



Scotch-Weld™

Low-Odor Acrylic Adhesives

DP810 • DP810 Black • DP810 NS

Technical Data

April, 2011

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 | | 3M™ Scotch-Weld™ Low-Odor Acrylic Adhesive | | |
|---|-------------------------------------|--|------------------------------------|-------------------------------------|
| | | DP810 | DP810 Black | DP810 NS |
| Color | Base (B) Accelerator (A) | Green White | Black White | Blue/Green White |
| Lbs./gal. | Base (B) Accelerator (A) | 8.7 - 9.1 8.7 - 9.1 | 8.7 - 9.1 8.7 - 9.1 | 8.7 - 9.1 8.7 - 9.1 |
| Viscosity (cps)⁽¹⁾ | Base (B) Accelerator (A) | 18,000 - 22,000 18,000 - 22,000 | 18,000 - 22,000 17,000 - 21,000 | 90,000 - 95,000 95,000 - 100,000 |
| Base Resin | Base (B) Accelerator (A) | Acrylic Acrylic | Acrylic Acrylic | Acrylic Acrylic |
| Mix Ratio | (Volume) (Weight) | 1:1 1:1 | 1:1 1:1 | 1:1 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.

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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)

| Substrate | 3M™ Scotch-Weld™ Low-Odor Acrylic Adhesive | | |
|------------------|--|------------------|------------------|
| | DP810 | DP810 Black | DP810 NS |
| | 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 | 3M Scotch-Weld Low-Odor Acrylic Adhesive | | |
|---------------|--|-------------|----------|
| | DP810 | DP810 Black | DP810 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 | 3M Scotch-Weld Low-Odor Acrylic Adhesive | | |
|-----------|--|-------------|----------|
| | DP810 | DP810 Black | DP810 NS |
| Etched Al | 30 | 20 | 23 |

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

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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 | 3M™ Scotch-Weld™ Low-Odor Acrylic Adhesive | | |
|----------------------|---------|--|-------------|----------|
| | | DP810 | DP810 Black | DP810 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 | 3M Scotch-Weld Low-Odor Acrylic Adhesive | | |
|------------|--|-------------|----------|
| | DP810 | DP810 Black | DP810 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 |

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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.

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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.

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.

Clean-up:

Excess adhesive can be removed with solvent such as MEK.* 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 120°F (49°C) for 30 minutes or to 150°F (66°C) for 10 minutes.

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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 (or see instructions pertinent to a specific primer).

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.*

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

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Storage For maximum shelf life, store Duo-Pak cartridges and bulk containers at 32°F (0°C) to 40°F (4°C). **Do not freeze.**

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 shipment from 3M.

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.

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.

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Printed in U.S.A.
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