



## TECHNICAL DATA SHEET

POLYPROOF

PHENOL RESORCINOL

ADHESIVE WITH HARDENER

The combination Polyproof Adhesive with hardener is approved by NTI, Norway, Otto-Graf Institut (FMPA), Germany, SKH/KOMO (DHBC No. 32389), Holland for the production of load-bearing timber structures.

POLYPROOF is specifically designed for use wherever maximum resistance to weathering is required, e.g. garden furniture, storm porches, constructional laminating, marine craft, gluing laminated plastic both to wood and itself.

POLYPROOF can also be used in door production, lamination, finger jointing and other applications in the wood working industry, where there is demand for high water and weather resistance of the joints. The combination has short pressing times even at lower pressing temperatures.

POLYPROOF has exception load bearing properties for all structural work including load bearing beams.

Used in wooden aircraft components.

**Properties of the bond-line**

Polyproof with hardener fulfils the requirements according to EN 301 (for glue type I and II, service classes 1,2,3), EN 391, EN 392 and DIN 68141.

## Directions for use

**Application tools** Brush, roller spreader, ribbon spreader etc

**Mixing ratio** Adhesive 100 parts by weight  
Hardener 15 parts by weight  
The accuracy in the hardener amount shall be  $\pm 1$  pbw.

**Pot life**

Temperature of glue mix	10°C	15°C	20°C	25°C	30°C
Pot life in hours	4½	2¼	1¼	2/3	½

When preparing large amounts of glue mixture, it is recommended to cool the glue to 10-15°C and after that add the hardener to extend the pot life.

**Wood temperature** The temperature should not be lower than 20°C.

**Moisture content of the wood** 8 - 14%. For the production of laminated beams 10 - 12%.

## General Application for jointing

To obtain the very best results the moisture content should be in the 12-14% range. Timber bought as kiln dried and stored under cover will present no problem.

Perhaps as important as the glue is the preparation the joining surfaces, especially for Oak and oily timbers, Teak, Iroko etc.

Timber direct from machining has a slightly glazed surface and the surface fibres are compressed by rollers etc, far from ideal and it is essential that the surfaces to be joined should be ridded of this unwanted smoothness.

Use a scouring plane (blade with fine points), hacksaw blade, or very coarse sandpaper. Plywood must be, treated in the same manner. Dust with a bristle brush, oily timbers should be degreased with methylated spirit. The faying area should be abraded as close to bonding as practically possible.

As important as preparation, is working in the correct temperature and that means, within reason, as warm as possible, 20C is ideal.

At higher temperatures the glue becomes much less viscous, easier to apply and penetrates the timber instead of laying on the surface, a better glue line results.

For the best results both surfaces of the joint should be glued. Use good quality brushes. Surfaces once glued should not be exposed to the air for any length of time. Do not over cramp; it's possible to starve a joint this way. Just bring the surfaces firmly into contact.

A minimum of twenty minutes closed assembly time should be allowed before the application of pressure.

This will enable the glue to penetrate the surface fibres of the timber and avoid excessive squeeze out.

The removal of surplus glue is best carried out when the glue has reached a jelly like stage, just before it goes off; it comes off readily and doesn't stick to anything. If the glue sets hard it will prove very arduous to remove it and from awkward places almost impossible.

# Factory assembly of Laminated beams and Presswork

**Planing of the wood** For best result at laminated beam production the timber must be smoothly planed. For optimum bonding strength the planing should take place within 24 hours before gluing.

**Glue spread** For production of laminated beams a minimum glue spread of 400-450 g/m<sup>2</sup> single-sided is recommended. A reduction of the glue spread, e.g. at very short assembly times, is only allowed to be done together with the Polyvine Products Technical Advisors, depending on the production parameters for the production line in question. This optimization implies that the set parameters are followed and that a continuous control of the adhesion quality is made by means of delamination tests. At HF gluings a glue spread of 250-350 g/m<sup>2</sup> single-sided is recommended. At other applications: 150-300 g/m<sup>2</sup>.

Difficult-to-glue wood or hardwood require double spreading in amounts of 150-200 g/m<sup>2</sup> on each side.

**Assembly time** The assembly time is the time from the glue application until the pressure is applied. The assembly time can consist of closed and open assembly time. The assembly time is influenced by the amount of adhesive, temperature and moisture content of the wood. The pressure must be applied while the glue is still tacky.

**Closed assembly time** Closed assembly time in minutes with different glue spreading and temperatures.

Glue spread	350 g/m <sup>2</sup>			450 g/m <sup>2</sup>		
	20°C	25°C	30°C	20°C	25°C	30°C

## Pine

Minimum time	5	4	3	7	6	4
Maximum time	30	25	15	45	30	20

## Spruce

Minimum time	10	8	5	15	10	7
Maximum time	30	25	15	45	30	20

Double spreading can increase the closed assembly time by 30-40%.

**Open assembly time** The open assembly time is approximately half of the closed assembly time. When gluing hard wood it is favourable with long assembly times.

**Pressing temperature** Soft wood can be glued at a joint temperature of 20°C. To be sure to obtain a good result heating of the glue joint to 30°C is recommended. When gluing hard wood the temperature of the glue

joint must be at least 40°C.

Constructions with tensions and hard woods requires at least 60°C to obtain adequate strength. Lowest pressing temperature has to be tried out. After the pressure is applied the heating can start.

### **Pressure**

Minimum 0,5 MPa for soft wood  
Minimum 1,0 MPa for hard wood  
In laminated beam production:

Minimum 0,7 MPa for 33 mm lamellas  
Minimum 0,9 MPa for 45 mm lamellas

According to DIN 1052/1-A1 maximum allowed thickness of lamellae is 42 mm.

### **Pressing time**

The pressing time depends on the temperature, the distance to the innermost glue joint, the glue spread, etc. The table below may be used as a guideline.

<u>Glue joint temperature</u>	<u>Minimum time for curing at indicated glue joint temperature</u>
20°C	4 hours
30°C	2 hours
40°C	45 min
60°C	12 min
80°C	3 min
100°C	1 min

It is essential that an adequate heating time is added to the above indicated times.

## **FINGERJOINTING OF CONSTRUCTION TIMBER.**

**Application equipment**      Profiled rollers, die.

**Moisture content**            Maximum 23%.

**Glue spread**                    With single-sided application 250-300 g/m<sup>2</sup> and with application on both ends 125-150 g/m<sup>2</sup> on each end. The total surface is for a 15 mm profile 8 x the cross-section of the wood, for 20 mm profile 6,5 x the cross-section of the wood and with 28-32 mm profile 10 x the cross-section of the wood.

**HF-heating**                      When fingerjointing lamellae for construction timber the temperature of the wood must be at least 15°C and the timber must be stored inhouse for at least 24 hours after fingerjointing. If HF-heating is used the fingerjointed lamellae can be taken out after 2 hours.

<b>Assembly time</b>	Maximum 90 sec.
<b>Mixing proportions</b>	Adhesive 100 pbw Hardener 15 pbw The accuracy when adding hardener should be $\pm 1$ pbw.
<b>Further processing</b>	Planing of finger-jointed wood can be made 7-10 minutes after jointing provided that the planer is not pulling the wood. Full hardening of the finger joint is achieved after 2 hours if the temperature of the wood in the joint zone has been more than 60°C. If pressing is made at 20°C full hardening is achieved after 24 hours.

## TECHNICAL DATA

<b>Type</b>	Phenol Resorcinol glue	
<b>Delivery form</b>	Adhesive liquid Hardener liquid	
<b>Colour</b>	Adhesive dark brown Hardener greyish brown	
<b>Viscosity</b>	Brookfield LVT, sp. 4, 12 r/min, 25°C:	
	Adhesive	approx. 5000 mPa.s
	Hardener	approx. 8000 mPa.s
<b>Density</b>	Adhesive	approx. 1150 kg/m <sup>3</sup>
	Hardener	approx. 1220 kg/m <sup>3</sup>
<b>Dry solids</b>	Adhesive	approx. 56%
<b>pH</b>	Adhesive	approx. 8
	Hardener	approx. 5
<b>Flash point</b>	Adhesive	70°C
	Hardener	81°C

## OTHER DATA

<b>Storage life</b>	Adhesive	6 months at 20°C in well closed packaging.
	Hardener	6 months at 20°C in well closed packaging.

If the packaging is left open when not in use the glue is susceptible to skin formation on the surface. To avoid this the packaging should be closed when not in use.

**Temperature sensitivity** Most suitable storage temperature is 15°C. The glue and the hardener are not harmed by freezing. If frozen, the adhesive and the hardener should be slowly thawed, after which the products are ready to use. Do not expose the glue or the hardener to temperatures above +30°C.

**Moisture sensitivity** None.

## HEALTH AND SAFETY

**Handling and cleaning instructions** Information regarding health and safety is found in the Materials Safety Data Sheet. Make sure always to study this information carefully before taking any new product into consideration.

### Always wear gloves

If glue gets onto skin wash with soap and water.

The tools are washed with tepid water before the glue has cured.

The information is based on laboratory tests and a long practical experience. It is introductory and intended to help the user find the most suitable method of working. Since the user's production conditions are beyond our control, we cannot be held responsible for the results of the work which is affected by local circumstances. In each particular case testing and continuous control are recommended.

12/05/2008	PJW	Polyvine Ltd
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