

HISTORICAL ROOTS OF URBAN GARDENING OF STREETS AND SQUARES

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Annotation: In modern roof constructions, metal two- or three-layer panels with foam insulation are used. The panels consist of one or two profiled metal sheets made of thin galvanized steel or aluminum alloys, insulation and a waterproofing or protective and decorative coating.

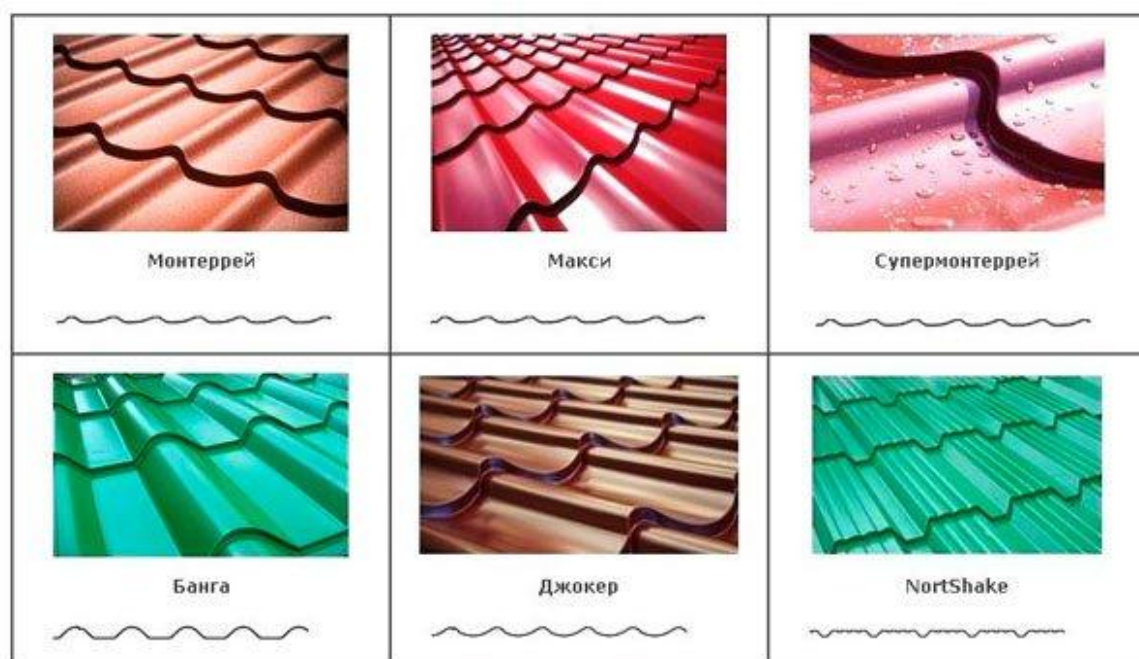
Keywords: Roofing sheet steel, gutters, metal tiles, metal two- or three-layer panels.

Roofing sheet steel is the main material for metal roofing. Sheets of roofing steel are fastened by bending the edges into folds: along the slope - standing, across the slope and in the valleys - recumbent to ensure unhindered water flow.

The metal roof is attached to the crate with klyalshers - narrow strips of roofing steel, which are nailed to the crate at one end and passed into the rebate with the other. After 700 mm, T-shaped steel crutches are nailed to the crate, to which the roof overhang is attached and bent over, forming a drip.

Gutters bring water to downpipes. Currently, steel roofs are used in individual construction. Their disadvantages are high metal consumption and high operating costs due to the need for regular painting.

The most popular, today, roofing material is a metal tile. They have proven themselves not only with high resistance to the temperature regimes of our climate, but also with a combination of reliability and durability of steel with an attractive appearance that imitates a roof made of natural tiles. (*Rice. 1.*)



Rice. 1. Metal sheet. Advantages of a metal tile:

- **durability** - the estimated service life of a metal tile reaches 50 years;
- **versatility** - can be used to create all types of roofs, with the exception of roofs with a slope angle of less than 14 degrees;
- due to the large number of coatings, metal tiles can be used in a wide temperature range, it can withstand both 50 degree frosts and scorching sun rays that can heat the roof surface up to 70 degrees;
- resistance to any kind of natural aggressive environments, such as rain, ultraviolet radiation, hail;
- **an unlimited area of use** - from covering private housing constructions in the city and outside the city, to the construction of apartment buildings and high-rise industrial buildings;
- **low specific gravity of the roof** - depending on the cross-section of the profile and other factors, the mass of 1 m² of a metal tile is approximately 4-5 kg;
- **short time and ease of installation** - a team consisting of only two workers is able to cover a roof with an area of 100 m² per shift;
- attractive appearance, almost completely imitating classical tiles;
- **a wide color palette in which metal tiles are made**, colors and shades are successfully combined with other building elements;
- **acceptable cost** – the price is fully consistent with high performance, available for the implementation of any, even the most budget projects.

A roof made of metal tiles can have a very complex shape, thanks to the great possibilities that this material gives. At the moment, about 70% of all roofs are equipped with metal roofing, which allows us to call it the leader among all roofing materials (Fig. 2).

In modern roof constructions, metal two- or three-layer panels with foam insulation are used. The panels consist of one or two profiled metal sheets made of thin galvanized steel or aluminum alloys, insulation and a waterproofing or protective and decorative coating.

Clay tiles are used in low-rise housing construction. Tiles are fire-resistant, but brittle and heavy material, and also, it requires a large roof slope (at least 50%) for water to drain.

Wood roofing materials are economical, simple, but have significant drawbacks: flammability and decay, so they are impregnated with fire retardant and anti-rotten compositions. Wood roofing materials are mainly used in the construction of temporary buildings.

Roof tiles are made from spruce, pine, fir, cedar, aspen wood; their length is 400-600 mm, width is not less than 70 mm, thickness is from 3 to 13 mm at the ends.

Shingles - wedge-shaped rectangular boards 500-700 mm long, 70-120 mm wide, 3-15 mm thick, with a groove along the thick edge at the ends. Shingles are made from wood of pine, spruce, fir, cedar, aspen.

Roof shingles - single-layer strips of coniferous and soft hardwood, cut along the fibers, 400-1000 mm long, 90-130 mm wide, 3-5 mm thick.

Roof shavings - chips, short cuts of softwood and soft hardwood; length 400, 450, 500 mm, width 70–120 mm, thickness 3 mm.

Roll roofing materials based on roofing paper impregnated with bituminous (glassine, roofing material, hydroisol) or tar (roofing felt) substances with surface treatment are produced in the form of rolls 10–30 m long of various widths.



Rice. 2. Metal roofing

Roll roofing materials based on roofing paper impregnated with bituminous (glassine, roofing material, hydroisol) or tar (roofing felt) substances with surface treatment are produced in the form of rolls 10–30 m long of various widths.

From glassine, the lower layers of the roofing carpet are made from roofing materials. Ruberoid is divided into roofing and lining, with coarse and fine-grained dressing. A ruberoid roof is laid on a wooden or concrete base, on which a cement or asphalt leveling layer (screed) is laid.

Two-layer roofs are made with a slope of more than 15° , three-layer ones are made with a slope of $5\text{--}2.5^\circ$; 4-5-layer roofing can have a zero slope. A wooden base for a ruberoid carpet - a solid flooring of bars 16-19 mm thick, 50-70 mm wide, laid at an angle of 45° to the working boardwalk.

Hydroisol (non-covering waterproofing material) is used for the underground part of buildings, for waterproofing flat roofs.

Tar roofing roll materials with sand and coarse-grained dressing are designed for the upper and lower layers of the roofing carpet.

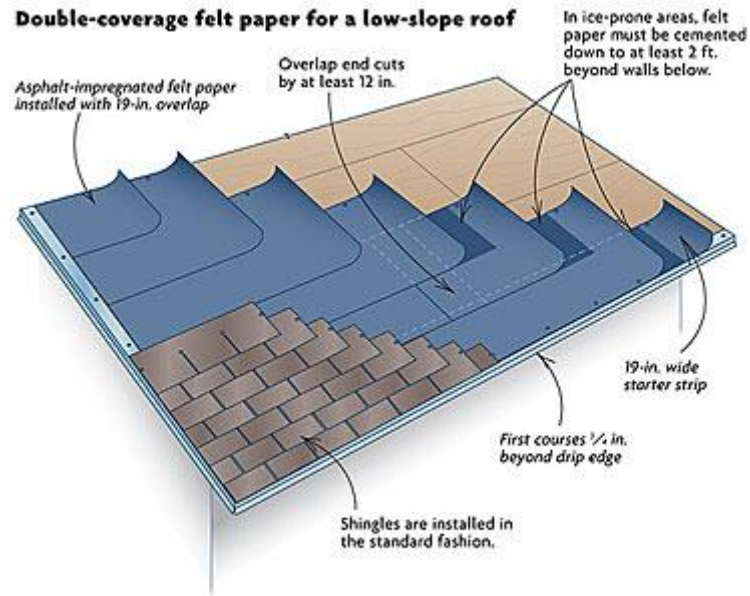
In addition to rolled roofing materials based on cardboard, there are materials on a non-rotting basis, such as glass-ruberoid, metal-isol, foil-isol, fiberglass, hydroglass-isol, etc. Roofing glass-roofing material is intended for the top layer of the roofing carpet, pasting waterproofing, and the installation of the lower layers of the roofing carpet. Hydrostekloizol is used for flat roofs of public and industrial buildings.

Mastic roofing materials (bitumen, bitumen-rubber, polymer, etc.) are divided into hot and cold according to the method of use. Roofing hot mastics are used for gluing rolled materials, and cold ones are used for roofing from rolled materials.

Recently, Katepal (ruflex) bituminous soft roofing, a flexible tile based on fiberglass, has gained popularity among builders and architects in most countries of the world. Katepal is a universal roof covering for pitched roofs.

The basis of soft tiles Katepal is non-woven fiberglass, the top layer consists of colored stone granules, the bottom - made of high quality self-adhesive modified bitumen (Fig. 3).

Katepal roofing provides a high level of heat resistance, frost resistance, strength and is unique due to the possibility of application in various climatic zones. The soft roof is silent, it isolates all the sounds and noises that come from the street.



Rice. 3. Structure of shingles

The soft tile perfectly resists such atmospheric phenomena as a rain, a hail, a strong wind. This roof is not subject to corrosion and biological destruction, does not rot. The top layer of shingles consists of colored slate dressing, which perfectly protects the roof from ultraviolet radiation, and also gives strength from mechanical damage.

Katepal roof tiles can be used for absolutely different types of roofs, even in the most difficult to reach places - due to the fact that this material is very flexible when working with it. When carrying out installation work, it does not require special tools when installing.

In addition, the uniqueness of this flexible tile can also be indicated by the fact that, thanks to its self-adhesive rubber-bitumen mass, it ensures complete tightness of the joint.

This material can be dyed in any color and for this, a two-color technology is used, which gives the material a special attractive appearance, as well as volume.

The color palette of the material has only saturated colors, among which red, forest green, brown-red can be distinguished.

Today, in construction practice, Bardolin roofing is often used - bituminous tiles, the central layer of which is elastic fiberglass. Bardolin is impregnated on both sides with bitumen, the top layer has mineral dressing, the bottom layer is silicon sand.

Bituminous tiles are manufactured in accordance with the European standard EN 544, it is a workable, resilient, crack-resistant, heat- and frost-resistant, water-resistant, durable roofing material made with fiberglass reinforcement with bituminous oxide and various colors of granular coating. Differs in ease – average weight of 10 kg/sq.m. Attractive and aesthetic varieties of colors and small size. With a roof slope of more than 30% or more, the Bar-dolin coating is attached to the wooden roof base (batten) with special nails.

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