Technical Data Sheet

Telephone: +44 (0)1352 757657
Telefax: +44 (0)1352 758914
Email: sales@tsresins.co.uk

Prefere 4152 with Powder Hardeners

Low viscosity liquid urea adhesive of high solids content.

Use

Prefere 4152 is used for small assembly applications in the furniture industry. It is also suitable for veneering.

With the special hardener Prefere 5603, Prefere 4152 cures exceptionally quickly under radio-frequency with glue-line or stray field heating conditions. Mixed with one of the filled hardeners, Prefere 4152 gives a high viscosity and low-cost glue mix without the separate addition of fillers or extenders. These mixes are suitable for use in a variety of assembly applications, and in conjunction with low-voltage or radio-frequency heating, for lipping and edge-banding.

Hardeners Prefere 5611 and Prefere 5612 contain an extender to counteract adhesive penetration through thin decorative veneers

Prefere 4152 possesses good flow properties which allow low, even rates of spread to be obtained. It is easy to clean off after use – precipitated adhesive is not sticky and readily washes from spreader rolls etc.

Technical data

	Prefere 4152
Appearance	Semi-opaque liquid
Viscosity at 25°C (mPas)	1000 – 2200
SG at 25°C (g/cm^3)	1.28 – 1.30
pH	7.0 – 8.5
Solids Content (%)	66 ± 2

Specification

Prefere 4152 with the appropriate hardener (except hardeners Prefere 5611 and Prefere 5612) conforms to Type MR of BS 1203 or BS 1204: Part 2, and these are grouped below according to the requirements met by the glue.

BS 1203 Type MR	Prefere 5689, 5600, 5602, 5603, 5604, 5605 and 5610.
BS 1204: Part 2 (Type MR) And BS EN 12765 (Class C3)	Prefere 5689, 5600, 5602, 5603 and 5610.

Instructions For Use

Choice of hardener

Hardener Prefere 5603

Radio-frequency hardener. Exceptionally fast cure under radio-frequency with glue-line or stray-field heating conditions.

Extender Prefere 5912 + appropriate hardener

Especially suited to bonding of thin and porous veneers to plywood, blockboard, particleboard, MDF etc. when using multi-daylight presses. Reduces glue penetration and cost, without affecting bond strengths.

Filled hardener Prefere 5610

Combined hardener and filler for edge-banding and lipping. Designed to control flow of glue into absorbent surfaces, e.g. the edge of particleboard and MDF. Suitable for use with radio-frequency and low voltage equipment.

Filled hardeners Prefere 5611 and Prefere 5612

Recommended for hot-press veneering applications at press temperatures between 85°C and 95° C. Reduces penetration when bonding porous veneers.

Mixture

The quantity of hardener to be added depends on the particular hardener chosen.

The proportions are given in Table 1.

	Parts by weight
Prefere 4152	100
Hardener Prefere 5604	15
Extender Prefere 5912	40
Prefere 4152	100
Hardener Prefere 5611	60
Water	0-10

Note: for best gluing results, add the minimum of water, to adjust viscosity.

Mix together resin, hardener and, if required, water. Stir thoroughly.

For hardener addition and pot-life (see table 1).

Preparation of Materials for Bonding

Surface Preparation

Ensure that the surfaces to be bonded are smooth, clean and free from dust or other deposits. Plywood veneers, lippings *etc.* should be of uniform thickness. To avoid wetting difficulties that may arise through case-hardening it is good practice to sand plywood before gluing even though it may appear to have been sanded at manufacture.

Moisture Content

For best results with TS Resins adhesives, the moisture content of the surfaces to be bonded should be within the range 7-13%, but when pressing at temperatures above 105°C moisture content should not exceed 10%. Variation between the adjacent surfaces should not be greater than 3% moisture content.

Application

Application is usually by mechanical spreader, with the actual spread depending on the mix and surfaces to be bonded.

Spread Rates

It is generally adequate to apply the mixture to one of the surfaces only. Using a mechanical spreader, spreads of 100 – 150 grams per square metre are obtainable.

Bonding pressure

For veneering or applying thin decorative laminated plastics to plywood, blockboard, etc., pressures of 0.35-0.42 MPa are adequate. For Radio frequency, the pressure is very important. Normally 0.35 -0.55 MPa is adequate, but surfaces must be in contact and pressure required will depend on stiffness of components.

Hot Pressing

(see tables 3 and 3A). At temperatures above 100 C curing cycles can be precisely determined only by trials under actual factory conditions. This is because at these high temperatures the glue spread and the absorbency and moisture content of the wood have a significant effect on the rate of cure, especially with flow-line presses. Provided the moisture content is controlled to within the recommended limits, the basic setting times given in tables 3 and 3A may be taken as a guide.

Heat Penetration

The basic setting times stated refer to glue line temperatures only and allowance must be made for the heat to travel from the press platen. Heat penetration time will vary according to the density of the wood, moisture content and distance to the farthest glue line. Table 4 is a guide to the additional time required for low and medium density timbers.

The pressing times apply when bonding absorbent materials such as low and medium density wood. The pressing time must be considerably extended when bonding less absorbent, or high density materials.

RF Heating

Radio-frequency heating conditions vary so considerably that even approximate times cannot be given, but Aerolite V can be used very successfully with any of the following hardeners:

Prefere 5689, 5600, 5602, 5604 and 5610.

Exceptionally fast setting times can be obtained using Hardener Prefere 5603. With glue-line or stray-field heating it is imperative that sufficient and even pressure is maintained on the joint, throughout the curing cycle, to avoid boiling in the glue line. Moisture content should be controlled to ensure that the wood is within the optimum limits given – see Moisture content.

Storage

TS Resins adhesives and hardeners should be stored firmly sealed in their original containers in a cool dry place (ideally 5 C – 20 C). Shelf life under these conditions is at least 3 months for Prefere 4152 and considerably longer for the hardeners.

Quantities Available

Prefere 4152 and the powder hardeners mentioned are available packed as follows:

Prefere 4152 – 25kg poly drum, 1000 litre IBC, road tanker

Extender Prefere 5912, Hardeners Prefere 5689, 5600, 5602, 5603, 5604, 5605, 5610, 5611 and 5612 – 25 kg paper sack with inner polythene liner.

Table 1 - Hardener addition and pot life

Hardener Addition Parts by weight per 100 parts Prefere 4152		**Pot-Life** (in hours) Temperatures of mixture (°C)				
		10	15	20	25	30
Prefere 5689	15	2-3	1-1½	¾-1	½ - ¾	¼ - ½
Prefere 5600	15	7-8	4½-5½	3-4	1¼ - 2	¾ -1¼
Prefere 5602	15	11-12	7-8	4-5	2-3	1-1½
Prefere 5603	20	18-20	11-12	6-7	3-4	1-2
Prefere 5604	15	24-30	13-16	8-9h	4-5	2-3
Prefere 5605	15	30-36	18-24	10-12	8-9	6-7
Prefere 5610	50	>24	12-15	6-9	3-4	2-3
Prefere 5611	60	>24	18-25	9½-12	5½-7	2¾-3¼
Prefere 5612	60	>24	16-28	10-17	6-11	3-5

Table 2 - Cold and warm pressing times

Hardener	**Glue-line Temperature (°C)**						
	10	15	20	25	30	35	40
Prefere 5689	2½h	1½h	1h	¾h	½h	¼h	10 min
Prefere 5600	8h	5h	3¼h	2h	1¼h	50 min	40 min
Prefere 5602	14h	8h	5h	3¼h	1¾h	65 min	50 min
Prefere 5603	--	12h	7h	5h	2h	70 min	55 min
Prefere 5610	--	--	9½h	4¾h	2¾h	1½h	1¼h
Prefere 5604	--	--	10h	8h	4½h	2¾h	1h

Note If the glue line is liable to be strained immediately after removal of pressure, the above times should be increased. Full strength and water resistance are only developed after several days, depending on temperature.

Table 3 - Hot pressing times

Hardener	**Glue-line Temperature (°C) and basic setting time (minutes)**					
	55	60	65	70	75	80
Prefere 5689	4¼	3	2	1½	1¼	¾-1
Prefere 5600	4¾	3½	3	2	1¾-2	1
Prefere 5602	6½-7	4-4½	3½	2-2½	1½-2	1¼-1½
Prefere 5603	8½	5-5½	3¾-4¼	2¼-2½	2¼	1½
Prefere 5604	--	--	--	2¾-3	2-2½	1¾
Prefere 5605	--	--	--	8½	6	4
Prefere 5610	8	5	3½	2¼	1¾	1¼
Prefere 5611	--	--	--	2¾-3¼	2¾-3	2-2¼
Prefere 5612	--	--	--	4-5	2¾-3½	2¾-3

Table 3A Temperature range 85°C - 140°C -Hot pressing

Hardener	Glue-line Temperature (°C) and basic setting time (minutes)					
	85	90	95	100	120	140
Prefere 5689	½-¾	¼-¾	¼	--	--	--
Prefere 5600	¾	¼	¼	--	--	--
Prefere 5602	1	¾	½	¼-½	¼	--
Prefere 5603	1¼-1½	1	¾	½-¾	¼-½	--
Prefere 5604	1½	1¼	1	¾-1	½-¾	--
Prefere 5605	3	2¼	1¾	1¼-1½	¾-1	--
Prefere 5610	1	¾	½	¼-½	¼	--
Prefere 5611	1½-1¾	1¼	1	¾	½	--
Prefere 5612	2	1½-1¾	1-1½	1	½	--

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.

Table 4 - Heat penetration

Distance to the glue line	Heat penetration time in minutes per mm distance to the glue line				
	80°C	90°C	100°C	110°C	120°C
Less than 5 mm	1.2	1.0	0.9	0.8	0.8
5 - 10 mm	1.7	1.4	1.2	1.1	1.0
More than 10 mm	2.0	1.7	1.4	1.3	1.2

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.

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