Scotch-Weld™
Acrylic Adhesives
DP807 • DP812 • DP825

Technical Data **January, 2013**

Product Description

3M™ Scotch-Weld™ Acrylic Adhesives DP807, DP812, and DP825 are two-part, 1:1 mix ratio, toughened acrylic structural adhesives. They exhibit excellent shear and peel strengths along with good impact, durability and bond well to many metals, ceramics, wood and most plastics with minimal surface preparation.

Features

- Excellent shear and peel strengths
- 5-minute work life (Scotch-Weld acrylic adhesive DP807)
  10-minute work life (Scotch-Weld acrylic adhesive DP812)
  25-minute work life (Scotch-Weld acrylic adhesive DP825)
- Minimal surface preparation
- Easy mixing
- Non-sag
- 1:1 mix ratio

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.

Product		3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
Color	Base (B) Accelerator (A)	Off-white Yellow	Off-white Yellow	Off-white Yellow
Net Weight (lbs./gallon)	Base (B) Accelerator (A)	8.2 8.0	8.2 8.0	8.2 8.0
Viscosity[1] @ 73°F (23°C)	Base (B) Accelerator (A)	35,000 cps 75,000 cps	35,000 cps 75,000 cps	35,000 cps 75,000 cps
Base Resin		Acrylic	Acrylic	Acrylic
Mix Ratio (B:A)	By volume By weight	1:1 1:1	1:1 1:1	1:1 1:1
Worklife[2] @ 73°F (23°C)	Nozzle mixed	4-6 minutes	9-11 minutes	24-26 minutes
Applied Open Time[3]		3 minutes	7 minutes	15-20 minutes
Time to Handling Strength[4]		8-10 minutes	15-20 minutes	25-35 minutes

1. Brookfield RVF Viscometer, #7 spindle at 20 rpm.
2. Approximate time during which material can remain in a mixer nozzle and still be expelled without undue force on the applicator.
3. Approximate time after application of adhesive that bonds can be made without adversely affecting wetting out of adhesive and ultimate performance levels.
4. Time to achieve approximate 50 psi Overlap Shear Strength (OLS) when cured at (73°F) 23°C.

Typical Cured Properties

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

Physical

Product	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
Color	Pale yellow	Pale yellow	Pale yellow
Shore D Hardness[5]	70	70	70
Full Cure Time	4-24 hrs. @ 73°F (23°C)	4-24 hrs. @ 73°F (23°C)	4-24 hrs. @ 73°F (23°C)

Typical Adhesive Performance Characteristics

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

Overlap Shear[6] (OLS) to Various Substrates (psi)

Substrate	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
Aluminum – Etched	3700 CF	3300 CF	3700 CF
Aluminum – abraded	3700 CF	3600 CF	3650 CF
Aluminum – uncleaned	3900 CF	3700 CF	3700 CF
Cold-Rolled Steel (CRS) – solvent wiped	3000 CF	2900 CF	3100 CF
Cold-Rolled Steel – slightly oily	2200 CF	2700 CF	2700 CF
Stainless Steel	3700 CF	3750 CF	3700 CF
Green Fiberglass Reinforced Plastic	2650 CF	2250 CF	2200 CF
Acrylic	1100 SF	1000 SF	850 SF
Polyvinylchloride (PVC)	1300 SF	1075 SF	1200 SF
Polycarbonate (PC)	950 SF	950 SF	950 SF
Acrylonitrile/Butadiene/Styrene (ABS)	1000 SF	900 SF	900 SF

AF: adhesive failure CF: cohesive failure SF: substrate failure

5. ASTM D2240. Specimen were cured for a minimum of 24 hours @ 73°F (23°C) before tested.

6. Overlap Shear (ASTM D-1002-64, 3M Test Method C-236) strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates. The thickness of the adhesive bond line was approximately 0.005". All strengths were measured at 73°F (23°C) except when noted, and samples were allowed to cure at 75°F (24°C) and approximately 50% RH for 1 week before tested. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

Typical Adhesive Performance Characteristics *(continued)*

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

Overlap Shear[7] Etched Aluminum Tested After 1 Week of Immersion in the Following Environments (psi)

Product	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
Control (no immersion) – cured 7 days at room temperature	3800	3820	3890
150°F (66°C) and 80% RH	2630	2480	2720
150°F (66°C) Tap Water	1640	1870	1990
20% Bleach solution	3890	3560	3760
IPA (Isopropyl Alcohol)	2960	2810	2860
Unleaded Gasoline	2640	2080	3230
Diesel Fuel	4060	3460	3590
50% Antifreeze	4230	3840	3760
Toluene	540	400	790
MEK (Methyl Ethyl Ketone)	NR	NR	NR
Acetone	NR	NR	NR

RT: room temperature ambience RH: relative humidity NR: not recommended

7. Overlap Shear (ASTM D-1002-64, 3M Test Method C-236) strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" coupons. The thickness of the adhesive bond line was approximately 0.005". All strengths were measured at 73°F (23°C) except when noted, and samples were allowed to cure at 75°F (24°C) and approximately 50% RH for 1 week before immersed. The separation rate of the testing jaws was 0.1 inch per minute.

Overlap Shear[8] Etched Aluminum Tested at Various Temperatures (psi)

Temperature	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
-67°F (-55°C)	1960	3000	2960
75°F (24°C)	3700	3500	3680
120°F (49°C)	2480	2900	2700
180°F (82°C)	850	1000	1000

8. Overlap Shear (ASTM D1002-64, 3M Test Method C-236) strength was measured on 1 in. wide x 1/2 in. overlap specimens. These bonds were made individually using 1" x 4" coupons. The thickness of the adhesive bond line was approximately 0.005". Bonds were allowed to cured for 7 days @ 73°F (23°C) and approximately 50% RH before tested. The separation rate of the testing jaws was 0.1 inch per minute.

T-Peel Adhesion[9] (piw) Etched Aluminum Tested After 1 Week at RT Cure

	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
Etched Al / Etched Al	26 CF	30 CF	28 CF

9. Aluminum/aluminum bonds tested at a jaw separation rate of 10 inches per minute at 73°F (23°C). Substrates were abraded steel 0.022" thick and 1" wide. Adhesive bond thickness was approximately 0.017".

Typical Adhesive Performance Characteristics

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

Rate of Strength Build-up[10] (psi) Etched Aluminum at Various Bonding Times

Time Bonding to Testing	3M™ Scotch-Weld™ Acrylic Adhesive DP807	DP812	DP825
10 minutes	210	25	30
20 minutes	2940	1660	1915
1 hour	4000	3650	3800
2 hours	3990	4175	4305
4 hours	4265	3945	4300
24 hours	4525	4310	4515

10. Overlap Shear (ASTM D-1002-64, 3M Test Method C-236) strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" coupons. The thickness of the adhesive bond line was approximately 0.005". All strengths were measured at 73°F (23°C) except when noted, and samples were allowed to cure at 75°F (24°C) and approximately 50% RH for 1 week before immersed. The separation rate of the testing jaws was 0.1 inch per minute.

Handling/ Curing Information

Directions for Use

1. For high 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, 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

   3M™ Scotch-Weld™ Acrylic Adhesives DP807, DP812 and DP825 are supplied in a dual syringe, plastic duo-pak cartridge as part of the 3M™ EPX™ Applicator System. To use, simply insert the duo-pak cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Next, remove the duo-pak cartridge cap and expel a small amount of adhesive to be sure both sides of the duo-pak cartridge are flowing evenly and freely. If automatic mixing of Part A and part B is desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after a uniform color is obtained.

   For Bulk Containers

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

3. For maximum bond strength, apply adhesive evenly to both surfaces to be joined.

4. Application to the substrates should be made within 3 minutes for Scotch-Weld acrylic adhesive DP807, 7 minutes for DP812, or 15-20 minutes DP825. Larger quantities and/or higher temperatures will reduce this working time.

Handling/ Curing Information *(continued)*

5. Join the adhesive coated surfaces and allow to cure at 60°F (16°C) or above until completely firm. Heat up to 120°F - 150°F (49°C - 66°C) will also speed curing. Scotch-Weld acrylic adhesives will fully cure in 24 hours @ 75°F (24°C).
6. Keep parts from moving during cure. Apply contact pressure if necessary. Maximum shear strength is obtained with a 3-5 mil bond line.
7. Excess uncured adhesive can be cleaned up with ketone type solvents*****.
8. Once 3M™ Scotch-Weld™ Acrylic Adhesive has been applied to a surface, it is best to join the two mating surfaces together as soon as possible or within the applied open time. The reason for this is that beyond the applied open time, Scotch-Weld acrylic adhesive may begin to form a thin "skin" over the exposed surface. If left exposed long enough, a thick enough "skin" may form which will inhibit the proper wetting needed to achieve maximum strength.

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

Surface Preparation

For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must me completely removed. The amount of surface preparation depends on the required bond strength, environmental aging resistance desired by the user.

The following cleaning methods are suggested for common surfaces:

Steel:

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents*****.
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with solvent to remove loose particles*****.
4. If a primer is used, it should be applied within 4 hours after surface preparation. If 3M™ Scotch-Weld™ Structural Adhesive Primer EC1945 B/A is used, apply a thin coating (0.5 mils or 0.013 mm) on the metal surfaces to be bonded, air dry for 10 minutes, then cure for 30 minutes at 180°F (82°C) prior to bonding.

Aluminum:

1. Alkaline degrease: Oakite® Aluminum Cleaner 164 (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water.
2. Acid etch: place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C)

Sodium dichromate	4.1 - 4.9 oz./gallon
Sulfuric acid, 66°Be	38.5 - 41.5 oz./gallon
2024-T3 aluminum (dissolved)	0.2 oz./gallon minimum
Tap water as needed for balance	

3. Rinse: rinse panels in clear running tap water.
4. Dry: air dry for 15 minutes; force dry for 10 minutes at 190°F ± 10°F (88°C ± 5°C).
5. If primer is to be used, it should be applied within 4 hours after surface preparation.

Surface Preparation *(continued)*

Plastics/Rubber:

1. Wipe with isopropyl alcohol*.
2. Abrade using fine grit abrasives.
3. Wipe with isopropyl alcohol*.

Glass:

1. Solvent wipe surface using acetone or MEK*.
2. Apply a thin coating (0.0001 in. or less) of 3M™ Scotch-Weld™ Metal Primer EC3901 to the glass surfaces to be bonded and allow the primer to dry before bonding.

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

Storage

Store product in cool, dry area where temperature range is 70°F (21°C). Refrigerated storage 40-60°F (4-16°C) is recommended, but do not freeze.

Shelf Life

3M™ Scotch-Weld™ Acrylic Adhesives DP807, DP812, and DP825 have a shelf life of 12 months in unopened original containers kept at recommended storage.

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 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 particular purpose and suitable for user's method of application.

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ISO 9001

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