PHYSICAL-MECHANICAL PROPERTIES OF EXTRA LIGHT CONCRETES BASED ON EXTRACTED VERMICULITE

[1]Yusufjonov Murodjon, [2]Abdullaev Mardon, [3]Yorbekov Asilbek, [4]Mustafayev Shukhrat
[1,2,3]Trainee-teacher of Yangiyer branch of Tashkent Institute of Chemical Technology
[4]Assistant teachers of the Yangiyer branch of the Tashkent Institute of Chemical Technology
https://doi.org/10.5281/zenodo.7952143

Abstract. *The article examines the physical and mechanical properties of vermiculite lightweight concrete. V state izuchayutsya physical-mechanical properties of vermiculite in light concrete. In the article to study the physical and mechanical properties of vermiculite lightweight concrete.*

Keywords: *vermiculite, properties, physical, mechanical, lightweight concrete.*

Copied _ determine the water permeability of vermiculite

30 g of expanded vermiculite sample dried to a constant mass is weighed and placed in a special container with a lid, 5 in water; 10; 30; 60; It is held for 1440 minutes, during which the water level should be 20 mm above the lid in a special container. To remove air bubbles in the sample, it is shaken several times in water in a special container, and after the given time interval, it is removed from the water and weighed (Table 3). Water absorbency is determined using the following formula:

$$W_{\text{сшм}} = \frac{m_{\text{сш}} - m_{\text{кур}}}{m_{\text{кур}}} \cdot 100\%$$

Here: m_{ssh} – mass of sawdust sample soaked in water, g.

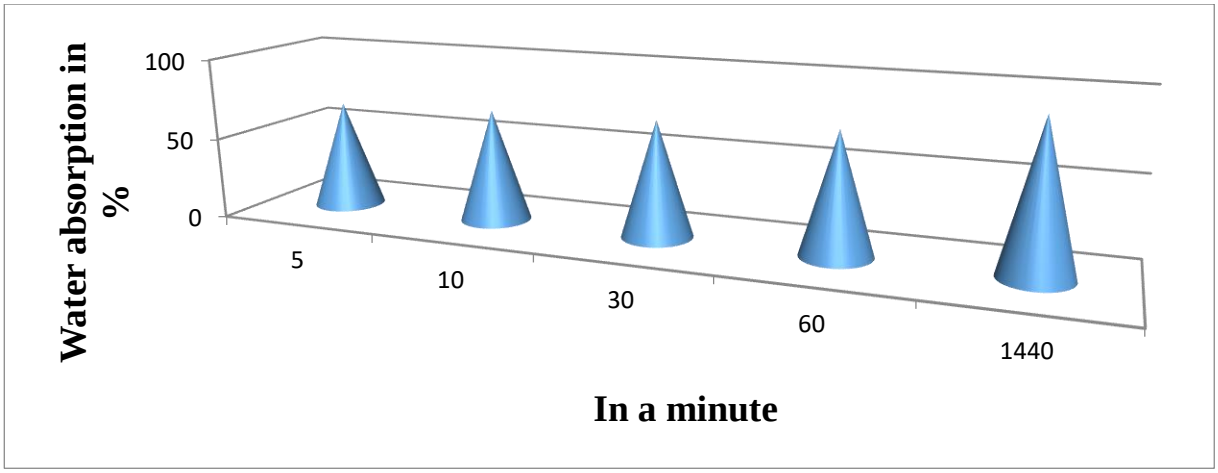
$_{build}m$ – mass of the dry sawdust sample, g.

1. Determination of water absorbency.

Copied _ determination of vermiculite water absorbency

Table 1

No	Dry state. Gr	A minute				
		5	10	30	60	1440
1	30	66.5	69.5	71.5	74.5	90.6



Copied _ determination of vermiculite by water-swelling mass diagram.

Copied _ Vermiculite to determine water absorption by volume.

Copied _ volume weight and average density of light concrete based on vermiculite is determined in a standard way after drying the cube-shaped samples of 7.07x7.07x7.07 cm at a temperature of 105 ^{0} C.

A sample with cleaned surfaces and dried to a constant mass is taken. Arbolite concrete made from 290 g of rice husk was taken to determine the water absorption property of lightweight concrete. The resulting mass is placed in a container with water. The requirements are determined by soaking 1/3 for 12 hours, then 2/3 for 12 hours, and 3/3 for 24 hours. [3.4]

In it, the water level should rise at least 20 mm above the surface of the sample. Then the samples are taken out of water, their surfaces are wiped with a wet cloth and weighed. Water absorption ($W_{\text{шим}}$ $W_{шим}$) % and is calculated using the following formula:

$$W_{шим} = \frac{m_2 - m_1}{m_1} \cdot 100\%$$

Here, m_1 - dry mass of the sample, g;

m_2 - mass of the sample after soaking in water, g.

Determination of the normal thickness of gypsum paste

Description. Normal density means that a brass cylinder with a diameter of 5 cm and a height of 10 cm shows a diameter of 18 cm when the plaster paste is spread out.

We started testing by adding water to 150-220 ml of water. Then, when we added 165 ml of water, we got the desired result, that is, our plaster dough spread 177-183 mm. Through this, we determined the water/gypsum ratio of 165/300=0.55. Then add the normal consistency adding to determine we started.

Table 2

No	**Gypsum (g)**	**Water (ml)**	**Spread**	**Supplement (%)**
1	300	165	16.5	0
2	300	195	18.5	0
3	300	205	23	0

4	300	172	18.5	0.5
5	300	170	19	1
6	300	165	18	1.5

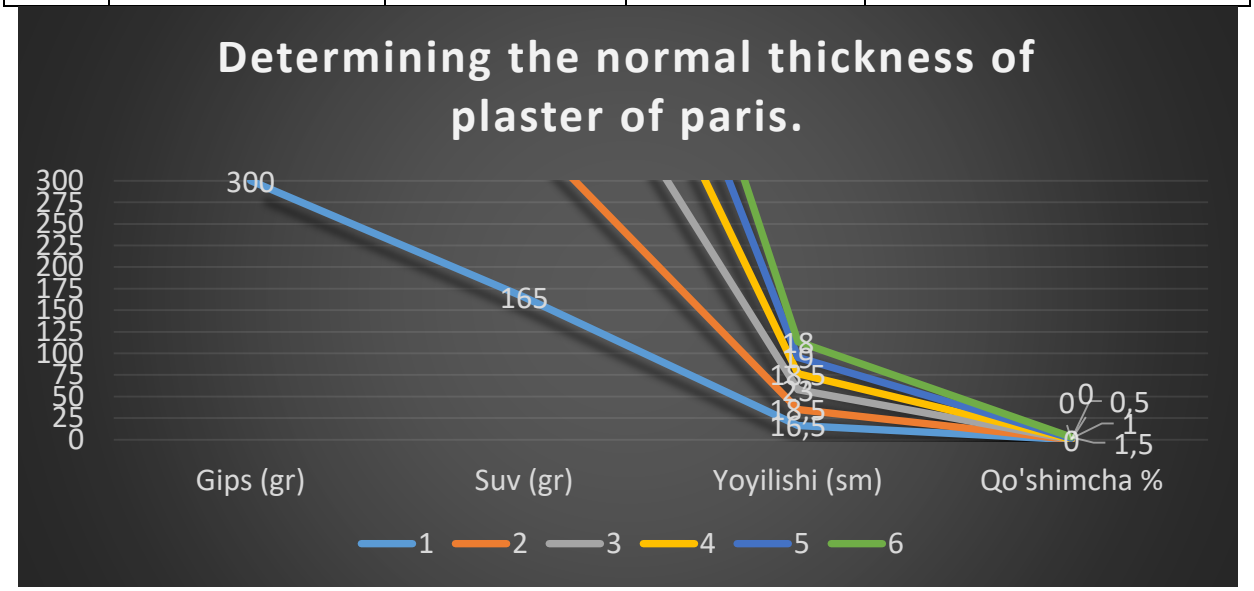


Figure 2. **Determination of the normal thickness of gypsum paste**

Figure 3. When we added 105 ml of water and 1.5% additive, the mixture spread to the desired amount, but it was difficult to mix and the mixture did not mix well with water. When making plaster paste with 2% addition, it became impossible to mix the mixture.

Determination of the period of thickening of gypsum paste.

Description. The time from the time of mixing gypsum in water to the time when the vika nina sinks 1 mm on the surface of the dough is called the period of thickening of the gypsum dough.

Table 3

Type of gypsum	Solidification index	Hardening time , min	
		the beginning , no less	end , no less
Fast hardening	A	2	15
Medium hardness	B	6	30
Slow hardening	V	20	44

To determine the hardening time of gypsum paste, we weighed 300 g of gypsum, put it in a bowl filled with enough water and mixed it for 30 seconds. We immediately put the finished plaster dough in a ring on a glass plate . Shake the plate 4-5 times to release air bubbles in the dough. Cut off the excess dough with a knife. We place the ring under the needle of the tool, lower the needle so that it touches the gypsum paste in the middle of the ring, and fasten the rod with the help of a clamping screw. Then we lower the needle every 30 seconds and dip it into the dough (every time you need to pierce a new part of the dough). After each time the needle is pulled out of the dough, it is necessary to wipe it well. The depth of immersion of the needle into the dough is shown by the spindle shaft. The time elapsed from the moment the dough is mixed (plaster powder is added to water) to the moment when the needle stops at the bottom of the dough, i.e. 0.5 mm before the plate, is the time when the dough starts to harden. The time elapsed from the time the dough has hardened until the needle cannot penetrate deeper than 0.5 mm into the dough means the time when the gypsum dough has finished hardening.

Table 4

Gypsum (g)	**Water(ml)**	**Extra(%)**	**Hardening time, min**	
			Beginning	**ending**
300	**195**	**0**	**4**	**8**

Fig. 4 Determination of the period of thickening of gypsum paste.

Determining the strength of sample hammers made of gypsum paste

Table 5

Plaster brand	40 x 40 x 160 mm base samples are made from 2 sets of strength limit, not less			
	compression , MPa (kgs/cm ^{2})		to bending , MPa (kgs/cm ^{2})	
G - 6	6	60	3	30

a) To bend resilience the limit define for 1200 g gypsum pulling take to water we put and 60 seconds during mixed up oiled to the mold we put from 2 hours so 4 x 4 x 16 cm _ _ o' - sized samples MII-100 to the device put it down to bend was _ _ strength we determined . 2 _ bottom support between the distance is 100 mm .

Calculation formula : $R_{эг} = \frac{3 \cdot P \cdot l}{2 \cdot b \cdot h^2}$;

Figure 5

b) Determining the compressive strength limit. Determining the compressive strength limit we used 6 and a half hammers. At the top and bottom of the half-hammers, we put steel sheets with dimensions of 40x62.5 mm, that is, with a surface area of 25 cm2, and we determined the limit of compressive strength with the help of a hydraulic press.

Calculation formula: $R_c = \frac{P}{S}$;

Table 6

Additional amount of bending strength limit (0.5%)

Indicator name	Samples			Average value
	1	2	3	
Bending strength limit , kgs / cm ^{2} mPa	28.2	27.9	29.2	28.43 (G6)

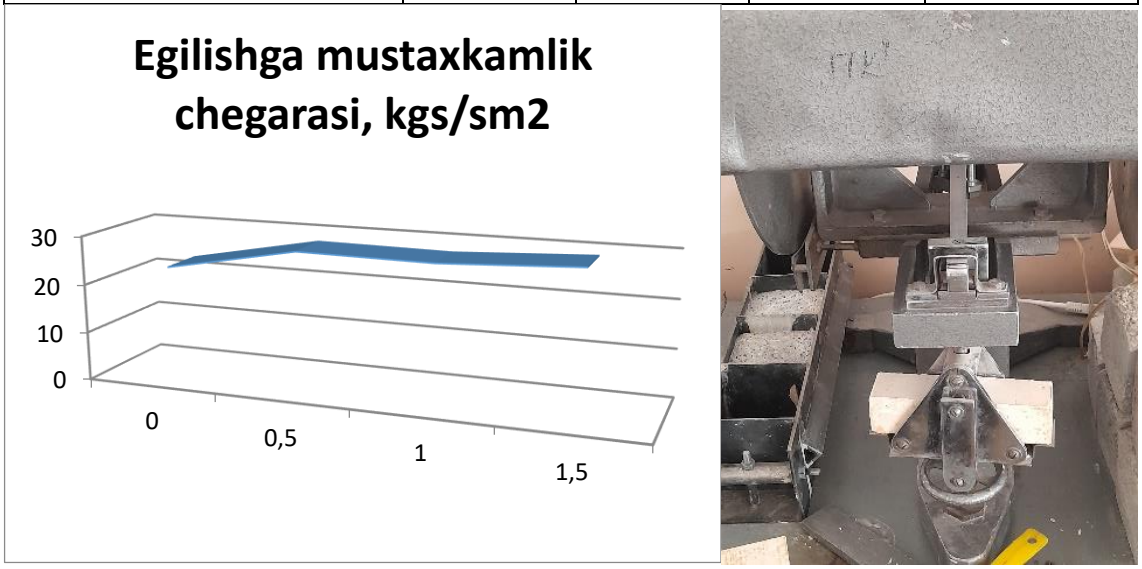


Figure 6 determination of bending strength limit

Table 7

Additional amount of compression strength limit (0.5%)

Indicator name	Samples (half)						average value
	1	2	3	4	5	6	
Manometer indication , kgs	1490	1440	1650	1740	1390	1370	1480

Cross-sectional area , cm ^{2}	25	25	25	25	25	25	25
Compressive strength limit , kgs / cm ^{2} mPa	59.6	57.6	66	69.6	55.6	54.8	60.53 (G6)

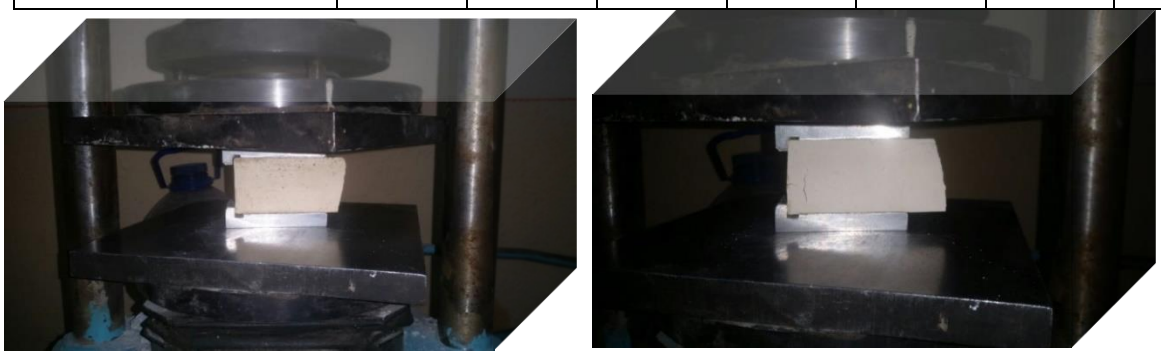


Fig. 7 determination of compressive strength limit

The results of the study showed that the addition of "SVV-500" additive reduces the water consumption in the production of gypsum paste from a normal well. It has been determined that optimal performance is achieved when 1% of "SVV-500" supplement is taken . When the amount of this additive is 1.5-2.0%, it was observed that the beginning of the bite period of gypsum is reduced.

I poured a sample into a 15x15x2 cm mold to determine thermal conductivity, and I poured samples into a 7.07x7.07x7.07 cm mold to determine its compressive strength. oh

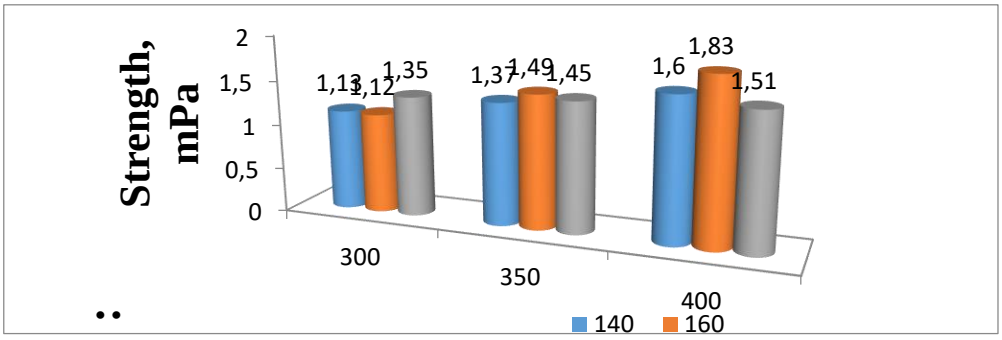


Diagram of 7-day compressive strength of ultra-lightweight concrete.

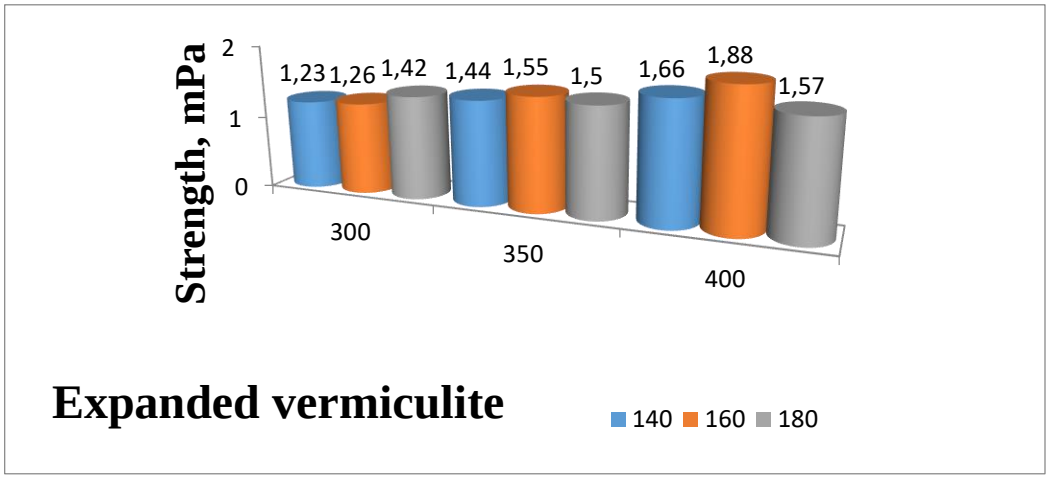


Diagram of 14 -day compressive strength of ultralight concrete.

REFERENCES

1. Uzbekistan Republic No. PQ- 3379 of the President of November 8 , 2017 " Energy resources reasonable to use provide _ measures _ _ About the decision
2. O'z _ DSt 712-96 (GOST 25485 - 89) " Cellular concretes . Technician conditions "
3. Friedrichsberg D.A. Course colloidal chemistry / D.A. Friedrichsberg. L.: Chemistry , 1984. - 368p.
4. Sinj A., Sinj P. Chelatione behavior of quinazoline (1H, 3H) – 2,4 – dithione //Jnorg. Chem. 1984. Vol. 5. P. 2341 – 2346.
5. www.Compleks Ru.
6. www.Coordination compounds Ru.