Item # 99479

3M

# Scotch-Weld™

## Low-Odor Acrylic Adhesives

## DP-810 • DP-810 Black • DP-810 NS

**Technical Data** **June, 2001**

**Product Description**

3M™ Scotch-Weld™ Low-Odor Acrylic Adhesives are two-part, 1:1 mix ratio, toughened structural adhesives with less odor than most acrylic adhesives. These adhesives have excellent shear and peel strength along with good impact resistance and durability. They can quickly bond to most metals, ceramics, rubbers, plastics and wood with minimal surface preparation.

**Features**

- Tough, durable bonds
- Minimal surface prep
- 10 minute time to handling strength
- Bonds stainless steel
- Low-odor acrylic adhesive
- 10 minute worklife
- 1:1 mix ratio
- Excellent shear and peel strength

**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 | | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|---|
| Color | Base (B)<br>Accelerator (A) | Green<br>White | Black<br>White | Blue/Green<br>White |
| Lbs./gal. | Base (B)<br>Accelerator (A) | 8.7 - 9.1<br>8.7 - 9.1 | 8.5 - 8.9<br>8.6 - 9.0 | 8.8 - 9.2<br>8.7 - 9.1 |
| Viscosity (cps)[1] | Base (B)<br>Accelerator (A) | 18,000 - 22,000<br>18,000 - 22,000 | 18,000 - 22,000<br>17,000 - 21,000 | 90,000 - 95,000<br>95,000 - 100,000 |
| Base Resin | Base (B)<br>Accelerator (A) | Acrylic<br>Acrylic | Acrylic<br>Acrylic | Acrylic<br>Acrylic |
| Mix Ratio | (Volume)<br>(Weight) | 1:1<br>1:1 | 1:1<br>1:1 | 1:1<br>1:1 |
| Time to Handling Strength (50 psi) | | 10 minutes | 10 minutes | 10 minutes |
| Full Cure @ 73°F (23°C) | | 8 - 24 hours | 8 - 24 hours | 8 - 24 hours |
| Worklife @ 73°F (23°C) | | 10 minutes | 10 minutes | 10 minutes |

For footnotes, see Test Methods and Footnotes on Page 4.

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Typical 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 Strength[2], tested @ 73°F (23°C)**

| | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|
| **Substrate** | **OLS (psi)** | **OLS (psi)** | **OLS (psi)** |
| **Etched Aluminum** | 4200 CF | 4200 CF | 4200 CF |
| **Abraded Aluminum** | 3900 CF | 3750 CF | 3850 CF |
| **Bare Aluminum** | 3800 CF | 3850 CF | 4100 CF |
| **CRS** | 3100 CF | 3600 CF | 3500 CF |
| **Oily CRS** | 3450 CF | 3450 CF | 3500 CF |
| **Stainless Steel** | 3400 CF | 3500 CF | 3400 CF |
| **Green FRP** | 3800 CF | 3000 CF | 1900 CF |
| **Acrylic** | 1100 SF | 550 MM | 800 SF |
| **PVC** | 1000 SF | 1000 SF | 1000 SF |
| **Polycarbonate** | 850 MM | 500 MM | 500 MM |
| **ABS** | 600 MM | 700 MM | 650 MM |

**Overlap Shear Strength psi, tested @ Temperature**

| Temperature | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|
| **-20°F (-29°C)** | 1750 AF/MM | 2000 AF/MM | 1600 AF |
| **75°F (24°C)** | 3650 CF | 3550 CF | 4000 CF |
| **120°F (49°C)** | 2000 CF | 2000 CF | 2350 CF |
| **180°F (82°C)** | 550 CF | 500 CF | 500 CF |

**T-Peel Strength (piw)[3], tested @ 73°F (23°C)**

| Substrate | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|
| **Etched Al** | 30 | 20 | 23 |

SF = Substrate Failure/Break
CF = Cohesive Failure
AF = Adhesive Failure
MM = Mixed (Mode of AF and CF)

For footnotes, see Test Methods and Footnotes on Page 4.

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Environmental Resistance[4]**

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

**Overlap Shear Strength (psi), tested @ 73°F (23°C)**

| Condition | Time | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|---|
| Control | 14 Days | 3750 CF | 3750 CF | 3800 CF |
| 160°F (71°C)/100% RH | 14 Days | 1500 MM | 1500 MM | 1250 AF |
| 160°F (71°C)/Soak | 14 Days | 1750 MM | 1650 MM | 1450 AF |
| 20% Bleach | 14 Days | 3450 CF | 3250 CF | 3750 CF |
| IPA | 14 Days | 3150 CF | 3050 CF | 3450 CF |
| 50% Antifreeze | 14 Days | 3850 CF | 3900 CF | 4000 CF |
| Gasoline | 14 Days | 2550 CF | 2550 CF | 3150 CF |
| Diesel Fuel | 14 Days | 4000 CF | 3950 CF | 4050 CF |
| Toluene | 14 Days | 2650 CF | 2600 CF | 3400 CF |
| MEK | 14 Days | 50 CF | 75 CF | 2100 CF |
| Acetone | 14 Days | 75 CF | 50 CF | 900 CF |

CF = Cohesive Failure
MM = Mixed (Mode of AF and CF)
AF = Adhesive Failure

**Typical Rate of Strength Build-Up**

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

**Overlap Shear Strength (psi), tested @ 73°F (23°C) at various times after bonding.**

| Condition | DP-810 | DP-810 Black | DP-810 NS |
|---|---|---|---|
| 10 minutes | 50 | 30 | 500 |
| 20 minutes | 1500 | 1150 | 1750 |
| 1 hour | 2250 | 2200 | 2850 |
| 2 hours | 2750 | 2700 | 3350 |
| 4 hours | 2950 | 2900 | 3700 |
| 8 hours | 3350 | 3200 | 3850 |
| 24 hours | 3600 | 3550 | 4000 |

For footnotes, see Test Methods and Footnotes on Page 4.

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Test Methods and Footnotes**

1) Viscosity obtained by Brookfield, DV-II, #7 Spindle, 20 rpm at 75°F (24°C).

2) Overlap Shear Test Method: overlap shear test for adhesion determined in accordance to ASTM D1002-72, sample dimensions were 1" x 4" x 1/8", with a 1/2 square inch area of overlap, bonded to themselves unless otherwise noted, allowed to cure for at least 6 hours at 75°F (24°C) before testing. Data were collected using a Sintech 5GL Mechanical Tester with a 2000# or 5000# load cell. Test rate was 0.1"/minute. Strength determined at 75°F (24°C) unless otherwise noted.

3) Peel tests (ASTM D1876-61T) on FPL etched, 0.032" gauge aluminum, with a .017" bondline thickness. Jaw separation rate 20"/min. All bonds were allowed to cure for at least 6 hours at 75°F (24°C) before testing.

4) Environmental tests were conducted by immersing bonded coupons prepared in accordance to description in footnote 2.

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Handling/Curing Information**

**Directions for use:**

Apply adhesive to clean, dry substrates, which are free of paint, oxide films, oils, dust, mold release agents and all other surface contaminants. See the Surface Preparation section for specific substrate preparation method.

**50 ml cartridge:**

Place Duo-Pak cartridge in 3M™ EPX™ Applicator. Remove cap. Dispense and discard a small amount of adhesive to assure even ratio and free flow. Clear orifice if necessary. Attach mixing nozzle. Apply adhesive to clean surfaces, join parts, secure until adhesive sets [15 minutes @ 70°F (21°C)].

Adhesive will fully cure in 6 hours @ 70°F (21°C). Store unused adhesive at 40°F (4°C) or below.

**200/400 ml cartridge**

While holding Duo-Pak cartridge in an upright position, remove and discard the insert from the cartridge by unscrewing plastic nut and removing metal washer. Place cartridge in a 1:1 200/400 ml EPX applicator. Dispense and discard a small amount of adhesive to ensure even ratio and free flow. Attach mixing and nozzle and secure with plastic retaining nut. Apply adhesive to clean surfaces, join parts, secure until adhesive sets [15 minutes at 70°F (21°C)]. Adhesive will fully cure in 6 hours @ 70°F (21°C). Store unused adhesive at 40°F (4°C) or below.

**Bulk Container Directions:**

Follow manufacturer's directions for bulk dispensing equipment.

**Clean-up:**

Excess adhesive can be removed with solvent such as 3M™ Scotch-Grip™ Solvent No. 3 or equivalent. Edge tack on a finished part or bond line can be removed with isopropyl alcohol*.

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

**Heat Cure:**

Full cure can be attained by raising the bondline temperature to 150°F (66°C) for 10 minutes.

**Approximate Coverage – By Size of Container**

| Bead Size | Linear ft per 50 ml | Linear ft per 200 ml | Linear ft per 400 ml | Linear ft per mixed gallon |
|---|---|---|---|---|
| 1/2" | 2.5 | 10 | 21 | 196 |
| 3/8" | 4.5 | 18 | 37 | 350 |
| 1/4" | 10.5 | 41 | 83 | 785 |
| 1/8" | 41.5 | 165 | 331 | 3,130 |
| 1/16" | 165 | 656 | 1,313 | 12,420 |

| Square ft per 50 ml | Square ft per 200 ml | Square ft per 400 ml | Square ft per mixed gallon |
|---|---|---|---|
| 5.2 | 20.8 | 41.6 | 400 |

**Coverage in square feet – (.004" bond line)**

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Surface Preparation**

3M™ Scotch-Weld™ Low-Odor Acrylic Adhesives can bond oily metal, plastic and other substrates with very little surface preparation. However, for the most consistent results and environmental resistance, all substrates should be clean, dry and free of paint, oxide films, dust, mold release agents and all other surface contaminants. The amount of surface preparation directly depends on the bond strength and environmental resistance desired by the user.

The following cleaning methods are suggested for common surfaces.

**Steel and Aluminum**

1) Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.
2) Sandblast or abrade using clean fine grit abrasives (180 grit or finer).
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 1945 B/A is used, apply a thin coating (.0005") on the metal surfaces to be bonded, air dry at 75°F (24°C) for 1 hr, then cure for 30 minutes at 180°F (82°C), 5 minutes at 250°F (122°C) or 3 hours at 75°F (24°C).

**Note:** Aluminum may also be acid etched. Follow the manufacturer's precautions and directions for this procedure.

**Plastic/Rubber**

1) Wipe with isopropyl alcohol.*
2) Abrade using fine grit abrasives (180 grit or finer).
3) Remove residue by wiping again with isopropyl alcohol.*

**Glass**

1) Solvent wipe surface using acetone.*
2) Apply a thin coating (0.0001" or less) of 3M™ Scotch-Weld™ EC-3901 Primer to the glass surfaces to be bonded and allow the primer to dry a minimum of 30 minutes at 75°F (24°C) before bonding for maximum adhesion.
3) Remove residue by wiping again with isopropyl alcohol.*

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

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Storage and Shelf Life**

**Storage:** For maximum shelf life, store Duo-Pak cartridges and bulk containers at 40°F (4°C) or below. Store bulk containers at 40°F (4°C) or below.

**Shelf Life:** When stored at the recommended temperatures in the original unopened containers, this product has a shelf life of twelve months from date of manufacture.

# Scotch-Weld™
## Low-Odor Acrylic Adhesives
DP-810 • DP-810 Black • DP-810 NS

**Precautionary Information**

Refer to Product Label and Material Safety Data Sheet for Health and Safety Information before using the product.

**For Additional Information**

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550. Address correspondence to: 3M Engineered Adhesives Division, 3M Center, Building 220-8E-05, St. Paul, MN 55144-1000. Our fax number is 651-733-9175. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

**Important Notice**

3M MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of application. Please remember that many factors can affect the use and performance of a 3M Engineered Adhesives Division product in a particular application. The materials to be bonded with the product, the surface preparation of those materials, the product selected for use, the conditions in which the product is used, and the time and environmental conditions in which the product is expected to perform are among the many factors that can affect the use and performance of a 3M product. Given the variety of factors that can affect the use and performance of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

**Limitation of Remedies and Liability**

If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty, or strict liability.

This Engineered Adhesives Division product was manufactured under a 3M quality system registered to ISO 9002 standards.

**For Additional Product Safety and Health Information,** See Material Safety Data Sheet, or call:

3M

**Engineered Adhesives Division**
3M Center, Building 220-8E-05
St. Paul, MN 55144-1000
Phone: 1-800-364-3577 or 651/737-6501
www.3m.com/adhesives

*Recycled Paper*
*40% pre-consumer*
*10% post-consumer*

Printed in U.S.A.