The shape and dimensions of specimens should correspond to GOST 14759-69. Edges of specimens should be uniform without any burrs. Surface of specimens, before testing, is prepared by mechanical or chemical method. In case of difference in opinions, the preparation of specimen surface is done by chemical method.

In the mechanical method, the surface of specimens from aluminium alloy is cleaned by emery having grain size 16 or 20, and those from steel - with emery having grain size 63 or 80.

Specimens, on the surface of which defects are detected, are subjected to additional processing.

After processing, the specimens are rubbed with a wad, wetted with benzine or acetone, followed by drying at 15-35°C for 10-15 minutes, and then with a wad, wetted with acetone, ethyl acetate or ethyl alcohol, followed by drying at the same temperature for 5 minutes.

In the chemical method, surfaces of the specimens are processed in the same way, after mechanical processing. Then the specimens are immersed for 10 minutes in a bath containing the solution, ~~of composition~~ indicated in table 2. Temperature of solution should 60-70°C for steel specimens and 60-100°C for aluminium alloy specimens.

Table 2.

Constituent	Proportion (in parts by wt) for aluminium alloy specimens	Steel specimens
Distilled water	170	150
Concentrated sulphuric acid	50	80
Sodium bichromate	30	20

Specimens, taken out from the bath, are washed with running water and then with distilled water and moisture is removed from their surface with filter paper.

After this, the specimens are held in drying cabinet for 30 minutes at 70-100°C and then cooled in air upto room temperature.

For gluing the specimens, a glue layer is applied on the prepared surface by brush or glass rod at relative humidity of surrounding medium not above 70%.

Specimens, coated with one layer of glue of grades BF-2, BF-4, BF-2N, BF-4N, are first held in air "upto tackiness" for 30-60 minutes, then in drying cabinet at 55-60°C for 15 minutes and cooled in air upto room temperature. Then the specimens are again coated with a glue layer, held in air "upto tackiness" for 30-60 minutes and then in drying cabinet for 15 minutes at 55-60°C. After this, the temperature in the drying cabinet is increased upto 85-90°C in 10-20 minutes without removing the specimens, and they are held at this temperature for 50-60 minutes.

Specimens, coated with one layer of glue of grades BFR-2 and BFR-4, are held in air "upto tackiness" for not more than 1 hour. Then they are again coated with a glue layer and placed in drying cabinet, heated upto 85-90°C for 1 hour. After removal from the drying cabinet and cooling down to room temperature, the specimens are joined to each other, placing them in a special cassette.

Cassette is fastened in lever press, whereupon the arm and load are selected in such a way that the specific pressure on the gluing surface is 5-6 kg/cm^2, and for glue of grades BFR-2 and BFR-4 it is 10-15 kg/cm^2. The fixture together with the specimens and load is placed in the drying cabinet, provided with

a thermocouple and thermoregulator, junction of thermocouple should be placed near glued joint of the specimens. Drying cabinet is heated upto 150±5°C and the specimens are held in it for 1 hour (for glue of grades BFR-2 and BFR-4, the temperature in the drying cabinet is brought upto 180±5°C and the specimens are held at this temperature for 2 hours). After this heating is stopped and the specimens are cooled in drying cabinet down to 50-40°C. Then the fixture together with specimens is removed from the drying cabinet, cassette is freed from the load and the specimens are taken out. Consumption of glue for double application should be 60-80 gm. (on conversion to dry substance) per m^2 of glued surface. Before test, the glued specimens are held at room temperature for not less than 16 hours.

3.5.3. Test procedure.

Shear strength of the glued joint is determined as per GOST 14759-69. Testing of specimens at 60, 80, 150 and 200°C is done in a chamber, which is initially heated upto the required temperature.

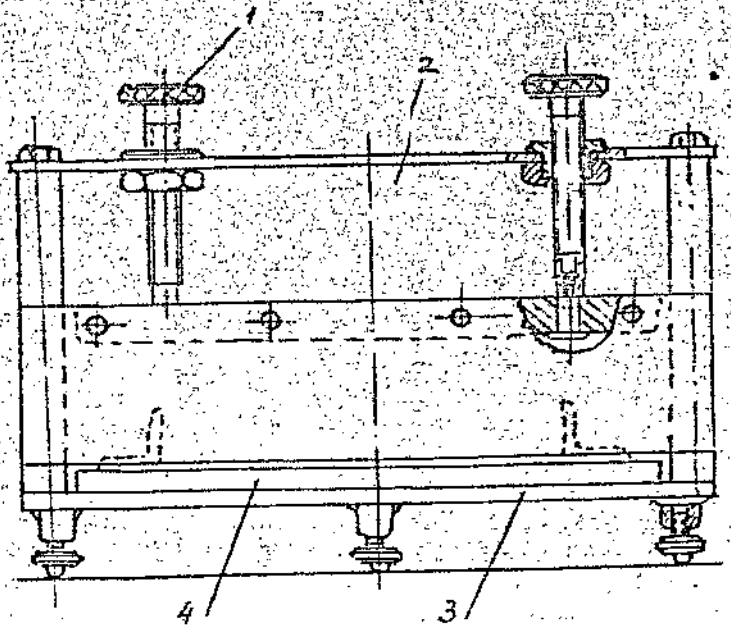
Duration of heating of specimens, before test, is 30-35 minutes. Not more than five specimens should be charged into the chamber at a time.

3.6. Determination of resistance to peeling off.

3.6.1. Apparatus and materials:

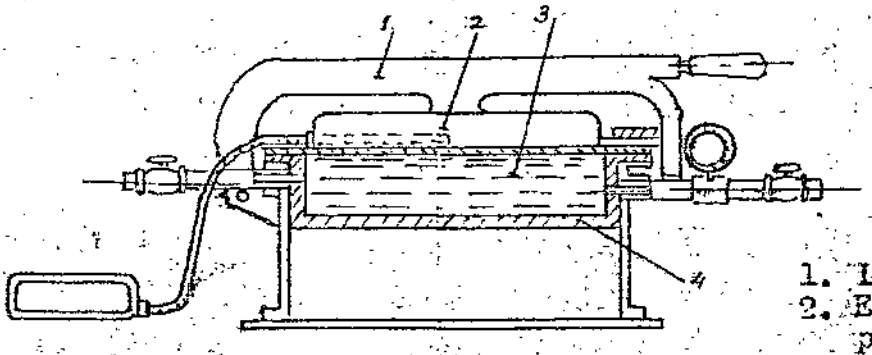
Tensile testing machine which provides measurement of load from 10 to 90 % of nominal scale value. The counter of the machine should be adjusted such that the load at the moment of conducting the test, can be recorded.

Rate of moment of bottom clamp of machine should be 100 mm/minute.



1. Regulating screw.
2. Blade
3. Base
4. Movable plate.

FIG.2



1. Lever
2. Electric hot plate
3. Diaphragm
4. Chamber containing water.

FIG.3

knife for removing paint (fig.2);

hydraulic press (fig. 3);

drying cabinet, which provides temperature 100°C with accuracy upto 5°C;

cotton sheeting No.2 to GOST 11680-76.

3.6.2. Test procedure

Rectangular specimens having length 150 mm (along warp) and width 140 mm (along weft) are cut from the sheeting and a line along the complete width of the specimen is marked at a distance of 50 mm (along the warp) from the edge with a pencil.

Specimen is immersed in water and the excess water is removed with filter paper without pressing, from the same side of the specimen, on which the glue is to be applied. On the wetted specimen a layer of glue BF-6 is applied by the help of the knife. For this purpose, the specimen is set under the blade of knife along the line marked earlier. Glue is applied over a portion of length 110 mm along the whole width of the specimen. Clearance of knife blade is 0.7 mm (clearance is checked with feeler gauge). After the application of glue layer, the specimen is dried on a metallic plate in a drying cabinet at 60-70°C for 30 minutes. Then the 2nd glue layer is applied and dried for 10 minutes at the same temperature. From dried specimen and original fabric, five strips each with dimensions 150 mm along the warp and weft are cut, 20 mm from the specimen with glue and 25 mm from the specimen with-out glue and from them the test specimens are pressed on the hydraulic press. For this purpose, the chamber of hydraulic press is initially filled with water and electric hot plate is switched-on.

On the lower part of diaphragm of press, the cut strips of original fabric are placed and on top of them the strips with glue are placed such that the original fabric protudes from each edge along the width by 2.5 mm. When temperature 160±5°C is attained, the heating is stopped, the electric hot plate is lowered and it is disconnected. The valve of water pipe is opened and the pressure is raised upto 0.5 kg/cm^2 observing on pressure gauge. After this the valve is closed and held in this condition for 1 minute as per a stopwatch. Then the drain valve is opened, the electric hot plate is raised and the glued specimens are removed. Test for peeling-off is carried out not earlier than 16 hours after pressing.

3.6.3. Test procedure

Glued portion of the specimen having length 110 mm is marked across the strip with pencil after every 10 mm. Length of the surface which is to be peeled-off should be 100 mm. Ends of the glued specimen are fastened in the grips of the machine. The load is noted after every 10 mm length of the specimen which is to be peeled off. Peeling-off is ceased at a distance of 10 mm from the edge of the specimen.

3.6.4. Calculation of results

Resistance to peeling off (σ peeling off), in kg/cm, is calculated as per formula:

$$\sigma_{\text{peeling off}} = \frac{P_{\text{average}}}{b},$$

where :

P_{average} - load, taken as the arithmetical mean value of 10 readings of each specimen, taken after every 10 mm, in kg ;

b - width of the specimen, in cm.

The arithmetical mean value from the determination of five specimens is taken as the test result. In this case the specimens, whose value of strength is less than 50% of the norms, are discarded and the arithmetical mean value of the remaining specimens is taken. Such specimens should not be less than four.

3.7. Determination of bending of glue film after solidification

3.7.1. Apparatus, devices, reagents and materials:

Drying cabinet, which provides temperature upto 200°C with accuracy upto 6°C.

Viscosimeter VZ-2, [illegible]

Ethyl alcohol (rectified) [illegible]

Industrial acetone to GOST 2768-69 or industrial ethyl acetate to GOST 8981-71.

Emery paper on fabric base to GOST 5009-75, having grain-size No. 16 or 20.

Tin to GOST 17718-72, No.40 or No.45.

3.7.2. Test preparation

Tin specimens in the form of strips with dimensions 100x10 mm are cleaned by emery cloth and then [illegible], washed with acetone, ethyl acetate or ethyl alcohol.

Before application, the glue is diluted with ethyl alcohol upto viscosity 15-20 seconds as per viscosimeter V3-1, and then it is applied on the prepared surface of the specimens by pouring or with a brush.

The specimens, coated with glue, are held in air "upto tackiness" for 30-60 minutes then in drying cabinet at 55-60°C for 15 minutes and then cooled in air upto room temperature.

Then the specimens are again coated with glue layer, held in air "upto tackiness" for 30-60 minutes, then in drying cabinet at 55-60°C for 15 minutes, after which the temperature in the drying cabinet is increased upto 150±5°C (for glue of grades BFR-2 and BFR-4 - upto 180±5°C), and the specimens are held at this temperature for an hour. Quantity of specimens for test should not be less than three.

3.7.3. Test procedure

Bending of glue film after solidification is determined on the specimens, cooled down to 20±5°C as per GOST 6806-73.

3.8. Determination of heat resistance of glue film after solidification and aging.

3.8.1. Apparatus, devices, reagents and materials are taken as per point 3.7.1.

Mandrel (fig.4), fabricated from any material, strictly maintaining an angle of 15°.

3.8.2. Specimens, their preparation for tests and preparation of glue - as per point 3.7.2. There should not be less than three specimens for the test.

3.8.3. Test procedure

Specimens, coated with glue, are held in drying cabinet at 180±5°C for 5 hours. After this it is cooled in air upto room temperature and bent at angle 45° with the help of mandrel. During this, cracks should not appear on the coating.

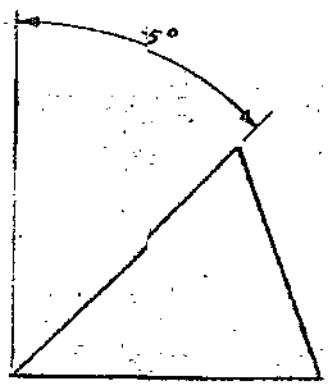


Fig.4.

3.9. Determination of corrosive effect of the glue.

3.9.1. Reagents and materials

Industrial acetone to GOST 2768-69 or ethyl acetate (industrial) to GOST 8981-71 or industrial ethyl alcohol to GOST 17299-71;

emery on the fabric base to GOST 5009-75, having grain size 16 or 20 and 63 or 80;

quality structural carbon steel of grade 25 to GOST 1050-74;

structural sheets from aluminium alloys D16AT to GOST 21631-76,

3.9.2. For testing of glue of grades BF-2N, BF-4N and BFR-2 steel specimens are taken, and for glue of grades BF-2 and BF-4 - specimens from aluminium alloy, having area 12 cm^2 [(6.0±0.5) x (2.0±0.2)] and thickness 2.0-2.5 mm.

There should not be less than three specimens for the test.

Before testing the glue, the surface of specimens from aluminium alloy is cleaned with emery cloth having grain size 16 or 20, and specimens from steel - with emery cloth having grain size 63 or 80. Then they are rubbed with a wad, wetted with acetone, ethyl acetate or ethyl alcohol and then dried at 15-35°C for 10-15 minutes.

3.9.3. Test procedure

Two layers of glue are applied on one side of the specimen by pouring or with a brush. Specimens are held at room temperature for 1 hour, then they are examined by the naked eye.

The glue is considered to be suitable, if there is no corrosion under the glue film on each specimen.

4. PACKING, MARKING, TRANSPORTATION AND STORAGE

4.1. Packing, marking, transportation and storage are carried out as per GOST 9980-71.

Glue is filled in clean dry airtight, galvanised, tinplated, aluminium or iron barrels, tins or flasks (GOST 5799-59), glass bottles (GOST 14182-69) which are closed with wooden conical stopper, following up with filling of special compounds, which do not get dissolved under the action of the glue.

Packing of glue in glass and polyethylene tare of capacity from 1 to 5 litres is allowed. Glue of grade BF-6, used for medical purposes, is packed in galvanized, aluminium flasks or tins. Glue, which is to be supplied in retail, is packed in small bottles and tubes having varied capacity, which are made insignificant

closing with polyethylene or polyvinylchloride stopper. Marking of the product, to be supplied in retail, should contain the following supplementary data:

a) Purpose;
b) price and type as per price list;
c) storage period (shelf-life);
d) inscription "INFLAMMABLE".

Glue, in small packing meant for retail trade, is packed in wooden boxes (GOST 18573-73), boxes made from corrugated cardboard (GOST 13841-68) and in the marking of transportation tare, the following details should be additionally indicated:

a) Net weight of one primary packing ;
b) Retail price and quantity of packing units, type as per price list;
c) The packer's number;
d) Period (shelf life) and conditions of storage.

Net weight should not be more than 30 kg.

4.2. In marking of transporting tare and also in the accompanying documents, the State quality mark (GOST 1-9-67) should be in applicable cases.

4.3. Packing should have the inscription: "Inflammable".

4.4. Glue should be stored in airtight tare at temperature not above 25°C.

5. MANUFACTURER'S GUARANTEE

5.1. Glue should be accepted by the quality control /department of manufacturing/ plant. Manufacturer should guarantee the conformity of phenol-polyvinylacetal glues to the requirements of this standard, provided the customer observes the conditions of storage, established

5.2. Guaranteed shelf-life period of phenol-polyvinylacetal glues is 3 months from the date of manufacture.

On expiry of guaranteed shelf-life, the glue, before application, should be checked for conformity to the requirements of this standard.

6. SAFETY REQUIREMENTS

6.1. Phenol-polyvinyl acetal glue is inflammable but not explosive fluid.

6.2. Liberation of the following gaseous substances is possible at 160°C from the glue of grades BF-2, BF-4, BF-2N, BF-4N, BF-6: Phenol, formaldehyde, ammonia, butyraldehyde, and from glues of grades BFR-2 and BFR-4, besides the indicated substances, liberation of furfural is possible.

Maximum permissible concentration of the above indicated substances, their inflammability and explosiveness are given in table 3.

Table 3

Substances	Maximum permissible concentration, mg/m³	Flash point °C	Self-ignition point, °C	Boiling point, °C	Zone of ignition, % by volume	Temperature limits of inflammability °C	
						Lower	Higher
Phenol	5	75	595	181.9	0.3-2.4	45	83
Formaldehyde	0.5	-	430	-21	7.0-73	-	-
Ammonia	20	-2	650	-33.4	15-28	-	-
Butyraldehyde	5	56	248	83	Lower limit 2.0	-	-
Furfural	10	61	260	161.7	1.8-3.4	60	72
Ethyl alcohol	1000	13	404	78.4	3.6-19	11	41

6.3. For prevention of harmful action of the substances, which are liberated at high temperature from the glues, it is necessary to provide plenum-exhaust ventilation in the chamber, which guarantees content of harmful substances within the values, which do not exceed the indicated max. permissible concentration.

6.4. Open fire, during operation of glue, is not allowed.

Appendix(reference) to
GOST 12172-74.

Resistance of glue to the action of aggressive mediums.

Aggressive medium	Norms for grades		
	BF-2	BF-4	BF-6
1. Oil	Stable	Stable	Stable
2. Benzine	Stable	Stable	Stable
3. Kerosine	Stable	Stable	Stable
4. Alcohol	Stable upto a limit	Stable upto a limit	Stable upto a limit
5. Acetone	-"-	-"-	-"-
6. Acid	Stable	Stable	-"-
7. Alkali	Stable upto a limit	Stable upto a limit	Stable upto a limit
8. Water	Stable	Stable	Stable
9. Mush room	Stable	Stable	Stable.

Other standards referred to in this standard.

GOST 8420-74	GOST 14759-69	GOST 5799-69
" 6806-73	" 9980-75	" 14182-69
" 10394-72	" 9070-75	" 18573-73
" 6371-73	" 7148-70	" 13841-68
" 10973-75	" 5009-75	" 1.9-67
" 1050-74	" 21631-76	
" 4237-76	" 2184-67	
" 2758-69	" 6981-71	
" 17299-71	" 6709-72	
" 11680-76	" 17718-72	