



## Ultra Light-Weld® GA-103

### Light-Curable FIP Moisture- and Chemical-Resistant Gasket

#### APPLICATIONS

- Fuel Cells
- Underwater Enclosures
- High-Temperature Sealing

#### FEATURES

- UV/Visible Light Cure
- Excellent Water Resistance
- Excellent Acid/Base Resistance
- Self-Leveling Liquid
- High/Low-Temperature Resistant
- Cures in Seconds
- Silicone Free
- Low Compression Set

#### SURFACES

- Plastics
- Electroplated Plastics
- Metals

Dymax Ultra Light-Weld® GA-103 is a Form-in-Place (FIP) and Cure-in-Place (CIP) gasketing resin formulated for fuel cells, underwater enclosures, and high-temperature sealing applications that require low compression set. GA-103 has good adhesion to plastic, electroplated plastic, and metal surfaces while providing superior heat, water, and chemical resistance. It can be dispensed in intricate and complex configurations with the added benefit of curing in-line, allowing for increased production speed and reduced inventories. 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 assembly costs. When cured with Dymax light-curing spot lamps, focused-beam lamps, or flood lamps, they deliver 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.

#### TYPICAL UNCURED PROPERTIES \*

Property	Value	Test Method
Soluble in	Organic Solvents	N/A
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Colorless Transparent Gel	N/A
Solubility	Organic Solvents	N/A
Density, g/ml	0.93	ASTM D1875
Viscosity, cP (20 rpm)	60,000 (nominal)	ASTM D2556
Shelf Life @ RT (22°C to 25°C) from Date of Manufacture	18 months	N/A

Chemical Resistance - % of Initial Weight	Weight Immediately After Exposure	Weight 1 Week After Exposure
Motor Oil SAE 10W-30	139%	138%
Brake Fluid	101%	101%
Transmission Fluid	101%	101%
Diesel Fuel	125%	118%
Power Steering Fluid	100%	100%
Salt Water 5% NaCl	101%	100%
Isopropyl Alcohol 99%	127%	97%
Suntan Lotion SPF 50	104%	102%
Hand Lotion	102%	100%

Note:

The samples were immersed in fluid for 72 hours at room temperature.

Immediately - wiped clean and weight measured.

1 week - Wiped clean, left at room temperature for 1 week and then weight measured.

#### CURED MECHANICAL PROPERTIES \*

Property	Value	Test Method
Durometer Hardness	00-75	ASTM D2240
Tensile at Break, MPa [psi]	0.9 [130]	ASTM D638
Elongation at Break, %	63	ASTM D638
Modulus of Elasticity, MPa [psi]	0.2 [35]	ASTM D638
Glass Transition T <sub>g</sub> , °C	-37	ASTM D5418
Compression Set, % (85°C, 22 hr)**	14.9	ASTM D395

#### DISPENSE EQUIPMENT RECOMMENDATIONS \*

Application	Manual	Semi-Automated	Fully Automated
Beads	SD-100	Model 400 Needle Valve	Eco-PEN

#### CURING EQUIPMENT RECOMMENDATIONS \*

Process Method	Spot Lamp	Flood Lamp	Conveyor
Broad Spectrum	BlueWave® 200	5000-ECE	UVCS Conveyor with Fusion F300 Lamp

\* 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.

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Technical Data Collected PRIOR TO 2008 Rev. 09/14/2020





OTHER CURED PROPERTIES *		
Property	Value	Test Method
Linear Shrinkage, %	0.8	ASTM D2566
Boiling Water Absorption, % (2 hr)	0.5	ASTM D570
Water Absorption, % (25°C, 24 h)	0.2	ASTM D570

### 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 <sup>2A</sup>	10 s

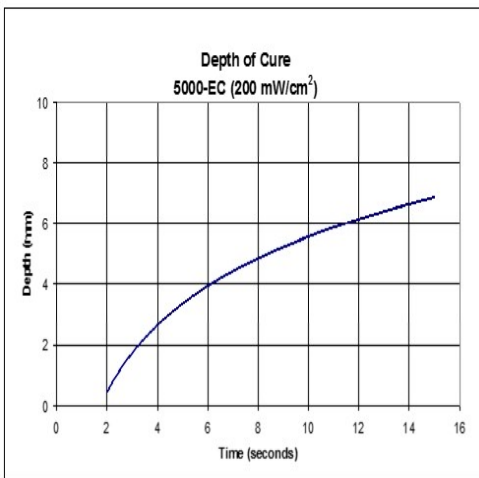
<sup>A</sup> Intensity was measured over the UVA range (320-395 nm) using a Dymax ACCU-CAL™ 50 Radiometer.

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 ( $>100 \text{ mW/cm}^2$ ) to produce a tack-free cure. Flooding the bond area with an inert gas, such as nitrogen, can also reduce the affects 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 SUPPORT

The Dymax Application Engineering team is ready to discuss your application requirements to provide the most appropriate dispensing and/or spraying solution. Visit our current dispensing equipment portfolio [here](#) or consult our [global contact](#) phone numbers and online chat feature (available in North America only) during normal business hours for instant support.

## 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 shelf life is noted on page 1 of this document, 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. Cleanup 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.

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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**FORM-IN-PLACE GASKETING RESINS  
GA-103 Product Data Sheet**

**CONTACT DYMAX**

[www.dymax.com](http://www.dymax.com)

**Americas**

USA | +1.860.482.1010 | [info@dymax.com](mailto:info@dymax.com)

**Europe**

Germany | +49 611.962.7900 | [info\\_de@dymax.com](mailto:info_de@dymax.com)

Ireland | +353 21.237.3016 | [info\\_ie@dymax.com](mailto:info_ie@dymax.com)

**Asia**

Singapore | +65.67522887 | [info\\_ap@dymax.com](mailto:info_ap@dymax.com)

Hong Kong | +852.2460.7038 | [dymaxasia@dymax.com](mailto:dymaxasia@dymax.com)

Korea | +82.31.608.3434 | [info\\_kr@dymax.com](mailto:info_kr@dymax.com)