Impact Resistant Structural Adhesive

07333 / 57333

Technical Data **January 2016**

Product Description

3M™ Impact Resistant Structural Adhesive is a two-part epoxy adhesive which provides an extended work time, but can be rapidly cured with heat. 3M™ Impact Resistant Structural Adhesive has excellent adhesion to a wide variety of properly prepared metal substrates, is intended for "true" structural bonding applications when specified by automotive OEM's, and is recommended for all weld-bonded and rivet-bonded joints.

Features

- Designed for Professional Aftermarket Collision Repair use
- Optimized Shear, Peel, and Impact Performance
- Corrosion Inhibiting Formula
- Color Changing Chemistry
- Room Temperature Curing / Accelerate with Heat

Initial Physical Properties

NOTE: The following technical information and data, while representative of current performance, should not be used for specification release or CAE purposes.

Container	200mL Duo-Pak Syringe or 450mL DMS Cartridge	
Base	Epoxy	Amine
Density (approximately)	9.5 lbs/gallon	9.9 lbs/gallon
Color	Off-White	Silver
Solids	100%	100%
Consistency	Viscous Liquid	Viscous Liquid
Mix Ratio by Volume	200	100
Mixed Viscosity	150,000 – 200,000 centipoise	
Elastic Modulus (ASTM D638)	2.1 GPa	
Elongation (ASTM D638)	2% - 3%	
Ultimate Tensile Strength (ASTM D638)	35 MPa	

Product Uses

This product is intended to augment, or in cases specifically identified by the OEM, replace welds/rivets used in the attachment of body panels, reinforcements, frame members, floor pans, etc., where strength is required to increase vehicle durability or stiffness. This product is NOT intended to be used for structural procedures that are "bond-only" unless specifically recommended by the vehicle manufacturer. As this product is anticipated to be used in "true" structural bonding applications, its selection in the repair process is to be strictly guided by the vehicle's original manufacturer.

For professional use only. Not intended for retail sale.

Accessories

200mL Duo-Pak Syringe Format (07333)

Applicators:
- PN08117 3M™ Manual Applicator, 200mL
- PN09930 3M™ Pneumatic Applicator, 200mL

Mixing Nozzles:
- PN08193 3M™ Static Mixing Nozzle (6/Bag)
- PN08194 3M™ Static Mixing Nozzle (50/Box)

450mL DMS Cartridge Format (57333)

Applicators:
- PN05846 3M™ DMS Applicator, Pneumatic

Mixing Nozzles:
- PN55847 3M™ Dynamic Mixing Nozzle (50/Box)
- PN58207 3M™ Nozzle Extension (12/Bag)

Performance Properties

The values shown below are for ambient air temperature and substrate temperature at 70°F/21°C.

Work Time	Fixture Time	Cure Time
60 minutes	8 hours	24 hours

Tensile Shear Strength (ISO 4587)

Environment	Description	3M™ IRSA
Room Temperature Cure	24 hours at 23°C	20.8 MPa
Cold Exposure (C)	RT Cure / 24 hours at -40°C (Tested Cold)	25.6 MPa
Hot Exposure (H)	RT Cure / 14 days at 80°C (Tested Hot)	10.5 MPa
Hot Exposure (RT)	RT Cure / 14 days at 80°C (Tested after 24h RT)	20.8 MPa
Humidity Exposure	RT Cure / 240 hours at 38°C & 95% RH (Tested after 24h RT)	20.3 MPa
Neutral Salt Spray	RT Cure / 480 hours NSS exposure (Tested after 24h RT)	18.1 MPa
Corrosion Cycle	RT Cure / Cyclic Corrosion Exposure (Tested after 24h RT)	20.3 MPa
Water Soak (W)	RT Cure / 168 hours water storage at 55°C (Tested Wet)	19.0 MPa
Water Soak (D)	RT Cure / 168 hours water storage at 55°C (Tested after 24h RT)	19.1 MPa

T-Peel Strength (ASTM D1876)

Environment	Description	3M™ IRSA
Room Temperature Cure	24 hours at 23°C	9.0 N/mm
Corrosion Cycle	RT Cure / Cyclic Corrosion Exposure (Tested after 24h RT)	7.7 N/mm

Wedge Impact Peel (ISO 11343)

Environment	Description	3M™ IRSA
Room Temperature Cure	24 hours at 23°C	9.6 J
Hot Exposure	RT Cure / 4 hours at 80°C (Tested Hot)	6.5 J
Cold Exposure	RT Cure / 4 hours at -20°C (Tested Cold)	6.1 J

Accelerated Heat Cure

NOTE: The cure time may be accelerated by applying heat (maximum 175°F/80°C for 30 minutes), if applied within 2 hours of adhesive application

Representative Accelerated Heat Cure Schedule: Tensile Shear Strength (% of Max)

Cure Time at Temperature	Cure Temperature				
	10°C	23°C	40°C	60°C	80°C
15 min				0%	95%
30 min				75%	100%
1 hour			5%	100%	
2 hour			80%		
4 hour		0%	100%		
8 hour		65%			
16 hour	25%	90%			
1 day	60%	95%			
2 day	75%	98%			
7 day	90%	100%			

Storage and Handling

When stored at the recommended conditions in original, unopened containers, this product should have a shelf life in excess of 12 months from the date of manufacture. Store at room temperature. Rotate stock on a "first-in / first-out" basis.

After use, leave the mix nozzle in place to seal the cartridge.

Directions for Use

SURFACE PREPARATION

1. Wash surface with soap and water to remove water soluble contaminants. Follow the soap and water wash with an appropriate VOC compliant product for removal of surface contaminants.
2. Remove all rust, primer, and paint from the areas to be bonded, welded, or riveted using a 3M Grade 80 Roloc™ Grinding Disc or Coarse Scotch-Brite™ File Belt. Only bond to clean, rust-free, bare metal
3. Test-fit all parts, including rivets or fasteners, and minimize large gaps between the flanges to ensure a uniform adhesive bond.
4. Remove the part from the vehicle.
    - *All areas to be MIG welded should be coated with 3M™ Weld-Thru II Coating (PN05917) according to the directions on the can. Adhesive should not be applied to the areas that will be MIG welded.*
    - *Areas to be welded using Squeeze Type Resistance Spot Welding (STRSW) should be coated with 3M™ Impact Resistant Structural Adhesive (PN07333/PN57333) (See Step 11). Weld-Thru coatings should not be applied to these areas.*
    - *Areas to be riveted should be coated with 3M™ Impact Resistant Structural Adhesive (PN07333/PN57333) (See Step 11). Weld-Thru coatings should not be applied to these areas.*

PRODUCT PREPARATION

5. Place the adhesive cartridge in the applicator gun.
6. Remove the retaining collar and plug from the end of the cartridge. Discard the plug, but save the retaining collar.
7. Before attaching a mixing nozzle, "equalize" the cartridge by dispensing just enough product to be sure that both parts A and B are present at the outlet.
8. Attach a 3M™ Mixing Nozzle to the cartridge and lock in place with the retaining collar.
9. Dispense a small amount of material through the mixing nozzle onto a disposable surface and discard.

GENERAL REPAIR PROCESS

10. Apply an adhesive bead to all bare metal surfaces of both pieces to be bonded. Using a plastic spreader or acid brush, tool out the adhesive to cover all bare metal surfaces.
11. Apply a 1/8" to 1/4" diameter adhesive bead to ONE part, centered on the flange (or as specified in the OEM Collision Repair Manual). Wide flanges, or flanges with small gaps, may require a larger bead. Apply a large enough bead to allow the adhesive to fill all voids and squeeze out of the flange seam, indicating that the joint is completely sealed
12. Clamp or fixture parts together with any OEM recommended mechanical fasteners.
13. Tool any adhesive "squeeze out" to seal the outside of the seam along all bonded edges.
14. Perform Squeeze Type Resistance Spot Welding in appropriate areas while the adhesive is uncured. DO NOT attempt to MIG weld through the adhesive. Set rivets or other fasteners while the adhesive is still uncured, typically within 2 hours of adhesive application.
    - *CAUTION: The adhesive may be combustible. Keep any MIG welding a minimum of 2 inches from the adhesive. As with any welding operation, keep the appropriate fire extinguisher within reach, and be alert to any smoke or flame that may be present.*
    - *Squeeze Type Resistance Spot Welding through uncured adhesive IS acceptable.*
15. Spray the interior cavities and any welded seams with 3M™ Cavity Wax.

Directions for Use Continued

16. If the parts are bonded only, clamps may be removed after 8 hours at 73°F.
    - *Parts should remain clamped longer if the temperature is below 73°F/23°C and/or if there is any tension on the part/bondline.*
    - *The cure time may be accelerated by applying heat (maximum 80°C for 30 minutes), if applied within 2 hours of adhesive application.*
17. Parts that utilize rivets or STRSW can be unclamped immediately.
18. After top coats have been applied, spray the interior cavities and any welded seams with 3M™ Rust-Fighter-I internal cavity wax (PN08891 / PN08892).
19. Allow 24 hours at a minimum of 73°F/23°C before returning the vehicle to service.

NOTE: 3M™ Impact Resistant Structural Adhesive, PN07333 / PN57333 will change color from silver to purple, indicating that the curing process has begun. Excessive heat application may reverse the color change effect from purple back to silver / grey.

CLEAN-UP

Prior to curing, PN07333/PN57333 may be cleaned from most surfaces with an appropriate VOC compliant product for removal of surface contaminants.

Precautionary Information

Before using this product, please reference Product Label and/or Safety Data Sheet for Health and Safety Information. Note: Laws controlling the acceptable amounts of Volatile Organic Compounds (VOC's) vary by state, and in some cases by locality. For surface preparation and clean-up activities, consult federal, state and local regulations regarding use of products containing VOCs in your area.

Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use

Many factors beyond 3M's control and uniquely within the user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a purpose and suitable for user's method of application.

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