

Technical Data Sheet



Telephone: +44 (0)1352 757657

Telefax: +44 (0)1352 758914

Email: sales@tsresins.co.uk

Prefere 4157 and Prefere 4111M with Hardener Prefere 5278

Prefere 4157 and Prefere 4111M are a medium and medium-high viscosity, urea-formaldehyde resins. They have long shelf lives and very good wash-down properties.

Use

The hardener Prefere 5278 is a hot-bonding hardener for a variety of applications, such as the production of doors, parquet flooring and curved plywood shapes and for veneering. They can also be used under radio frequency glue line heating conditions.

The hardener is formulated with a view to use in automatic mixing equipment preparing small batches of resin and hardener. If greater batches are mixed by hand, there is a risk that the heat evolved will raise the temperature of the glue mix, thus reducing the pot life.

Technical data

	Prefere 4157	Prefere 4111M	Prefere 5278
Appearance	Translucent to opaque liquid	Semi opaque liquid	Off-white liquid
Viscosity at 25°C (mPas)	1800 - 2500	3100-3400	1800-5000
SG at 25°C (g/cm³)	1.27 – 1.33	1.27 – 1.32	~1.21
pH	7.5 – 8.6	8.3 – 8.6	4.0 – 4.5
Shelf Life at 20°C	~ 6 months	~ 6 months	~ 3 months

Delivery form

Prefere 4114 and the respective hardeners can be delivered in bulk, IBCs or drums.

Storage of the adhesive



Technical Data Sheet

Prefere 4157 and 4111M have a limited shelf life. The viscosity increases during storage and may eventually get so high that the glue is no longer usable. The shelf life will be shorter the higher the storage temperature is. The optimal storage temperature is 15-20°C.

Storage of the hardener

Under no circumstances should the hardener be stored at temperatures below 10°C. It is also recommended to store the hardener below 20°C. Higher storage temperatures may reduce the shelf life of the product.

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 still be obtained at even higher moisture content.

Mixing ratio

	Parts by weight
Prefere 4157	100
Hardener Prefere 5278	25
Prefere 4111M	100
Hardener Prefere 5278	20

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



Technical Data Sheet

Pot life

Resin	Hardener Addition (pbw)	Pot Life in hours Temperature of glue-mix / °C			
		15	20	25	35
4157	25	13	5 ¼	2 ¾	1 ½
4111M	20	22	9	4 ½	2 ¾

These pot-life times are to be used as an indication. The actual pot-life will be influenced by humidity, quantity of glue-mix and other factors.

Glue spread

The glue spread rate depends on the surface of the adherents. Typical glue spread for most applications is 100 – 180 g/m². On very smooth surfaces (eg medium density fibreboard) lower glue spreads may be used. On the other hand, on rough veneer surfaces, higher glue spreads may be required.

Assembly times

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

By varying the assembly time certain enhancements can be achieved, such as reduced wood penetration, improved anchoring of the adhesive into the wood etc. 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 airflow (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.



Technical Data Sheet

Pressure

The required bonding 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 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

Resin	Press Time in Seconds			
	80°C	90°C	100°C	120°C
4157	150	95-100	65	35
4111M	230	135	85-90	45

Press times are calculated for a spread rate of 100gsm. Press times will need to be adjusted for different spread rates. High density woods and panel products such as MDF and moisture resistant particleboard may require longer pressing times due to their higher heat capacity and slower rate of water absorption. All pressing times should be used as a guide and not taken as a specification.

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, the heat capacity of the press, the heat transfer of the wood material and distance to the farthest glue line.

When veneering with veneer thicknesses below 1mm, the heat transfer at temperatures above 100°C can be calculated to be 1-2 seconds per 0.1mm veneer thickness. For other applications the table below 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 furthest glue line
70-80°C	2 minutes
90-100°C	1 minute

Because so many local conditions affect the pressing times, it is recommended to establish the correct pressing times by running trials using the customer's own equipment.

Radio frequency heating conditions vary considerably, depending on many factors, such as voltage and frequency of the generator, the electrical properties of the adherents and the size of the adherents, so even approximate pressing times cannot be stated. Thus, pressing times should be established by conducting trials using the local conditions at the customer's site. In RF presses, the pressing time can vary from



Technical Data Sheet

approximately 20 seconds (with high-effect 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 typically 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 relevant Material Safety Data Sheets for Prefere 4157, Prefere 4111M and hardener Prefere 5278.

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

When handling the adhesive, hardener and the glue mix it is recommended that certain precautions normally taken when handling chemicals are 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 and 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 a working day.

Adequate ventilation of the workshops should be maintained.



Technical Data Sheet

Caution

TS Resins adhesives and hardeners are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come into contact with foodstuffs or food utensils, and measures should be taken to prevent the uncured materials from coming into contact with the skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper – non cloth – towels should be used to dry the skin. Adequate ventilation of the working area is recommended. These precautions are described in greater detail in Material Safety Data sheets for the individual product. These are available on request and should be referred to for fuller information.

The suggestions given in these notes are based on data gained from experience and tests. However, since operating conditions in the user's plant is beyond our control, we cannot assume responsibility for any risks or liabilities, which may result from the use of our products. The information provided were believed to be accurate at the time of preparation, or obtained from sources believed to be generally reliable. However, TS Resins Ltd makes no warranty concerning their accuracy, and TS Resins Ltd will not be liable for claims relating to any party's use of or reliance on information or recommendations contained herein, regardless of whether it is claimed that the information or recommendations are inaccurate, incomplete or otherwise misleading. Further, TS Resins Ltd makes no warranty concerning any product, except that the product shall conform to contracted specifications.

PdW 05.2018