

Preferere 4115

Liquid urea adhesive for the wood working industry for use with the hardeners **Preferere 5156, 5219, 5222, 5224, 5267**

Use

Preferere 4115 is a liquid urea adhesive. The adhesive, when used together with the hardeners Preferere 5156, 5219, 5222, 5224, 5267 are designed for various applications for the wood working industry. The adhesive systems are suitable for hot bonding as well as for use under radio frequency heating conditions.

Provided that the adhesive system is used according to the instructions in this technical data sheet it offers the possibility of obtaining end-products with E1 emissions.

Technical data for the adhesive

Appearance	Milky white, viscous liquid
Solids content (2 h at 120°C)	68 - 71%
Viscosity at 20°C	1700 - 4000 mPa.s *
Viscosity at 25°C	1300 - 3600 mPa.s *
pH at 25°C	8,0 – 9,5
Density at 25°C	1,31 ± 0,02 g/cm ³

*The viscosity is measured by Brookfield, RVT, spindle 2 at 20 rpm.

Storage of the adhesive

The viscosity of Preferere 4115 increases during storage and may eventually become so high that the adhesive is no longer usable. The shelf life is shorter the higher the storage temperature is.

The storage stability of Preferere 4115 from the date of production is given in the following table for different storage temperatures.

Temperature	15°C	20°C	25°C	30°C
Storage stability in months	3½	2½	1½	1

Although the shelf life of Preferere 4115 is longer at low temperatures, cold adhesive will be higher in viscosity and can be difficult to pump. Optimal storage temperature is therefore 15-20°C. It is warned against diluting adhesive that has been stored too long or at too low temperature with water to lower the viscosity. Instead it is recommended to keep it for a few days at 20-25°C.

Customers who get Preferere 4115 supplied in bulk are referred to our Technical Information Leaflet No. 5E "Bulk storage and handling of liquid resins" which contains useful information about storage of resins and operation of storage tanks.

Prefere 4115 is not flammable.

Technical data for the hardeners

	Prefere 5156	Prefere 5219	Prefere 5222	Prefere 5224	Prefere 5267
Appearance	Greyish - white liquid				
Shelf life at 20°C	3 months	3 months	4 months	4 months	3 months
Viscosity at 25°C, mPa.s	1800 - 4000	1800 - 4000	2300 - 4500	2300 - 4500	2300 - 4500
pH at 25°C	2,7 – 3,3	2,7 – 3,3	3,8 - 4,3	4,3 - 5,3	3,4 - 4,0
Density at 25°C [\pm 0,01 g/cm ³]	1,32 g/cm ³	1,32 g/cm ³	1,28 g/cm ³	1,28 g/cm ³	1,25 g/cm ³

Storage of the hardeners

The hardeners must under no circumstance be stored at temperatures below 10°C. It is also recommended to store the hardeners below 20°C. Higher storage temperatures may reduce the shelf life of the product.

Storage temperatures above 25°C are not recommended.

Delivery form

Prefere 4115 and the respective hardeners can be delivered in bulk, IBC's or drums.

Glue mix preparation

The hardeners are mixed with Prefere 4115 in a ratio of 100 : 20 parts by weight (pbw).

It is warned against changing the recommended hardener dosage, e.g. to obtain longer pot life or shorter pressing time. For several reasons, the correct hardener dosage is important. If the glue mixture is not suitable, our Marketing Department will recommend an alternative.

Pot life

The pot life of Prefere 4115 with hardeners are given in the table below.

Temperature	Pot life in hours at		
	15°C	20°C	25°C
Prefere 5156	15	7½	3½
Prefere 5219	1½	¾	½
Prefere 5222	8	4	2
Prefere 5224	12	6	3
Prefere 5267	9	4½	2¼

Glue spread

The glue spread rate depends on the surface of the adherents. Normal glue spread is 100-180 g/m². On very smooth surfaces (e.g. medium density fiber board) lower glue spread may be used. On the other hand, e.g. on rough veneer surfaces higher glue spreads may be required.

Assembly time

Assembly time is the time elapsing between glue application and pressure application. It can be subdivided in open (from glue application until assembly of the adherents) and closed assembly time (from assembly until pressure is established).

By varying the assembly time special effects can be achieved, e.g. reduced wood penetration and improved anchoring of the adhesive system in the wood. However, the pressure must be applied whilst the glue mix is still tacky.

The maximum assembly time depends on the hardener used, glue spread rate, temperature, relative humidity and the velocity of the air flow (ventilation, draught). Hence, exact figures cannot be given. If a fast curing hardener is used, the risk of pre-cure must be taken into consideration.

Pressure

The pressure is determined by the density, surface evenness and thickness tolerance of the adherents as well as the assembly time. Glue being squeezed out of the glue line when the pressure is applied is an indication of sufficient pressure.

Normal pressure should be in the range of 0,3-1,6 N/mm² (3-16 kp/cm²), depending on the type of bonding operation and the materials to be bonded.

Pressing properties

The pressing times of Prefere 4115 with different hardeners are given in the table below.

Temperature	Setting times in seconds at				
	70°C	80°C	90°C	100°C	110°C
Prefere 5156	630	300	135	60	35
Prefere 5219	45	30	25	20	<20
Prefere 5222	300	130	85	40	30
Prefere 5224	570	270	120	50	35
Prefere 5267	330	150	90	45	30

The pressing times (basic setting times) stated refer to glue line temperature only and allowance must be made for the heat to travel from the press platens.

The heat penetration time will vary depending on press temperature and the heat capacity of the press, the heat transfer of the wood material and distance to the farthest glue line.

When veneering with veneer thickness below 1 mm, the heat transfer at above 100°C can be calculated to be 1-2 sec per 0,1 mm veneer thickness. For other applications the following table can be used as a guide to the additional time required for low and medium density timbers.

Press temperature	Additional time per mm distance to the farthest glue line
70-80°C	2 minutes
90-100°C	1 minute

Allowance must be made for the heat to travel from the press platen. The heat penetration time will vary depending on press temperature and the heat capacity of the press, the heat transfer of the wood material and distance to the farthest glue line.

Because so many local conditions affect the pressing times it is recommended to establish the correct pressing time by trials on the spot.

Radio frequency heating conditions vary considerably, depending on many factors, such as voltage and frequency of the generator, the electric properties of the adherents and the adhesive and the size of the adherents, and even approximate pressing times cannot be stated. Thus, the pressing times should be established by trials under the prevailing, local conditions. In RF-presses (through heating), the pressing time can vary from ca 20 seconds (with high-effect RF generators) to a few minutes, depending on the mass of the adherents and the choice of hardener.

Cleaning

Mixing and application equipment should be cleaned at the end of the working day. If the glue mix thickens in the application equipment, the equipment must immediately be emptied and cleaned. Otherwise, there is a risk that the glue will cure. Cured glue is insoluble and must be scraped off.

The equipment is most easily cleaned with lukewarm water (30-50°C).

Adhesives are potential pollutants. Glue remainders and untreated wash water may not be discharged into public drains or water-courses unless a permit has been obtained from the appropriate authorities. Advice on safe handling of glue remainders and waste water can be found in our Technical Information Leaflet No. 2E "Glue waste disposal - Pollution prevention".

Safety precautions

Reference is made to the Safety Data Sheet for Prefere 4115 and the hardeners Prefere 5156, 5219, 5222, 5224 and 5267.

When the adhesive and the hardener are mixed a chemical reaction will start. The pH of the mixture will be in between the value for the adhesive and the hardener. The free formaldehyde content for the adhesive will be reduced. The acid/salt concentration of the hardener will be diluted.

When handling the adhesive, the hardener and the glue mix, it is recommended that certain precautions normally taken when handling chemicals is observed. Skin contact with the uncured glue should be avoided, since people with particularly sensitive skin may be affected. It is recommended to wear protective gloves, likewise eye protection where there is a risk of splashes. Hands and forearms should be thoroughly washed with soap and warm water at the end of the working day. Adequate ventilation of the workshops should be maintained.

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