



# Multibond 4000 FF DEV

## PRODUCT DESCRIPTION

Multibond 4000 FF DEV is a formaldehyde free, one component polyvinyl acetate emulsion product that meets DIN EN 204 D3 and ANSI HPVA EF 2002 Type II water resistance. Multibond 4000 FF DEV was designed for use with hardwood plywood veneered products that are expected to meet stringent, formaldehyde emission standards. This product can be hot pressed, cold pressed and finger jointed. Like all adhesives, proper gluing practices are needed to achieve stated performance.

## PHYSICAL PROPERTIES

**Chemical Family Description:** Polyvinyl acetate emulsion adhesive

**Appearance:** Cream

**Freeze/Thaw Stable:** No

**pH:** 2.0-3.0

**Typical Viscosity (cps):** 2,250 - 3,750

**Suggested Minimum Use Temperature:** 46°F

**Weight Per Gallon (lbs.):** 9.08

**Weight Solids (%):** 47-50

## APPLICATION GUIDELINES

**Moisture Content:** Six to eight percent is the recommended moisture content for the gluing stock. High moisture content will dramatically increase the clamp time needed. Additionally, panel shrinkage may occur resulting in stress cracks or end joint delamination.

**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 guarded against. When possible, glue joints should be prepared and glued the same day.

**Tolerances:** Gluing stock should be uniform in thickness. Variation in thickness should not exceed  $\pm 0.005$  inches. Sanding to thickness should be performed using higher than 50 grit abrasives. For products that cannot be uniform in thickness, greater amounts of spread and pressure will be required.

**Spread:** Generally, 35-50 pounds per 1,000 square feet of glue line (6-9 wet mils or 180-260 ft<sup>2</sup>/gal) is adequate. (The greater the thickness variation and roughness of the substrates, the greater the need for higher spreads.)

**Assembly Time:** Assembly time can vary greatly depending on the adhesive used, glue spread, porosity and moisture content of stock, environmental conditions, etc. A small bead of adhesive squeeze-out around the perimeter of the bottom panel in the stack is desirable. Generally accepted assembly time is 5-10 minutes

**Pressure:** Pressure is dependent upon the species or material to be glued. Direct contact of the gluing surfaces must be achieved to obtain maximum strength. Suggested pressures for various substrates are; high pressure laminates 30-80 psi; solid core stock 100-150 psi; all veneer constructions 150-250 psi. **Rougher veneer will require higher press pressures. Good surface contact is required to get best performance.** (Performance testing of manufactured parts is recommended to ensure satisfactory results.)



## Multibond 4000 FF DEV

### APPLICATION GUIDELINES (Continued)

**Press Time:** Press time is dependent on the adhesive used, gluing stock type, moisture content of the stock and environmental conditions. Typical cold press times range from 30 minutes to two hours and should be determined under plant conditions. RF press times should be determined by in-plant testing on each machine. Press time is dependent on the adhesive used, gluing stock type, moisture content of the stock and environmental conditions. This hot press schedule is provided as a recommended starting point. In plant testing is recommended especially for temperatures and substrate thicknesses beyond this chart.

	160	170	180	190	200	210	220	230	240	250	
Distance to Deepest Glue Line	1/32"	1' 31"	1' 25"	1' 19"	1' 14"	1' 09"	1' 05"	1' 01"	0' 57"	0' 53"	0' 50"
	1/16"	1' 53"	1' 46"	1' 39"	1' 33"	1' 27"	1' 21"	1' 16"	1' 11"	1' 07"	1' 02"
	3/32"	2' 22"	2' 13"	2' 04"	1' 56"	1' 49"	1' 42"	1' 35"	1' 29"	1' 24"	1' 18"
	1/8"	2' 58"	2' 46"	2' 36"	2' 26"	2' 16"	2' 08"	1' 59"	1' 52"	1' 45"	1' 38"
	5/32"	3' 42"	3' 28"	3' 15"	3' 02"	2' 51"	2' 40"	2' 29"	2' 20"	2' 11"	2' 03"
	3/16"	4' 38"	4' 20"	4' 03"	3' 48"	3' 33"	3' 20"	3' 07"	2' 55"	2' 44"	2' 33"
	7/32"	5' 47"	5' 25"	5' 05"	4' 45"	4' 27"	4' 10"	3' 54"	3' 39"	3' 25"	3' 12"
	1/4"	7' 15"	6' 47"	6' 21"	5' 57"	5' 34"	5' 13"	4' 53"	4' 34"	4' 17"	4' 00"

Temperatures above 200° F are not recommended for High Pressure Laminates by their manufacturers.

### PERFORMANCE PROPERTIES

**Meets or exceeds the following industry standards:**

- WDMA TM-6 type II
- 7 ply birch veneer 3/4" unfinished – ASTM D 5582 formaldehyde results .04 µg/ml
- ANSI/HPVA HP-1-2004 Type II water resistance
- European Standard DIN EN 204 D3 (formerly DIN 68602 B3)
- ASTM D 5572 Dry Use – Ponderosa Pine – Lab Testing  
Dry - 6004 psi 91%wf      3 Cycle Soak - 6030 psi 81%wf      220°F - 1252 psi
- ANSI/HPVA EF-2002 cyclic soak

Block Shear Strength:	PSI	Wood failure%
Room Temperature	3745	71
150°F Overnight	1485	0

### STORAGE AND HANDLING

**Shelf Life:** Best used within 6 months of date of manufacture.

**Note:** Discoloration of wood veneer products occurs occasionally. This phenomenon is very infrequent and ranges in appearance, color and may vary with the species of the veneer. Discoloration may appear during or after the manufacturing process. Among other things, environmental conditions in some manufacturing plants can contribute to discoloration. If veneer discoloration occurs, our representatives are prepared to visit and assist you in attempting to identify the causes of the staining and possible solutions. Because such discoloration is attributable to conditions beyond our control, Franklin International can assume no responsibility of liability for any discolorations that might occur.

**Important Notice to Purchaser:** Our recommendations, if any, for use of this product are based on tests believed to be reliable. The greatest care is exercised in the selection of our materials and in our manufacturing operations. However, we make no recommendation to use this product in any manner which conflicts with existing laws and/or patents and WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED, REGARDING THIS PRODUCT OR ITS USE, INCLUDING MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, THE MANUFACTURER IS NOT LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES OF ANY KIND. Revised 09/24/08.

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