# RYSTIX SALES c.c.

**Suppliers of Rystix resins & Timbacare sealers & coatings**

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# RYSTIX FINGERBOND RESIN SYSTEM

**TWO COMPONENT WBP LIQUID PHENOL - RESORCINOL RESIN SYSTEM FOR THE RAPID FINGERJOINTING OF TIMBER**

## 1. GENERAL PROPERTIES:

***RYSTIX FINGERBOND RESIN SYSTEM*** is a pure synthetic resin system especially designed for the rapid fingerjointing of solid timber by the two component or "honeymoon" principle. It can be used for jointing both hardwoods and softwoods.

**Component A** is a resin/hardener mixture with an extended pot-life in excess of 24 hours and is applied to one profile of the fingerjoint.
**Component B** is an accelerator resin, which requires no mixing, has an indefinite pot-life, and is applied as is to the other profile of the fingerjoint.

When the two profiles are pressed together in the press to form a completed fingerjoint, the accelerator (component B) reacts with the resin/hardener mix (component A) to rapidly produce a strong and durable joint which, when fully cured, conforms to the requirements of the British Standard Specification (BS) 1204 (WBP) and the South African National Standards Specification (SANS) 10096 Exposure Class 1, as a "structural water and boil-proof adhesive".

FINGERBOND RESIN varies in colour from a light honey colour to a reddish brown liquid which when mixed with powdered FINGERBOND HARDENER in the ratio 5 parts resin by weight to 1 part hardener by weight forms component A of the system.

FINGERBOND ACCELERATOR is a dark brown liquid, which forms component B of the system.

The rapid curing of this resin system allows continuous production of fingerjointed timber and eliminates the lengthy curing process required with normal resin systems. Elaborate heated curing chambers are not required and the joints can even be cured under normal room temperature conditions. Refer to the section on "Pressing and Curing" to obtain detailed recommendations for obtaining the best results.

The system has been so designed to eliminate as far as possible the emission of unpleasant smelling formaldehyde fumes during use.

## 2. PACKING AND STORAGE:

FINGERBOND RESIN is supplied in 225 kg brown plastic drums having brown coloured labels. FINGERBOND ACCELERATOR is supplied in 225 kg green metal drums having green coloured labels. FINGERBOND HARDENER is supplied in 22,5 kg plastic lined woven polypropylene bags. Two bags of hardener are required for each drum of resin.

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All components should be stored under cover and in cool conditions. **The drums of resin and accelerator should not be stored outside in direct sunshine.**
Stored correctly the shelf life of all components is in excess of 12 months. The hardener bags should be stored on pallets to prevent wetting by flooding. Any drums or bags that have been opened or are leaking through damage should be used first to prevent deterioration or loss of strength.

NOTE 1: The mixture of one drum of resin with two bags of hardener produces a total of 270 kg of mix, whereas one drum of accelerator contains only 225 kg of product. This means that for every 5 drums (plus 10 bags) of resin mixed a total of 6 drums of accelerator will be required for balanced consumption.

NOTE 2: It is essential that at least two drums of each component should be stored in the temperature controlled glue room at all times. This is to ensure that the temperature of the contents of the drums is maintained within the working range of 20 to $25^0$C during colder times of the year. If consumption exceeds two drums of each component per week, then the drums held under controlled temperature conditions should be increased to three or four of each component.

NOTE 3: The hardener powder is best stored within the glue room in a rubber dustbin with lid. Two bags of hardener should be added to this bin outside the factory to avoid powder contaminating the working area. The filled bin can then be placed near the mixing station within the glue room.

**3. PREPARATION OF THE RESIN MIX (COMPONENT A):**

NOTE: Before using any product from drums that have been standing unused for some time, it is advisable to roll the drums before opening to ensure their contents are homogeneous.

| | | |
|---|---|---|
| Compulsory mixing ratio: | FINGERBOND RESIN liquid: | 5 parts by weight. |
| | FINGERBOND HARDENER powder: | 1 part by weight. |

**FINGERBOND ACCELERATOR (COMPONENT B)** requires no mixing and is used as is.

An accurate and reliable weighing system is required to maintain the correct mixing ratio of resin and hardener. Measurement by volume is not recommended. Equipment used for weighing and mixing the components should be clean and dry and free from contamination from other resins or chemicals.

The use of an efficient mechanical mixer will produce a smooth lump-free mix in less than 5 minutes. **The powdered hardener should preferably be added to the liquid resin during agitation.**

Small quantities (less than 5 kg) can be mixed by hand.

CAUTION: Under no circumstance should the resin mix come into contact with or be mixed with the liquid accelerator before application to the joint profiles, as this will cause rapid hardening of the resin mix.

The viscosity of the resin/hardener mix is designed to match that of the liquid accelerator at $25^o$C. Working in the recommended temperature range of around $25^o$C will therefore give the best results.

Both components when ready to apply have pot-lives in excess of 24 hours, which greatly reduces downtime on the production line. Cleaning is usually only necessary at the end of each day and due to the ready solubility of both resins can be done using cold or lukewarm water.

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PRECAUTIONS: The weighing and mixing of the resin and hardener should be done in a well-ventilated area, preferably with some form of extraction to prevent the operator being exposed to vapours from the powdered hardener. It is recommended that the operator(s) wear suitable protective gear in the way of gloves and respirator masks during the weighing and mixing process.

**4. TIMBER PREPARATION:**

To obtain the best results the timber to be jointed should be passed through the fingerjoint profile cutters immediately prior to the application of the two resin components.

**NOTE:** The jointing of extremely cold timber should be avoided and best results are achieved with timber in the 20 - 25 $^{o}$C range.
Under conditions when the ambient and timber temperatures are likely to be below 15°C it is advisable to store the timber out of the cold in a warmer part of the factory.

The moisture content of all timber should be closely controlled within the range of 7 to 14 %. Best results will be achieved with timber in the range of 8 to 12 % moisture. High moisture leads to dilution of the resins, while dry timber results in rapid penetration of the resins into the timber and can result in starved or dry joints. It is also important to ensure that the joints are free from loose dirt and dust before resin application.

**5. APPLICATION OF THE RESIN SYSTEM**:

Using correctly profiled fingers, sufficient of each component of the system should be applied to each profile to ensure that adequate but not excessive squeeze-out occurs from the joint area during pressing.

It is also important to apply as near as possible equal quantities to each profile to ensure that the two components react in the correct ratio to produce the strongest bond in the shortest possible time.

The resin and accelerator have been formulated for application by the most modern machines equipped with mechanical applicators; however they can also be applied by hand where these facilities are not available. When applying manually it is best to apply the resin and accelerator to stacks of joints that have been vertically aligned over their respective buckets. In this way any excess liquid will fall back into the bucket for re-use. The application can be done using a profiled joint shaped with a handle.

NOTE: Care should be taken to avoid wood chips or sawdust contaminating either the glue in the applicator troughs or in the buckets if manually applied. This can lead to uneven glue spreading and poor quality glue joints. Automatic applicators are usually equipped with brushes to eliminate contamination prior to application and it is important to maintain these brushes in good working order.

6. **PRESSING AND CURING THE FINGERJOINTS:**

The clamping pressure will depend on the length of the fingers and the thickness of the timber. The shorter the finger profile length, the greater is the actual area of the fingerjoint and therefore the greater is the pressure required to press the joint together.
The following table has been extracted from the SANS 10096 “The Code of Practice for the jointing of softwoods and hardwoods” and should be used as a guide.
Practical trials will be necessary to ensure that the correct pressure leads to close fitting joints free from end splitting.

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| FINGER LENGTH | HARDWOODS | SOFTWOODS & LESS DENSE HARDWOODS |
|---|---|---|
| **mm** | **MPa** | **MPa** |
| 7,5 - 10 | 15,3 | 7,8 |
| 10,1 - 21 | 12,75 | 5,8 |
| 21,1 - 31 | 10,2 | 4,0 |
| 31,1 - 41 | 7,65 | 2,0 |

**NOTE**: After jointing and cross-cutting to length, the jointed lengths should be gently handled ON EDGE to avoid disturbance of the joints. They should be stacked by laying them flat in layers separated by stickers to allow the free flow of air between the layers during curing.

The stacks should then be left undisturbed for a minimum time dependent on the curing temperature, before being further handled.

The following table serves as a guide to the curing time required for the joints to develop sufficient strength to allow further handling and processing.

| TEMPERATURE OF THE TIMBER AND FACTORY WORK PLACE: | 10-15°C * | 15-20°C * | 20-25°C | 25-30°C | 30-35°C |
|---|---|---|---|---|---|
| **MINIMUM CURING TIME:** | **2-3h** | **2-2,5h** | **1,5-2h** | **1-1,5h** | **1h** |

*** NOTE**: Under conditions when the ambient and timber temperatures are likely to be below 15°C it is advisable to apply some form of heating to the jointed timber on the stack immediately after jointing to ensure that the glue line temperatures are above 20°C.
A simple form of heating can be applied by having floor steam pipes, or a panel or fan, distributing heat to the jointed timber on the stacks that are covered over with a tarpaulin or other form of canopy.
The consequences of not using some form of heating in very cold conditions is that, although the glue lines may appear to be perfect after curing, when subjected to a preservative treatment, the joints could soften and ultimately fail in service.

Although the joints develop rapid initial strength, full curing takes several days and reference should be made to paragraph 8 below if the joints are to be pressure treated using water borne preservatives.

## 7. CLEANING:

Cleaning of machinery and other equipment should always be carried out before the resin has hardened. The ready water solubility of both components means that cold or luke-warm water is all that is required to clean up. The use of brushes will assist in cleaning more difficult areas such as applicator rollers etc. Washing of effluent should be passed through suitable filters or settling sumps to remove any harmful phenolic residues.

NOTE 1: Consult Rystix Health and Safety Bulletin for detailed information on effective waste disposal from the process.

NOTE 2: Consult Rystix Sales regarding the use of a suitable bond-release agent for application to machinery and conveyors to prevent the build-up of glue residues etc. This will significantly reduce clean-up and other downtime at the end of each shift.

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## 8. PRESERVATIVE TREATMENT OF JOINTED TIMBER:

To ensure optimum joint quality is maintained it is recommended that a minimum period of 7 days be allowed for the joints to cure fully before being subjected to water borne pressure treatment (e.g. CCA). Shorter times are possible with spirit-based preservatives and it is recommended that the technical advice of RYSTIX SALES be first sought before treatment is undertaken.

## 9. PRECAUTIONS:

Provided normal care is taken FINGERBOND RESIN, HARDENER and ACCELERATOR when used in accordance with the recommended procedures should not present any hazards to either worker or the environment.

The usual precautions associated with the handling of phenolic resins should be taken and in particular the use of suitable barrier creams and gloves and respirator masks should be utilised by all operators who are handling and mixing the product. Inhalation of the formaldehyde vapours should be avoided and contact with the eyes and skin should be prevented.

Any accidental contact with the skin or eyes should be immediately rinsed with plenty of water and appropriate medical attention given. Should accidental ingestion occur then immediate medical attention should be sought.

## 10. NOTE:

The information contained in this bulletin is based upon our current knowledge and experience and is given in good faith. Customers using the product should by preliminary tests and trials establish that the products are suitable for application under their specific working conditions. Since the products are stored, handled and applied under conditions that are beyond the control of RYSTIX SALES, RYSTIX SALES cannot accept responsibility for any direct or consequential loss suffered, how so ever this should arise from the use of the FINGERBOND system.

Active technical service forms an integral part of our service and customers are encouraged to make use of this in optimising the performance of the FINGERBOND system under their conditions of application.

**FOR FURTHER INFORMATION CONTACT**:

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