

GA-140 Light-Curable FIP Moisture- and Chemical-Resistant Gasket

APPLICATIONS

- Fuel Cells
- Automotive Door Handles
- Appliance Housings
- Critical Electronic Assemblies and Devices

FEATURES

- UV/Visible Light Cure
- Low Outgassing
- Cures Soft and Tack Free
- Excellent Tear Resistance
- Clear in Color
- Cures in Seconds
- Silicone Free
- Conforms to Intricate Channels or Recesses

SURFACES

- Nylon
- Most Plastics (ABS, PVC, PC, PMMA)
- Metals

Dymax GA-140 Form-In-Place and Cure-In-Place Gasketing Resin is formulated for fuel cell, automotive door handle, appliance housing, and critical electronic assembly and device applications which require a soft, tack-free, low-outgassing, flexible gasket with compression set. GA-140 has good adhesion to nylon and plastic surfaces. The resin can be dispensed in intricate and complex configurations with the added benefit of curing in-line which allows for increased production speed and reduced inventories. It contains no nonreactive solvents and cures upon exposure to light. GA-140's ability to cure in seconds enables faster processing, greater output, and lower assembly costs. When cured with Dymax light-curing spot lamps, focused-beam lamps, or flood lamps, it delivers optimum speed and performance for maximum efficiency. Dymax lamps offer the ideal balance of UV and visible light for the fastest, deepest cures. This product is in full compliance with RoHS Directives 2015/863/EU and 2011/65/EU.

TYPICAL UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Colorless Translucent Gel	N/A
Solubility	Organic Solvents	N/A
Density, g/ml	1.01	ASTM D1875
Viscosity, cP (20 rpm)	39,000 (nominal)	ASTM D2556

OTHER CURED PROPERTIES *

Property	Value	Test Method
Linear Shrinkage, %	2	ASTM D2566
Boiling Water Absorption, % (2 h)	2	ASTM D570
Water Absorption, % (25°C, 24 h)	1	ASTM D570

ELECTRICAL PROPERTIES *

Property	Value	Test Method
Dielectric Constant (1 MHz)	5.15	ASTM D150
Dissipation Factor (1 MHz)	0.09	ASTM D150
Dielectric Breakdown Voltage, V	574	MIL-I-46058C
Volume Resistivity, ohm-cm	1.85 x 10 ¹¹	ASTM D257
Surface Resistivity, ohm	5.60 x 10 ¹¹	ASTM D257

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
Durometer Hardness	A35	ASTM D2240
Tensile at Break, MPa [psi]	1.5 [211]	ASTM D638
Elongation at Break, %	167	ASTM D638
Modulus of Elasticity, MPa [psi]	0.71 [104]	ASTM D638
Glass Transition T _g , °C	13°C	DSTM 256 [‡]
Compression Set, % (85°C, 22 h)**	14.9	ASTM D395

* Not Specifications

N/A Not Applicable

** Compression set is expressed as percentage of deflection per ASTM D395 Method B at 25% deflection. To determine percent recovery, subtract ¼ of the value from 100%. For example, the recovery is 98.8% with a 5% compression set.

‡ DSTM Refers to Dymax Standard Test Method



CURING GUIDELINES

Cure rate is dependent upon many variables, including lamp intensity, distance from the light source, and required depth of cure. The cure time listed below is based upon lab tests and is intended for reference only. Cure time is defined as the time to achieve a full cure of a 3.2 mm [0.13 in] thick gasket.

Recommended Minimum Cure Intensity	Cure Time
150 mW/cm ² ^A	10 s

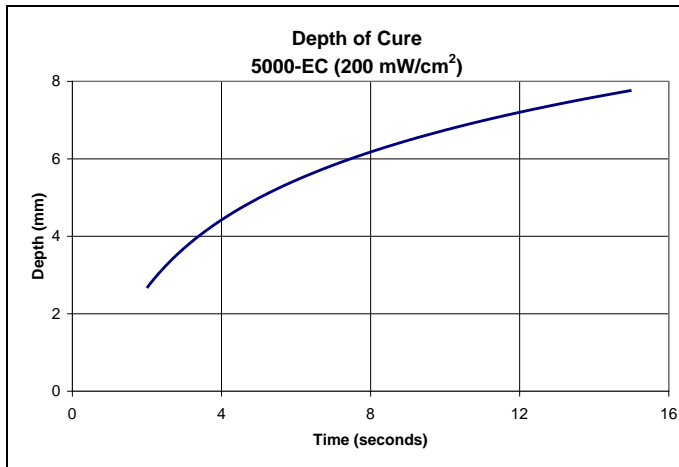
^A Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.

Full cure is best determined empirically by curing at different times and intensities, and measuring the corresponding change in cured properties. Full cure is defined as the point at which more light exposure no longer improves cured properties. Higher intensities or longer cures may degrade Dymax light-curable resins.

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.

DEPTH OF CURE

The graph below shows the increase in depth of cure as a function of exposure time. 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 surfaces in contact with the resin should be clean and free from grease, mold release, or other contaminants prior to dispensing the gasketing resin.
3. Oxygen in the atmosphere may inhibit surface cure. Surfaces exposed to air may require higher intensity UV (>100 mW/cm²) 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.
4. Part should be allowed to cool after cure before testing.
5. Light curing generally produces some heat. If necessary, cooling fans can be placed in the curing area to reduce the heating effect on components.
6. At the point of curing, an air exhaust system is recommended to dissipate any heat and vapors formed during the curing process.
7. 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.

DISPENSING THE GASKETING RESIN

This material may be dispensed with a variety of semi-automated and fully automated fluid delivery systems. Small area applications including beads and small dots can be achieved using Dymax Model 400 needle valve systems. The value system can be used in a semi-automated or fully automated application. Dymax has several other dispensing systems that may be suitable for use with our gasket 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 visible or UV light. This product may polymerize upon prolonged exposure to ambient and artificial light. Keep covered when not in use. This material has a six-month shelf life from date of shipment, unless otherwise specified, when stored between 13°C [55°F] and 32°C [90°F] in the original, unopened container. GA-140 in pails may exhibit a hazy, whitish appearance after exposure to cold temperatures. If such an appearance is noticed, the material should be placed in an ambient environment of 20 – 24°C (68 – 75°F) for at least three days. We do not recommend accelerating the warming with additional heat as it will adversely impact the uncured material. After the recommended warming-up step, the clear material is suitable for its intended use.

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 of removal.

GENERAL INFORMATION

This product is intended for industrial use only. Keep out of 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.

Numerous factors—including, without limitation, transport, storage, processing, the material with which the product is used, and the ultimate function or purpose for which the product was obtained—may affect the product's performance and/or may cause the product's actual behavior to deviate from its behavior in the laboratory. None of these factors are within Dymax's control. Conclusions about the behavior of the product under the user's particular conditions, and the product's suitability for a specific purpose, cannot be drawn from the information contained in this document.

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