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ABOUT THE USE OF WOLLASTONITE AGGREGATE CONCRETE

Annotation: *Wollastonite-based concretes have a high resistance to bending and elongation. Such strong concrete can be used to produce concrete and reinforced concrete structures, which can withstand the dry and hot climates of the Republic.*

Keywords: *polymer concrete, glass plastics, silicate materials, light and ultra-light concrete, high strength*

In recent years, the country's building materials industry has been producing high-tech polymer materials and polymer concrete, glass plastics, silicate materials, light and ultra-light concrete, high-strength concrete and reinforced concrete products. One of the new raw materials widely used in the construction industry today is wollastonite. It is used in the construction industry for ceramics, various paints, pigments, asbestos cement products, in the cement industry, etc. widely used. Scientists have shown that wollastonite raw materials can be used as fine and coarse aggregates for concrete (mainly Wlastonite wastes used in ceramics and other manufacturing industries). Its reserves are widespread in the Central Asian region, including dozens of deposits in the country.

The color of wollastonite is gray, white, or reddish-white, sometimes reddish. There is also a colorless, completely transparent version. The luster shines like glass on the surface of the bonding plane.

It is known that wollastonite can be used as a mineral additive in cement production and as a coarse and fine filler in concrete. Wallastonite talc added to cement clinker as a mineral additive significantly improves its physical and mechanical properties. That is, such cements are less deformable, resistant to external influences, cold-resistant and other properties. High-strength concrete can also be obtained by using fractionated wollastonite sand and gravel as aggregates for concrete. Because materials made of wollastonite masses have a needle-like (woolly) structure, they dry quickly and achieve a very high bond strength with other components (cement, sand, etc.). Also, the volume of wollastonite is almost rigid and has a number of properties such as heat and cold resistance. Cement consumption in wollastonite concrete is significantly reduced when obtaining concrete with the same strength. That, in turn, leads to economic savings.

Wollastonite-based concretes have a high resistance to bending and elongation. Such strong concretes can be used to produce concrete and reinforced concrete structures that can withstand the dry and hot climates of the Republic. The raw material for wollastonite concretes is not imported from separate deposits, using a secondary raw material - wollastonite, which is removed as industrial waste.

The chemical formula of pure wollastonite is CaSiO3 = Ca3 [SiO3O2] (calcium silicate), which contains 48.3% SaO and 51.7% SiO2. It also contains up to 9% of other minerals (iron, sodium, magnesium, alumina and other compounds). Due to the fact that the composition has such a needle-like structure of individual chains, wollastonite crystals do not lose their needle-like structure even when crushed. The high strength of quartz crystals ensures the hardness of this mineral.

The raw material of wollastonite is mainly formed in hardened limestones or in the form of crystalline calcium garnets, gibboroids and bonds of feldspar, dioxide, vesuvian or as a separate mass in igneous rocks.

Wollastonite is mainly used as a micro-reinforcing filler due to its needle-like structure. There are varieties of wollastonite fibers used for industry with an average length of 200 to 20 microns. Its microinjection structure is shown in Figure 1.

One of the main reasons why wollastonite raw material is used as a mineral filler is its needle-like (fibrous) structure in natural crystals, which does not change even when crushed to the final product (raw material). The main indicator of anisotropic particles of wollastonite is the ratio of long fibers to the width of these fibers.

Figure 1. Microignacious structure of wollastonite (magnified 1700 times).

It is known that in the industry of production of concrete and reinforced concrete products, as well as in the performance of individual concrete works, improving their quality, ensuring long-term and resistance to aggressive environments, relative savings in cement consumption is one of the current problems.

Vollastonite the structure of the raw material is a very strong bonded polymer silicate. This connection is usually very difficult to break. Much better results can be obtained by autoclaving (high steam temperature and pressure) to use wollastonite as a binding mineral. In the cement industry, various active mineral additives are allowed to be added. In many cases, because of the high cost of

such additives, the cost of cement increases. The inclusion of wolstonite as a mineral additive in cement improves its construction and technical properties. These include the production of high-strength and durable concrete and reinforced concrete structures, the production of lightweight concrete; it is possible to drastically reduce the consumption of cement and other materials, as well as reduce the overall cost of construction work.

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