

Environmentally Safe Activator 535-A for Fast, Reliable Structural Bonding

INTRODUCTION

DYMAX 535-A is an ODC-free, environmentally safe activator that enhances safety in the workplace and has excellent degreasing and wetting properties. It is used to cure DYMAX 800, Multi-Cure[®] 600, and other specialty-grade structural adhesives that are designed for fast structural bonding. High-strength bonds form to metal, painted/coated metal, plated and surface-treated metal, ferrite, ceramic, glass, wood, and thermoset plastic substrates. Long, pre-applied open times are available.

DESCRIPTION

An ODC-free activator containing Isopropyl Alcohol as a carrier solvent.

THE BENEFITS OF COLD BONDING

Activated-adhesive structural bonding with ODC-free formulations provide a broad range of process control advantages. The key benefit is to allow cure speed to match assembly speed thereby increasing total process efficiency. A variety of application techniques, and the elimination of heat curing and other delays in curing, increase the flexibility of process design. One-part cleaning action and broad tolerance of adhesive-to-activator ratios increase bonding consistency and reliability. Rapid, on-demand curing to fixture or handling strength allows in-line quality control and increased production throughput.

TECHNICAL DATA

TYPICAL LIQUID PROPERTIES

Color	Amber to Brown
Solvent Present	Isopropyl Alcohol
ODC Present	None
Solvent Flash Time	10-40 seconds
Toxicity	Moderate TLV=400ppm
Flash Point (Closed Cup)	57°F (37°C)
Specific Gravity	0.9
On-Part Activator Life	8 Hours
Viscosity	7.5 cP

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. Allow recommended on-part flash time for solvent (if present) to evaporate. Surfaces will have an oily appearance.
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 fill the joint completely without squeeze-out.
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 applied as a drop or bead squeezes from the center to the edges of the bonding surfaces. This technique promotes mixing and ensures 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. 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 5:1 to 20:1. The critical factor is that a thin film of activator on one mating surface contacts adhesive bead(s) on the other mating surface, and that both mix during assembly. With these criteria met, actual adhesive-to-activator ratio may vary with assembly design and adhesive/activator dispensing systems. It should be noted that 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 the cleaning of 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 or chemically resistant, open 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.

TWO-SIDED ACTIVATION

Two-sided activation is recommended for larger bond line gaps exceeding .020". 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 may help to ensure complete cure through large bondline gaps. Parts should then be left undisturbed during actual cure-to-fixture or handling strength. VT and Gel formulations of adhesive should be used for large bond gaps.

CLEAN UP

Excess activator and adhesive may be cleaned up with alcohol, esters, and other common solvents. Ketones, eg. acetone, should not be used on surfaces to be bonded.

DISPENSING AND HANDLING

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. If activator turns dark brown or black, its effectiveness should be questioned and determined. This can be done by determining fixturing time between glass or metal slides. (See *Recommended "Speed Of Cure" Fixture Test* described below).

PACKAGING AND SHELF LIFE

Activators are available in 7-mL glass vials or 1-quart, 1-gallon, and 5-gallon metal containers. Activator has a one-year shelf life 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 (below) to determine its potency.

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 that the results be charted. This will ensure the adhesive and activator are working appropriately.

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 your 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.

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