STUDY OF THE EFFECT OF TEMPERATURE AND HUMIDITY ON THE QUALITY OF WOOD MATERIALS

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Abstract: *Important affecting the strength of wooden structures one of the factors is temperature and humidity. The results of the study conducted in the article the analyzed and relevant conclusions are summarized.*

Keywords: *Wood materials, strength, factors, type of wood, humidity, temperature, physical and mechanical properties, types of humidity.*

The expansion of the production volume and field of use of wooden constructions is one solving a number of important issues, including reducing material consumption, requires the improvement of constructive solutions.

The scientific research work carried out in recent years has brought the work in this area to a new level citing a number of important and pressing issues along with raising is releasing.

One of the relevant elements of the use of wooden materials is gluing constructions are considered. [1]

Assembling glued structures list of compositions participating entries:

- to the type of improvised materials;
- to the type and composition of glue;
- put in the moisture of rough materials;
- to the technology of production;
- to the conditions of exploitation, etc.

Physical and mechanical properties of coarse materials under the influence of variable temperature and humidity the study shows the dimensions of the cross surfaces of structures at a level close to the actual case allows you to identify. At the same time, the influence of their constructions during the period of exploitation daily and monthly exposure indicators that allow a more thorough analysis of this work taqaza makes. [2]

It is known that the coefficient of determination of the marginal strength of rough materials k_W depending on the amount of temperature and humidity from the specified size rough material tested standard copies were determined based on experimental testing.

The change of the K_W coefficient in accordance with the amount of temperature and moisture in Table 1 cited.

The coefficient of friction (K_W) is used as the ultimate strength of materials. The list of compositions includes entries.

Table 1.

Temperature, 0^C	**The amount of the KW coefficient at the specified humidity**			
	10	**15**	**20**	**25**
10	0,574	0,824	1,053	1,303
20	0,611	0,861	1,113	1,365
30	0.648	0,898	1.173	1,435
40	0.685	0,983	1,233	1,485

Based on a comparison of the results of the experiment presented in Table 1, we draw the following conclusions it became possible to determine.

At each indicated point, a 0.25 value change in humidity was observed for temperature changes of 100C.

Based on the analysis of the test results, as a result of a temperature change of 100C strength averaged 0.51 in bending, 0.52 in melting along the fibers, along the fibers and it was determined to change to 0.50 in compression.

The determined results increase the moisture content to certain percentage values shows a decrease. [3]

Taking moisture into account when determining the effect of moisture on strength the following formula was used to determine the value of the coefficient. [4]

K=σ15 / σW - where σ15 is the change in humidity in the range of 0 -30% and σW is the strength at the tested humidity.

The data presented shows that it is necessary to conclude that wood materials are one of the important issues to consider during their exploitation.

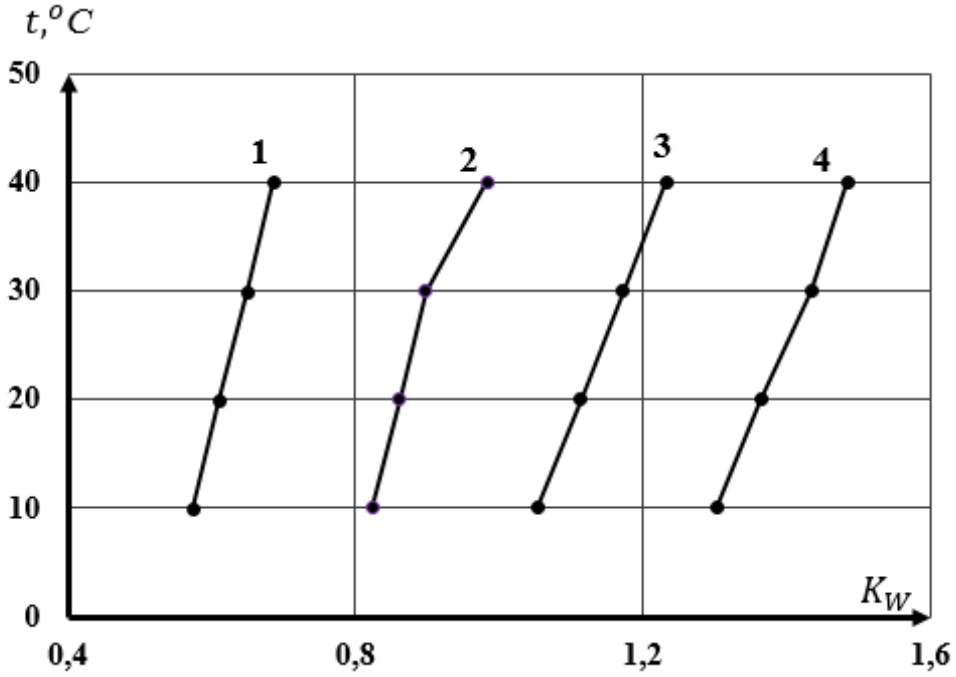

Figure 1. Graph of the change in the coefficient KW taking into account the effect of humidity at a given temperature.

1.When the moisture content of the material is 10%; 2,3,4-same humidity 15, 20, 25% respectively when.

2.Table 2 presents data on the change in the strength of wood materials as a result of increasing humidity at the same temperature.

Changes in consistency due to temperature and humidity.

Table 2

№	Indicator name	t =200C *W* =10%	=200C *W* =20%	t =200C *W* =30%
1	Bending strength, MPa	61,2	53,4	40,5
2	Modulus of	12,3	10,7	9,2

	elasticity, GPa			

Analysis of the results showed that the strength of wood materials decreases with increasing humidity (Figure 2).

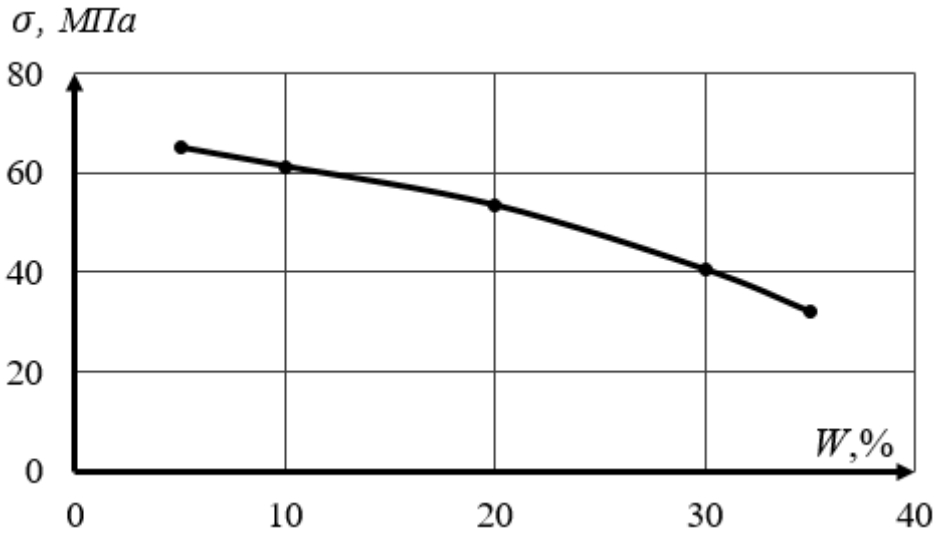

Figure 2. The graph of the change of strength under the influence of moisture.

These indicators depend on the stress-strain state of materials in bending It was determined that it changes by 0.78 in the range of 10-20%, and by 12.0 MPa in the range of 20-30%. Same hus seeing that the elastic modulus also changed to values of 1.6 and 1.5 GPa, respectively possible.

It is known that the indicators of strength depend on the distribution of moisture in the trunk of trees depends. The percentage of moisture in the trunk, middle and top parts of different trees moisture meter was determined with the help of electric device EV-2M and the results are in 3 tables entered.

Analysis of the results presented in Table 3 shows the moisture content averaged between sections for pine the difference is 19%, and 21.1% for spruce, and the difference between pine and spruce is 8.8 was found to be equal to percent.

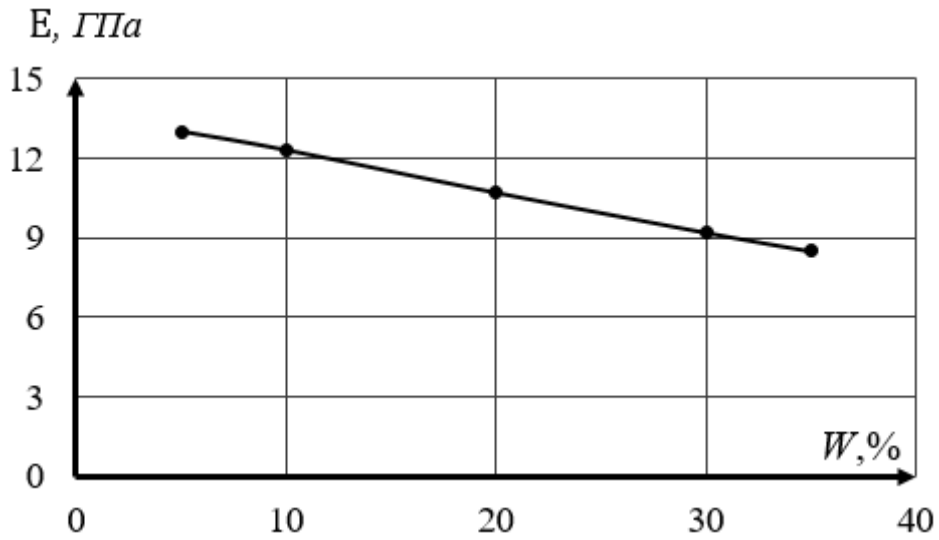

Figure 3. The graph of the change of the modulus of elasticity under the influence of moisture.

Distribution of moisture in the trunk of trees

Table 3.

№	Tree species	Moisture in the material		
		In the body part	In the middle	At the top
1	Pine	93,4	112,4	121,6
2	Tylogoch	102,2	123,3	131,2

At the same time, moisture content also varies along the cross-section of a tree. Analyses have shown that while the moisture content in the heartwood of freshly cut wood is on average 40-50%, in the bark layer this figure is around 120-130%.[5]

When processing wooden materials, take into account the strength indicators of the materials that the processing is effective in the case where the average humidity is in the range of 30-35% confirmed. [6]

Graphs of dependence obtained on the basis of the results determined above are in figures 1, 2 and 3 given.

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