

Technology of Mechanical Processing of Materials

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Annotation: This article describes the technology of mechanical processing of materials. Flattening and milling of materials are similar processes, which means one- and two-sided processing of materials. Various tools and equipment are used in the mechanical processing of wood materials. They are used to cut, flatten, engrave and perform other technical processes. When processing wood materials, the flatness of the surfaces depends on what tools are used to make them.

Key words and phrases: wood, sinch, arch, tow masts, tower bridges, suspension bridges, gables, domed molds, silos.

Monolithic wooden beams differ from other beams by low labor costs, ease of manufacture, low cost. The disadvantage is that its length is limited. Therefore, the arch spacing of this type of beams is small and is widely used as a variety of beams.

Nowadays, effective glued board beams are widely used in timber-framed buildings, and they have geometric shapes.

Glued beams can be of any size and geometric shapes. For this reason, this type of beam is widely used in the Commonwealth countries in buildings with a porch spacing of up to 24 meters, and in world practice up to 30 meters.

One of the main advantages of glued beams is that, as mentioned above, it is possible to place different types of wood materials on the cutting surfaces.

Types of special wooden devices include towing masts, tower bridges, suspension bridges, gables, domed molds.

Tow masts serve as a base for communication and electrical networks, towers serve as various towers, lighting and surveillance towers for radio and television networks. While silos are used as mineral fertilizers and fodder storage structures for livestock, aerated and domed molds are widely used in the manufacture and construction of reinforced concrete, stone and brick structures. The height of the tow masts can be 90 m and higher.

They can consist of one or more elements. The diameter of the mast body is 30 cm. up to 12 m in length. The circle is made of cut wood. It uses steel ropes as traction. The drawers are attached to the anchor elements with special compensators (screws) and because they have several structural knots, the use of modern glued metal rod joints in attaching the corners provides great economic efficiency.

Wooden bridges are a widely used girder multi-arched structure. Bridges up to 60 m long are used on highways, while multi-arch bridges are widely used on railways.

The use of wooden bridges, especially in wood-rich areas, provides great economic benefits. One of the main drawbacks is that it rots under the influence of constant humidity and atmosphere. If their surface is treated with various chemicals and greasy antiseptics, the service life will be up to 50 years.

The main elements of the bridges are the beams and supports, which receive the loads arising from traffic.

There are bridges that run in the middle, below, and above, depending on the direction of the moving base.

Depending on the type of main load-bearing elements, they can be beamed, trussed, glued girder, arch-shaped, mixed, girder (girder).

The wooden towers are monolithic, lattice-like, and lattice-like in appearance. It also varies depending on the appearance of the grilles. The supports of bridges are often made of reinforced concrete,

concrete piles (piles). If the base elements are also made of wood impregnated with antiseptics, they are called solid wood bridges.

Wooden aisles and domes are temporary structures, consisting of a column and a platform, on which wooden planks are placed. The wooden domed molds consist of a wooden deck, sideboards, and a base.

As mentioned above, the use of wooden structures allows to reduce the cost of construction of special and structures in forest-rich areas.

The bars of the towers are made of round wood, beams, half-timbers and thick planks. The column of the towers is made by connecting one or more timbers according to the standard length of the timber. Concrete or reinforced concrete foundations are used as a base.

Silos are cylindrical and rectangular in shape and are widely used to store feed and mineral fertilizers for agriculture. The walls will be made of wooden siding and two-sided cladding.

One or two layers of moisture-proof material are attached between the covers, and heat and cold-resistant materials are attached to the outside.

The height of glued plywood silos is 10 m. It is made of individual elements with dimensions of 3x3 m. The height of such individual elements is 1.2 m. The most responsible part of silos is their connecting part.

Various tools and equipment are used in the mechanical processing of wood materials. They are used to cut, flatten, engrave and perform other technical processes.

Frame, disc and belt saws are used to cut materials. The basis of frame saws are saws made of steel with a thickness of 1.8 ... 2.2 mm. Round saws consist of steel disks with a thickness of 1 ... 5.5 mm and a diameter of 200 ... 1250 mm and are used for longitudinal and transverse cutting of materials. Belt saws, on the other hand, consist of a belt provided with continuous cutting teeth and are widely used in cutting materials.

To reduce the friction of the saws with the material being cut when cutting materials, the tips of the teeth are tilted to the sides at the following values, and these values vary on different saws. For example, this value is 0.7 mm for frame saws, 0.3 ... 0.6 mm for disc saws, and 0.2 for belt saws. ...0.35 mm.

Depending on the number of saws, there are 2 types of rotary saw machines. For example, TsDK 4-3 (1 saw), TsDK -5 and TsMR -1 (2 and 3 saws).

Flattening and milling of materials are similar processes, which means one- and two-sided processing of materials. The teeth of the milling cutter are shaped differently to give the elements a different look.

The basis of leveling tools is blades with a thickness of 8 ... 12 mm (thick) and 2.5 ... 5 (thin). The length of the blades is 100 ... 1800 mm. In some cases, leveling is done in 2 and 4 directions, for example using the S16-5P device. The blade of the milling cutters is variable and is attached to special circular elements.

To connect small-sized board materials along the length and side edges is carried out using 4-spindle tooth-cutting machines, and for this purpose machines such as SHO-151-5, SHD-10-3, ShD-15-3 are used. The rotation speed of the tool is 3500 ... 5700 times per minute.

SV-12 and other types of machines are used to drill materials. The speed of rotation of the spindle is 3000 ... 10000 times per minute.

Disk electric saws IE-5106, IE-51025 are used for manual mechanical processing of elements. Machines such as SO-40A, SO-97 are used for leveling parquet floors.

In addition, hand tools include electric saws, electric cutters, punching tools, and tools needed for attachment.

When processing wood materials, the flatness of the surfaces depends on what tools are used to make them. According to the norm, this figure is 500 ... 2500 μm when cutting with a frame saw, 130 ... 500 μm when cutting with a band saw, 150 ... 750 μm when cutting with a circular saw, 25 ... 130 μm when leveling, milling while 30 ... 200 μm . Therefore, the plane of the surfaces is divided into 12 classes according to the norm.

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