

501-E Activator

Environmentally Safe for Fast, Reliable, Structural Bonding

INTRODUCTION

501-E activator, when pre-applied to metallic, plated, ceramic, or glass substrates, rapidly and completely cures high-strength Dymax 800 and 600 Series structural adhesives in gaps from less than 1 mil to 20 mils. Pre-applied parts can be joined immediately or after up to 24 hours of open time.

501-E activator is environmentally safe because it is completely free of solvents (VOCs) and ozone-depleting chemicals (ODCs). 501-E's low volatility and high flash point also enhances safety in the workplace. This product is in full compliance with the RoHS Directives 2002/95/EC and 2003/11/EC.

KEY BENEFITS

- Strong structural bonds. Fixtures in seconds. No solvent flash-off time.
- No volatile organic compounds (VOCs). No ozone-depleting chemicals (ODCs).

THE BENEFITS OF COLD BONDING

Cold bonding increases efficiencies, consistency, and reliability. Dymax's ODC-free formulations provide a broad range of process control advantages by matching the cure speed with assembly needs, thereby increasing total process efficiency. Process design is made simpler and cheaper due to the long open times available, no pot life concerns or waste, and rapid room-temperature fixture. Activator 501-E provides on-part cleaning action and broad tolerance of adhesive-to-activator ratios. Rapid, on-demand curing to fixture or handling strength allows in-line quality control and increased production thru-put.

TECHNICAL DATA

TYPICAL LIQUID PROPERTIES

Color	Yellow to Amber
Solvent Present	None
ODC Present	None
Solvent Flash Time	None
Toxicity	Moderate
	TLV=None
Flash Point (Closed Cup)	245°F
Specific Gravity	1.0
On-Part Activator Life	24 Hours
Viscosity	30-40 cP

TYPICAL CURING PROPERTIES (Per ASTM D1002 modified)

	Dymax Structural Adhesive 846	Multi-Cure® Adhesive 602
Fixture Time (2 Mil Gap)	15-20 Seconds	10-15 Seconds
5 Minutes	1,100 psi	2,400 psi
10 Minutes	1,300 psi	2,700 psi
30 Minutes	1,800 psi	3,100 psi
24 Hours	3,000 psi	3,600 psi
72 Hours	3,500 psi	3,600 psi
1 Hour at 200°F	3,500 psi	3,800 psi
10 Mil Gap	3,000 psi	2,600 psi
20 Mil Gap	2,500 psi	800 psi
20 Mil Gap - 1 Hour at 200°F	2,500 psi	2,800 psi



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USE & APPLICATION

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.

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 0.15".
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 ring of liquid becomes visible 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 600 and 800 Series 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 (less than 5:1 adhesive-to-activator) may result in weaker ultimate bond strengths.

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

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 plastic surfaces. Grease, wax, and some mold-release agents are barriers against adhesion.

Activator dispensing: Activator is easily applied with dispensing equipment for automated assembly. Best methods are spraying or pad printing. Natural felt, lambswool, horsehair, or chemically resistant polyurethane and silicone foams are suitable. Spray application is also satisfactory. Proper ventilation must be provided, as well as proper design of spray nozzles to prevent overspray. Overspray on surrounding surfaces does not dissipate. Activated surfaces have an oily appearance. Pressurize dispensers only with nitrogen, never with air.

TWO-SIDED ACTIVATION

Two-sided activation is recommended when bonding porous surfaces and for larger bond-line gaps exceeding .015". Parts must be assembled as quickly as possible once adhesive is applied over activator, since curing begins in seconds. Movement of parts upon assembly promotes mixing of adhesive and activator and may help to ensure complete cure through large bond-line gaps. Parts should then be left until the fixture or handling strength is obtained. VT and GEL formulations of adhesive should be used for large bond gaps.

CLEANUP

Excess activator and adhesive may be cleaned with alcohol, esters, and other common solvents. Ketones, eg. acetone, should not be used on surfaces to be bonded as they sometimes leave a harmful residue.

PACKAGING AND SHELF LIFE

Activators are available in 8.3-mL glass vials or 8-ounce, 1-quart, 1-gallon, and 5-gallon metal containers. Activator has a 12-month shelf life from date of shipment, unless otherwise specified, when stored in original, unopened, and undamaged containers. No shelf life is stipulated once opened. Activator is oxygen sensitive. Containers should be closed immediately following dispensing. Resealing container under nitrogen extends shelf life. If activator turns black, run the fixture test (on following page) to determine its potency.

HANDLING AND PRECAUTIONS

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 "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 be +/- 50% of the average for our combination of adhesive and activator. If outside these limits, repeat, check method, and check with different lot of activator or adhesive.

CAUTION

Avoid skin and eye contact. Non-porous protective gloves or barrier hand cream should be used. Do not wear jewelry. Protective eye goggles should be worn when handling activator. Avoid breathing of vapor. Use positive ventilation to remove vapors. For industrial use only. Avoid contact with eyes and clothing. In case of contact, immediately flush with water for at least 15 minutes; for eyes, get medical attention. Wash clothing before reuse. Keep out of reach of children. Do not take internally. If swallowed, vomiting should be induced at once and a physician called. For specific information, refer to the product Material Safety Data Sheet before use.