

Ultra Light-Weld® 3193 Structural Plastic Bonder with Blue Fluorescence

APPLICATIONS

- Appliance Assembly
- Plastic Housing Assembly
- Display Assembly
- Plastic Lamination
- Bond Joint and Sealing

FEATURES & BENEFITS

- UV/Visible Light Cure
- High Bond Strength to PC
- Resistant to Thermal Shock
- Built-In Fluorescence Provides a Method to Ensure In-Line Quality Control Utilizing Optical Scanners
- Less than 0.5% Shrinkage
- Very Fast Cure

RECOMMENDED SUBSTRATES

- PC
- ABS

Dymax Ultra Light-Weld® material 3193 is designed for rapid bonding and lamination of PC and ABS. This product fluoresces bright blue in the bond area and provides a method to ensure in-line quality control utilizing optical scanners. Dymax Ultra Light-Weld® materials contain no nonreactive solvents and cure upon exposure to light. Their ability to cure in seconds enables faster processing, greater output, and lower processing costs. When cured with Dymax light-curing spot lamps, focused-beam lamps, or flood lamps, they deliver optimum speed and performance for industrial product assembly. Dymax lamps offer the optimum balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with the RoHS Directives 2002/95/EC and 2003/11/EC.

UNCURED PROPERTIES *		
Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Pale Yellow Transparent Liquid	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.10	ASTM D1875
Viscosity, cP (20 rpm)	3,100 (nominal)	ASTM D1876

OTHER CURED PROPERTIES *		
Property	Value	Test Method
Refractive Index (20°C)	1.51	ASTM D542
Boiling Water Absorption, % (2 h)	4.2	ASTM D570
Water Absorption, % (25°C, 24 h)	1.2	ASTM D570
Linear Shrinkage, %	0.39	ASTM D2566
Glass Transition T _g , °C	100	DSTM 256 [‡]

CURED MECHANICAL PROPERTIES *		
Property	Value	Test Method
Durometer Hardness	D80	ASTM D2240
Tensile at Break, MPa [psi]	53 [7,700]	ASTM D638
Elongation at Break, %	4.0	ASTM D638
Modulus of Elasticity, MPa [psi]	816 [118,370]	ASTM D638
Tensile Compression Shear, MPa [psi]		
Glass-to-Glass	7.9 [1,150]	DSTM D250 [‡]
Glass-to-Stainless Steel	6.7 [975]	DSTM D251 [‡]
PC-to-PC	11 [1,170]	DSTM 255 [‡]

ADHESION	
Substrate	Recommendation
ABS acrylonitrile-butadiene-styrene	✓
PC polycarbonate	✓

- ✓ Recommended Adhesive o Limited Applications
 † Requires Surface Treatment (e.g. plasma, corona treatment, etc.)

* Not Specifications
 N/A Not Applicable
 ‡ DSTM Refers to Dymax Standard Test Method



© 2011-2012 Dymax Corporation. All rights reserved. All trademarks in this guide, except where noted, are the property of, or used under license by Dymax Corporation, U.S.A.

Technical data provided is of a general nature and is based on laboratory test conditions. Dymax does not warrant the data contained in this bulletin. Any warranty applicable to the product, its application and use is strictly limited to that contained in Dymax standard Conditions of Sale. Dymax does not assume responsibility for test or performance results obtained by users. It is the user's responsibility to determine the suitability for the product application and purposes and the suitability for use in the user's intended manufacturing apparatus and methods. The user should adopt such precautions and use guidelines as may be reasonably advisable or necessary for the protection of property and persons. Nothing in this communication shall act as a representation that the product use or application will not infringe on a patent owned by someone other than Dymax or act as a grant of license under any Dymax Corporation Patent. Dymax recommends that each user adequately test its proposed use and application before actual repetitive use, using the data in this communication as a general guideline.

Rev. 05/09/2012

Dymax Corporation
 +1.860.482.1010 | info@dyamax.com | www.dyamax.com

Dymax Europe GmbH
 +49 611.962.7900 | info_de@dyamax.com | www.dyamax.de

Dymax Engineering Adhesives Ireland Ltd.
 +353 21.237.3016 | info_ie@dyamax.com | www.dyamax.ie

Dymax Oligomers & Coatings
 +1.860.626.7006 | info_oc@dyamax.com | www.dyamax-oc.com

Dymax UV Adhesives & Equipment (Shanghai) Co. Ltd.
 +86.21.37285759 | dymaxasia@dyamax.com | www.dyamax.com.cn

Dymax UV Adhesives & Equipment (Shenzhen) Co. Ltd.
 +86.755.83485759 | dymaxasia@dyamax.com | www.dyamax.com.cn

Dymax Asia (H.K.) Limited
 +852.2460.7038 | dymaxasia@dyamax.com | www.dyamax.com.cn

Dymax Asia Pacific Pte. Ltd.
 +65.6752.2887 | info_ap@dyamax.com | www.dyamax-ap.com

Dymax Korea LLC
 +82.2.784.3434 | info_kr@dyamax.com | www.dyamax.com/kr

CURING GUIDELINES

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² [10 psi] between glass slides. Actual cure time typically is 3 to 5 times fixture time.

Dymax Curing System (Intensity)	Fixture Time or Belt Speed ^A
2000-EC (50 mW/cm ²) ^B	<1 s
5000-EC (200 mW/cm ²) ^B	<1 s
BlueWave [®] LED Prime UVA (10 W/cm ²) ^C	<0.2 s
BlueWave [®] 75 (5.0 W/cm ²) ^B	<0.2 s
BlueWave [®] 200 (10 W/cm ²) ^B	<0.2 s
UVCS Conveyor with one 5000-EC (200 mW/cm ²) ^D	8.2 m/min [27 ft/min]
UVCS Conveyor with Fusion F300S (2.5 W/cm ²) ^D	8.2 m/min [27 ft/min]

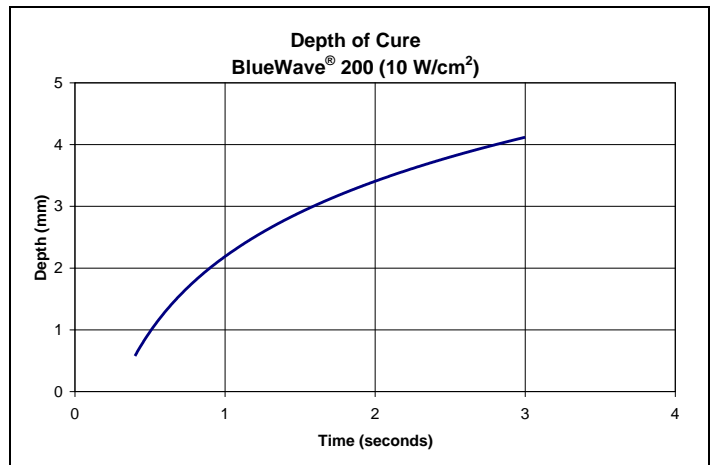
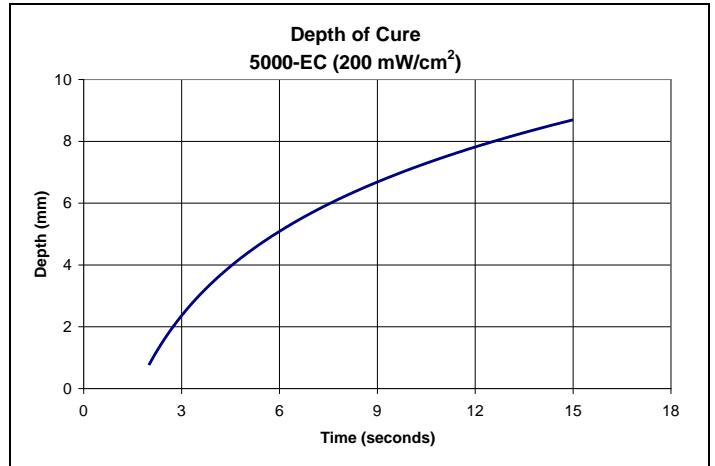
- A** Fixture times/belt speeds are typical for curing thin films through 100% light-transmitting substrates. Light-obstructing substrates require longer cure times.
- B** Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.
- C** Intensity was measured over the UVA/Visible range (350-450 nm) using a Dymax ACCU-CAL™ 50-LED Radiometer.
- D** At 53 mm [2.1 in] focal distance. Maximum speed of conveyor is 8.2 m/min [27 ft/min]. Intensity was measured over the UVA range (320-395 nm) using the Dymax ACCU-CAL™ 100 Radiometer.

Full cure is best determined empirically by curing at different times and intensities, and measuring the corresponding change in cured properties such as tackiness, adhesion, hardness, etc. Full cure is defined as the point at which more light exposure no longer improves cured properties. Higher intensities or longer cures (up to 5x) generally will not degrade Dymax light-curable adhesives.

Dymax recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for full cure. Although Dymax Application Engineering can provide technical support and assist with process development, each customer ultimately must determine and qualify the appropriate curing parameters required for their unique application.

DEPTH OF CURE

The graphs below show the increase in depth of cure as a function of exposure time with two different lamps at different intensities. A 9.5 mm [0.37 in] diameter specimen was cured in a polypropylene mold and cooled to room temperature. It was then released from the mold and the cure depth was measured.



OPTIMIZING PERFORMANCE AND HANDLING

1. This product cures with exposure to UV and visible light. Exposure to ambient and artificial light should be kept to a minimum before curing. Dispensing components including needles and fluid lines should be 100% light blocking, not just UV blocking.
2. All bond surfaces should be clean and free from grease, mold release, or other contaminants prior to dispensing the adhesive.
3. Cure speed is dependent upon many variables, including lamp intensity, distance from the light source, required depth of cure, bond gap, and percent light transmission of the substrate.
4. Oxygen in the atmosphere may inhibit surface cure. Surfaces exposed to air may require high-intensity (>100 mW/cm²) UV light to produce a dry surface cure. Flooding the bond area with an inert gas, such as nitrogen, can also reduce the effects of oxygen inhibition.
5. Parts should be allowed to cool after cure before testing and subjecting to any loads.
6. In rare cases, stress cracking may occur in assembled parts. Three options may be explored to eliminate this problem. One option is to heat anneal the parts to remove molded-in stresses. A second option is to open the gap between mating parts to reduce stress caused by an interference fit. The third option is to minimize the amount of time the liquid adhesive remains in contact with the substrate(s) prior to curing.
7. Light curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce the heating effect on components.
8. At the point of curing, an air exhaust system is recommended to dissipate any heat and vapors formed during the curing process.

DISPENSING THE ADHESIVE

This material may be dispensed with a variety of manual and automatic applicators or other equipment as required. Questions relating to dispensing and curing systems for specific applications should be referred to Dymax Application Engineering.

CLEAN UP

Uncured material may be removed from dispensing components and parts with organic solvents. Cured material will be impervious to many solvents and difficult to remove. Clean up of cured material may require mechanical methods of removal.

PERFORMANCE AFTER TEMPERATURE EXPOSURE

Light-cured Dymax materials typically have a lower thermal limit of -54°C [-65°F] and an upper limit of 150°C [300°F]. Many Dymax products can withstand temperatures outside of this range for short periods of time. Please contact Dymax Application Engineering for assistance.

STORAGE AND SHELF LIFE

Store the material in a cool, dark place when not in use. Do not expose to light. This product may polymerize upon prolonged exposure to ambient and artificial light. Keep covered when not in use. This material has a minimum six-month shelf life from date of shipment, unless otherwise specified, when stored between 10°C [50°F] and 32°C [90°F] in the original, unopened container.

GENERAL INFORMATION

This product is intended for industrial use only. Keep out of the reach of children. Avoid breathing vapors. Avoid contact with skin, eyes, and clothing. Wear impervious gloves. Repeated or continuous skin contact with uncured material may cause irritation. Remove material from skin with soap and water. Never use organic solvents to remove material from skin and eyes. For more information on the safe handling of this material, please refer to the Material Safety Data Sheet before use.