

The extent of hardening of UF¹ cured at temperatures 100 °C and 170 °C has been investigated in the work. Ammonium salts: NH₄Cl ammonium chloride; urea-ammonium NH₄NO₃–(NH₂)₂CO–H₂O nitrate; nadsernokisly ammonium (NH₄)₂S₂O₈; hydrophosphate of ammonium (NH₄)₂HPO₄ were used as hardeners.

The minimum and maximum values of the degree of curing of the UF binder with NH₄Cl cured at 100 °C are given in Table 2. Dependences of the degree of UF hardening on the proportion of additives of hardeners, constructed from the average values, are shown in the Figure 2 (curing at a temperature T = 100 °C) and in the Figure 3 (T = 170 °C).

Table 2. Curing degree of UF binder with NH₄Cl, cured at 100 °C

NH ₄ Cl, %	0.8		1.0		1.2		1.4		1.6		2.0	
Q, %	91.57	92.1	94.74	95.27	94.61	93.87	92.68	93.24	92.16	92.39	90.32	91.60

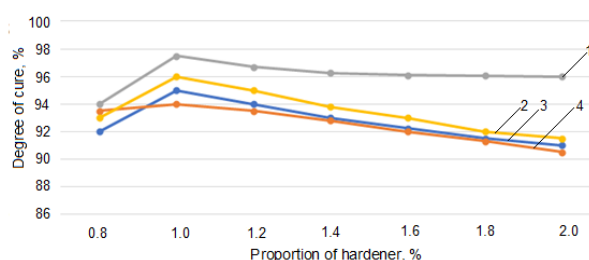


Figure 2. Dependence of the degree of curing of the urea-formaldehyde binder on the proportion of additive curing agents (the curing temperature T = 100 °C):
 1 – (NH₄)₂S₂O₈; 2 – (NH₄)₂HPO₄; 3 – NH₄Cl; 4 – NH₄NO₃–(NH₂)₂CO–H₂O

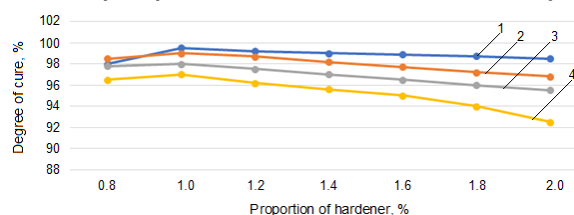


Figure 3. Dependence of the degree of curing of the urea-formaldehyde binder on the proportion of additive curing agents (the curing temperature T = 170 °C):
 1 – NH₄Cl; 2 – NH₄NO₃–(NH₂)₂CO–H₂O; 3 – (NH₄)₂S₂O₈; 4 – (NH₄)₂HPO₄

At the curing temperature of the UF binder at 100 °C, the best cure rate is provided by the use of an ammonium nitrate (NH₄)₂S₂O₈ additive in the amount of 1 % by the resin weight. At a curing temperature of 170 °C, the maximum cure is given by the addition of ammonium chloride in the amount of 1 %. These experimental results make it possible to choose the composition of the adhesive composition for the production of composite boards, but it is necessary to take into consideration the effect of the plant filler on the board indicators. The fractional composition of the filler from waste spinning was determined by sieving in a sieve analyzer and weighing a part of the fraction. The determination results of the fractional composition of the filler are shown in Table 3.

Table 3. Results of determination of fractional composition of filler

Fraction	Share of fraction for cotton waste <i>i_{fr}</i> , %	Share of fraction for flax waste <i>i_{fr}</i> , %
–/10	0.059	0.339
10/7	0.285	0.020
7/5	0.339	0.045
5/2	0.229	0.106
2/0.5	0.042	0.266
Pallet	0.043	0.216

Non-returnable waste of spinning and cotton has an average length:

- for cotton 4.76 mm;
- for flax 4.12 mm.

¹ The research was carried out by magister Mochalov A.N.

