Scotch-Weld$^{\Sigma}$
Low Odor Acrylic Adhesives

DP8805NS Green • DP8810NS Green • DP8825NS Green

Technical Data Sheet October 2018

Product Description

3M™ Scotch-Weld™ Low Odor 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. Their low odor and non-flammability features also make them easier to incorporate into a manufacturing process.

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

DP8810NS 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. DP8805NS Green and DP8825NS Green should yield similar results.

Product Features

- Toughened
- Excellent shear strength
- High 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$^{\Sigma}$ Scotch-Weld$^{\Sigma}$ Low Odor Acrylic Adhesive		
		DP8805NS Green	DP8810NS Green	DP8825NS Green
Color	Base (B) Accelerator (A)	Off-White Blue		
Viscosity[1]	Base (B) Accelerator (A)	45,000 cP 15,000 cP	45,000 cP 15,000 cP	40,000 cP 15,000 cP
Density[2]	Base (B) Accelerator (A)	1.06 g/cm^3 1.08 g/cm^3	1.06 g/cm^3 1.08 g/cm^3	1.12 g/cm^3 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]		3–5 minutes	8–12 minutes	22–24 minutes
Open time[4]		4–6 minutes	8–12 minutes	20–22 minutes
Time to handling strength[5]		6–8 minutes	16–20 minutes	42–46 minutes
Time to structural strength[6]		8–10 minutes	19–23 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 Σ Scotch-Weld Σ Low Odor Acrylic Adhesive		
	DP8805NS Green	DP8810NS Green	DP8825NS Green
Color	Blue-Green		
Full cure time	24 hours		
Viscosity	45,000 cP	45,000 cP	40,000 cP
Density	1.06 g/cm^3	1.06 g/cm^3	1.12 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 Σ Scotch-Weld Σ Low Odor Acrylic Adhesive		
	DP8805NS Green	DP8810NS Green	DP8825NS Green
Aluminum	3,900 CF	3,600 CF	3,100 CF
Stainless steel	3,500 CF	3,400 CF	2,700 CF
PVC	2,000 SF	1,800 SF	1,400 SF
ABS	1,200 SF	1,200 SF	1,300 SF
Acrylic	1,100 SF	1,100 SF	1,000 SF
Polycarbonate	800 AF	1,000 CF	900 CF
Polystyrene	400 AF	550 AF	550 AF
Polyester (fiber-reinforced)	650 AF	1,000 AF	900 AF
Epoxy resin (fiber-reinforced)	3,300 CF	3,400 CF	2,700 CF
Aluminum (tested at -40°F)	800 AF	900 AF	1,000 AF
Aluminum (tested at 180°F)	900 CF	900 CF	700 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.

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 these low odor acrylic adhesives, uncured adhesive on exposed surfaces does not evaporate away quickly, leaving a wet film of partially cured material. For manufacturing processes that need a dry surface quickly, such as for subsequent sanding or painting operations, consider instead the standard acrylic adhesives (DP8405NS Green, DP8410NS Green, DP8425NS Green, and Metal Bonder DP8407NS Green).

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 Σ Scotch-Weld Σ Low Odor Acrylic Adhesive		
	DP8805NS Green	DP8810NS Green	DP8825NS Green
Tensile modulus (psi)	140,000	125,000	Not tested
Tensile strength (psi)	1,800	1,650	Not tested
Tensile strain at break (%)	8.5	6.5	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 Σ Scotch-Weld Σ Low Odor Acrylic Adhesive		
		DP8805NS Green	DP8810NS Green	DP8825NS Green
300°F (149°C)	Aluminum	100%	100%	100%
-40°F (-40°C)		100%	95%	95%
120°F (49°C) + 80% relative humidity		70%	65%	75%
150°F (66°C) + 80% relative humidity		65%	70%	70%
185°F (85°C) + 85% relative humidity		50%	50%	30%
Water		70%	75%	60%
90°F (32°C) Water		55%	55%	45%
120°F (49°C) Water		35%	35%	35%
Salt water (5 wt% in water)		75%	75%	75%
Diesel fuel		95%	90%	95%
Motor oil		100%	95%	100%
Antifreeze (50 wt% in water)		85%	90%	95%
Isopropyl alcohol		60%	50%	65%
Bleach (10 wt% in water)		65%	65%	75%

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 Σ Scotch-Weld Σ Low Odor Acrylic Adhesive		
		DP8805NS Green	DP8810NS Green	DP8825NS Green
-40°F (-40°C)	PVC	100%	100%	85%
120°F (49°C) + 80% relative humidity		100%	95%	90%
150°F (66°C) + 80% relative humidity		100%	100%	90%
185°F (85°C) + 85% relative humidity		95%	100%	85%
Water		100%	100%	100%
Salt water (5 wt% in water)		100%	100%	100%
Hydrochloric acid (16 wt% in water)		100%	95%	100%
Sodium hydroxide (10 wt% in water)		90%	95%	65%

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)
3. Gasoline and similar liquids

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

Substrate	3M™ Scotch-Weld™ Low Odor Acrylic Adhesive		
	DP8805NS Green	DP8810NS Green	DP8825NS Green
Aluminum	25 CF	35 CF	30 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