NEW TYPE OF GYPSUM BASED LIQUID MIXTURE

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Abstract
The dry construction plasters production (DCPP) is much younger than in other sectors of the construction industry. However, in this short period of time, dry construction plasters (DCPP) are taking their rightful place in finishing and waterproofing works construction. The DCPP use in the finishing work increases labor productivity by 2-3 times and significantly improves quality. This article presents the research results on dry construction plaster mixtures that improve the thermal insulation properties while maintaining the construction technical properties on the basis of local raw materials.
Nowadays, the demand for construction materials modern quality types is growing significantly.

Keywords
Dry construction mixtures, wood chips, heat, gypsum-based plaster mixtures, thermal conductivity, plaster thickness, moisture, and thermal conductivity.

Introduction
On the basis of the President Resolution of the Republic of Uzbekistan on May 23, 2019 PG No -4335 "On additional measures for the construction materials industry accelerated development" the dry construction industry mixes in the Republic is rising to a new level [1]. The construction materials range is expanding, especially due to energy-saving, new modern and industrial waste materials. The construction materials range is expanding, especially due to energy-saving, new modern and industrial waste materials. One of the ways to reduce costs in the dry building production mixes is to study the compositions with high thermal protection properties using local raw materials and introduce them into the most optimal compositions production created. In addition, such thermal insulation properties, mixtures

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that form a porous structure allow to reduce the amount of energy consumed during the buildings and structures operation. Uzbekistan has sufficient raw material reserves for the construction materials development industry. In particular, dozens of mining reserves for gypsum production have been identified. [8]

Topic Relevance

In today's complex and aggressive climate, the most pressing issues facing researchers are the building materials durability, heat transfer, dry building production mixes with improved cold tolerance from local raw materials and industrial waste, lowering the production cost**.** It is also important to create a high-performance gypsum-based plaster by replacing perlite vermiculite agiporite agiporite penapalistrol, etc., which is used as a light filler in gypsum-based plasters, with local raw materials such as plant and wood chips.

The obtained results and their analysis

At present, dry construction mixtures are classified according to the international standard GS 31189-2015 "Dry construction mixtures" according to the following characteristics:

- according to the conditions of use;
- according to the largest particle $D_{the\ largest}$ filler;
-depending on the binder type;
-according to the functional application;
- according to the surface.[2]

Depending on the material application conditions under study, the largest particle the $D_{the\ largest}$......... filler (0mm $\geq D_{the\ largest} \geq$ 1.25 mm), gypsum according to binder type, plastered according to the functional application, light thermal insulation , must meet the requirements for manual laying on the surface[2].

A dry building mixes series for plaster under the brand "KNAUF", "BeneFit", which occupy the main segment of building mixes market in Uzbekistan the indicators were compared and compared on the basis of the requirements GS 31377-2008 "Dry building plaster mixes based on gypsum binder " specifications (Table 1 and Figures 1 and 2).

1-Fig. Rotband. 2-Fig. Hardrock

1-Table Knauf and Benefit products Comparison Gypsum-based plaster

Naming of indicators	**Types of plaster dry construction mixtures**		**According to GS requirements**
	Rotband.	**Hardrock**	
1	**2**	**3**	**3**
Humidity,% by mass	0,1	0,1	0,30
Pile density, kg / m^3	910±20	980±20	-
Maximum size, mm	1,2	1,2	5
Hardening, the beginning of min The end	45-60 120-140	45-60 120-140	not less than -45 minutes when done manually, in a mechanized manner not less than -90 minutes.-
Water holding capacity%	98-99	97-98	≥90
Material row (consumption per 1 m^2 when the thickness is 10 mm), kg	10	10	-
Strength, MPa, Compression To bend	4,7-5 2,5-2,6	4-7 2-2,7	≥2.0 ≥1,0
Adhesion strength of solid alloy to the base surface, MPa	0,45-0,50	0,50-0,55	≥0,30
Thermal conductivity W /m^0K	0,25	0,45	-
Guaranteed shelf life of specially coated VAT, months	6	6	6

Note: The uncertainty of the limit of strength in compression and bending of each grout plaster varies depending on the amount of sand in the gypsum used.

As can be seen from Table №1, the Rotband nozzle under the Knauf brand has a better thermal conductivity than the Drosk nozzle, ie 0.25 W / m 0K, [4] [7] as well as a volume difference of 50 kg per cube, so each drosk. we found ways to improve the properties of the plaster a bit. The quality of gypsum also differs depending on the production technology of G5 gypsum production shops, which are based on G5 gypsum plasterboard, and the selected equipment and gypsum deposits. Requirements for the production of gypsum GS 125-79 Example of G5 gypsum 2-hour compressive strength limit 5 MPa, the strength of the product is not always 5 MPa, sometimes low, sometimes high. you can see that the strength limits vary from 6% to 12% depending on the amount of sand in the plaster. The onset of solidification is corrected by chemical additives, and water demand also varies slightly depending on the amount of sand. [5]

To improve the thermal insulation performance of DCPP, various local organic wastes were selected and their effects on the composition of the mixture were studied. [8]

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The selected organic waste was local wood chips, annual field crops (wheat straw and cotton stalks), which were crushed using a special feed **grinder KDU-20**. [5], were crushed to the required extent in the crushing equipment. All selected wastes are of the type of renewable raw materials and are unnecessary wastes that occur after the annual harvest of agricultural products.

The average chemical composition of sawdust of organic trees and plants) is given in Table 2. [3]

Table 2. Average chemical composition of sawdust,%

Name		**Cellulose $C_6H_{10}O_5$**	**Lignin $C_{14}H_{40}O_{16}$**	**Pentozony$C_5H_8O_4$**	**Plant glue**	**ash**
trees and plants	timber	44,2	24,2	19,1	1,1	2,31
	roots and branches	41,5	22,1	14,2	1,8	10,8
	plant stems	34,7	25,9	15,6	3,1	6,8

The research was continued in order to find the optimal composition of thermal insulation plaster used in the decoration of buildings and structures using local raw materials and organic waste, the properties of which were studied above.

As a binder in the studied composition used crushed sawdust of poplar sawdust, straw and cotton stalks, which is supposed to increase the thermal insulating properties by reducing the performance of G-5 and volumetric mass. These wastes were obtained in 2%, 5%, 10%, percentages relative to the binder mass. The granular composition of the crushed organic waste is given in Table 3.

Table 3. Granular composition of organic waste

Sieve eye dimensions, mm	**The rest , %**	**Distribution of sawdust by size,%**
5	0,48	29.27% is a large, coarse part that is recyclable
2,5	4,19	
1,25	24,79	
0,63	**23,73**	**60.47% in content preparation working part used**
0,315	**19,07**	
0,16	**17,67**	
0	10,07	10.07% waste portion
Жами	100	

Note: The crushing process was carried out using a feed grinder KDU-20.

Volumetric weights of sawdust formed after crushing of this organic waste:
poplar-based sawdust, 135 kg / m^3 at a moisture content of 7.7%;
straw-based sawdust, 135 kg / m^3 at a moisture content of 3.5%;
stalk-based sawdust, 203 kg / m^3 at a moisture content of 7.1%.

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As can be seen from the above, the part of these chips used in the main plaster mix is in the range of sizes (0.16-1.25) mm, which is 60.47% of the total amount. Table 4 shows the results obtained from the study of the basic physical and mechanical properties of various components prepared from the above selected raw materials and wastes.

Table 4. Strength indicators of the studied components

№	Types of attachments	The amount of additives relative to the binding mass ,%	DCPP Volume weight kg / m^3	DCPP humidity %	Strength limits of compositions under laboratory conditions, MPa						Compliance with the requirements of GS 31377-2008
					Squeeze			Bending			
					7 day	14 day	28 day	7 day	14 day	28 day	
1	Poplar sawdust	2	902	2,2	7,66	8,44	8,89	3,59	3,79	3,99	+
		5	924		7,81	8,24	8,68	3,42	3,61	3,81	+
		10	875		4,51	4,95	5,39	2,97	3,17	3.37	+
2	Straw	2	900	2,1	7,1	7,58	7,98	3,64	3,84	4,05	+
		5	926		5,52	5,83	6,14	3,21	3,39	3,57	+
		10	877		4,86	4,99	5,30	2,65	2,83	3,01	+
3	Cotton sawdust	2	911	2,2	9,16	9,67	10,1	2,64	2,79	2,94	+
		5	929		7,84	8,28	8,72	3,22	3,40	3,58	+
		10	889		4,88	5,15	5,43	2,82	2,98	3,14	+
4	Hardrock	0	980	2	6,97	6,97	7,00	2,54	2,54	2,68	+
5	Rotband.	0	930	2	4,67	4,67	4,70	2,36	2,36	2,50	+

The highest compressive strength of the compounds in Table 4 above is 961 kg / m^3 with 2% cottonseed added, with a 28-day value of 10.18 MPa. However, such high-strength mixtures are not required in accordance with GS 31377-2008 Dry building plaster mixes based on gypsum binder "Technical conditions and this figure can be reduced to a value not lower than 2.0 MPa.

This is done for two purposes when reducing the amount of binder and adding organic additives. First, replacing the binder, ie a certain part of the gypsum, with sawdust, while maintaining the required amount of strength, reduces the bulk density of the dry construction mix intended for plastering, which improves the natural heat and sound transmission coefficients. allows you to save up to%. Other necessary construction and technical properties of the optimal components that give the required strength were also studied. When examining the structures of specimens of different compositions, we see that the percentage increase in sawdust resulted in the formation of evenly spaced porous structures. Such structures allow the plaster layers inside the building to create a better sanitary-hygienic breathable layer than the dense structural plaster.

From this point of view, the thermal insulation properties of 5% of the components selected as optimal in terms of construction and technical properties were tested for different

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thicknesses. For this purpose, on the basis of the requirements of GS 7076-99 "Building materials and products" Method for determining thermal conductivity and thermal resistance in a stationary thermal regime, the thermal conductivity of the samples was determined on the instrument ITS-1 "150". The results obtained are presented in Table 5 below.

Figure 3. Samples were prepared by mixing plant and wood chips with a gypsum binder and showing the internal structure views by breaking them after curing. 1 simple plaster without addition. 5% relative to the mass of the 2-stem mixture. 3 ordinary sawdust is 5% relative to the mass of the terracotta mixture. 4 Straw crumbs are 5% of the total mass of the mixture. 10% relative to the total mass of the 5-stem mixture.

If we look closely at Figure 3, we can see that the overall appearance of the product changes as the amount of wood chips increases.

5-Table Thermal conductivity of samples prepared from the studied components depending on their thickness

Name	Compound amount%	Sliding thickness mm	Thermal conductivity W / /(м^{0}K)
Poplar sawdust content	5	10	0,2590
		20	0,3131
		30	0,3672
Straw sawdust content	5	10	0,2515
		20	0,3088
		30	0,3661
Cotton stalk content	5	10	**0,2580**
		20	**0,3150**
		30	**0,3726**
Comparable Hardrock structure	0	10	0,4512
		20	0,5085
		30	0,5658
The comparable "Rotband. structure	0	10	0,2580
		20	0,3342
		30	0,3915

Note: Samples were tested at 1% humidity.

The results obtained confirm that the size and content of the sawdust to be added are important to the thermal conductivity, not the type of sawdust origin, i.e. what type of organic plant to add. The contents have the smallest values in terms of thermal conductivity in samples with a thickness of 10 mm. As the thickness of the layers increases, their thermal conductivity values increase proportionally. In our opinion, this situation can be attributed to the increase in thickness with an increase in the amount of starter, which is the main part of the tested content and is several times heavier than the sawdust. This pattern is observed in all structures.

Compared to the newly studied ingredients in the Uzbek market, we can see that the proposed ingredients have a much better thermal conductivity. For example, if the thermal conductivity of a 5% cotton sawdust with a thickness of 10 mm has a coefficient of thermal conductivity of 0.2580 W / (m0K), with a sawdust content of 0.2590 W / (m0K), and a straw sawdust content of 0.2515 W / (m0K), the same is true. The thermal conductivity of the comparable Hardrock sample is 0.45 W / (m0K) and that of the Rotband sample is 0.2580 W / (m0K).

Conclusion

The level of quality and technical parameters of construction using local raw materials and organic waste (agricultural flora) have confirmed the possibility of producing dry construction mixtures for effective plastering. Laboratory studies have shown that the thermal conductivity of these proposed lightweight additives is 1.5-2 times more effective than compared brands. It was found expedient to use them in interior plastering of buildings and structures.

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