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# Technical Data Sheet

3M™ Scotch-Weld™ Low Odor Acrylic Adhesive DP8705NS

English-US

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**Supersedes:** April, 2024

Product Details

Regulatory Info/SDS

## Product Description

3M™ Scotch-Weld™ DP8705 Adhesive is a low odor, non-flammable, two-part acrylic structural adhesives with a 10:1 mix ratio.

## Product Features

- Low-odor, non-flammable acrylic formulation
- Non-sag formulation resists running and slumping of adhesive
- Room temperature cure
- Contains spacer beads to control bond line thickness

## Technical Information Note

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

**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.

## Typical Uncured Physical Properties

| Attribute Name | Value |
|---|---|
| Color | Black [1] |
| Mix Ratio by Volume (B:A) | 10:1 |
| Mix Ratio by Weight (B:A) | 10:1 |

[1] Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.

| Attribute Name | Temperature | Value |
|---|---|---|
| Base Color | | Black |
| Accelerator Color | | Gray |
| Base Density | | 1 g/cm³ [1] |
| Accelerator Density | | 1.1 g/cm³ [1] |
| Base Viscosity | 22 °C (72 °F) | 15000 — 80000 cP [2] |
| Accelerator Viscosity | 22 °C (72 °F) | 5000 — 20000 cP [2] |

[1] Density measured using pycnometer.

[2] Viscosity measured using cone-and-plate viscometer; reported viscosity at 4 $sec^{-1}$ shear rate.

## Typical Mixed Physical Properties

| Attribute Name | Temperature | Value |
|---|---|---|
| Density (mixed) | | 1 g/cm³ |
| Viscosity | | 40,000 cP |
| Worklife | | 3 — 4 min [1] |
| Open Time | | 4 — 6 min [2] |
| Set Time (min) | 22 °C (72 °F) | 6 — 8 min [3] |
| Time to Structural Strength | | 8 — 12 min [4] |
| Time to Full Cure | 22 °C (72 °F) | 24 h |

[1] Maximum time that adhesive can remain in a static mixing nozzle and still be expelled without undue force on the applicator. Cure

times are approximate and depend on adhesive temperature.

[2] Max time allowed after applying adhesive to a substrate before bond must be closed and fixed. Cure times approximate and depend on adhesive temperature. Hotmelts: The approx. bonding range of a 1/8" bead of molten adhesive on a non-metallic surface.

[3] Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

[4] Minimum time required to achieve 1,000 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

## Typical Physical Properties

| Attribute Name | Value |
|---|---|
| Cured Color | Black |
| Mixed Color | Black |

## Typical Cured Characteristics

Temperature: 22 °C (72 °F)

| Attribute Name | Test Method | Value |
|---|---|---|
| Shore D Hardness | ASTM D2240 | 65 [1] |

[1] Tensile and Elongation. Samples were 51 mm (2") dumbbells with 3 mm (0.125") neck and 0.8 mm (0.03" sample thickness. Separation rate was 51 mm/min (2"/min)

## Typical Performance Characteristics

### Overlap Shear Strength

Temperature: 22 °C (72 °F)
Dwell Time: 24 h
Test Method: ASTM D1002, ISO 4587

| Test Condition | Substrate | Surface Prep | Value |
|---|---|---|---|
| 22°C | Aluminum | Etched | 2,404 lb/in² [1] |
| 22 °C | Cold Rolled Steel | Light Abrasion and Solvent Clean | 2,092 lb/in² [2] |
| 22 °C | ABS | Light Abrasion and Solvent Clean | 505 lb/in² [2] |
| 22 °C | Acrylic (PMMA) | Light Abrasion and Solvent Clean | 616 lb/in² [2] |
| 22 °C | Epoxy Resin (fiber-reinforced) | Light Abrasion and Solvent Clean | 1,701 lb/in² [3] |
| 22 °C | Polyester (PET) | Light Abrasion and Solvent Clean | 643 lb/in² [4] |
| 22 °C | Polycarbonate (PC) | Light Abrasion and Solvent Clean | 148 [4] |

[1] 1min open time, 1/2in overlap, 0.010in bond line thickness, separation rate 0.1 in/min metals, 2 in/min plastics, abraded and solvent wiped substrates, 1/16in metals, 1/8in plastics
Cohesive (CF), Adhesive (AF), and Substrate (SF) Failure

[2] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates,
Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber.
Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

[3] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates,
Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber.
Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

[4] 25 mm (1") wide, 12.5 mm (1/2") overlap samples, 25 mm (1") x 100 mm (4") substrates.
Separation rate 2.5 mm/min (0.1 in/min) metal, 5 mm/min (2 in/min) plastic, 51 mm/min (20 in/min) rubber.
Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

Substrate: Aluminum
Surface Prep: Etched
Temperature: 22 °C (72 °F)
Test Condition: 22 °C

| Attribute Name | Test Method | Value |
|---|---|---|
| Bell Peel | ASTM D3167 | 45 lb/in width [1] |

[1] Floating roller peel; adhesives allowed to cure for 24 hours a@RT; 25 mm (1") wide samples;
Samples pulled at 15 mm/min (6 in/min)
Cohesive (CF), Adesive (AF) and Substrate (SF) Failure

| Attribute Name | Value |
|---|---|
| Additional Test notes | 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.<br><br>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 Environmental Performance

### Overlap Shear Strength

Test Condition: 22°C
Dwell Time: 500 h
Test Method: ASTM D1002, ISO 4587

| Temperature | Environmental Condition | Substrate | Value |
|---|---|---|---|
| 22 °C (72 °F) | Diesel Fuel Submersion | Aluminum | 80 % [1] |
| 22 °C (72 °F) | Gasoline Submersion | Aluminum | 11 % [1] |
| 22 °C (72 °F) | Water Submersion | Aluminum | 62 % [1] |
| 22 °C (72 °F) | Salt water (5 wt% in water) | Aluminum | 64 % [1] |
| 85 °C (185 °F) | 85%RH | Aluminum | 70 % [1] |
| 49 °C (120 °F) | 80%RH | PVC | 100 % [1] |

[1] Performance % to control sample @RT. Samples were cured @RT for at least 24h prior to Environmental Exposure.<br>Overlap shear (OLS) strengths were measured on 1in wide 1/2in overlap specimens on 1in x 4in x .060in substrates.<br>Jaw separation 0.05 in/min. 10 mil bondline.

**Overlap Shear Strength**

Substrate: Aluminum
Dwell Time: 30 min
Test Method: ASTM D1002, ISO 4587

| Temperature | Test Condition | Value |
|---|---|---|
| -40 °C (-40 °F) | -40°C | 200 % (4795 lb/in²) [1] |
| 49 °C (120 °F) | 49°C | 60 % (1437 lb/in²) [1] |
| 82 °C (180 °F) | 82 °C | 32 % (767 lb/in²) [1] |
| 200 °C (392 °F) | 200°C | 4 % (98 lb/in²) [1] |
| 200 °C (392 °F) | 22°C | 90 % (2152 lb/in²) [1] |

[1] Performance % to control sample @RT. Samples were cured @RT for at least 24h prior to Environmental Exposure.<br>Overlap shear (OLS) strengths were measured on 1in wide 1/2in overlap specimens on 1in x 4in x .060in substrates.<br>Jaw separation 0.05 in/min. 10 mil bondline.

## Dispense Properties

| Attribute Name | Value |
|---|---|
| Cleaning Recommendation | Excess uncured adhesive can be cleaned with methyl ethyl ketone (MEK) |
| Fillers | Product contains ceramic particles from 0.002" to 0.010" |
| Mixing Nozzle Recommendation | Quadro Mixing Nozzle<br>Mix Elements: 16<br>Length (mm): 90<br>Volume (ml): 1.72<br>3M Stock #:7100202930 [1] |
| Mixing Nozzle Recommendation | Helical Mixing Nozzle<br>Mix Elements: 18<br>Length (mm): 221.9<br>Volume (ml): 12.96<br>3M Stock #: 7100015959 (Helical Low waste<br>Mixing Nozzle<br>Mix Elements: 24<br>Length (mm): 136.7<br>Volume (ml): 6.28<br>3M Stock #:7100066351 ) [2] |
| Packaging | 45ml & 490ml cartridges<br>5 gallon pails<br>55 gal drums |
| Thixotropic Index | 3.8 |

[1] 50ml Cartridge
[2] 400ml Cartridge

## Handling/Application Information

### 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.

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 and Shelf Life

Store under normal conditions of 16° to 27°C (60° to 80°F) in the original packaging, out of direct sunlight. Refrigeration at 40°F (4°C) will help extend shelf life. Do not freeze. Allow product to reach room temperature prior to use. For best performance, use duo-pak containers within 15 months from date of manufacture. Bulk shelf life may vary; please consult your local 3M contact.

## 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

## Automotive Disclaimer

**Select Automotive Applications:**
This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

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## ISO Statement

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