowability over other brands. Up to 80% of PM, as well as electrolytic copper powder brand ICP - 1, must pass through a fine sieve with a mesh to 0045 K. At the same time there should be no seals, extraneous inclusions or lumps. electrolytic copper powder should have strict density for each grade, from 1.3 grams per cubic centimeter for ICP - A and to 2.7 for PMS - V. By agreement with the buyer values can be slightly modified. It comes electrolytic copper powder batches in barrels for 85 kg. The whole Party must be made one technological regulations, to have a single document on the quality, the average powder composed of the same brand. The document about quality should be registered: trademark, brand name product, batch number, net and gross weight, date of manufacture, test results. Copper powder for manufacturing powder metallurgy parts, and for some other purposes, for example in the automotive, aerospace, chemical, electrical industries. Also, electrolytic copper powder is used in instrument making, ceramic-metal and electro industry. Using this powder embedded contacts of electrical machines produce brushes, filters for purifying oils, bushings, rings, and many others.

ICP-1 Copper powder

ICP-1 Copper powder is a powder, which acts as the basis of copper (mass fraction of about 99.5%). In a variety of industries use copper powder of various grades. Copper PCA-1 refers to a stable powder and is in great demand in many areas of production. Due to its unique technological properties, copper powder ICP-1 is indispensable in

the following areas: - in powder metallurgy of it made by pressing different parts; - In instrument; - In the steel industry; - In the automotive industry (including the production of car tires), aircraft and the like; - In the chemical industry; - In lacquers.

Make copper powder PMS-1 according to GOST 4960. There are two ways to produce this substance: mechanical, physical and chemical. The mechanical method does not affect the chemical composition of the material, so it is often used when you want to expose raw minor changes. When physical and chemical methods to obtain copper powder, electrolytic deposition technology is used. Processing exposed to different solutions, often copper sulfate, and the raw materials varies considerably at the chemical level. Sometimes, these two methods are used together. High-quality copper ICP-1 powder has no lumps and has a bulk density of 1.25 - 1.9 g / cm³.

To transport it uses special steel drums with a capacity of 50 dm³ with polyethylene insert and the lid tightly closed. Transportation can be covered by any kind of transport. Keep copper powder ICP-1 can be not more than six months from the date of manufacture, without opening the packaging, and avoiding oxidation.





Cooper grid

Grid copper is not subject to corrosion and acid-base environment, has anti-magnetic properties, wear resistant. Produced mesh copper wire of different diameters and different mesh size, as well as two kinds of fabric woven - plain and twill. All these parameters are regulated by GOST 6613. It sets parameters for woven wire mesh with square mesh, is made of non-ferrous metals and their alloys. Grids are used:

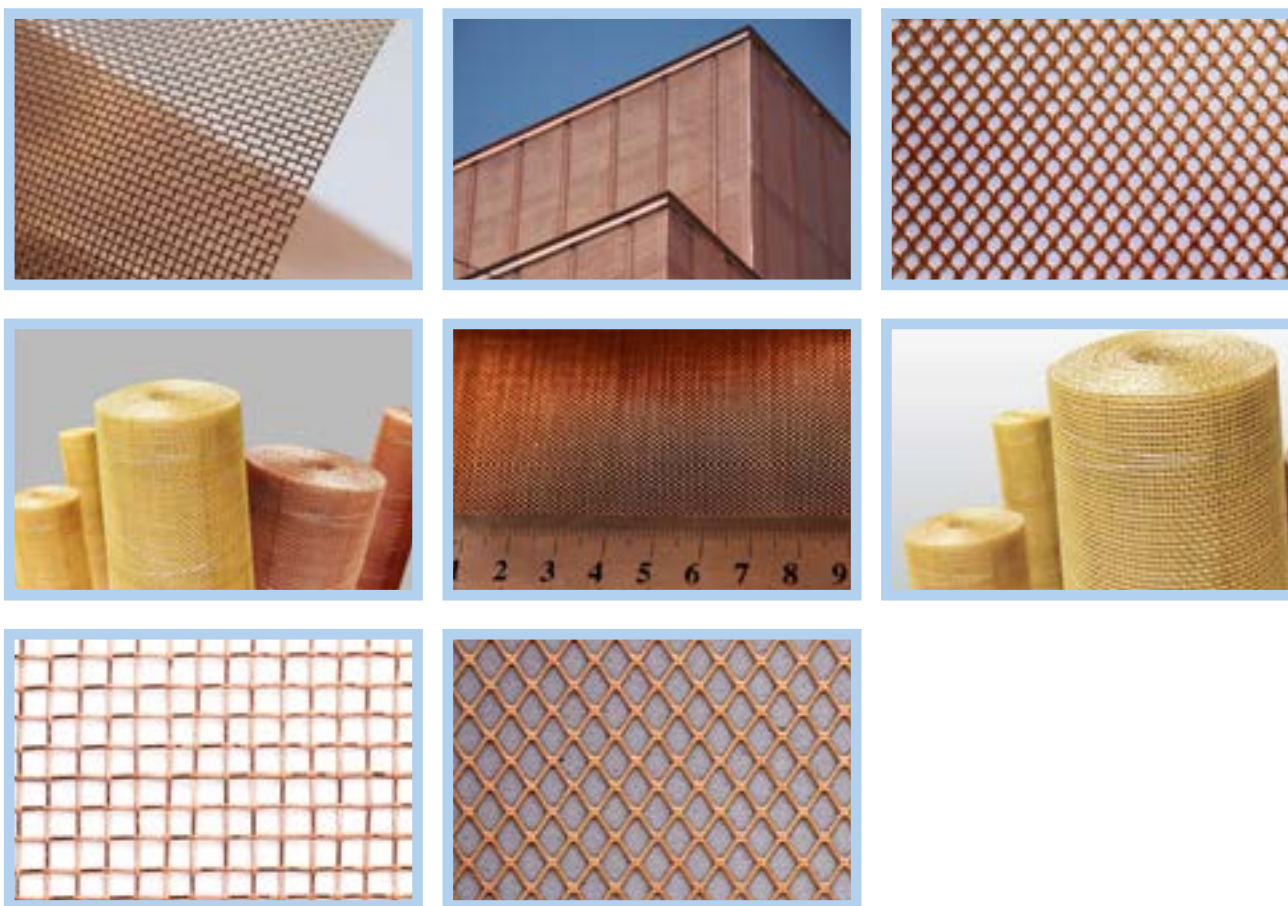
- for the separation of the grain size of splintered materials;
- for the filtration of liquids and gases;
- for control of different materials on the particle size by grinding and crushing.

In accordance with the mesh size and wire thickness, and in accordance with the method of weaving, each species is assigned a copper mesh number. Grid copper must be made of annealed wire. It allowed discoloration, but not allowed corrosive spots, scale, cracks, creases, marks broach affecting the size of the cells, broken wires (more than 10 mm in length) and cross-linked site.

Grid copper produced in accordance with GOST 6613 has a certain diameter of the wire and the nominal size of the cells in the world, as well as specified deviation on these parameters, strictly in accordance with the rules of the standard. This standard regulates the width of each of the types of mesh and a minimum segment length.

Used mesh copper in electronics and instrumentation as screens for highly sensitive instruments and devices that protect from the effects of electromagnetic waves. Sometimes copper grid is set for the entire screening rooms for the staff in hazardous industries.

Often, copper mesh screening in order to replace a copper plate or sheet and, though inferior to them in the density is much lighter in weight and price. An important factor is the ability of copper mesh breathable, water and light - often it is these properties are a priority.



The alloy of copper-phosphorous

Copper-phosphorous alloy - an alloy, which is based on copper and phosphorus (besides impurities are main components). According to GOST 4515 share two brands: MF10, where the mass fraction of phosphorus close to 10% (from 9.5 to 11); MF9 and where the mass fraction of phosphorus around 9% (8 to 9.5). Mass fraction of both alloy components together should be at least 99.8 and 99.5 percent, respectively. Most MF10 produce for export and for domestic consumption MF9. For a quick visual differences between the two marks on the product are color-coded. For MF10 color indelible paint white, black and for MF9. The alloy is produced in the form of plates 30h370h215 mm. The deviation from this norm is 5 - 10 mm. Some consumers are willing to get the material in the form of long strips or rods, so manufacturers can vary the type of manufactured products at the buyer's discretion. Each plate or strip should have a uniform consistency without any inclusions. There are several areas where the use of copper-phosphorous alloy is: is its use as a deoxidizer during melting brass; Adds a member of various bronzes; -to a solder containing phosphorous; -for improve the strength properties of the products of aluminum and silicon alloy (for example, the cylinder blocks of internal combustion engines, copper-phosphorous alloy added to the cast in an amount of 0.1 - 0.2%). When shipping a special attention to dry - humidity is strictly prohibited both in transit and in storage.

Copper phosphorous MF9

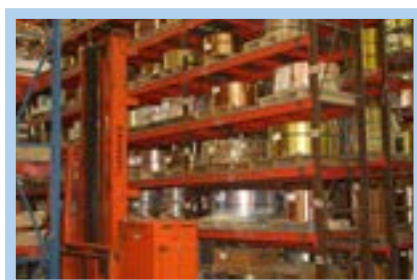
Copper phosphorous brand MF9 or, as they call it ligature, represents a copper-phosphorous alloy, which is used as a deoxidizer or modifier during cooking / welding of copper or copper alloys. In addition, this kind of non-ferrous metal is commonly used solder. The use of such additives as MF9 phosphorous copper, other alloys imparts greater hardness, elasticity. Due to its qualities of copper phosphorous has been widely used in various fields of production, pipe rolling, manufacture of electric vacuum equipment, and many other areas of modern industry.

The production technology and the chemical composition of copper phosphorous MF9, as well as any other copper alloy, is strictly regulated by GOST. Phosphor manufactured copper in the form of tiles of a certain size, which are separated by 40 pinches lobes. Furthermore, to check the quality of the finished copper-phosphorous alloy into account the absence of impurities, the slag material on the surface and in section, and other factors. If there are kinks in the bays, it is permitted by the standards and does not speak of defective products. Each batch must be accompanied by the relevant documents and certificates of quality, indicating trademark, lot number, grade alloy, and other data. In addition, any party copper phosphorous verified to conform to the quality indicators, which are taken to check for at least three tiles.

Phosphor copper MF10

Phosphor copper MF10 (ligation) - phosphorous is a special copper-based alloy. This master alloy contains 9.5-11% phosphorus, total phosphorus and copper - 99.8%, there is also a small proportion of impurities. The alloy has a number of distinct advantages, which allow wide use of this material for production purposes. Suitable phosphor copper MF10 in the production of various alloys, bronzes. Alloy itself is also used as the solder, either in pure form or in combination with special alloys.

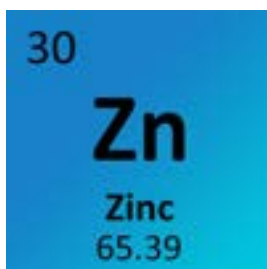
Chemically ligature is a copper-based deoxidizer. In the production of phosphorus-containing copper alloys, especially bronze, casting or tin-phosphor copper phosphorous MF10 is used as an alloying element. When molding certain categories of products, in particular an alloy engine blocks administered to improve the quality of the casting. The amount of the alloy is 0.1-0.2%, in some cases, the dosage is increased. MF10 ligation products used in the casting of silumin as a modifier. The use of phosphorous copper increases the hardness, elasticity and increases the resistance of the alloy. Directly to consumers phosphor copper MF10 is the engine building, household appliances, various areas of engineering and foundries. The alloy is produced in accordance with the specifications of GOST 4515-93, produced in the form of rods or bars, consisting of forty parts, separated by pinches. Dimensions of tiles 370 * 215 * 30mm.





ZINC

General Information



Zinc content in marks is strictly regulated by GOST. Quality vintage zinc offered by our company, is tested in the laboratory. To verify compliance with regulatory and accompanying documentation, using modern methods for the determination of zinc as the main element, and the number of impurities. It determines the content of elements such as arsenic, tin, copper, iron, cadmium, lead, zinc itself. Previously received

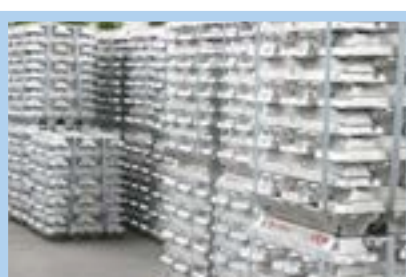
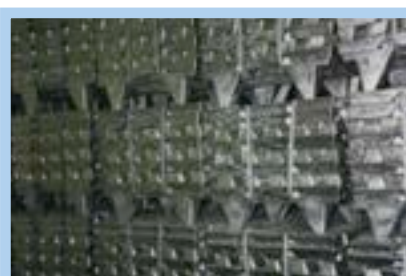
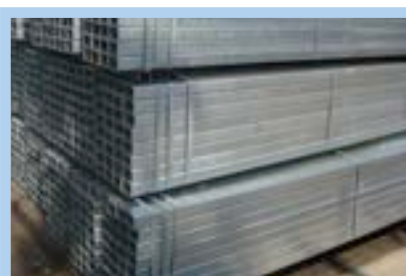
zinc pyro techniques now electrolytic zinc in the volume of total output is about 90%. Our company has carried out the sale of zinc C0a, C0 CV0, C1 C2, zinc price depends on the brand, refer to the table, which shows the price of zinc. We also supply high-purity zinc for scientific investigations. Zinc, depending on the brand of the corresponding marked with colored paint, with the exception of high-purity zinc, Makira its packaging, as Zinc ingots may incorporate additional admixtures. Global zinc production increased annually, but zinc prices continue to rise, its price on the London Metal Exchange in the near future will not decrease significantly, given the current trend, experts predict that zinc prices will only grow.

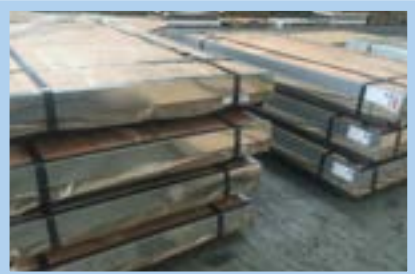
Analysts attributed this to the development of the construction industry, the automotive industry and mechanical engineering. Manufacture and sale of zinc in Russia is also on the rise, zinc production is constantly evolving. 7 Zinc Density g / cm³, melting temperature of 419 ° C, Bunsen burner flame can melt (vaporize) zinc, its boiling point 906 ° C. Maximum permissible concentration (MPC) of harmful substances in the air of the working area secured in the GN 2.2.5.686-98. Use of zinc in the printing and automotive industries, in the production of zinc powder, in galvanizing, in alloys, goes to the anodes in electroplating zinc metal brand CV is the backbone of many zinc-aluminum coating, a zinc roof made of zinc-titanium. Buyers should pay attention to the fact that the price of zinc in the Russian market depends on how much zinc on the London Metal Exchange, and therefore cannot be below it. Zinc (ingot weighing about 25 kg).

Grade of zinc ingots

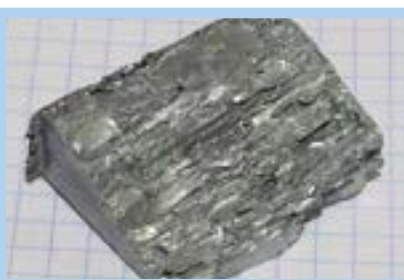
- Zinc CV0
- Zinc C0a
- Zinc C0
- Zinc C1
- Zinc C2

ZINC MANUFACTURING FACILITIES





Rolled Zinc



Zinc protectors

Zinc protectors of various brands you will always find an assortment of our company. They are made of zinc alloy contact TSP1, TSP2 and TSP3. Designed zinc protectors for protection of various types of vessels and pipelines against corrosion due to exposure to seawater or fresh water. It should be noted that zinc protectors, unlike similar materials made of magnesium alloy or aluminum, have such properties as fire and explosion. That is why these products are used to protect against corrosion of oil storage tanks and tankers. Also important for the operating conditions and the fact that, when dissolved zinc protectors do not emit waste into the environment, thereby contaminating it. Since most of the steel structures are made of carbon or low-alloy steel, zinc protectors is the best suited to protect them from corrosion, as zinc electronegativity greater than that of steel. We produce protectors in full accordance with GOST. At all stages of our products undergo the strictest quality control, so it is on the technical characteristics is not inferior to foreign analogues, and sometimes even exceeds them. zinc protectors can be used on painted and unpainted surfaces of ships and other water metalwork. Many years of experience in the use of protectors shows that reservoirs in which they are used, not in need of repair due to corrosion during the entire period of operation. Lifetime zinc treads, depending on the application, ranging from five to thirty years. You can always

order protectors in our company. Your order will take a skilled manager of our company, who will answer all questions about any products of our production. You can also order protectors zinc necessary for you size with the specified characteristics. Extensive experience and use the most modern equipment allow us to offer our customers only the finest quality product at a reasonable price. We also supply aluminum and magnesium protectors of the following types: R-PHA-10, PHA-P-30, P-PHA-60, PHA-P-15, P-PHA-45, P-POM-4, P-POM- 10, P-POM-30, P-POM-60, P-ROM-0.8 P-ROM-3, P-ROM-6, F-POA-5, F-POA-9, P-ROA- 11, P-DOM-7, P-CCM-6, P-CCM-12, P-NLM-14, P-NLM-63, P-CAC-13, P-SC-1, P-KOA-1, P-KOA-1-1, II-3-1-CoA, P-KOA-5-1, P-COM-3, P-COM-6, P-KOA-4, P-KOA-8, P- KOA-12, P-KOA-20, P-KOA-10, P-COM-10.

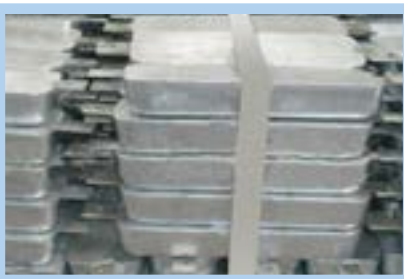
Zinc protector P-REC (non-disconnectable)

Tread Zinc - one of the types of products offered in our wide range. More often, it is used to protect pipelines, underwater vessels (external and internal) from corrosion. In most cases, the ship is painted to prevent the harmful effects of water, however, over time the coating may be damaged, leading to the appearance of corrosion. Can fully protect the vessel using only zinc tread. It creates an electrical circuit between them and the protected surface. It should be borne in mind that such a figure as the electronegativity of the tread material should be greater than that of the vessel material. Also, zinc protector is used to protect the inside of the ship's tanks and tankers. Zinc Protector, offered by us, is fully consistent with the standards GOST 26251. In accordance with the requirements of this document, we supply non-disconnectable protector of TSP1 zinc alloys, and TSP2 TSP3 two types: P-REC-5 and P-REC-10. The main difference from the articles of protectors of zinc magnesium and aluminum alloys is that the zinc alloys totally fireproof. In addition, when the protector zinc anodic dissolution does not pollute the working environment. For this reason, according to applicable standards for the protection of oil tankers used only from that of matter. Tread Zinc has proven effective in protecting against corrosion of both the outer and inner surface of the vessels. Studies show that for the tanks, which use zinc protector, do not repair or painting of metal required for the duration of their operation. Tread life of the zinc is from ten to thirty years, depending on operating conditions. Our product range includes zinc protectors of all sizes. In agreement with the customer, our experts can make products with the specified parameters. To order the zinc protector, you simply call us. Great experience and well-honed system of production allows us to sell zinc protector of excellent quality at a reasonable price. If necessary, we are ready to organize the delivery of the ordered goods by you.

Zinc Protector P-KOTS (shorted)

Zinc Protector - one of the types of products supplied by our organization. This protector is used as a means of electrochemical protection on various ships - passenger, freight, small size, ferries and on offshore platforms and pipelines. Zinc Protector creates an artificial electrical circuit extending between the product itself and the metal of which it is intended

to protect against corrosion. Used protectors of zinc as painted and unpainted surfaces. In the second case, the rejection of painting materials enables significant savings. According to the principle of its operation, all protectors are divided into short-circuited, suspended, adjustable and switchable with ballast. Since most metal structures are made of steel, as a protector for metals which can be used with a more negative electrode potential value - zinc and zinc alloys. Our organization is ready to offer you any size zinc protector, and the weight of the finished product can range from five to eighty-four kilograms. All products are made by our specialists with the requirements of GOST. Our product range is represented by short Zinc Protector brands KOTS P-5, P-Kots-10, P-Kots-15, P-Kots-36. It is worth noting that the cathodic protection system can be installed on new and already entered into the reservoirs operation. It should be noted that the zinc protector absolutely fireproof. In this connection it is used for oil tankers, unlike protectors, magnesium or aluminum alloys. Another definite plus zinc as the material for the protectors is that the anodic dissolution when in use does not form wastes polluting working environment. Zinc protector, depending on the operating conditions, can last from ten to thirty years. This research has shown that with this type of protection of tanks and vessels during this period did not require repair.

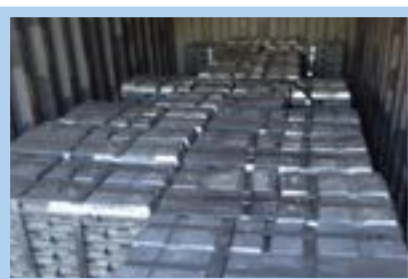




Zinc ingots

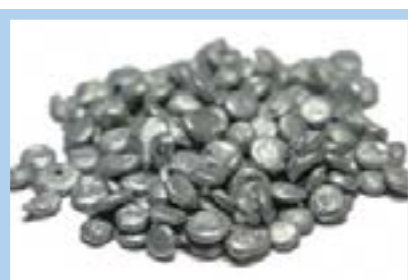
Zinc ingots are a type of our products. Scope of this metal is very wide, because of its physical and chemical properties. Zinc ingots used to produce a wide variety of zinc semi-sheets, strips, bars, etc. In addition, zinc ingots used to create a variety of metal alloys - printing, tread, foundry and anti-friction. Depending on the purity of the material, zinc is divided into several grades, among which the largest percentage of zinc is TSV00 mark - not less than 99.997% of the metal therein. Zinc ingots supplied by us in full compliance with the requirements of GOST. At all stages of production established strict quality control, so we offer our customers only the best products at reasonable prices. Zinc ingots must be of good quality to have a flat surface without delaminations and cracks. Their presence suggests that before you a product made with violations of the process. On the surface of the ingots must also be free of burrs. GOST admits the presence of small undulations, and does not consider it a sign of rejection. The finished products are marked with colored stripes on end. For example, zinc ingots brand TS1 marked green stripe, C2 - a strip of red, and w3 - brown. In the production of zinc TSV00 brand mark is not applied, and stamped on the container or packaging. We supply zinc ingots of different brands. In agreement with the customer, our organization is ready to supply zinc ingots with desired performance and weight.





Zinc granular

Zinc granular presented in range of our company is the same as zinc, plastic silvery white metal but in the form of granules and cleaner. It is flexible enough to quickly darkens and outdoors. This is because the granular zinc reacts with oxygen and is covered with an oxide film. Granular zinc is used as reducing agent at different process and chemical processes. As an example, mention may be made of them, as precipitation of gold from cyanide solutions, the development of cadmium and copper by purification of zinc sulfate, as well as the creation of hydrosulfite. Granular Zinc can also be used to create a variety of alloys, types such as intermetallic compounds, for example. Made of zinc granulated batches, each of which must contain granules with the same chemical composition. We are always ready to supply you with granular zinc in any volumes and with the necessary characteristics to you. Transportation of finished products is carried out in special airtight containers or in dense PET packages. It should avoid zinc oxidation as a result of exposure to air. Store zinc granules is necessary in areas with low air humidity, avoiding direct sunlight. Our organization is always ready to offer you excellent quality granules of zinc at a reasonable price. If necessary, we will arrange delivery of the goods ordered by you.





Zinc powder

The modern world industry produces many different grades of zinc powders that differ in chemical composition and particle size and shape. The zinc powders have a particle shape of a sphere, ellipse, and the shape of flakes. Most small size of the powder is zinc dust. Produced zinc dust produced in different ways. The molten metal is atomized in a vacuum, and then cooled. Or is precipitated from aqueous solutions by means of current. The product is extracted from the condensation of zinc and retorts in special autoclaves. Zinc dust can be milled by different mechanical means. Most zinc dust used in the production of special paints and coatings, which have anti-corrosion properties. Zinc dust is used in hydro-electrometallurgy, including in procuring gold. The product is used during thermaldiffusion galvanizing. This method of coating a layer of zinc metal surface much more effectively galvanizing. Thermodiffusion zinc coating is more uniform in structure, this method can galvanize products of complex shapes and threaded connections, parts with holes, modular configuration. zinc dust is used in the manufacture of tires, in powder metallurgy, production of pyrotechnics. Zinc dust is sold in sealed packaging - plastic bags, metal containers of different sizes. If the powder is used for the production of batteries, the raw material to be packaged in pre-galvanized containers. Permissible to use another package, provided that the container will be maintained tightness. By agreement between the purchaser may use different versions of the packages. When transporting this type of product, you need to be careful, avoid contact of flammable materials, acids, alkalis. If stored properly zinc dust does not lose its properties of six months from the date of manufacture.

Zinc powder PTS 1

In the interaction with the environment, many metals self-destruct. They are covered with rust, crumble, lose resistance. Adverse conditions, high temperatures and humidity significantly accelerate this process. One type of protection of metal structures is the application of a thin layer of zinc, wherein zinc powder is used. In carrying out the method of cold galvanizing, metal surfaces are applied several layers of soil, in which the composition has a zinc powder. Primer is applied with a thin layer by brush, roller, by any of the methods of airless or pneumatic spray. In such methods, the use of zinc powder is less dangerous to use, a person inhaling the vapors of zinc dust can be poisoned. After applying the primer layer, the product becomes protected against corrosion.

Zinc PTS1 grade powder according to GOST 12601 has the following chemical composition in percent:

Zn	96
Sb	0.001
As	0.0005
Sn	0.001
Cu	0.0004
Cd	0.0015
Pb	0.001
Fe	0.0005

Often PTS1 zinc powder is used and the method of applying a hot zinc coating on metal surfaces - thermal diffusion coating. This method is suitable for the corrosion protection of parts with holes, carvings, prefabricated parts of various configurations of cast iron, all types of steel. If thermal diffusion zinc coating can get almost any desired thickness of the zinc layer. Zinc powder is used in the combination of zinc coatings, which consist of alternating layers, which are applied to the product. World practice of this method calls a "duplex system". On the surface of the metal part, a layer of a mixture of zinc powder, is then coated with lacquer or polymer waterproofing layer. Also, the zinc powder is used in the production of zinc oxide, as a constituent element for chemical power sources - in batteries and accumulators.

In developing our zinc powder is not used secondary, because By definition, primary zinc powder to spoil its impurities cannot, they are in it to a minimum, which is not true of secondary housing.

Zink powder PTS2

Unprotected metal products are destroyed, need updating and replacing that annually leads to millions in losses. That is why there are many ways to protect the metal blanks, components and structures, such as galvanizing that uses zinc powder PTS2. Many metallic structures protected against corrosion by hot dip galvanizing. Immediately prior to the application of the zinc layer of the product is necessary to degrease, rinse, wash and carry out etching again. Details dipped in a bath of ceramic hot melt of zinc. After galvanizing zinc surplus in the blanks removed in special centrifuges. Such a method is not suitable for the coating layer of zinc threaded parts and fasteners, small items, as are zinc nodules and threads need to eat through again. A method of hot-dip galvanizing is not suitable for high-strength steel grades of billets. Such articles and materials may be protected from corrosion thermodiffusion coating method in this process is also applied PTS2 zinc powder.

Zinc powder PTS2 brand in IEC 12601 has the following chemical composition in percent:

Zn	95
Sb	0.001
As	0.0005
Sn	0.001

Cu	0.0004
Cd	0.002
Pb	0.002
Fe	0.0005

To protect against destruction of the metal parts and construction zinc-filled treated with a special composition. The composition of such paint coatings include various synthetic resins, polymers, varnishes, zinc powder. Apply a mixture of zinc bearing rollers, avoiding any kind of sprays, not to inhale zinc dust that can cause poisoning of the body. Zinc powder is used for galvanizing treatments diffuse in industries such as construction vessels, the automotive industry. Use it in the refining industry. He needs in the chemical industry, where zinc powder is used in the production of special and benzidine dyes, and zinc oxide.

Zinc powder PTS3

Among the different types of rolled metal demand zinc and materials from it. Enough broad scope has zinc powder PTS3 - fines, zinc recycling product into a powder. Zinc powder PTS3 contains zinc metal as a base, and a small amount of other metals, including iron, arsenic, lead, copper, cadmium, tin, antimony, that their percentage:

Sb	0.001
As	0.001
Sn	0.001
Cu	0.001
Cd	0.006
Pb	0.006
Fe	0.002
Zn	95

Zinc powder included in the paints. They paint the metal constructions and designs, which are operated in adverse weather conditions. Zinc powder is one of the paint components, which have excellent anti-corrosion properties. Covering such a paint base material, it is possible to save the structure from damage and prolong its service life. Zinc powder is consumed by the pharmaceutical industry. Of zinc powder used in the chemical industry, it is a component in the manufacture of lubricants, plastics, including fluoroplastic. The zinc powder used in hydrometallurgy, where the leaching process with aqueous solutions of the chemicals recovered from concentrates, ores, as well as production waste pure metals - nickel, zinc, copper, aluminum and other metals. Recycling non-ferrous metallurgy allows the economical use of raw materials and benefit economically, since Recycled raw material contains gangue as ores and concentrates, and much richer content of recoverable elements. Zinc powder displace precious metals such as gold and silver from cyanide solutions. Zinc powder PTS3 is the raw material during the thermal diffusion zinc coating

procedure that protects the surface of metal parts from corrosion. Powder is used in pyrotechnics - it is part of the mix that colors the flame blue. Adhering to the technology, we are confident in the high quality of its products.

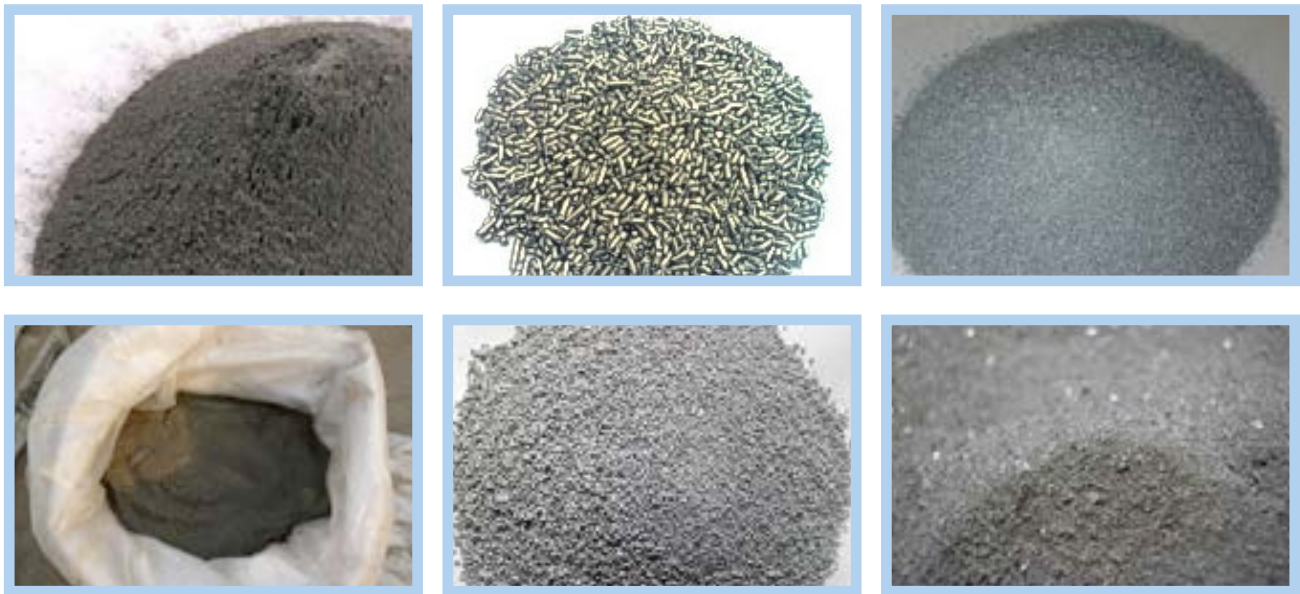
Zinc powder PTS4

Zinc powder PTS4 regulated by GOST 12601. It is consumed as a raw material in the metallurgical, electrical, petrochemical, aircraft industry, often to produce coatings resistant to corrosion. For example thermal diffusion galvanizing products. Depending on the production parameters and zinc powder is divided into two classes: A class - fine zinc powder is produced by rectification; B Class - coarse zinc powder produced by spraying. In Class A brands include powder PTS1, PTS2, PTS3, PTS4, and in Class B include powder PTS5, PTS6, PTS7. Brand powder produced dictates the chemical composition of the powder - the ratio of zinc and metal impurities. Zinc powder PTS4 GOST 12601 has the following chemical composition:

Zn	95
Sb	0.02
As	0.01
Sn	0.001
Cu	0.005
Cd	0.05
Pb	0.02
Fe	0.007

Zinc powder itself is a powdery gray powder, it is not allowed sorts of non-metallic inclusions. Each manufacturer of zinc powder must control the particle size of the powder (Class A - up to 160 m, Class B - up to 630 microns). Implemented by zinc powder in sealed packaging - buckets / drums with large packaging and plastic bags with small packages. zinc powder in the production of a danger to human health - zinc dust in contact through the respiratory and digestive organs can cause poisoning organism. Because of this, when it is used requires adequate protection.





Zinc alloys

Already at 100 - 150 degrees zinc easily processed rental, pressing and deep drawing, but at 200 degrees, the metal becomes quite fragile. Due to these shortcomings in the industry often do not use pure zinc and its alloys. Zinc-based alloys have a low melting temperature and good flowability. They are easy to process under pressure, can be cut, welded or soldered. Zinc alloys may also be applied to any (metal or non-metallic) surface is produced by chemical or electrochemical method. All the zinc-based alloys retain its positive properties. Over the mass distribution of zinc alloys obtained in the field of injection molding, which is used for the manufacture of parts in the automotive industry, a variety of household appliances, office equipment and many other industries. This is due to the fact that zinc alloys most technological in handling and allow for thin-walled castings. Zinc alloys, depending on the application is divided into casting, anti-friction, warping, printing, tread alloys and solders. Casting zinc alloys (3,5-4,3% Al, 0,6-3,5% Cu, 0,03-0,06% Mg) -has a high fluidity, good fill the form and do not interact with its metal. This property provides thin-walled castings of any, even the most complex shapes.

Anti-friction zinc alloys (9-12% Al, 1-1,5, % Cu, 0,03-0,06% Mg) - have hard and soft components. Details of such a zinc alloy obtained by treating under pressure or by casting. Wrought zinc alloys (13-17% Al, 4,5-5% Cu, 0,05% Mg) - similar in properties with brass. Ingots of alloys obtained by casting, and then from these ingots are made sheets, rods and other semi-finished products. Printing zinc alloys (2,2-7,5% Al, 0,06-4,5% Cu, 1,2-1,8% Mg) - used during casting typographic fonts, this is due to good flowability and high resistance to abrasion alloys. Sacrificial zinc alloys (0,2-0,7% Al + Mg and Mn additives) applicable for corrosion protection in shipbuilding and industrial sector, given the explosion and fire these alloys.

Solders - such zinc alloys have a very wide range of composition and they are used for soldering of various compositions. These joints have a very high strength, but, unfortunately, low resistance to corrosion. Solder copper-zinc quite durable and, for example, is used for brazing of steel of various grades. Modern industry is constantly looking for new options

for the zinc alloy to improve its qualities.

Foundry alloys of zinc

By itself, the zinc does not have the necessary technological properties, which would be used in the foundry industry. Therefore, certain foundries zinc alloys have been developed. Depending on what the parameters should have the alloy in its composition can include magnesium, copper, aluminum, manganese, magnesium, iron, antimony, cadmium, lead, tin. The main alloying zinc foundry additives include copper, aluminum, magnesium and manganese. On the hardness potential, which will have a zinc alloy in the future, the most affected by the copper, iron and magnesium. So often in foundries apply these alloys, as their technical and physical characteristics, they satisfy the requirements of many industries using zinc alloys in its production process. Let us consider how the impact on the various properties of zinc dopants. Basically casting of zinc alloys - ternary, as dopant materials being copper, aluminum and magnesium. Magnesium alloy composed of zinc contained in the minimum amount and greatly reduces intergranular corrosion. However, it significantly reduces the effect of these impurities on zinc, tin or lead. Elevated levels of the alloying element leads to a significant deterioration of the mechanical properties of the zinc alloy. Adding copper casting alloys of zinc metal strength increases, and also increases the flowability during casting. However, the copper additive significantly reduce the service life of the finished parts, since over time they change in size (increase) due to the aging of the metal. The presence of aluminum, which is often added to a zinc alloy casting, substantially reduces the solubility of iron in smelting. It is the same as copper can increase the strength of the alloy and its fluidity. It should be noted that in addition to the metals listed in the casting of zinc alloys often added manganese, which lowers the impact resistance, and also increases the ductility of the material, and nickel, metal enhancing resistance to steam and hot water.

Zinc alloy TSAM4- 1

Zinc alloy TSAM4-1 - a zinc alloy, aluminum and copper, and the numbers following abbreviations indicate percentage alloying elements contained in the alloy, that is, 4% aluminum, and 1% copper. So what are the main advantages of this zinc alloy presents? The main thing - is the low production cost of the alloy, while retaining the strength characteristics of a wide band and low energy cost due to a low melting temperature. This zinc alloy is widespread in the construction industry, mechanical engineering, used for the manufacture of structural and decorative elements. Its ability to lower corrosion also much appreciated. Another distinguishes this material is that it can be thin-walled and porous in casting. This led him into the automobile industry, where it is made into different parts of assemblies and mechanisms are made radiators and more. Plus, the ease with which the zinc alloy applied on paint, chrome plating, oxidation, and so on. The increased fluidity at casting a chance to get complex shapes. Durability is also an advantage of this material. Do not be amiss to mention that of the zinc alloy products quite well processed by mechanical means, although it rarely happens that the machining did not what to use as a zinc alloy exhibits excellent surface accuracy and forms with the

appropriate casting. Often in the process zinc alloy replaces brass, bronze, cast iron, aluminum alloys. Nowadays, modern production is hard to imagine my life without this versatile material.



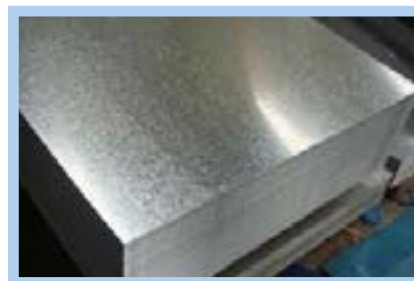
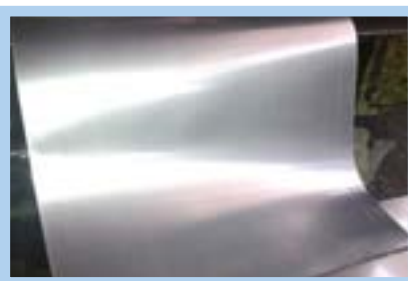
Rolled zinc

Rolled zinc - the common name of the class of zinc products. Machining usually produced by pressure / rental, with the result that is obtained rolled zinc - sheets, wire, zinc ribbon anodes, etc. In our assortment you will find the most diverse Zinc rental. As a consumable material for galvanizing process used zinc anodes. Available brands are TS1 and U0. Zinc is produced this car in accordance with the requirements of GOST 1180, or on the agreed terms of reference. Zinc anodes are plates having a length of 40 centimeters to 2 meters. The width of the plates ranges from 5 to 60 centimeters, and their thickness is about 4 to 20 millimeters. GOST admits slight undulation of ready anodes and uncut edge on both sides.

Our organization has also supplied a rolled zinc as zinc wire of various diameters and

brands. Its use is also due to the unique properties of the metal. Zinc wire often used in zinc coatings applied to metal surfaces spraying method. Made this Zinc rolled zinc grade TS1 by cold deformation. Zinc wire according to GOST should have a circular section with a diameter of 1.5 millimeters to 3.2 millimeters. Precision products can be both normal and elevated. Particular attention when choosing a wire draw on its surface - it should not have impurities, except for traces of grease, as well as cracks, scratches and bundles. If desired, the wire may be coated with a special lubricant preservative.

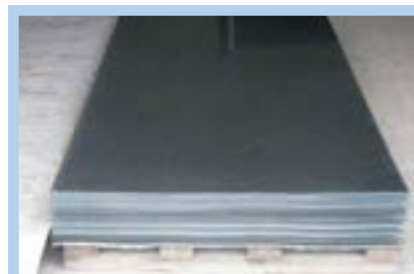
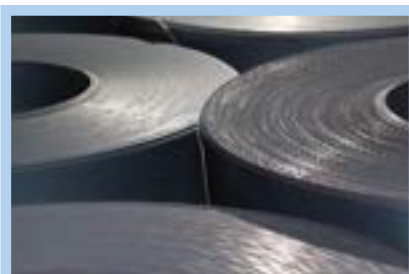
The tape and sheets of zinc, you can also purchase from us. Zinc tape has a wide range of applications - it is used for the production of clichés, special fuses. Zinc sheets are used to create galvanic cells, parts of different instruments in engineering and aviation. You can always order any zinc hire in our company. We practice an individual approach to each of its customers, so ready to make for you any products with the required dimensions and technical specifications.



Zinc sheet

For the production of sheets of zinc GOST 598 uses zinc grades TS1, U2, U0 according to GOST 3640. Zinc sheet is used for electrochemical cells, auto parts and Aviadevice, in the manufacture of anodes and cathodes, as well as a protective material in the heavy industry, because zinc has excellent anti-corrosion properties. Its corrosion resistance is caused by the fact that the interaction with the air flow, zinc plate covered with a layer of oxide or basic carbonate, which protects it from oxidation. This is the main reason, according to which an oxidizing agent after contact with the metal, will not be able to harm him, because the oxide film formed is practically insoluble and does not allow the reaction to develop further. Zinc sheet thickness ranges from 0.15 mm to 6 mm. On the surface sheet of zinc must be free from defects, such as dents, fingerprints, bubbles, and other, what would it could not affect its use for its intended purpose. When testing a zinc sheet passes a visual inspection. It is measured: it is necessary to know the thickness, width, leaf length. When measured using a "blind method", when the sample is selected at random. Further, zinc sheet is tested to determine the chemical composition

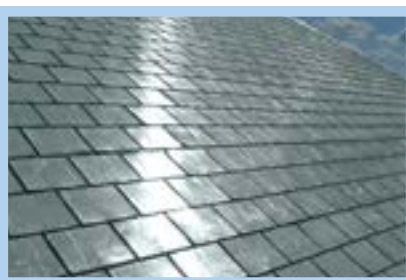
and properties. Chemical control is done through the analysis of samples taken from each selected sheet according to GOST 2423, but it is possible to use other methods to study the composition. If the results in disagreement, for more detailed control study. The sheet transporting no special conditions are required, but you should always choose a covered vehicle. When storing a zinc sheet must be protected from possible mechanical damage on impact, falling, etc., Exposure to moisture or active chemicals.



Seam roof zinc-titanium

One of the best types of roofing sheet or coil metal seam roofing is zinc-titanium. Its advantage is in a connection between the individual elements (pictures) in the rebate. -The System mounts, which does not require through-holes, prevents corrosion, seam roofing zinc-titanium serves up to 100 years. She “bribes” of its economy (compared to copper) and physico-mechanical properties. The material had the following chemical composition: 99.995% zinc, 0,08-0,17% copper, 0.015% aluminum, 0,07-0,12% titanium. Options. Vertical type fold: a double and angular rebate - used for roofs with a slope of 3-25 (35 angular) degrees. Corner double fold greater, and is used on the concave and convex surfaces, the maximum length of the picture -. 16 m length pattern can be up to 20 m, and the angle of inclination of 5 degrees (provided with a latch bracket).. Seamed roof panels are normally delivered with standard dimensions: - sheet thickness of 0.50 to 0.80 mm; - Profile length from 0.4 m to 6.0 m; - Useful width from 216 mm to 543 mm. The base, which put seam roofing zinc-titanium, a wooden board or plywood is not recommended roofing material, etc. insulator, which is based on lime, cement, asphalt,

plaster, oil, including PVC-film. In addition to its durability and ease of installation seam roofing Zinc-titanium is very attractive in appearance. Color with purple shimmer, thanks to the resulting patina over time, is a classic, gray, dark gray. You can resort to an artificial patina, giving the roof was originally a permanent blue-gray color.



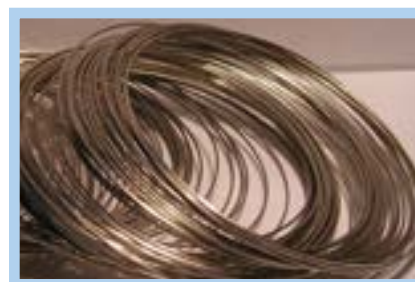
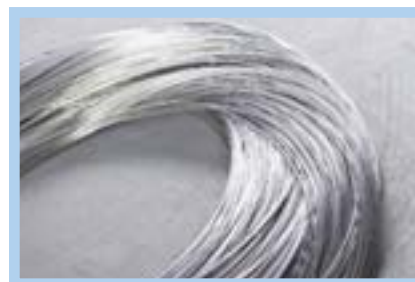
Zinc wire

Zinc wire - one of the many types of rolled zinc. Most often it is used to create the zinc coating sputtering method. Zinc wire is manufactured in accordance with the standards GOST 13073. According to GOST, zinc wire can have a diameter from 1.5 to 3.2 millimeters. When this limit value for the deviation of the wire diameter of from 1.5 to 2.3 mm is 0.06 mm, for the rest, this value cannot exceed 0.08 mm. Made of zinc wire with a circular cross-section, its roundness index cannot exceed the limit value deviation in the transverse diameter. Depending on the degree of manufacturing precision products are divided into normal and increased accuracy. Zinc wire of good quality should have a surface with no chips, scratches, cracks, oxidized portions and bundles. Visitors are allowed in the presence of residual grease surface. If necessary, we can cover languishing special preservative grease. Zinc wire is released batches, each of which consists of a wire of the same diameter and the chemical composition and manufacturing precision. At the party issued a document containing information about the manufacturer, batch weight, a wire and a party room.

Wire Zinc TS1

Wire Zinc TS1 is a type of rolled zinc in our range. It is made of zinc labeled TS1. The zinc content is at least 99.5%. The remainder of the alloy - it impurities such as iron, copper, lead and cadmium. Use wire zinc TS1 often zinc coating various surfaces, usually of metal, spraying. The diameter of the wire varies from 1.5 to 3.2 millimeter tenths. Made TS1 wire in accordance with the requirements of GOST 13073-77 by cold deformation. Wire Zinc TS1 according to the standards the industry, should not have surface defects such as cracks, delamination, scratches or traces of oxidation. It comes the view rolled zinc

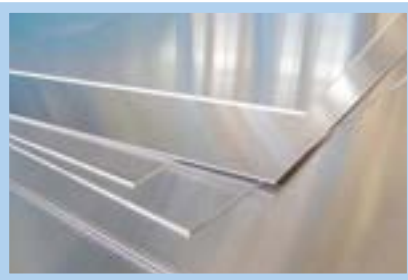
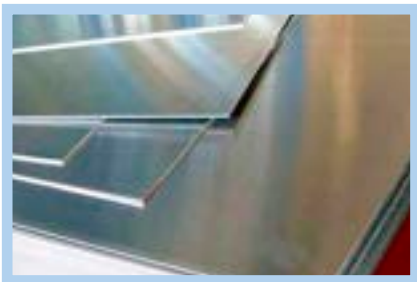
parties, and they are collected in the coils, and then bind to the bay. From each batch are selected by two bundles of which take part in consequence of a wire for chemical analysis. External quality control is subjected to each of the coils of wire, without using magnifying devices. Wire Zinc TS1 must have a circular cross section. GOST allow small deviations in diameter, however, to products with diameters of two and a half and three millimeters of their minimum value. This wire increased manufacturing precision. With regard to transportation and storage, then they are not facing any special requirements. Wire Zinc TS1 is safe in storage and use, virtually the only condition for its storage is not an assumption contact with skeins of precipitation. Transporting zinc wire TS1 can any covered transport.



Zinc plate

Tape Zinc and Zinc plate (including for electroplating) are a type of rolled zinc, which we supply. Zinc plate is made in accordance with the terms of reference agreed with the customer, using the zinc grades U0, TS1S and TS1. The chemical composition of

each of these marks is set to GOST 3640. metal zinc plate should have a smooth surface free of impurities that could hinder visual inspection. The presence of chips, cracks or stratification marker of poor quality products. The most common zinc plates supplied by us, have a thickness of 4 to 20 millimeters. Zinc plate made by your specifications, will reduce the cost of special equipment for metal processing. It can be used as an anode for electroplating or for further machining. Excellent quality plates and fine grain structure is provided by a modern rolling mill and continuous quality control. The anode plate rolled zinc electroplating allows the inclusion of reverse current that using anodes cast zinc leads to their destruction and precipitation of, and hence pollution of the working environment. Rolled zinc plate will reduce energy costs. Our company will produce for you plates and zinc plates of different thicknesses in the shortest possible time, at the same time you will be pleased and high quality products and reasonable price.



Zinc ingots

Zinc ingot is a specific form of the metal, is a raw material, which is produced from various types of metal products and the destination. The shape of the ingot is chosen for optimum packaging and use in further processing. Zinc is one of the most used non-ferrous metals, the total consumption of zinc ingots is 4-5% of the metal. Chushka zinc GOST 3640 is the following brands: U0, TS0A, TS1, TS1S, U2, TS2S, w3, TS3S, CV, TSV0, TSV00. Weight ingots GOST installed and is about 25 kg. This provision applies to all brands except TSV00, zinc ingot brand TSV00 can be produced with a weight of 5 kg and 10 kg. Each zinc brand distinguished by the color of the paint, which is marked by:

W3 - Brown

U2 - Red

TS1 - Green

U0 - White

CV - Yellow

TSV0 - blue Most of the pig goes on the zinc galvanizing for corrosion protection and production of zinc alloys. Basic zinc alloys are melted with the addition of aluminum and copper - CAM. The additive alloy may be present 0.1% magnesium. This is done in order to increase the corrosion resistance and stability of molded parts in size. In parts of zinc alloys can be applied for even greater stability solo chromium, nickel and others.

Zinc TS0A

Metal products and designs have always been in demand in various types of production. Its main property has played a crucial role in this. Insufficient resistance of steel to corrosion can be corrected by galvanizing, coating on the surface of metal parts zinc layer. One of the most common brands of zinc is zinc TS0A. It is used for the manufacture of zinc sheets, tapes, protectors to protect against corrosion. Zinc TS0A successfully used for galvanizing metal products by hot-dip galvanizing. Zinc TS0A has the following chemical composition in percent by GOST 3640:

Zn	99.98
Impurities	0.02
Al	0.005
As	0.0005
Sn	0.001
Cu	0.001
Fe	0.003
Cd	0.003
Pb	0.01

Also TS0A zinc is used as a material for anodes for electroplating. Zinc coating layer, in this

case, the surface of the product occurs from the conductive surface by electrodeposition. After the solution was heated electrolyte an electric current, whereby the zinc is uniformly deposited on the surface of the article. Galvanic galvanizing method allows you to receive coverage of 20-30 microns thick. The treated parts are not only protected from corrosion, but also more durable. This galvanizing is one of the efficient and reliable forms of protection of metal structures against corrosion. Zinc is a widely used metal, it is used in the manufacture of devices for automobiles, ships, aircraft. It is irreplaceable in the production of zinc alloy, needed for the production of zinc powder, zinc oxide.

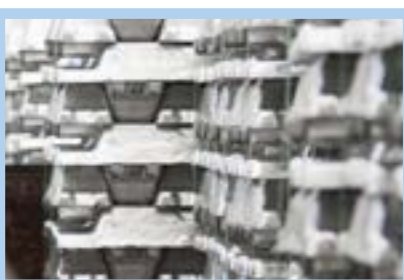
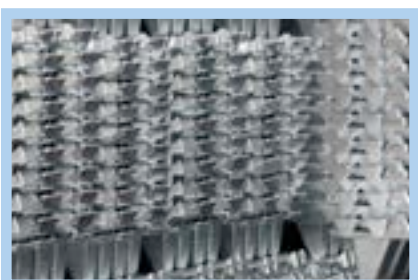
Zinc ingots TSV00

Zinc ingots are used in a variety of industries, it comes with different degrees of purity - of different brands. Each brand has its own designation in accordance with GOST 3640.

Among metal products supplied by us has a zinc ingots TSV00 brand, which has the following chemical composition:

Zn	99.997
Impurities	0.003
Al	0.00001
As	0.0005
Sn	0.00001
Cu	0.00001
Fe	0.00001
Cd	0.002
Pb	0.00001

Zinc ingots is a raw material for the production of zinc alloys and products made of zinc: -zinc anodes; zinc tape; -zinc wire. -zinc sheets. Zinc ingots labeled CV goes in pigs approximately 25 kg, except for the brand TSV00, the weight distribution of 5 or 10 kg. It is necessary to pay attention to the customer that zinc ingots GOST 3640 may be made of the weight which the customer requires, if it is specified in advance. Zinc in pigs has optimum for packages in the form of folding on pigs have grooves to separate them apart. When viewed from the appearance of the zinc ingots, should pay attention to the fact that there are no visible inclusions of slag. There should not be unknown alien inclusions and fracture of pigs. Supporting documents for zinc ingots should include heat number, the results of the chemical analyzes produced. At the ends of each ingots deposited multicolored stripes that represent the brand of metal. Deliver zinc ingots in all modes of transport, which is suitable for the carriage of this cargo. Store packed in closed rooms, and guard against contact with pigs of different chemicals and other types of pollution. Zinc ingots may be stored up to 15 years from date of manufacture. After this period, the products must be checked for suitability and compliance with quality standards.





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