



Advantage EP-925

PRODUCT DESCRIPTION

Advantage EP-925 is a two-component emulsion polymer isocyanate (EPI) adhesive recommended for applications requiring exceptional water, heat and solvent resistance. Advantage EP-925 can be utilized with conventional cold press, or hot press equipment, and has been enhanced to provide superior performance with radio frequency press equipment.

Advantage EP-925 allows for reduction in conditioning time before surfacing which improves productivity. Advantage EP-925 is also characterized by good spreader stability compared with traditional EPI adhesives, and is low foaming.

PHYSICAL PROPERTIES

Advantage EP-925

Chemical Family Description: Emulsion polymer isocyanate adhesive based on vinyl acetate

Appearance: White colored liquid

Typical Viscosity (cps): 8000 - 11,000

Weight per gallon (lbs): 10.6

Weight Solids (%): 56.5 – 59.0

pH: 6.5 - 8.5

Freeze/Thaw Stable: Yes

Suggested Minimum Use Temperature: 46 °F

Mixed Viscosity (cps): 10,000 - 16,000 when mixed;
17,000-30,000 at 1 hour

Typical Pot Life:

The useable liquid (pot) life of Advantage EP-925 is in excess of one hour at 77 °F. However the viscosity of the mix will increase as it ages. Wood glued with older material will have less water resistance, a characteristic common to most EPI adhesives. Therefore, it is recommended that fresh adhesive be mixed only when it is to be immediately used.

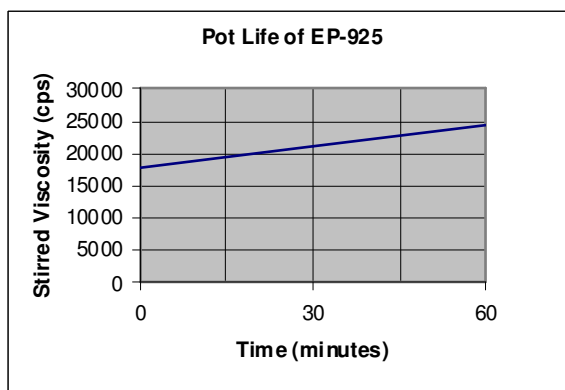
Hardener 200

Chemical Family Description: Polymeric MDI

Appearance: Brown colored liquid

Typical Viscosity (cps): 150 - 230

Specific gravity: 1.23



MIXING INSTRUCTIONS

Advantage EP-925 resin is mixed with Hardener 200 at a ratio of 100 parts resin to 15 parts Hardener by weight or 6.45 parts resin to 1 part Hardener by volume. Avoid mixing for long periods of time or with excessive agitation as pot life is affected by mixing time and speed.

While this product can be easily mixed by hand, it is usually more convenient to mix the components in a meter mix unit. Your Franklin representative can work with you to supply the appropriate mixing equipment.



APPLICATION GUIDELINES

Moisture Content: Six to ten percent is the recommended moisture content for the gluing stock. Higher moisture content will increase the clamp time needed. Additionally, moisture content should mirror as closely as possible that which will be experienced in the end use market for the wood product being manufactured.

Stock Preparation: The preparation of the stock to be glued is extremely important. Joints cut from rip saws should be free of saw marks. They should also be straight and square. Moulded or jointed stock should be free of knife marks. Glazed or burnished joints will prevent adhesive penetration and should be avoided. When possible, glue joints should be prepared and glued the same day. Gluing stock should be uniform in thickness. Variation in thickness should not exceed ± 0.005 ". Sanding to thickness should be performed using higher than 50 grit abrasives. Bowing of staves used in edge gluing should be kept to a minimum, typically less than 0.050" end to end.

Spread Rate: The recommended adhesive coating layer is the same as for most PVA products or approximately 0.007" in thickness. EPI adhesives have superior gap filling properties due to their higher percent solids content. While Advantage EP-925 has higher percent solids content than most PVA adhesives, it also has a higher specific gravity than PVA. This means that in order to apply the same 0.2 mm thickness layer of wet adhesive as for PVA, a higher gram weight of adhesive should be applied. Generally, 200 g/m² of glue line is adequate.

Conveyorized spreaders are commonly used in edge-gluing applications. Adjust the applicator to ensure complete coverage on the staves. One side application is adequate in most situations. Verify that adequate coverage exists by monitoring squeeze-out along the glue lines when the panels are under pressure.

Clamping Pressure: Pressure is dependent upon the species or material to be glued and joint preparation. Direct contact of the gluing surfaces must be made to obtain maximum strength. Suggested pressures for various wood densities are 8-15 inches apart and 2 inches from the end of the panel to evenly distribute pressure along the entire length of the glue line.

Press/clamp Time: A minimum press time of 30 minutes is recommended under ideal conditions when using soft wood species at moisture contents less than 8-10% and factory temperatures of 68 °F. Longer press times will be required for higher density species, higher moisture contents and colder factory temperatures. It is recommended that optimum press times be determined in actual plant conditions recognizing that seasonal changes may lead to variable requirements.

On dry, low density lumber, the press time recommended for Advantage EP-925 will be similar to that obtainable when using Titebond 50. As moisture content of the gluing stock increases, Advantage EP-925 can be expected to cure more rapidly than Titebond 50 under the same circumstances. This is related to the fact that: a) the resin+hardener mixture has a higher percent solids content than Titebond 50 and b) a reaction occurs between the hardener and moisture present on the wood surface, effectively reducing the moisture content in the joint region. Having reported this, we repeat our recommendation to determine optimum press time in actual plant conditions.

Working pauses: The spreader should be kept running during pauses in production for lunch breaks, etc. to help extend the working life of the adhesive.

Machining: Post-gluing conditioning is not unlike PVA products, although shorter curing times are frequently possible. We recommend that panels be allowed to condition at least six hours prior to additional processing.

Cleanup: The foaming and cross-linking characteristics of EPI may cause blockages in the wastewater plumbing. Furthermore, there may be disposal concerns with the mixed product. It is recommended that the excess glue from the spreader and mixing containers be poured into a container and disposed of. Avoid sealing the container for at least 24 hours to permit EPI components to finish reacting. Glue pans and rollers may then be washed in warm water.



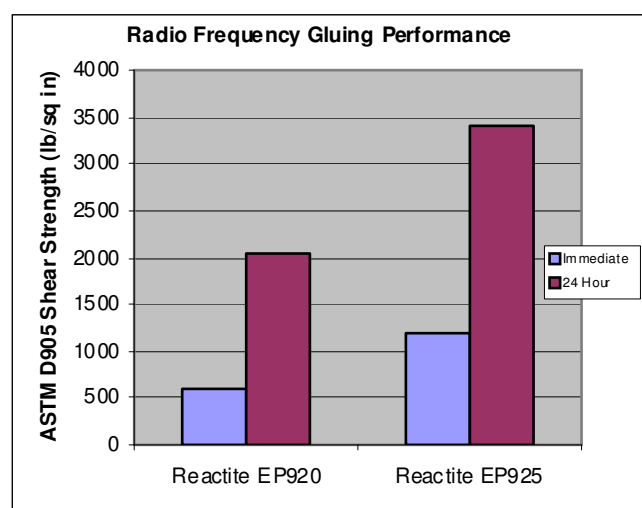
PERFORMANCE PROPERTIES

Bond Strength and Radio Frequency Gluing Performance

Advantage EP-925 is formulated to provide higher immediate bond strengths than conventional EPI adhesives. A positive correlation exists between the adhesive's electrical conductivity and its immediate bond strength upon removal from radio frequency press equipment – with higher conductivity resulting in higher immediate bond strengths.

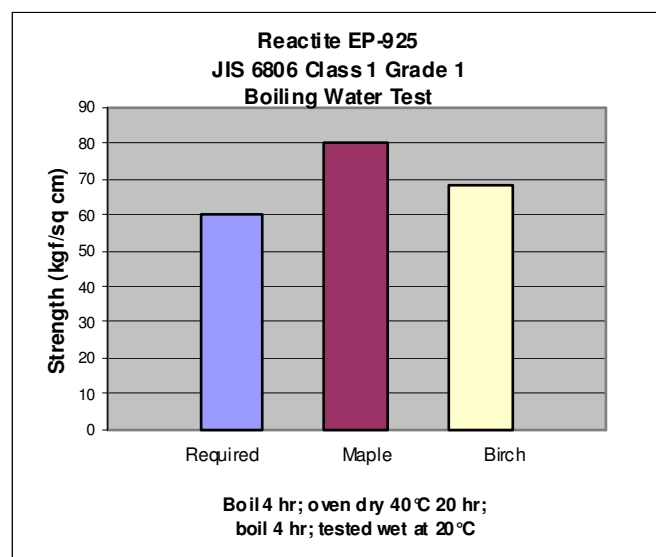
	Conductivity
Reactite EP-920	1.69 (μ Mho)
Japanese EPI (competitor)	1.87 (μ Mho)
Advantage EP-925	4.25 (μ Mho)

The table to the right compares the strength of glue bonds made using Reactite EP-920 and EP-925, tested immediately upon removal from the radio frequency gluing machine (blue bar) and for the same wood panel tested after 24 hours conditioning at 71 °F and 50% relative humidity (maroon bar).



Bonding Strength and Durability

- **Japanese Industrial Standard Class 1, Grade 1: Pass** (refer to chart for boiling water test results)
- **Japanese Agricultural Society (JAS) standard for glued laminated timber for fixture**
 - Cold water soak delamination test: Pass
 - Boiling water soak delamination test: Pass
- **EN 204 Group D4: Pass**
 - WATT 91: > 7N/mm² (passed)
- **ASTM D-5751-99 Laminated Joint Testing: TECO 05-243A (SYP) and 05-243C (Radiata Pine)**





Bonding Strength and Durability (cont.)

- **ASTM D-905 Block Shear**
Tested after 7 days conditioning at 22 °C.

Maple

77 °F 3990 psi - 61%WF

149 °F 3195 psi - 78%WF

Room Temperature Speed of Set: 1.25 (Very Fast)

HANDLING AND STORAGE

Shelf Life: Six months at 70 °F. Store in closed containers.

Storage of Hardener: Hardener 200 is very susceptible to moisture. We recommend that it be kept in a sealed container. A desiccant or nitrogen blanket is recommended.

Safety and Disposal: Hardener 200 is a polymeric isocyanate. Use of gloves and other protective equipment is recommended. Consult MSDS before use for additional information.

IMPORTANT NOTICE TO CUSTOMER:

The recommendations and data contained in this Product Data Sheet for use of this product are based on information Franklin believes to be reliable. They are offered in good faith without guarantee, as conditions and methods for use of our product by Customer and are beyond Franklin's control. Customer should determine the suitability of the product for a particular application before adopting it on a commercial scale. Discoloration and checking of wood veneer materials may occur with use of the product. These occurrences range in appearance, color and may also vary depending upon the species of wood veneer to which the product is applied. Such discoloration and checking may appear during or after the manufacturing process which utilizes the product. Environmental conditions in some manufacturing plants and end-use locations can contribute to discoloration and checking. Because such discoloration and checking are attributable to conditions beyond Franklin's control, Franklin cannot assume any responsibility or liability for any discoloration and/or checking problems that might occur.

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