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Technical Data Sheet

3M™ Scotch-Weld™ Acrylic Adhesive 8507NS

V-2 | English-US
Last Revision Date: October, 2025
Supersedes: September, 2025

Additional Info

Regulatory Info/SDS

Product Description

3M™ Scotch-Weld™ Acrylic Adhesive 8507NS is a high-performance, two-part structural acrylic adhesive. 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.

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 Color		Off-White / Light Tan
Accelerator Color		Gray
Color		Gray
Base Density		0.96 g/cm³ (8.0 lb/gal) [1]
Accelerator Density		1.09 g/cm³ (9.1 lb/gal) [1]
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) [2]
Base Viscosity	23 °C (73 °F)	101,000 cP (101,000 mPa.s) [2]

[1] Density measured using pycnometer.

[2] Viscosity measured using cone-and-plate viscometer; reported viscosity at 3.8 sec^{-1} shear rate.

Typical Mixed Physical Properties

Attribute Name	Test Method	Temperature	Substrate	Value
Open Time				7 min [1]
Worklife	ASTM D1002, ISO 4587	23 °C (73 °F)	Etched Aluminum	7 min [2]
Time to Handling Strength		23 °C (73 °F)		15 min [3]
Time to Structural Strength		23 °C (73 °F)		25 min [4]

Attribute Name	Test Method	Temperature	Substrate	Value
Time to Full Cure				24 h

[1] 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.

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

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

[4] 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 Cured Characteristics

Temperature: 23 °C (73 °F)
Dwell Time: 7 d

Attribute Name	Test Method	Value
Shore D Hardness	ASTM D2240	82

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/in²) [1]
Acrylic (PMMA)	IPA Wipe	7.8 MPa (1130 lb/in²) [1]
Brass	Solvent Wipe	23.6 MPa (3430 lb/in²) [2]
Copper	Solvent Wipe	13.2 MPa (1910 lb/in²) [2]
Cold Rolled Steel	Solvent Wipe	19.4 MPa (2820 lb/in²) [2]
FRP (Epoxy)	IPA Wipe/Abrade/IPA Wipe	21.7 MPa (3150 lb/in²) [1]
Galvanized Steel	Solvent Wipe	14.8 MPa (2150 lb/in²) [2]
HIPS	Solvent Wipe	2.6 MPa (380 lb/in²) [2]
Polycarbonate (PC)	IPA Wipe	8.0 MPa (1160 lb/in²) [1]
FRP (Polyester)	IPA Wipe/Abrade/IPA Wipe	8.8 MPa (1270 lb/in²) [1]
PVC	Solvent Wipe	11.7 MPa (1700 lb/in²) [2]
Stainless Steel	Solvent Wipe	22.8 MPa (3310 lb/in²) [2]
Aluminum	MEK/Abrade/MEK	26.1 MPa (3790 lb/in²) [1]

[1] 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)

[2] 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: Etched
Temperature: 23 °C (73 °F)
Test Condition: 23 °C

Attribute Name	Test Method	Dwell Time	Value
Bell Peel	ASTM D3167		6.8 N/mm (39 lb/in width) [1]
Overlap Shear Strength	ASTM D1002, ISO 4587	24 h	28.8 MPa (4170 lb/in²) [2]

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

Substrate: Aluminum
Surface Prep: MEK/Abrade/MEK
Test Condition: Pendulum Impact

Attribute Name	Test Method	Value
Impact Shear Strength	ASTM D950	12 J [1]

[1] 21.7J Hammer

Test Condition: 100 mm/min
Test Method: ASTM D638, ISO 527

Attribute Name	Temperature	Value
Elongation	23 °C (73 °F)	5.3% [1]
Modulus		1,119 MPa [1]

[1] Type IV dogbone

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%) [1]
49 °C (120 °F)	49 °C	16.3 MPa (2370 lb/in²) (63%) [1]
82 °C (180 °F)	82 °C	8.5 MPa (1230 lb/in²) (32%) [1]
200 °C (392 °F)	200 °C	0.4 MPa (60 lb/in²) (2%) [1]

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

Overlap Shear Strength

Substrate: Aluminum
Temperature: 23 °C (73 °F)
Dwell Time: 7 d
Test Method: ASTM D1002, ISO 4587

Environmental Condition	Test Condition	Surface Prep	Value
200°C / 30 minutes	23 °C	MEK/Abrade/MEK	26.8 MPa (3880 lb/in²) (102%) [1]
85 °C + 85 %RH: 500 hrs		MEK / Abrade / MEK	12.2 MPa (1770 lb/in²) (47%) [2]
Diesel Fuel: 500 hrs		MEK / Abrade / MEK	25.5 MPa (3700 lb/in²) (98%) [2]
Gasoline: 500 hrs		MEK / Abrade / MEK	25.9 MPa (3750 lb/in²) (99%) [2]
Salt water (5% wt in water): 500 hrs		MEK / Abrade / MEK	27.6 MPa (4010 lb/in²) (106%) [2]
Water: 500 hrs		MEK / Abrade / MEK	26.5 MPa (3840 lb/in²) (101%) [2]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.76-0.13 mm (3-5 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)

[2] 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
65 °C + 85 %RH: 500 hrs	11.9 MPa (1720 lb/in²) (61%) [1]
85 °C + 85 %RH: 500 hrs	3.2 MPa (460 lb/in²) (16%) [2]
Diesel Fuel: 500 hrs	18.1 MPa (2620 lb/in²) (93%) [2]
Gasoline: 500 hrs	18.3 MPa (2650 lb/in²) (94%) [2]
Salt water (5% wt in water): 500 hrs	19.2 MPa (2780 lb/in²) (99%) [2]
Water: 500 hrs	18.9 MPa (2740 lb/in²) (97%) [2]

[1] 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)
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[2] 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: PVC
Surface Prep: IPA Wipe
Temperature: 23 °C (73 °F)
Test Condition: 23 °C
Dwell Time: 7 d
Environmental Condition: 49 °C + 80 %RH: 500 hrs

Attribute Name	Test Method	Value
Overlap Shear Strength	ASTM D1002, ISO 4587	11.9 MPa (1730 lb/in²) (109%) [1]

[1] 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.76-0.13 mm (3-5 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)

Electrical and Thermal Properties

Attribute Name	Value
Glass Transition Temperature (Tg)	98 °C (209 °F) [1]

[1] Measured at one week via DMA

Coefficient of Thermal Expansion

Test Condition	Value
Below Tg	107.4 µm/(m° C) [1]
Above Tg	266.7 µm/(m° C) [1]

[1] CTE determined using TMA Analyzer using a heating rate of 3 °C per minute. Second heat values given.

Temperature: 23 °C (73 °F)
Test Condition: 500 V, 60 s

Attribute Name	Test Method	Value
Surface Resistivity	ASTM D257	9.39E-03 m²K/W

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, 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.
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 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. 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 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. Use duo-pak containers within 12 months from the 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

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

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