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Flexibility Indicator of "Hydroizol-K" Waterproofing Material

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Abstract:

On the basis of an alternative construction bitumen, the flexibility of the wrapped Hydroisol-K material was determined. “As the thickness of the hydroisol-K” material increases, its elasticity has improved. When the thickness of the hydroisol-K sample is 3 mm, its flexibility temperature is -10.5 oS, when its thickness is 5 mm, its flexibility temperature is -13.5 oS, and when its thickness is 10 mm, its flexibility temperature is -9 oS, and it is standard It has been proven that hydrostecloisol, which meets the requirements, differs from the waterproofing material by -4 oS and has a negative indicator of -6 oS from the Filiizol waterproofing material.

Keywords: Waterproofing, flexibility temperature, construction bitumen, wrapping material, waterproofing material.

Introduction. It is known that decrees and decisions on the further development of the construction industry and the construction materials production complex in the Republic, ensuring the construction of affordable housing for the population in the regions, and reducing the supply and demand imbalance in the housing construction market were considered [1].

By April 2022, a draft of the Presidential Decree will be developed on the wide introduction of renewable energy sources and improvement of energy efficiency in housing and communal economy, social sector facilities and other sectors [2].

“In the construction of housing, social and commercial facilities built within the framework of the state programs of New Uzbekistan massifs”, devices producing electricity and thermal energy from renewable energy sources are widely used. Model projects on the introduction of renewable energy sources will be developed in the facilities of the private sector, social sphere and local government bodies.

Operational, technological and economic factors are taken into account when installing waterproofing, the main of which are: the permissible level of wetting of winding structures (Construction norms and rules); crack resistance of the insulated structure (Construction norms and rules); capillary rise height of water depending on soil density; value of hydrostatic pressure; mechanical effect on waterproofing (compression from the mass of superstructures, soil sprinkling and underground water pressure, stretching depending on the relative displacement of mobile structural elements, soil, foundation, foundation, surface construction baseline, etc. sinks); the effect of aggressive environments on waterproofing (Construction norms and rules); temperature effect on waterproofing (maximum permissible temperature depending on the type and material of waterproofing during operation); natural effects (sun radiation, ice, waves, biological pests, sediments: rain, hail, snow, etc.); work production conditions (possibility of complex mechanization, possibility of using waterproofing coating on wet bases, possibility of winter operation), lack of materials and waterproofing cost; seismicity of the construction site; special properties of soil and bases: sedimentary, sprinkler, swelling, water-saturated, biogenic, eluvial, saline soils and foundations of structures [3, 4].

Research methods. The material's ductility was implemented in two samples with dimensions (150±1)x(20±1) mm using the following test instruments [5, 6]:

- a refrigerator that ensures the creation of a certain temperature;
- a test bruce made of solid wood, plastic or other materials with low thermal conductivity, with a radius of round on one side (Fig. 2.10). The radius must be specified in standards or specifications for a particular material. Brus thickness 2R;
- A thermometer with a divisibility value of 1 or 2 °S according to GOST 2823-73;
- A second counter with a division value of 0.2 s according to GOST 5072-79;
- Metal gauge on GOST 427-75;
- cooling mixture;
- water tank;
- cotton cloth or filter paper.

Before testing at a positive temperature, the samples are placed in a container of water, the temperature of which must correspond to the standards or technical conditions for the material being tested, and it is stored in it for (10±0.5) minutes. When tested at 273 K (0 °C), samples are placed in ice water, if eaten at negative temperatures - in the refrigerator or cooling mixture and stored for (20±0.5) minutes. The composition of the cooling mixture is indicated in standards or specifications for a specific material [7, 8].

Testing. After the specified time has passed, the sample is removed from the test medium and applied to the flat surface of the beam with the bottom side, so that about 0.25 of the sample length rests on it. The free end of the sample is tilted (5±1) s until another flat surface occurs around the rounded part of the beam (the sample takes the form of V).

The surface of the curved sample is dried with a cotton cloth or filter paper and the appearance is checked. The time from the moment the sample is taken from the test environment to the end of the test should not exceed 15 s.

Research results and discussion. The flexibility of hydroisol-K waterproofing material was studied and the obtained results were found to be good.

If cracks and bumps do not appear on the surface of the material during the testing of the waterproofing material, then the waterproofing material meets the standard requirements and the obtained results were included in Table 1.

Table 1 Test results of waterproofing material samples

Indicator name	Tajribalar			Requirements for waterproofing material	
	The thickness of the 1st sample is 3mm	The thickness of the 2nd sample is 5mm	The thickness of the 3rd sample is 10mm	Hydrostec-loisol TSh 400-1-51-83	Filizol TSh 400-1-409-5-92
1	2	3	4	6	7
Flexibility, the radius of rotation of the brus at temperature is 20 mm, oS	-10,5	-13,5	-9	-5	-15

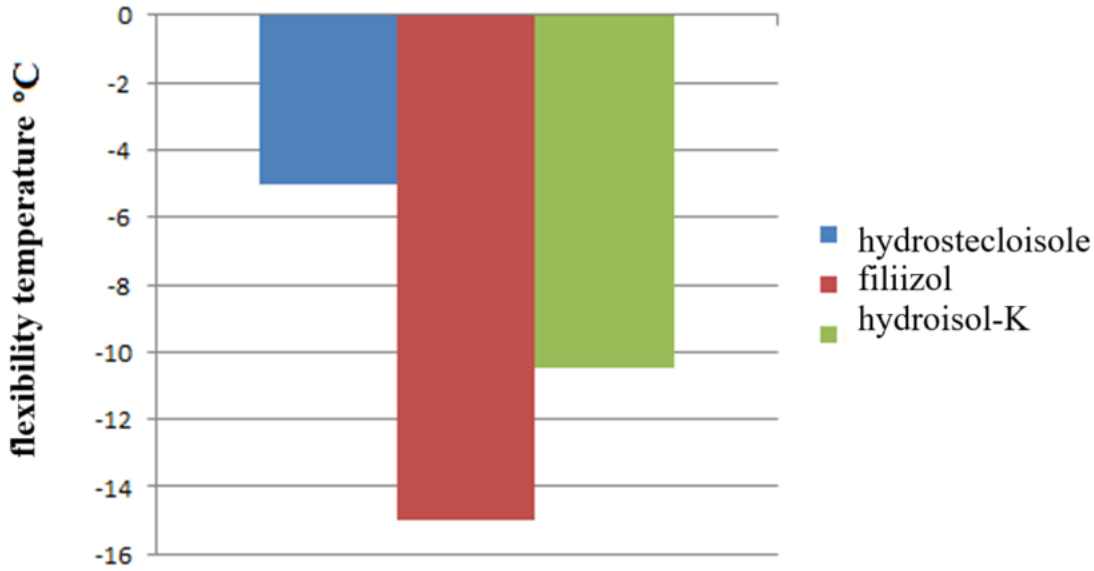

Figure 1. Flexibility temperature compared to the standard requirements of a sample with a thickness of 3 mm

Based on the test results of hydroisol-K waterproofing material samples presented in Table 1, graphs of dependence on flexibility temperature and sample thickness were made (Figures 1-2).

As can be seen in Figure 1, when the thickness of the Hydroisol-K sample taken by us is 3mm, its flexibility temperature is -10.5 ºC and it is -5.5 ºC difference from the hydrostecloisol waterproofing

material that meets the standard requirements, but from the Filiizol waterproofing material it was proved that it has a negative indicator [9].

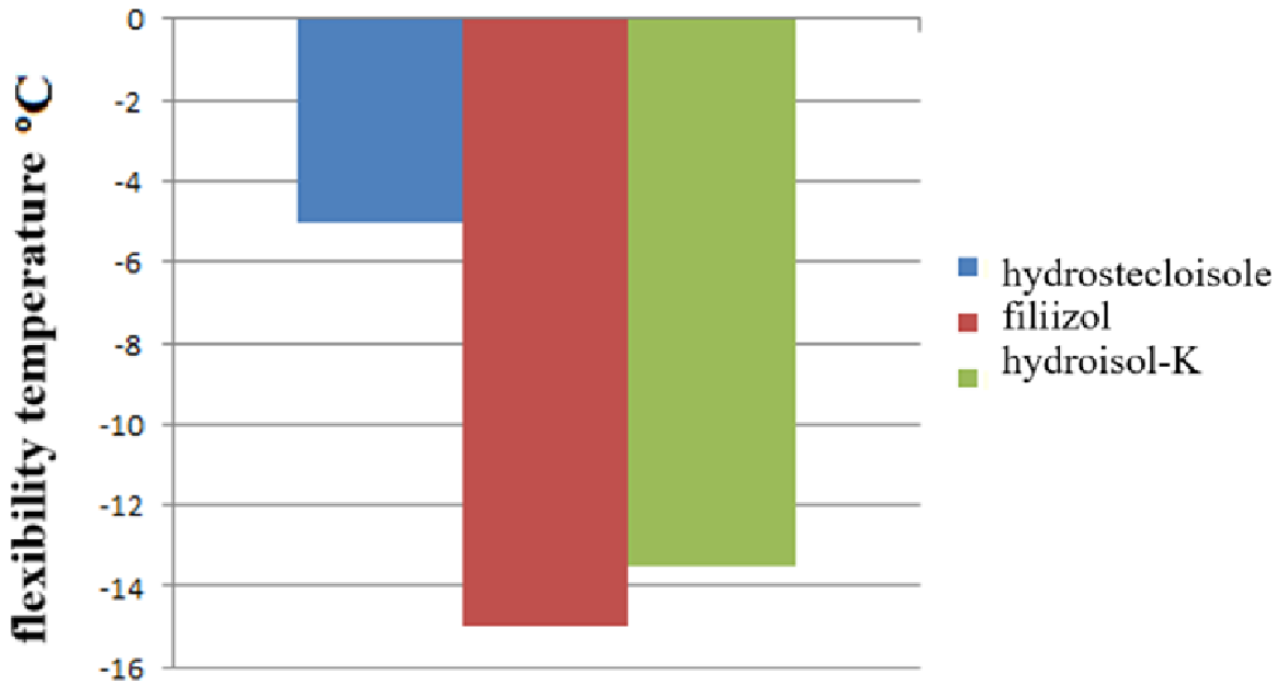

Figure 2. Flexibility temperature compared to the standard requirements of the sample with a thickness of 5 mm

As can be seen in Figure 2, when the thickness of the Hydroisol-K sample taken by us is 5 mm, its flexibility temperature is -13.5 ºC and it is -8.5 ºC difference from the hydrostecloisol waterproofing material that meets the standard requirements, but from the Filiizol waterproofing material it was proved that it has a negative indicator [10].

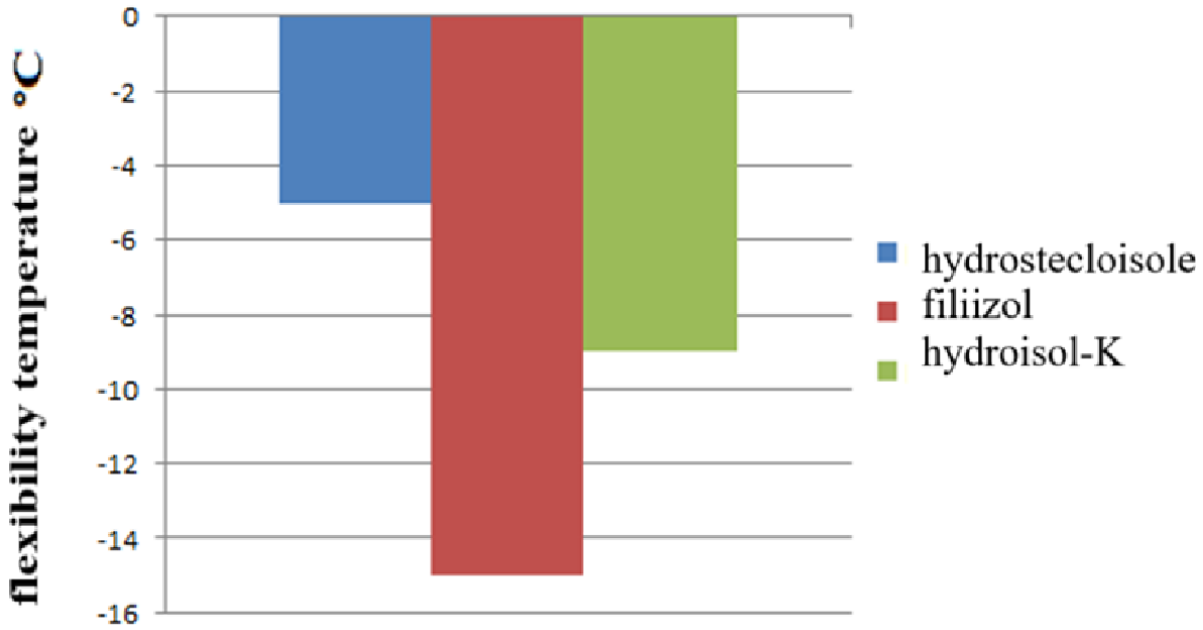

Figure 3. Flexibility temperature compared to the standard requirements of the sample with a thickness of 10 mm

As can be seen in Figure 3, when the thickness of the Hydroisol-K sample taken by us is 10mm, its flexibility temperature is -9 ºC and it differs from the hydrostecloisol waterproofing material that meets the standard requirements by -4 ºC, and from the Filiizol waterproofing material -6 ºC it was proved that it has a negative indicator [11].

Conclusion. From pictures 1-3, it can be concluded that the thicker the hydroisol-K sample, the better its elasticity temperature is confirmed. But as the thickness of the hydroisol-K sample increases, its consumption cost is proportional to it. Because when the thickness of 1 piece of rolled hydroisol-K sample is 3 mm, the consumption of the bitumen composition of the new composition is 18-20 kg, as the thickness of the sample increases, the consumption of the developed bitumen composition increases propocially.

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