

# 3081

## PVC Bonding Adhesive for Clamshell Packaging

### APPLICATIONS

- Bonding Clamshell Packaging
- Bonding Blister Packs
- Ideal of Automation

### FEATURES

- Fast Cure (<5 seconds)
- One Component
- Excellent Adhesion

### BONDS

- PVC
- Polycarbonate
- Many other plastics

Dymax 3081 adhesive is designed for rapid bonding and sealing of PVC plastic clamshell packages. This product dispenses easily and cure quickly for precise quantity and placement of adhesive. Dymax adhesives are solvent-free and cure upon exposure to UV and/or visible light. Their ability to cure in seconds enables faster processing, greater throughput, and lower assembly costs. When cured with Dymax UV light curing spot lamps, focused beam lamps, or flood lamps, they deliver optimum speed and performance. Dymax lamps offer the optimum balance of UV and visible light for the fastest cures. This product is in full compliance with RoHS directives 2015/863/EU.

TYPICAL UNCURED PROPERTIES *		
Property	Value	Test Method
Solvent Content	No Non-reactive Solvents	N/A
Chemical Class	Urethane (Meth) Acrylate	N/A
Appearance	Clear/Light Amber Liquid	N/A
Solubility	Alcohols/Chlorinated Solvents/Ketones	N/A
Toxicity	Low	N/A
Flash Point	>95°C (200°F)	N/A
Density (g/ml)	1.05	ASTM D1875
Refractive Index	1.478 (20°C)	ASTM D1218
Viscosity, cP (20 rpm)	450 (nominal)	ASTM D1084

CURED MECHANICAL PROPERTIES *		
Property	Value	Test Method
Durometer Hardness	D55	ASTM D2240
Tensile at Break, MPa [psi]	15.2 [2,200]	ASTM D638
Elongation at Break (%)	200	ASTM D638
Tensile at Yield, MPa [psi]	11 [1,600]	ASTM D638
Elongation at Yield (%)	125	ASTM D638
Modulus of Elasticity, MPa [psi]	103.4 [15,000]	ASTM D638
Peel Strength (PVC), kg/m [lb/in]	214 [12]	ASTM D903

OTHER CURED PROPERTIES *		
Property	Value	Test Method
Appearance	Clear, Colorless	
Refractive Index @ 20°C	1.51	ASTM D542
Linear Shrinkage (%)	1.57	DSTM D2556
Boiling Water Absorption, 2 hr (%)	1.3	ASTM D570
Water Absorption @ 25°C, 24hr (%)	1.8	ASTM D570
Thermal Limit (brittle/degrades)	-55 to 180°C (-65 to 350°F)	DSTM D200**

ADHESION	
Substrate	Recommendation
Acrylic	✓
Polycarbonate	✓
PET (inc. APET, RPET)	✓
PVC	✓

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

\* Not Specifications  
 \*\* DSTM is a Dymax standard test method



**CURING GUIDELINES**

Fixture Time is defined as the time to develop a shear strength of 10 psi (0.1 N/mm<sup>2</sup>) between glass slides. Actual cure time is typically 3 to 5 times fixture time.

Dymax Curing System Intensity <sup>A</sup>	Fixture Time/Speed <sup>B</sup>
2000-EC (50 mW/cm <sup>2</sup> ) <sup>A</sup>	1 sec
5000-EC (200 mW/cm <sup>2</sup> ) <sup>A</sup>	1 sec
BlueWave <sup>®</sup> 200 (10 W/cm <sup>2</sup> ) <sup>A</sup>	1 sec
UVCS Conveyor with one 5000-EC (200 mW/cm <sup>2</sup> ) <sup>A</sup>	27 ft/min
UVCS Conveyor with Fusion F300S (2.5 W/cm <sup>2</sup> ) <sup>C</sup>	>27 ft/min
WIDECURE <sup>®</sup> Conveyor (900 mW/cm <sup>2</sup> ) <sup>A</sup>	>50 ft/min

**A** Intensity was measured over the UVA range (320-395 nm) using the Dymax ACCU-CAL™ 50 radiometer.

**B** Curing through light blocking substrates may require longer cure times if they obstruct wavelengths used for light curing (320-450 nm for UV light+visible light curing and 320-400 nm for UV-light-only curing). These fixture times/speeds are typical for curing thin films through 100% light transmitting substrates.

**C** At 2.1" focal distance. Maximum speed of conveyor is 27 feet per minute (fpm). Intensity was measured over the UVA range (310-395 nm) using the Dymax ACCU-CAL™ 160 radiometer.

Full cure is best determined empirically by curing at different times and/or 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 UV exposure no longer improves cured properties. Higher intensities or longer cures (up to 5x) will generally not degrade Dymax UV curing adhesives. Dymax recommends that customers employ a safety factor by curing longer and/or at higher intensities than required for full cure. Although Dymax Applications Engineering can help, each customer must ultimately determine the curing parameters required for their unique application.

**OPTIMIZING PERFORMANCE AND HANDLING**

1. This product cures with exposure to UV and/or visible light. Exposure to UV, 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 transmission of the substrate through which the energy must pass.
4. Oxygen may inhibit surface cure. Surfaces exposed to air may require high intensity UV (> 100 mW/cm<sup>2</sup>) to produce a tack-free 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. For rare applications, stress cracking may occur in assembled parts. Three options may be explored to minimize this problem from occurring. 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.

6. UV curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce heat.
7. A good practice is to utilize an air exhaust system at the point of curing. This will dissipate the heat and vapors formed during the curing process.

**DISPENSING THE ADHESIVE**

This material may be dispensed with a variety of automatic bench-top syringe applicators or other equipment as required. Direct questions relating to dispensing and curing systems for specific applications, should be referred to the Dymax Applications Engineering.

**STORAGE AND SHELF LIFE**

Store the material in a cool, dark place when not in use. Do not expose to visible or UV light. This product may polymerize upon prolonged exposure to ambient light. Keep covered when not in use. This material has an 18-month shelf life from date of manufacture, unless otherwise specified, when stored between 10°C (50°F) and 32°C (90°F) in the original, unopened container.

**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.

**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.

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