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Scotch-Weld™
Acrylic Adhesives

DP8405NS Green • DP8410NS Green • DP8425NS Green

Technical Data Sheet **October 2016**

Product Description

3M™ Scotch-Weld™ Acrylic Adhesives are high performance, two-part acrylic adhesives that offer excellent shear, peel, and impact performance. These toughened products provide improved adhesion to many plastics and metals, including those with slightly oily surfaces. These durable products feature a fast rate of strength build, providing structural strength in minutes.

Review UL File QOQW2. MH17478 and Sign Components Manual (SAM) File E464624 for certification of these adhesive systems in electrical equipment.

DP8410NS Green has been tested for surface flammability, smoke, toxic gas generation, and caloric content per ASTM E162, ASTM E662, ASTM E1354, Bombardier SMP 800-C, and Boeing BSS 7239 test methods. DP8405NS Green and DP8425NS Green should yield similar results.

Product Features

- Toughened
- Excellent shear strength
- Outstanding peel and impact strength
- 10:1 mix ratio
- Variety of open times available
- 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).

Typical Uncured Physical Properties

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

Property		3M™ Scotch-Weld™ Acrylic Adhesive		
		DP8405NS Green	DP8410NS Green	DP8425NS Green
Color	Base (B) Accelerator (A)	Brown Blue		
Viscosity[1]	Base (B) Accelerator (A)	65,000 cP 30,000 cP	65,000 cP 30,000 cP	90,000 cP 30,000 cP
Density[2]	Base (B) Accelerator (A)	1.02 g/cm^3 1.07 g/cm^3		
Mix ratio	By volume	10 Parts B : 1 Part A		
	By weight	9.5 Parts B : 1 Part A		
Note: Cure times are approximate and depend on adhesive temperature.				
Work life[3]		4–6 minutes	10–12 minutes	22–24 minutes
Open time[4]		2–4 minutes	7–9 minutes	20–22 minutes
Time to handling strength[5]		14–16 minutes	26–30 minutes	42–46 minutes
Time to structural strength[6]		18–20 minutes	34–38 minutes	50–56 minutes

1. Viscosity measured using cone-and-plate viscometer; reported viscosity at 3.8 sec-1 shear rate.
2. Density measured using pycnometer.
3. Maximum time that adhesive can remain in a static mixing nozzle and still be expelled without undue force on the applicator.
4. Maximum time allowed after applying a small amount of adhesive to one substrate before bond must be closed and fixed in place.
5. Minimum time required to achieve 50 psi of overlap shear strength.
6. Minimum time required to achieve 1,000 psi of overlap shear strength.

Typical Mixed Physical Properties

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

Property	3M™ Scotch-Weld™ Acrylic Adhesive		
	DP8405NS Green	DP8410NS Green	DP8425NS Green
Color	Green		
Full cure time	24 hours		
Viscosity	60,000 cP	60,000 cP	85,000 cP
Density	1.03 g/cm^3		

Typical Cured Physical Properties

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

Overlap Shear (psi)[7]

Substrate	3M™ Scotch-Weld™ Acrylic Adhesive		
	DP8405NS Green	DP8410NS Green	DP8425NS Green
Aluminum	4,400 CF	3,900 CF	3,800 CF
Stainless steel	3,700 CF	3,500 CF	3,400 CF
PVC	1,800 SF	1,700 SF	1,600 SF
ABS	1,100 SF	1,100 SF	1,100 SF
Acrylic	1,300 SF	1,300 SF	1,500 SF
Polycarbonate	1,200 SF	1,300 SF	1,200 SF
Polystyrene	500 AF	550 AF	550 SF
Polyester (fiber-reinforced)	750 AF	1,000 SF	880 AF
Epoxy resin (fiber-reinforced)	4,300 CF	4,200 CF	3,300 CF
Aluminum (tested at -40°F)	2,600 CF	3,600 CF	3,800 CF
Aluminum (tested at 180°F)	1,300 CF	1,250 CF	1,450 CF

7. Overlap shear values measured using ASTM D1002; 1 min open time; adhesive allowed to cure for 24 hours at room temperature; 1/2" overlap; 0.010" bond line thickness; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1/16" thick metals and 1/8" thick plastics; failure modes:
AF: adhesive failure CF: cohesive failure SF: substrate failure

Note: Environmental aging tests have shown that these adhesives may accelerate the corrosion of certain bare metals (such as cold rolled steel, copper, brass, and bronze), leading to low bond strength values and early bond failure. These adhesives also have relatively low adhesion to low surface energy plastics (such as polypropylene, polyethylene, TPO, and PTFE). Applications involving any of these materials should be carefully evaluated by the end user for suitability.

Typical Cured Physical Properties (continued)

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

Mechanical Properties[8]

Property	3M™ Scotch-Weld™ Acrylic Adhesive		
	DP8405NS Green	DP8410NS Green	DP8425NS Green
Tensile modulus (psi)	195,000	190,000	Not tested
Tensile strength (psi)	2,800	2,250	Not tested
Tensile strain at break (%)	9.5	6.0	Not tested

8. Tensile properties measured using ASTM D638; adhesives allowed to cure for 2 weeks at room temperature; 1/8" thick Type I test specimens; samples pulled at 0.2 in/min.

Environmental Resistance[9]

Condition	Substrate	3M™ Scotch-Weld™ Acrylic Adhesive		
		DP8405NS Green	DP8410NS Green	DP8425NS Green
300°F (149°C)	Aluminum	100%	100%	100%
-40°F (-40°C)		100%	95%	100%
120°F (49°C) + 80% relative humidity		85%	85%	85%
150°F (66°C) + 80% relative humidity		65%	60%	60%
185°F (85°C) + 85% relative humidity		35%	40%	45%
Water		80%	90%	95%
90°F (32°C) Water		75%	85%	85%
120°F (49°C) Water		45%	50%	50%
Salt water (5 wt% in water)		90%	95%	85%
Gasoline		80%	75%	55%
Diesel fuel		100%	100%	100%
Motor oil		100%	100%	100%
Antifreeze (50 wt% in water)		100%	100%	100%
Isopropyl alcohol		90%	90%	85%
Bleach (10 wt% in water)		80%	95%	90%

Typical Cured Physical Properties (continued)

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

Condition	Substrate	3M™ Scotch-Weld™ Acrylic Adhesive		
		DP8405NS Green	DP8410NS Green	DP8425NS Green
-40°F (-40°C)	PVC	100%	100%	100%
120°F (49°C) + 80% relative humidity		100%	95%	95%
150°F (66°C) + 80% relative humidity		100%	100%	95%
185°F (85°C) + 85% relative humidity		100%	100%	100%
Water		100%	100%	100%
Salt water (5 wt% in water)		100%	100%	95%
Hydrochloric acid (16 wt% in water)		100%	95%	95%
Sodium hydroxide (10 wt% in water)		100%	95%	90%

9. Values indicate overlap shear test performance retained after 1,000 hours of continuous exposure relative to a control sample left at room temperature; samples conditioned for 24 hours at room temperature and 50% relative humidity prior to tests.

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 Acrylic Adhesives to the following liquids should be avoided:

1. **Elevated temperature (>100°F) water**
2. **Ketone-type solvents (acetone, MEK)**

Floating Roller Peel (lb/inch width)[10]

Substrate	3M™ Scotch-Weld™ Acrylic Adhesive		
	DP8405NS Green	DP8410NS Green	DP8425NS Green
Aluminum	55 CF	60 CF	50 CF

10. Floating roller peel values measured using ASTM D3167; adhesives allowed to cure for 24 hours at room temperature; 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; failure modes: AF: adhesive failure CF: cohesive failure SF: substrate failure

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.

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.
4. The adhesive and all materials should be at 60°F (16°C) or above prior to assembly. 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™ 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.*

Aluminum/stainless steel:

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.

3M™ Scotch-Weld™ Acrylic Adhesives

DP8405NS Green • DP8410NS Green • DP8425NS Green

Storage	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.
Shelf Life	3M™ Scotch-Weld™ Acrylic Adhesives have a shelf life of 18 months from date of shipment from 3M in unopened original containers kept at recommended storage conditions.

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.
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