



846-GEL

High-Strength Structural Adhesive with Activator Cure

APPLICATIONS

- Bonding Ferrite Magnets in DC Motor Assemblies
- Joining Dissimilar Substrates
- Metal Frame Bonding

FEATURES

- Activator Cure with 535-A-Rev-A and 501-E-Rev-A
- High-Performance Structural Adhesive
- High Tensile Shear Strength
- Contains No Volatile Solvents or Ozone-Depleting Chemicals
- Thermal Shock Resistance

RECOMMENDED SUBSTRATES

- Metals
- Ferrite
- Ceramic
- Glass

Dymax 846-GEL is designed for rapid assembly and bonding of a variety of surfaces including metals, ferrite, glass, and ceramics. Dymax 846-GEL is a high-performance, general structural adhesive that fixtures in 20 to 60 seconds. This material is especially suited for bonding ferrite magnets to DC motor assemblies. Dymax 846-GEL adhesive is used with activators 535-A-Rev-A or 501-E-Rev-A to form excellent bonds between close fitting parts. This product is in full compliance with RoHS directives 2015/863/EU.

UNCURED PROPERTIES *

Property	Value	Test Method
Solvent Content	No Nonreactive Solvents	N/A
Chemical Class	Acrylated Urethane	N/A
Appearance	Translucent Straw	N/A
Soluble in	Organic Solvents	N/A
Density, g/ml	1.06	ASTM D1875
Viscosity, cP (20 rpm)	29,000 (nominal)	ASTM D-2556
Shelf Life @ RT (22°C to 25°C) from Date of Manufacture	18 months	N/A

CURING GUIDELINES

Curing Conditions	501-E-REV-A	535-A-REV-A
Fixture Time/Handling Strength	15-20 sec	15-20 sec
Lap Shear with CRS laps (psi) after dwell times as listed below:		
5 minutes	829	820
30 minutes	1244	1149
24 hours	2095	2106
72 hours	2028	2118
1 hour at 93°C (200°F)	2255	2242

CURED MECHANICAL PROPERTIES *

Property	Value	Test Method
	Room Temperature (control)	
Steel laps (psi)	1800	ASTM D1002
Aluminum laps (psi)	1500	ASTM D1002
Stainless Steel laps (psi)	1800	ASTM D1002
	Moisture Resistance: 85°C/85% RH, 72 h	
Steel laps (psi)	1500	ASTM D1002
Aluminum laps (psi)	1200	ASTM D1002
Stainless Steel laps (psi)	1500	ASTM D1002
	Two Thermal Shock Cycles -30°/150°C, 1 h soak	
Steel laps (psi)	2100	ASTM D1002
Aluminum laps (psi)	1500	ASTM D1002
Stainless Steel laps (psi)	2000	ASTM D1002

RECOMMENDED SPEED OF CURE FIXTURE TEST

This test is recommended for inspection of incoming adhesive and activator and for in-line process control. Production parts are ideal for in-line inspection and QC. Alternatively, microscope slides or steel laps may be used as the test substrate. It is recommended that this test be performed at the beginning of each shift and the results charted. This will ensure the adhesive and activator are in good working order.

Step 1: Apply a thin film of activator to one part. Cover about one square inch.

Step 2: Apply a thin, 1/16" BEAD of adhesive (do not spread) to the other part.

Step 3: With a 3/4" to 1" overlap, press the two parts together and hold for 5 seconds. (Note – as the adhesive bead rolls across the activator, it picks up the activator – this is how they mix.)

Step 4: Every 5 seconds, gently tap the end of one part while holding the other part still. Fixture time is when the parts resist movement with light finger pressure.

Step 5: Record the fixture time. Fixture time should fall within the range set during process validation. If outside these limits, repeat, check method, and check with different lot of activator or adhesive.

* Not Specifications
N/A Not Applicable





OPTIMIZING PERFORMANCE AND HANDLING

For most bonding applications, activator is applied to one bonding surface and adhesive to the other. Spraying, dipping, brushing, or pad transfer are all acceptable techniques for application.

Activators are oxygen sensitive. Containers must be kept closed or stored under nitrogen when not in use in order to maintain shelf life. Remove only enough activator from the container that can be used in a short period of time.

Recommended Technique:

1. Apply a thin film of activator to one of the surfaces to be bonded. Activator should not stand in pools. Surfaces will have an oily appearance. Activating both surfaces may produce better results on some porous surfaces or if bond-line gaps exceed 0.015".
2. Apply a single drop or small bead of adhesive (DO NOT SPREAD) onto the mating surface. When the parts are joined the adhesive spreads, mixing with activator to completely fill the joint.
3. Assemble parts and clamp or leave undisturbed until fixture (handling strength) occurs. Assembled parts should be held immobile until adhesive fixture occurs. Movement of parts relative to each other prior to achieving fixture or handling strength can result in weaker bond lines.

Additional Technical Considerations:

Adhesive Application: Adhesive should only be applied as a drop or bead that squeezes from the center to the edges of the bonding surfaces. This technique promotes mixing and assures maximum contact of adhesive and activator over the entire bond area. Use the optimum amount of adhesive to COMPLETELY FILL the joint. Apply just enough adhesive so that a small fillet becomes visible around all edges when the parts are pressed together. Do not overfill. The "fillet" should cure if the proper ratio of adhesive to activator has been used.

Adhesive/Activator Ratio: Dymax Multi-Cure® and structural bonding adhesive systems are formulated to allow a wide tolerance of adhesive-to-activator ratios. The same approximate strength results when using ratios from 15:1 to 30:1. The critical factor is that a thin film of activator on one mating surface contact adhesive bead(s) on the other mating surface and that both mix during assembly. With these criteria met, the actual adhesive-to-activator ratio may vary with assembly design and adhesive/activator dispensing systems. It should be noted that flooding or over-activation may result in weaker ultimate bond strengths.

Applying activator to porous surfaces: Two-sided activation may be preferable to activating only one of two mating surfaces depending on the porosity of the substrate.

Surface preparation: Most substrates require little if any surface preparation, though adhesion is frequently enhanced by clean, mechanically roughened surfaces. Follow the manufacturer's instructions for cleaning or preparing surfaces. Grease, wax, and some mold-release agents are barriers against adhesion.

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 our SD-100 syringe dispenser and Model 400 needle valve systems. These valve systems can be used in manual, semi-automated, or fully automated applications. Dymax has several other dispensing systems that may be suitable for use with our 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 shelf life noted on page 1 of this document, when stored between 10°C (50°F) and 32°C (90°F) in the original, unopened container.

ACTIVATOR: Dymax activators are oxygen sensitive. The container should remain closed at all times other than when activator is being removed for use. For maximum effectiveness, activator should not be exposed to air for more than four hours. Recommend resealing activator with nitrogen gas when not in use.

CLEAN UP

Excess adhesive and activator may be cleaned with organic solvents. Ketones, like Acetone, should not be used on surfaces to be bonded as they sometimes leave a harmful residue. 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.

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