See-Cure 3220-SC
Flexible Adhesive for Bonding Plastics

APPLICATIONS

- **Plastic Housing Assembly**
- **Plastic Lamination**
- **Plastic Window Bonding**
- **Plastic Appliance Assembly**

FEATURES

- **Blue to Colorless Upon Full Cure**
- **UV/Visible Light Curing**
- **Flexible**

RECOMMENDED SUBSTRATES

- **ABS**
- **PC**
- **PET**
- **PVC**
- **PU**

Dymax See-Cure material 3220-SC is designed for rapid bonding and laminating of plastics such as ABS, PC, PET, PVC, and PU. The blue color transitions to colorless upon exposure to sufficient light energy indicating full cure has been achieved. Dymax industrial 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 assembly. Dymax lamps offer the optimum balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with RoHS2 directives 2015/863/EU and 2011/65/EU.

UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Blue Transparent Liquid	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.00	ASTM D1875
Viscosity, cP (20 rpm)	600 (nominal)	ASTM D1084

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	D60	ASTM D2240
Tensile at Break, MPa [psi]	15.0 [2,200]	ASTM D638
Elongation at Break, %	180	ASTM D638
Modulus of Elasticity, Mpa [psi]	110 [16,000]	ASTM D638

OTHER CURED PROPERTIES *

Property	Value	Test Method
Cured Appearance	Colorless	N/A
Refractive Index (20˚C)	1.50	ASTM D542
Boiling Water Absorption, % (2 h)	4.2	ASTM D570
Water Absorption, % (25˚C, 24 h)	4.7	ASTM D570
Linear Shrinkage, %	2.5	DSTM 614‡
Glass Transition T_g, ˚C	59	DSTM 256‡

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

ADHESION

Substrate	Recommendation
ABS acrylonitrile-butadiene-styrene	✓
PA polyamide	o
PC polycarbonate	✓
PET poly(ethylene terephthalate)	✓
PMMA poly(methyl methacrylate)	o
PU polyurethane	✓
PVC poly(vinyl chloride)	✓
SAN (Styrene-acrylonitrile)	✓
TPU (Thermoplastic Polyurethane)	✓

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

RoHS Compliant

Technical Data collected prior to 2008

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CURING GUIDELINES

The vivid blue color of this adhesive transitions to colorless when fully cured. The charts below provide information on cure time required to transition from blue to colorless using different light sources and adhesive thicknesses. Cure rate is dependent upon many variables including lamp intensity, distance from the light source, and required depth of cure. The times and belt speed for the transition listed below are based on lab results and are intended for reference only.

Dymax Curing System (Intensity)	5000-EC (200 mW/cm²) [B]
Adhesive Thickness, mm [mil]	**Time to complete transition, s [A]**
0.10 [4.0]	9
0.20 [8.0]	9
0.41 [16]	10
0.81 [32]	12

Dymax Curing System (Intensity)	BlueWave® 200 (10.0 W/cm²) [B]
Adhesive Thickness, mm [mil]	**Time to complete transition, s [A]**
0.10 [4.0]	1.5
0.20 [8.0]	1.5
0.41 [16]	1.5
0.81 [32]	1.9

Dymax Curing System (Intensity)	UVCS Conveyor with Fusion F300 (2.5 W/cm²) [C]
Adhesive Thickness, mm [mil]	**Belt speed to complete transition, m/min [ft/min] [A]**
0.10 [4.0]	2.1 [7]
0.20 [8.0]	2.1 [7]
0.41 [16]	2.1 [7]
0.81 [32]	1.8 [6]

A. Curing through light-blocking substrates may limit the ability of See-Cure adhesives to transition from blue to colorless and may require additional time and/or intensity. These times/speeds are typical for curing through 100% UV and Visible light-transmitting substrates.

B. Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.

C. 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™ 150 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.

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 must ultimately determine and qualify the appropriate curing parameters required for their unique application.

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 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 RESIN

This material may be dispensed with a variety of manual, semi-automated, and fully automated fluid delivery systems. Small area applications including beads and small dots can be achieved using hand-held Dymax dispensing systems like out SD-100 syringe dispenser and our Model 400 needle valve systems. The value system can be used in a manual, semi-automated or fully automated application. Dymax has several other dispensing systems that may be suitable for use with out adhesive materials. Questions relating to and defining the best fluid delivery system and curing equipment for specific applications should be discussed with the Dymax Application Engineering Team.

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 12-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.

CLEANUP

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. Cleanup of cured material may require mechanical methods such as ultrasonic bath, water jet, vacuum tweezers, air knife and/ or warming to aid in the removal.

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 Safety Data Sheet before use.

The data provided in this document are based on historical testing that Dymax performed under laboratory conditions as they existed at that time, and are for informational purposes only. The data are neither specifications nor guarantees of future performance in a particular application. Dymax does not guarantee that this product's properties are suitable for the user's intended purpose.

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