

## Prefere 4114

Liquid urea adhesive for the applications  
flooring, veneering, board-on-frame

### Use

Prefere 4114 is a liquid urea adhesive that is used together with the following liquid hardeners for the respective application areas:

- Prefere 5160M (flooring / parquet, veneering)
- Prefere 5163M (flooring / parquet, veneering)
- Prefere 5180 (door & board-on-frame)

The adhesive system with above hardeners is especially designed for flooring / parquet, veneering as well as doors & board-on-frame applications but can also be used for a wide range of other applications within the wood industry. Prefere 4114 is suitable for hot bonding as well as for use under radio frequency heating conditions.

The choice of hardener for Prefere 4114 depends on operating conditions, such as requirements on glue mix pot life and reactivity. However, even other factors may affect the choice of hardener, for example the glue ability of the material, environmental requirements and special operating conditions (e.g. automatic adhesive/hardener mixer, equipment for separate application, radio frequency heating), etc.

The adhesive system with the above hardeners is developed for bonding operations that require especially good bonding quality and performance also for materials and wood species that might be difficult to glue.

Prefere 4114 with the hardeners Prefere 5160M, 5163M and 5180 will give end-products of E1 quality for most applications and processes provided that the instructions in this data sheet are followed.

The adhesive system is designed to be preferably used with automatic metering/mixing equipment.

### Technical data for the adhesive

	Prefere 4114
Appearance	Yellowish, viscous liquid
Solids content (2 h at 120°C)	69 - 71%
Viscosity at 20°C	3500 - 5000 mPas*
Viscosity at 25°C	2300 - 4000 mPas*
pH at 25°C	8,0 - 8,6
Density at 25°C	ca 1.30 g/cm <sup>3</sup>

\*The viscosity is measured by Brookfield, RVT, spindle 4 at 20 rpm.

### Technical data for the hardeners

	Prefere 5160M	Prefere 5163M
Appearance	Greyish-white liquid	Greyish-white liquid
Shelf life at 20°C	4 months	4 months
Viscosity at 25°C	330 mPa.s*	500 mPa.s*
pH at 25°C	2,6	3,4
Density at 25°C	1,2 g/cm <sup>3</sup>	1,15 g/cm <sup>3</sup>

	Prefere 5180
Appearance	Greyish-white liquid
Shelf life at 20°C	4 months
Viscosity at 25°C	500 mPa.s*
pH at 25°C	approx. 3.3
Density at 25°C	1.12 ± 0.01 g/cm <sup>3</sup>

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

### Delivery form

Prefere 4114 and the respective hardeners can be delivered in bulk, IBC's or drums.

### Storage of the adhesive

The viscosity of Prefere 4114 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 Prefere 4114 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	4	3	2	1

Although the shelf life of Prefere 4114 is longer at low temperatures, cold adhesive will be higher in viscosity and can be difficult to pump.

Customers who get Prefere 4114 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 4114 is not flammable.

## Storage of the hardeners

The optimal storage temperature for the hardeners Prefere 5160M, 5163M and 5180 is 20°C. At this temperature the storage stability will be 4 months. The hardeners must under no circumstance be stored at temperatures below 10°C. Storage temperatures above 25°C are not recommended.

## The wood

The wood to be bonded must be of uniform thickness. The surfaces must be free from oil, fat, dust or other deposits.

The adhesive system gives the highest bond strength when the moisture content of the wood is 4-8%. Acceptable bond strength can be obtained at even higher moisture content,

## Glue mix preparation

The hardeners are mixed with Prefere 4114 always in a ratio of 100:20 parts by weight (pbw).

It is warned against changing the 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 4114 with hardeners is given in the table below at different temperatures

Temperature	10°C	15°C	20°C	25°C	30°C
Prefere 5160M	1 1/3	1	3/4	1/2	-
Prefere 5163M	5	3	1 1/2	1	1/2
Prefere 5180	-	3	1 3/4	1	1/2

## Glue spread

The glue spread rate depends on the surface of the adherents. Normal glue spread is 100-180 g/m<sup>2</sup>. On very smooth surfaces (e.g. medium density fibreboard) lower glue spread may be used. On the other hand, e.g. on rough veneer surfaces higher glue spreads may be required.

## Assembly time

By varying the assembly time (open and/or closed) 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/mm<sup>2</sup> (3-16 kp/cm<sup>2</sup>), depending on the type of bonding operation and the materials to be bonded.

### Pressing time

The pressing times of Prefere 4114 with different hardeners are given in the table below.

	60°C	70°C	80°C	90°C	100°C	110°C
Prefere 5160M	150	70	45	40	35	30
Prefere 5163M		170	80	65	45	35
Prefere 5180	360	180	90	60	45	

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 pr 0.1 mm veneer thickness. For other applications the following table can be used as a guide to calculate the additional time required for low and medium density wood species.

Press temperature	Additional time per mm distance to the farthest glue line
50-60°C	3 minutes
70-80°C	2 minutes
90-100°C	1 minute

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. Due to that exact pressing times cannot be given, the required pressing times for RF pressing processes should be established by trials under the prevailing, local conditions.

## 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 Sheets for Prefere 4114 and the hardeners Prefere 5160M, 5163M and 5180.

When the adhesive and 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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