

August, 2017

3M™ Scotch-Weld™ Metal Bonder Acrylic Adhesive DP8407NS Gray

Product Description

3M™ Scotch-Weld™ Metal Bonder Acrylic Adhesive DP8407NS Gray is a high performance, two-part acrylic adhesive that offers excellent shear, peel, and impact performance. This toughened product provides excellent adhesion to many plastics and metals, including those with slightly oily surfaces. This special formulation provides outstanding durability on metal substrates (including bare steel, copper, brass, bronze, and galvanized steel), even when exposed to high temperature and humidity environments.

Product Features

- Excellent strength and durability on bare metals, plastics, and other materials
- Toughened
- Outstanding peel and impact strength
- 10:1 mix ratio
- Increased cure speed with applied heat
- Contain glass beads (0.010" diameter) to control bond line thickness

Note: Unless otherwise indicated, all properties measured at 72°F (22°C).

Note: The following data are taken from tests conducted on a limited number of production runs. 3M will continue to test samples from additional manufacturing lots and issue a new Technical Data Sheet if the results change.



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Technical Information Note

The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Typical Uncured Physical Properties

Property	Values	Notes
Base Color	Brown	
Accelerator Color	Dark Gray	
Base Density	0.98 g/cm ³	Density measured using pycnometer.
Accelerator Density	1.08 g/cm ³	Density measured using pycnometer.
Viscosity	20,000 cP	
Base Viscosity	15,000 cP	Viscosity measured using cone-and-plate viscometer; reported viscosity at 3.8 sec ⁻¹ shear rate.
Accelerator Viscosity	50,000 cP	Viscosity measured using cone-and-plate viscometer; reported viscosity at 3.8 sec ⁻¹ shear rate.
Mix Ratio by Volume (B:A)	10:01	
Mix Ratio by Weight (B:A)	9:01	

Typical Performance Characteristics

Additional Test notes

This adhesive has relatively low adhesion to low surface energy plastics (such as polypropylene, polyethylene, TPO, acetal, and PTFE). Applications involving any of these materials should be carefully evaluated by the end user for suitability.

Note: The data in this sheet were generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough hand-mixing will afford comparable results.

Bell Peel: 50 lb/in width

Conditions

Dwell/Cure Time: 24 hr @ Room Temperature

Substrate: Aluminum

Failure mode: CF

Methods

ASTM D3167

Additional Information

notes: 1" wide samples; 0.017" bond line thickness; samples pulled at 6 in/min; aluminum surfaces etched; substrates used were 1/16" thick and 0.020" thick aluminum.

Note: The data in this sheet were generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough hand-mixing will afford comparable results.

Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

Typical Performance Characteristics (continued)

Overlap Shear Strength	Substrate	Failure mode	Test Condition
4500 lb/in ²	Aluminum	CF	
3400 lb/in ²	Galvanized steel	CF	
3800 lb/in ²	Stainless Steel	CF	
3500 lb/in ²	Cold Rolled Steel	CF	
1900 lb/in ²	Polyvinyl chloride (PVC)	SF	
1900 lb/in ²	Copper	AF	
1000 lb/in ²	ABS	SF	
1700 lb/in ²	Brass	AF	
1600 lb/in ²	Acrylic (PMMA)	SF	
1100 lb/in ²	Polycarbonate (PC)	SF	
450 lb/in ²	Polystyrene Foam	SF	
1300 lb/in ²	Fiber Reinforced Polyester	SF	
4100 lb/in ²	FRP (Epoxy)	CF	
3400 lb/in ²	Aluminum	CF	-40°F(-40°C)
1400 lb/in ²	Aluminum	CF	180°F(82°C)

Property: Overlap Shear Strength

Method: ASTM D1002

Dwell/Cure Time: 1 min open time, 24 cure @ Room Temperature

Surface Preparation: Abraded and Solvent Wiped

notes: 1/2" overlap; 0.010" bond line thickness; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; substrates used were 1/16" thick metals and 1/8" thick plastic. AF: adhesive failure CF: cohesive failure SF: substrate failure

Environmental Resistance (OLS)	Environmental Condition	Substrate
90 %	392°F (200°C) for 30 minutes	Aluminum
85 %	120°F (49°C) Water	Aluminum
90 %	90°F (32°C) Water	Aluminum
85 %	150°F(66°C) + 80% relative humidity	Aluminum
100 %	-40°F(-40°C)	Aluminum
100 %	300°F(149°C)	Aluminum
100 %	120°F(49°C) + 80% relative humidity	Aluminum
85 %	185°F(85°C) + 85% relative humidity	Aluminum
95 %	Water	Aluminum
95 %	Salt water (5 wt% in water)	Aluminum

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Typical Performance Characteristics (continued)

Environmental Resistance (OLS)	Environmental Condition	Substrate
70 %	Gasoline	Aluminum
100 %	Diesel Fuel	Aluminum
100 %	Motor Oil	Aluminum
100 %	Antifreeze (50 wt% in water)	Aluminum
75 %	Isopropyl Alcohol (IPA)	Aluminum
95 %	Bleach (10 wt% in water)	Aluminum
100 %	-40°F(-40°C)	Polyvinyl chloride (PVC)
95 %	120°F (49°C) + 80% relative humidity	Polyvinyl chloride (PVC)
95 %	150°F (66°C) + 80% relative humidity	Polyvinyl chloride (PVC)
100 %	Water	Polyvinyl chloride (PVC)
95 %	Salt water (5 wt% in water)	Polyvinyl chloride (PVC)
100 %	Hydrochloric acid (16 wt% in water)	Polyvinyl chloride (PVC)
95 %	Sodium hydroxide (10 wt% in water)	Polyvinyl chloride (PVC)
85 %	185°F (85°C) + 85% relative humidity	Polyvinyl chloride (PVC)
100 %	300°F (149°C)	Cold Rolled Steel
95 %	120°F (49°C) + 80% relative humidity	Cold Rolled Steel
65 %	185°F (85°C) + 85% relative humidity	Cold Rolled Steel
75 %	120°F (49°C) Water	Cold Rolled Steel
90 %	392°F (200°C) for 30 minutes	Cold Rolled Steel

Property: Environmental Resistance (OLS)

Method: ASTM D1002

Dwell/Cure Time: 24 hr @ Room Temperature

notes: Values indicate overlap shear test performance retained after 1,000 hours of continuous exposure relative to a control sample left at room temperature.

Note: Fully-cured structural adhesives can withstand short-term incidental contact with almost any solvent, chemical, or environmental condition. However, long-term continuous exposure of these Low Odor Acrylic Adhesives to the following liquids should be avoided: 1. Elevated temperature (>100°F) water 2. Ketone-type solvents (acetone, MEK) 3. Gasoline and similar liquids

Typical Mixed Physical Properties

Property	Values	Test Condition	Notes
Color	Gray	Mixed	
Density (mixed)	0.99 g/cm ³		

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Typical Mixed Physical Properties (continued)

Property	Values	Test Condition	Notes
Worklife	5 to 7 min		Maximum time that adhesive can remain in a small static mixing nozzle and still be expelled without undue force on the applicator. Cure times are approximate and depend on adhesive temperature.
Open Time	6 to 8 min		Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place. Cure times are approximate and depend on adhesive temperature.
Time to Handling Strength	22 to 26 min	Room Temperature	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.
Time to Structural Strength	28 to 32 min		Minimum time required to achieve 1,000 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.
Time to Full Cure	1 day		

Typical Cured Characteristics

Property	Values	Method	Dwell/Cure Time	Notes
Modulus	170,000 lb/in ²	ASTM D638	2 wk @ Room Temperature	1/8" thick Type I test specimens; samples pulled at 0.2 in/min.
Tensile Strength	24,000 lb/in ²	ASTM D638	2 wk @ Room Temperature	1/8" thick Type I test specimens; samples pulled at 0.2 in/min.
Tensile Strain at Break	10 %	ASTM D638	2 wk @ Room Temperature	1/8" thick Type I test specimens; samples pulled at 0.2 in/min.

Handling/Application Information

Directions for Use

1. To obtain the highest strength structural bonds, paint, oxide films, oils, dust, mold release agents, and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength and environmental aging resistance desired by user. For suggested surface preparations on common substrates, see the section on surface preparation.

2. Mixing For Duo-Pak Cartridges

Store cartridges with cap end up to allow any air bubbles to rise towards the tip. To use, simply insert the cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Then remove the cap and expel a small amount of adhesive to ensure material flows freely from both sides of cartridge. For automatic mixing, attach an EPX mixing nozzle to the cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after obtaining a uniform color.

Mixing For Bulk Containers

Mix thoroughly by weight or volume in the proportion specified on the product label or in the typical uncured properties section. Mix approximately 15 seconds after obtaining a uniform color.

3. Apply adhesive and join surfaces within the open time listed for the specific product.

Larger quantities and/or higher temperatures will reduce this working time. The adhesive and all materials should be at 60°F (16°C) or above to achieve highest bond strength.

4. Allow adhesive to cure at 60°F (16°C) or above until completely firm. Applying heat up to 150°F (66°C) will increase cure speed.

5. Keep parts from moving during cure. Apply contact pressure or fixture in place if necessary. Optimum bond line thickness ranges from 0.005 to 0.020 inch; shear strength will be maximized with thinner bond lines, while peel strength reaches a maximum with thicker bond lines.

6. Excess uncured adhesive can be cleaned up with ketone-type solvents.*

*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

Surface Preparation

3M™ Scotch-Weld™ Metal Bonder Acrylic Adhesives are designed to be used on painted or coated metals, most plastics, and some bare metals. The following cleaning methods are suggested for common surfaces:

Painted/coated metals:

1. Wipe surface free of dust and dirt with clean cloth and pure isopropyl alcohol.*

2. Sandblast or lightly abrade using clean fine grit abrasives. Do not completely remove the paint layer or coating down to bare steel.

3. Wipe again with clean cloth and pure isopropyl alcohol to remove loose particles.*

Metals:

1. Wipe surface free of dust and dirt with clean cloth and pure acetone.*

2. Sandblast or lightly abrade using clean fine grit abrasives.

3. Wipe again with clean cloth and pure acetone to remove loose particles.*

Plastics:

1. Wipe surface free of dust and dirt with clean cloth and pure isopropyl alcohol.*

2. Lightly abrade using fine grit abrasives.

3. Wipe again with clean cloth and pure isopropyl alcohol to remove loose particles.*

Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

Storage and Shelf Life

Store product at 80°F (27°C) or below. Refrigeration at 40°F (4°C) will help extend shelf life. Do not freeze. Allow product to reach room temperature prior to use.

3M™ Scotch-Weld™ Acrylic Adhesives have a shelf life of 12 months from date of manufacture in unopened original containers kept at recommended storage conditions.

Trademarks

3M, Scotch-Weld and EPX are trademarks of 3M Company.

References

Safety Data Sheet (SDS)

https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP8407NS Gray

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

Technical Information

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