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ESTIMATION OF TREATMENT EFFICIENCY OF NATURAL CLADDING STONE SURFACES BY MECHANICAL AND CHEMICAL METHODS

The advance of science does not stand still. Its pre-conditions are related to the growth of consumer requirements to the products. So, the new methods of treatment of natural cladding stone appear in the stone processing industry. The influence of chemical and mechanical treatment of natural cladding stone on its lightness and brilliance was studied on the example of Pokostivsky granodiorite, and also the problem of management of natural stone lightness was solved. The mechanical methods of treatment of natural stone were fully investigated, namely, the forming of microstructure of rockforming minerals was investigated by means of microscopy and spectral analysis. Depending on the roughness of the stone surface, the change of brilliance of its surface was studied. In relation to chemical treatment, the influence of different coloured pigments on brilliance and colors of carbonate rocks (marble, limestone) was studied. **The aim of the work** is an estimation of treatment efficiency of natural cladding stone by mechanical and chemical methods. **The tasks** are: 1) to define the indexes of surface brilliance of natural cladding stone treated by mechanical and chemical methods; 2) to define the indexes of surface lightness of natural cladding stone treated by mechanical and chemical methods; 3) to define the indexes of surface saturation of natural cladding stone treated by mechanical and chemical methods. **35 samples** from the following types of natural cladding stone (5 samples of each of 7 types of stone) were used: Pokostivsky granodiorite, Bukivsky gabbro, Golovynsky labradorite, Mezhyritsky granite, Kapustynsky granite, Zhadkivsky granite, Leznikivsky granite. A flat-grinding machine was used for their **mechanical** treatment. For **chemical** treatment of the surface of natural cladding stone were used the following impregnating means: 1. means for the impregnation of Tenax Easywet, on the basis of varnish, that gives the effect of wet stone to the surface and is used for treatment of surface of all types of natural stone for protecting from moisture, oil, fat and for color strengthening; 2. transparent crystallizer - Kristalizer, on the basis of solution of silicates with a beeswax that is used for the improvement of brilliance and chromaticity of all types of stone; 3. black crystallizer - Gabbro+ for products from the natural stone such as: granite, gabbro, labradorite. This means deeply penetrates and closes pores, microcracks, protecting a stone from destruction. It strengthens and satiates the color of stone and gives it a delicate brilliance; 4. red crystallizer - Leznik, on the basis of solution of silicates with red pigments for products from a natural stone (red tints). **The method of estimation of treatment efficiency of the surface of natural cladding stone by mechanical and chemical methods** involves the use of digital images of samples and implementation of their treatment by the facilities of the modern computing engineering. The methodology of determination of **colors of natural cladding stone** is as follows: 1) the samples of stone with sizes 10×20cm are taken; 2) the samples are cleaned and their surfaces are scanned; 3) the received image is worked over; the middle indexes of lightness (L) and colour

coordinates are determined; 4) the indexes of saturation of S are determined by converting of the received average color coordinates. The methodology of **determination of surface brilliance** of stone involves the use of measuring means (glossmeter). The methodology of determination of surface brilliance of natural cladding stone is as follows: 1) the samples are cleaned from dust, dirt and other substances; 2) the device is calibrated according to the standard; 3) brilliance is measured in 6 different points of the sample; 4) average brilliance indicators of the stone surface are determined for each sample. **To estimate the treatment efficiency of the surfaces of natural cladding stone by mechanical and chemical methods**, it is necessary at first to define the average brilliance of its surface. After determining the brilliance of polished and sawn samples of stones, the chemical impregnating means are used between the process of impregnation and the process of reading of indicators. The diagram of the **polished surface** of natural stone shows that at the chemical treatment on the different types of natural stone brilliance increases. The diagram of the **sawn surface** of natural stone shows that at the chemical treatment on the different types of natural stone brilliance increases. An important constituent at the determination of decorativeness of natural cladding stone is objective determination of its color descriptions. A color is characterized according to next basic signs: by color tone, saturation and brightness. Having studied a sawn surface we obtained the following data: sawn samples have greater brightness than the polished samples at mechanical treatment, and at chemical - saturation and brightness of the treated surface of natural cladding stone change considerably. As a result of the study, it is possible to draw a conclusion, that each of the chemical impregnating means influences differently on the decorative indexes of the surface of natural cladding stone. They increase brilliance, darken the stone, they can both improve and worsen its saturation. Depending on the type of the used means, the saturation of the stone both increased and decreased. Efficiency of their use depends on mineralogical composition of natural stone.