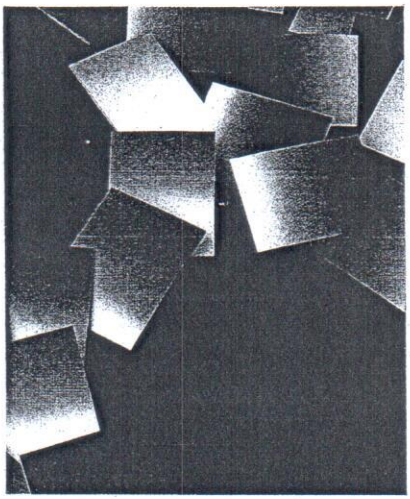


KOYO BOND

WATER BASED POLYMER-ISOCYANATE ADHESIVE FOR WOOD

KOYO SANGYO CO., LTD.

WATER BASED POLYMER-ISOCYANATE ADHESIVE FOR WOOD

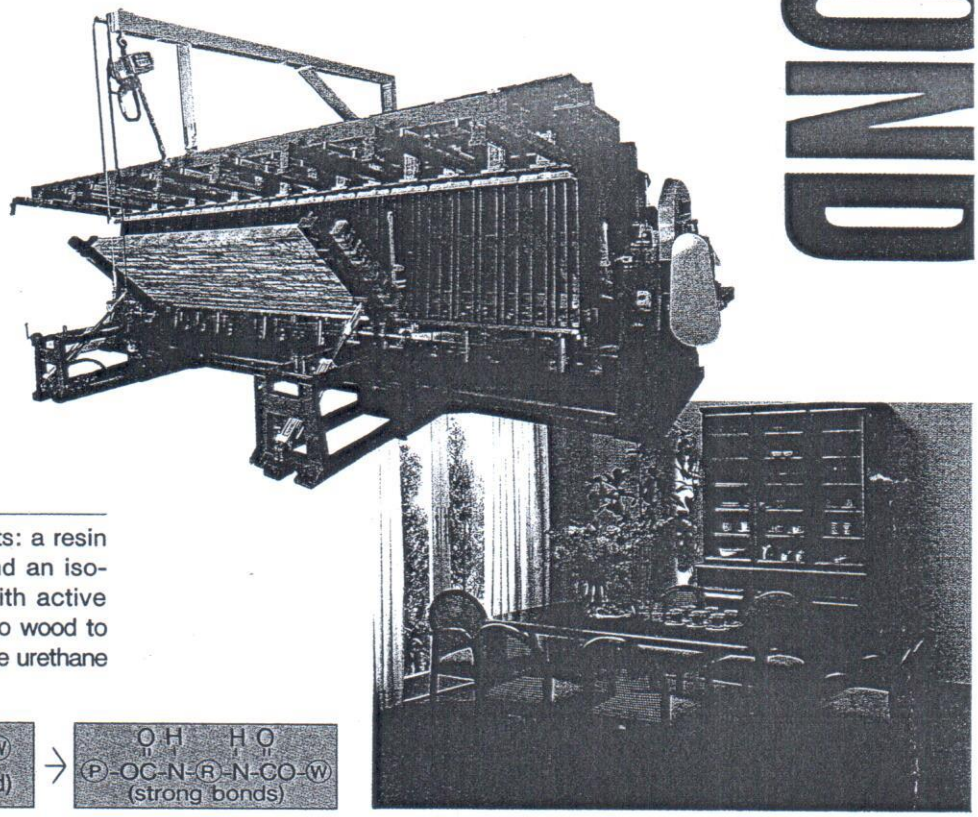
KOYO BOND

FOR LAMINATED WOOD APPLICATIONS

Koyo Bond technology is a water based polymer-isocyanate adhesive system; a unique two-part cross-linking system which cures under a wide range of temperatures to form excellent water, heat and solvent resistant bonds. Koyo Bond is designed for wood to wood, wood to metal, and wood to plastic bonding. Koyo Bond is well known and widely accepted not only in Japan but also in Asian countries. Also, Koyo Bond technology has been licensed to 14 companies in 8 countries.

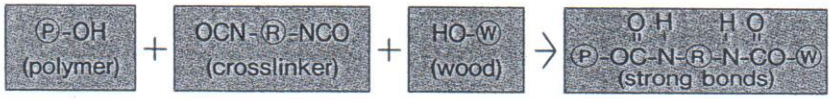
Features

- Fast curing
- Cure at wide range of temperatures
- Cure at neutral pH
- Contain no formaldehyde
- Economical
- High strength
- Water, heat and solvent resistant



Koyo Bond Chemistry

Koyo Bond is composed of two components: a resin containing a reactive aqueous polymer and an isocyanate crosslinker. Crosslinker reacts with active groups of not only aqueous polymer but also wood to produce strong chemical bonds. For example urethane bond is produced as shown below:



Typical Physical Properties	KR-7800	KR-134	KR-560
Appearance	White fluid	White fluid	White fluid
Viscosity at 25°C	60±20 ps	100±30 ps	150±30 ps
Solids	58± 3%	60± 3%	43± 3%
pH	7.5± 1.0	7.5± 1.0	7.0± 1.0
Typical Applications			
Crosslinker	AJ-1	AJ-1	AP
Mix ratio resin/cross. by weight	100/15	100/15	100/15
Press time at 25°C	60 to 120 minutes	20 to 60 minutes	20 to 60 minutes
Wood species	"Hard-to-bond wood species" such as teak, kalin, sungkai, red oak, etc.	Hard woods and soft woods except for "Hard-to-bond wood species"	Rubberwood, ramin, ash, birch, alder, etc. and soft woods
Main Features			
	Highest durability	Best workability Short press time	Low cost Short press time

PRODUCTION MANUAL OF LAMINATED WOOD BY USING KOYO BOND

Substrate preparation

Thickness accuracy of a lamina shoud be within **0.1 mm** and moisture content between 7 and 12%.

Adhesive preparation

Mix **15 parts** of crosslinker with **100 parts** of resin by weight. Adhesive preparation should be done about every **40 minutes** because the mixture has a limited usable period. Water should not be added into Koyo Bond.

Pre-assembly

Before actual bonding, **pre-assembly** should be carried out to ensure everything is all right. Assemble one set of laminas on a table without glueing. Reject defective laminas. Mark a line with chalk on one surface of assembled laminas.

Spreading

One set of laminas should be spread quickly and uniformly with roll spreader or hand roller.
Spread rate is **280 g/m²**.

Assembly

Glued laminas should be placed on press machine, generally within **5 minutes.** Place glued laminas just in the order of pre-assembly and make sure the same chalk line reappears.

Pressing

Press time and pressure should be adjusted counting on various conditions. **Visual observation** on a surface should be carried out to ensure that small amount of glue is squeezed out on every glue line. Start and end time can be recorded on the board.

Scraping

After releasing pressure, **scrape squeezed glue** from the board. The board should be handled with care as glue is not completely cured at this stage.

Trimming (Optional)

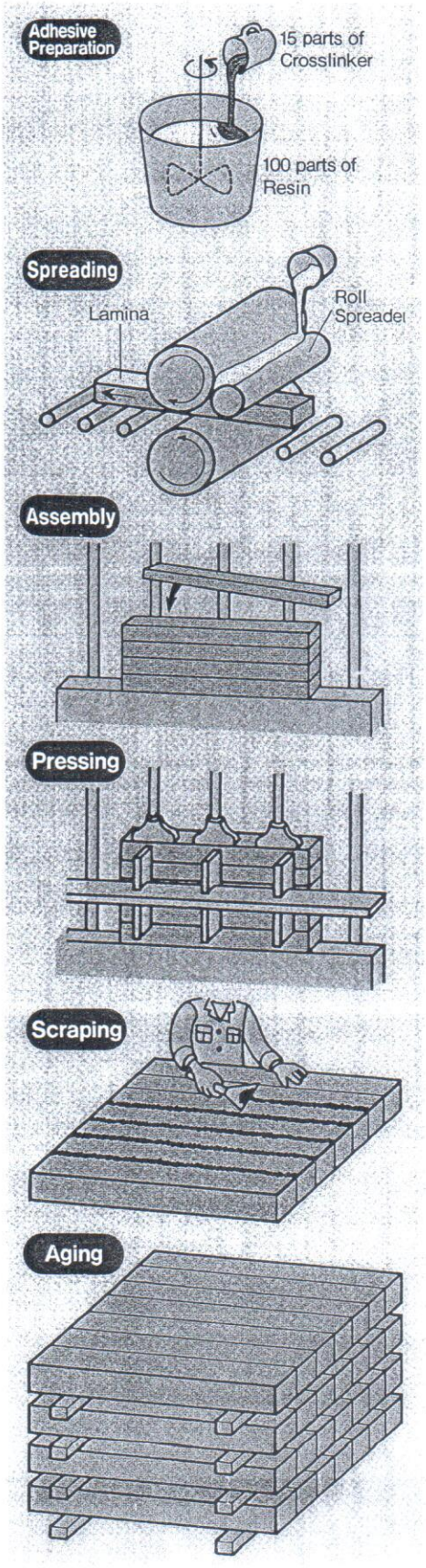
Trimming and rough sanding can be done after overnight pre-aging in ambient conditions. Do not expose the board to direct sunlight. Too much air circulation and heat should be avoided.

Aging

Leave the board for a few days before finishing.

Finishing

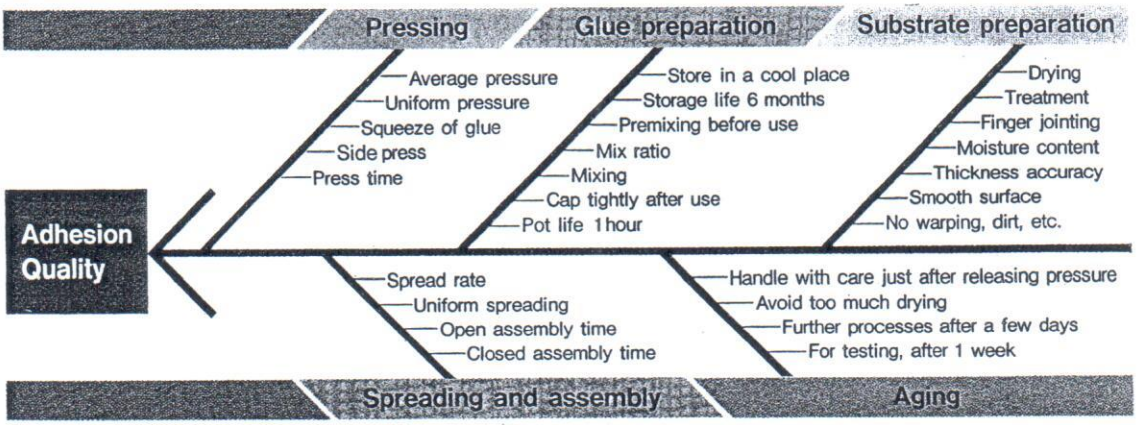
Sawing, moulding, planing, sanding, painting, etc.



Notes

The above conditions are typical examples in **Southeast Asia.** Optional adjustment may be necessary depending on wood species, ambient conditions, type of equipment, requirements of adhesion properties, etc.

Quality Control



Safety

Koyo Bond crosslinker may irritate the skin and eyes. Use with adequate ventilation and wear a mask, goggles and rubber gloves as protective equipment.

Medical First Aid

In case that closslinker touches eyes or skin, the following are necessary emergency actions.
Eyes: Flush with clean water for at least 15 minutes and consult physician immediately.
Skin: Thoroughly wash exposed area with soap and water. If irritation or rash develops, get medical attention.

Storage

Storage life of Koyo Bond is 6 months after shipment when containers are kept closed. Store in a cool place and avoid direct sunlight. Crosslinker reacts with moisture in the air. Therefore, container should be kept closed after each use.

Cleaning

It is very hard to remove the fully cured Koyo Bond mixture. Therefore, mixed Koyo Bond should not be left for a long time on any undesired surface like machine, tool, container, hand, cloths, etc. Washing by water should be carried out promptly after use.

Waste Water Treatment

Koyo Bond does not contain any toxic substance. However, the waste water is white colored and the following processes are recommended to remove suspended solid materials.

The concentration of waste water should be less than 5%. Add following chemicals while stirring.

Waste water		100 parts
NaOH	Solid	0.12
$Al_2(SO_4)_3$	$25\%_{aq.}$	1.6
AP-120	$0.2\%_{aq.}$	1.6

Diafloc AP-120 is high molecular flocculant. Before the addition of AP-120, high speed agitation is recommended, but after the addition, agitate slowly for a short time and leave the mixture to allow sedimentation.
Filter the mixture by fabric, wire gauze (80 mesh) or vacuum filter. Filtrate can be drained. Residue should be buried or burned.

Technical Service

Our laboratory chemists can check and advise the best grade and conditions for your production. If you have any questions, please contact us or our distributor.

KOYO SANGYO CO., LTD. Ishikawa LK Bldg. 4F, 9-9 Kaji-cho, 1-chome, Chiyoda-ku, Tokyo, 101 Japan.
TEL 81-3-3252-1709 FAX 81-3-3252-1708

Distributor

Sole Distributor For Malaysia :
CELCURE (M) SDN BHD (11176-H) or
CELCURE CHEMICALS (M) SDN BHD (15028-A)
Lot 28-29 Kepong Industrial Area, Lorong Kuang Bulan,
Taman Kepong, 52100 Kuala Lumpur.
P.O. Box 12047 50766 Kuala Lumpur, Malaysia.
Tel: 603-6274 2288 Fax: 603-6276 7560 e-mail: celcure@celcure.com

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