Scotch-Weld™

DP8700NS Series

Preliminary Technical Data Sheet **July 2021**

Product Description

3M™ Scotch-Weld™ DP8700 Series adhesives are low odor, two-part acrylic structural adhesives that offer excellent shear, peel, and impact performance. These products provide excellent adhesion to many painted/coated metals, plastics, glass, and bare metals. These special formulations provide outstanding shear and impact strength at cold temperatures.

Features

- Excellent strength and durability on a wide variety of common materials
- Low odor
- Outstanding cold temp performance
- Minimal surface preparation
- Contains ceramic beads to control bond line thickness

Note: The following data is taken from tests conducted on limited production runs. 3M will continue to test samples from additional product runs and will issue a new data page if the test results change.

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™		
		DP8705NS	DP8710NS	DP8725NS
Color	Base (B)	Black		
	Accelerator (A)	Gray		
Viscosity[1]	Base (B)	40,000 cP		
	Accelerator (A)	15,000 cP		
Density[2]	Base (B)	1.04 g/cm^3		
	Accelerator (A)	1.08 g/cm^3		
Mix ratio	By volume	10 Parts B : 1 Part A		
	By weight	10 Parts B : 1 Part A		
		Note: Cure times are approximate and depend on adhesive temperature.		
Work life[3]		3-4 minutes	8-10 minutes	20-22 minutes
Open time[4]		4-6 minutes	10-12 minutes	20-25 minutes
Time to handling strength[5]		6-8 minutes	12-14 minutes	25-30 minutes
Time to structural strength[6]		8-12 minutes	15-20 minutes	30-35 minutes

1. Viscosity measured using cone-and-plate viscometer; reported viscosity at 4 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 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.

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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™		
	DP8705NS	DP8710NS	DP8725NS
Color	Black		
Full cure time	24 hours		
Viscosity	40,000 cP		
Density	1.04 g/cm^3		
Shore A Hardness	65		

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™		
	DP8705NS	DP8710NS	DP8725NS
Etched Aluminum	2,435 CF	1,933 CF	TBD
Cold rolled steel	2,133 CF	2,023 CF	TBD
ABS	566 AF	878 AF	TBD
Acrylic	622 CF	662 AF	TBD
Polycarbonate	149 AF	180 AF	TBD
Polyester (fiber-reinforced)	682 AF	674 AF	TBD
Epoxy resin (fiber-reinforced)	1,624 CF	2,114 CF	TBD
Etched Aluminum (tested at -40°F)	4,418 CF	4,556 CF	TBD
Etched Aluminum (tested at 120°F)	1,567 CF	1,421 CF	TBD
Etched Aluminum (tested at 180°F)	690 AF	668 AF	TBD

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. Metals and fiber-reinforced polymers were prepared by cleaning with acetone, light abrasion and a final acetone clean. Plastics were prepared by cleaning with isopropyl alcohol. Substrates used were 1/16" thick metals and 1/8" thick plastics. Failure modes:
AF: adhesive failure CF: cohesive failure SF: substrate failure

Note: This adhesive also has 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.

Note: The presence of oxygen inhibits the cure of acrylic structural adhesives. Therefore, any exposed surfaces of the mixed adhesive will cure much more slowly than adhesive contained within the bond line. With methyl methacrylate (MMA) acrylic adhesives, any uncured adhesive on the surface flashes off immediately, leaving a surface that feels dry to the touch. With this low odor acrylic adhesive, uncured adhesive on exposed surfaces does not evaporate away as quickly, leaving a tacky film of partially cured material. For manufacturing processes that need a tack-free surface quickly, such as for subsequent sanding or painting operations, consider instead using a standard MMA acrylic adhesive.

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™		
	DP8705NS	DP8710NS	DP8725NS
Tensile modulus	TBD	6,410 psi	TBD
Tensile strength	TBD	1,051 psi	TBD
Tensile strain at break	TBD	113%	TBD

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. Strains measured using digital image correlation.

Environmental Resistance[9]

Condition	Substrate	3M™ Scotch-Weld™		
		DP8705NS	DP8710NS	DP8725NS
392°F (200°C) for 30 minutes	Etched Aluminum	88%	112%	TBD
392°F (200°C) for 30 minutes	Cold Rolled Steel	61%	71%	TBD
85°F (29°C) + 85% relative humidity for 500 hours	Etched Aluminum	TBD	81%	TBD
120°F (49°C) + 80% relative humidity for 500 hours	PVC	TBD	TBD	TBD
Ambient Water Soak for 500 hours	Etched Aluminum	TBD	TBD	TBD
Diesel Fuel Soak for 500 hours	Etched Aluminum	TBD	TBD	TBD
Gasoline Soak for 500 hours	Etched Aluminum	TBD	TBD	TBD
Salt Water Soak (5 wt% in water) for 500 hours	Etched Aluminum	TBD	71%	TBD

9. Values indicate overlap shear test performance retained after specified 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 this acrylic structural adhesive to the following liquids should be avoided:

1. **Elevated temperature (>120°F) water**
2. **Ketone-type solvents (acetone, MEK)**

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.

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

Substrate	3M™ Scotch-Weld™		
	DP8705NS	DP8710NS	DP8725NS
Etched Aluminum	49 CF	68 CF	TBD

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.

Dispensing Characteristics

Material Characteristic	8705NS	8710NS	8725NS
Thixotropic Index	TBD	3.8	TBD
Mix Nozzle Recommendation – 45mL	Quadro Mixing Nozzle Mix Elements: 16 Length (mm): 90 Volume (ml): 1.72 3M Stock #:7100202930	Quadro Mixing Nozzle Mix Elements: 16 Length (mm): 90 Volume (ml): 1.72 3M Stock #:7100202930	Quadro Mixing Nozzle Mix Elements: 16 Length (mm): 90 Volume (ml): 1.72 3M Stock #:7100202930
Mix Nozzle Recommendation – 490mL	Helical Mixing Nozzle Mix Elements: 18 Length (mm): 221.9 Volume (ml): 12.96 3M Stock #: 7100015959	Helical Mixing Nozzle Mix Elements: 18 Length (mm): 221.9 Volume (ml): 12.96 3M Stock #: 7100015959	Helical Mixing Nozzle Mix Elements: 18 Length (mm): 221.9 Volume (ml): 12.96 3M Stock #: 7100015959
Alterative Mix Nozzle Recommendation – 490mL	Helical Low waste Mixing Nozzle Mix Elements: 24 Length (mm): 136.7 Volume (ml): 6.28 3M Stock #:7100066351	Helical Low waste Mixing Nozzle Mix Elements: 24 Length (mm): 136.7 Volume (ml): 6.28 3M Stock #:7100066351	Helical Low waste Mixing Nozzle Mix Elements: 24 Length (mm): 136.7 Volume (ml): 6.28 3M Stock #:7100066351
Abrasive Fillers	Ceramic Beads, 0.01" NOM	Ceramic Beads, 0.01" NOM	Ceramic Beads, 0.01" NOM
Packaging – 45 mL	MixPac B System	MixPac B System	MixPac B System
Packaging – 490 mL	MixPac F system	MixPac F system	MixPac F system
Packaging – 5 gallon kit	5 gallon straight sided pail - steel	5 gallon straight sided pail - steel	5 gallon straight sided pail - steel
Packaging – 55 gallon kit	55 gallon straight sided drum - steel	55 gallon straight sided drum - steel	55 gallon straight sided drum - steel
Base Pumping Equipment Recommendation – High Flow	25.0 cc/rev EPDM Progressive Cavity Pump	25.0 cc/rev EPDM Progressive Cavity Pump	25.0 cc/rev EPDM Progressive Cavity Pump
Accelerator Pumping Equipment Recommendation – High Flow	3.0 cc/rev Viton ETP Progressive Cavity Pump	3.0 cc/rev Viton ETP Progressive Cavity Pump	3.0 cc/rev Viton ETP Progressive Cavity Pump
Base Pumping Equipment Recommendation – Low Flow	3.0 cc/rev EPDM Progressive Cavity Pump	3.0 cc/rev EPDM Progressive Cavity Pump	3.0 cc/rev EPDM Progressive Cavity Pump
Accelerator Pumping Equipment Recommendation – Low Flow	0.3 cc/rev Viton ETP Progressive Cavity Pump	0.3 cc/rev Viton ETP Progressive Cavity Pump	0.3 cc/rev Viton ETP Progressive Cavity Pump

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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.

   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™ Acrylic Adhesives are designed to be used on painted/coated metals, most bare metals, and most plastics and composite materials. 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.*****

Bare 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 and composite materials:

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

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™ Adhesives DP8705NS, DP8710NS and DP8725NS have a shelf life of 12 months from date of manufacture in unopened original containers kept at recommended storage conditions.

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Precautionary Information	Refer to Product Label and 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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