



# Technical Data Sheet

3M™ Scotch-Weld™ Acrylic Adhesive  
8507NS



Regulatory  
info/SDS

## Product Description

DP8507NS is a high-performance, two-part structural acrylic adhesive with excellent shear performance. It provides excellent shear strength on many plastics and metals, including good strength on metals with slightly oily surfaces. This special formulation allows the bonding of various metal substrates including cold-rolled steel, copper, brass, stainless steel and galvanized steel.

## Product Features

- Excellent shear strength on bare metals, plastics and other materials
- Toughened
- 10:1 mix ratio
- Contains ceramic particles to control bond line thickness

**Note:** Unless otherwise indicated, all properties are measured at 72°F (22°C).

## Technical Information Note

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

**PRELIMINARY TDS.** 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
Mix Ratio by Volume (B:A)	10:1
Mix Ratio by Weight (B:A)	10:1.13

Attribute Name	Temperature	Value
Base Colour		Off-White/Light Tan
Accelerator Colour		Grey
Base Density		0.96 g/cm <sup>3</sup> (8.0 lb/gal) <sup>1</sup>
Accelerator Density		1.09 g/cm <sup>3</sup> (9.1 lb/gal) <sup>1</sup>
Viscosity	23°C (73°F)	93,000 cP (93,000 mPa.s)
Accelerator Viscosity	23°C (73°F)	11,000 cP (11,000 mPa.s) <sup>2</sup>
Base Viscosity	23°C (73°F)	101,000 cP (101,000 mPa.s) <sup>2</sup>

<sup>1</sup> Density measured using pycnometer.

<sup>2</sup> Viscosity measured using cone-and-plate viscometer; reported viscosity at 3.8 sec<sup>-1</sup> shear rate.

## Typical Mixed Physical Properties

Attribute Name	Test Method	Temperature	Substrate	Value
Open Time				7 min <sup>1</sup>
Worklife	ASTM D1002, ISO 4587	23°C (73°F)	Etched Aluminum	7 min <sup>2</sup>
Time to Handling Strength		23°C (73°F)		15 min <sup>3</sup>

Attribute Name	Test Method	Temperature	Substrate	Value
Time to Structural Strength		23°C (73°F)		25 min <sup>4</sup>
Time to Full Cure				24 h

<sup>1</sup> 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 3.2 mm (1/8 in) bead of molten adhesive on a non-metallic surface.

<sup>2</sup> Maximum time that adhesive can remain in a static mixing nozzle and still be expelled and provide at least 80% of the maximum strength.

<sup>3</sup> Minimum time required to achieve 0.3 MPa (50 psi) of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

<sup>4</sup> Minimum time required to achieve 6.9 MPa (1,000 psi) of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

## Typical Performance Characteristics

### Overlap Shear Strength

Temperature: 23°C (73°F)

Dwell Time: 7 d

Test Method: ASTM D1002, ISO 4587

Substrate	Surface Prep	Value
ABS	IPA Wipe	8.3 MPa (1200 lb/in <sup>2</sup> ) <sup>1</sup>
Acrylic (PMMA)	IPA Wipe	7.8 MPa (1130 lb/in <sup>2</sup> ) <sup>1</sup>
Cold Rolled Steel	Solvent Wipe	19.4 MPa (2820 lbs./in. <sup>2</sup> ) <sup>2</sup>
FRP (Epoxy)	IPA Wipe/Abrade/IPA Wipe	21.7 MPa (3150 lb/in <sup>2</sup> ) <sup>1</sup>
FRP (Polyester)	IPA Wipe/Abrade/IPA Wipe	8.8 MPa (1270 lb/in <sup>2</sup> ) <sup>1</sup>
Polycarbonate (PC)	IPA Wipe	8.0 MPa (1160 lb/in <sup>2</sup> ) <sup>1</sup>
PVC	Solvent Wipe	11.7 MPa (1700 lbs./in. <sup>2</sup> ) <sup>2</sup>
Brass	Solvent Wipe	23.6 MPa (3430 lbs./in. <sup>2</sup> ) <sup>2</sup>
Copper	Solvent Wipe	13.2 MPa (1910 lbs./in. <sup>2</sup> ) <sup>2</sup>
Galvanized Steel	Solvent Wipe	14.8 MPa (2150 lbs./in. <sup>2</sup> ) <sup>2</sup>
HIPS	Solvent Wipe	2.6 MPa (380 lbs./in. <sup>2</sup> ) <sup>2</sup>
Stainless Steel	Solvent Wipe	22.8 MPa (3310 lbs./in. <sup>2</sup> ) <sup>2</sup>
Aluminum	MEK/Abrade/MEK	26.1 MPa (3790 lb/in <sup>2</sup> ) <sup>1</sup>

<sup>1</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.13–0.20 mm (5–8 mil) 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. Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3–1.6 mm (50–64 mil), rubber and plastic 3.2 mm (125 mil) Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

<sup>2</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.25 mm (10 mil) 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. Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3–1.6 mm (50–64 mil), rubber and plastic 3.2 mm (125 mil) Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

Substrate: Aluminum

Surface Prep: Light Abrasion and Solvent Clean

Temperature: 23°C (73°F)

Test Condition: 23°C

Attribute Name	Test Method	Value
Bell Peel	ASTM D3167	5.3 N/mm (30 lb/in width) <sup>1</sup>

<sup>1</sup> 25 mm (1) wide 13 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)

Attribute Name	Value
Additional Test notes	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.

## Typical Environmental Performance

### 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	13.2 MPa (1910 lb/ft²) (50% ) <sup>1</sup>
49°C (120°F)	49°C	16.3 MPa (2370 lb/in²) (63% ) <sup>1</sup>
82°C (180°F)	82°C	8.5 MPa (1230 lb/in²) (32% ) <sup>1</sup>
200°C (392°F)	200°C	0.4 MPa (60 lb/in²) (2% ) <sup>1</sup>

<sup>1</sup> 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

Surface Prep: MEK/Abrade/MEK

Temperature: 23°C (73°F)

Dwell Time: 7 d

Test Method: ASTM D1002, ISO 4587

Environmental Condition	Value
85°C + 85%RH: 500 hrs	13.7 MPa (1980 lb/in²) (52% ) <sup>1</sup>
Salt water (5% wt in water): 500 hrs	27.6 MPa (4010 lb/in²) (106% ) <sup>1</sup>
Diesel Fuel: 500 hrs	27.6 MPa (4000 lb/in²) (106% ) <sup>1</sup>
Gasoline: 500 hrs	22.2 MPa (3220 lb/in²) (85% ) <sup>1</sup>
Water: 500 hrs	26.5 MPa (3840 lb/in²) (101% ) <sup>1</sup>

<sup>1</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.25 mm (10 mil) 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. Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil) Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

### Overlap Shear Strength

Substrate: Cold Rolled Steel

Surface Prep: Solvent Wipe

Temperature: 23°C (73°F)

Dwell Time: 7 d

Test Method: ASTM D1002, ISO 4587

Environmental Condition	Value
85°C + 85%RH: 500 hrs	4.3 MPa (620 lb/in²) (22% ) <sup>1</sup>
Salt water (5% wt in water): 500 hrs	19.2 MPa (2780 lb/in²) (99% ) <sup>1</sup>
Diesel Fuel: 500 hrs	17.4 MPa (2520 lb/in²) (89% ) <sup>1</sup>
Gasoline: 500 hrs	18.2 MPa (2640 lb/in²) (94% ) <sup>1</sup>
Water: 500 hrs	18.9 MPa (2740 lb/in²) (97% ) <sup>1</sup>

<sup>1</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.25 mm (10 mil)  
 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. Substrate  
 thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil) Cohesive  
 Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

## **Dispense Properties**

Attribute Name	Value
45-50ml Cartridge Nozzle	Quadro (Orange), 16 element, 90mm, 1.7ml, #7100202930
490ml Cartridge Nozzle	Helical (Orange), 18 element, 222mm, 13.0ml, #7100304367

## **Handling/Application Information**

### **Directions for Use**

1. To obtain the highest strength structural bonds, paint, oxide films, oils, dust, mould 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.

#### **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 colour.

#### **Mixing 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 colour.

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. The adhesive and all materials should be at 60°F (16°C) or above to achieve highest bond strength.

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™ Metal Bonder Acrylic Adhesives are designed to be used on painted or coated metals, most plastics and some bare metals. 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.\*

**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:**

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 at 16° to 27°C (60° to 80°F) and 40 to 60% relative humidity in the original packaging, out of direct sunlight. Shelf life is 12 months from date of manufacture. Shelf life for bulk packaging is six months from date of manufacture.

## 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 an 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**

This product was manufactured under a 3M quality system registered to ISO 9001 standards.

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