Technical Data Sheet

3M™ Scotch-Weld™ Toughened Epoxy Adhesive LSB360NS Green

Product Description

3M™ Scotch-Weld™ Toughened Epoxy Adhesive LSB360NS Green is a two-part, 1:1 mix ratio, toughened epoxy structural adhesives which exhibits a 10 hour work life. It exhibits excellent shear and peel strengths along with good impact, durability and bonds extremely well to many surfaces including slightly oily metal and SMC. It is formulated to be non-sagging on vertical surfaces.

Product Features

- Excellent shear and peel strengths
- Easy mixing
- 10 hour work life
- Color Indication of Mixing
- Non-Sag
- 1:1 mix ratio

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

Property	Values	Additional Information
Color	Bright Green	View
Notes: Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.		
Base Color	Yellow	
Accelerator Color	Blue	
Base Viscosity	>274 Pa-s	View
Temp C: 23C Temp F: 72F Notes: Cone and Plate; 57 RPM		
Accelerator Viscosity	>103 Pa-s	View
Temp C: 23C Temp F: 72F Notes: Cone and Plate; 57 RPM		

Base Net Weight	9.9 lb/gal
Accelerator Net Weight	10 lb/gal
Mix Ratio by Volume (B:A)	1:1
Mix Ratio by Weight (B:A)	1:1

Typical Mixed Physical Properties

Property	Values	Additional Information
Open Time (min)	600 min	View

Notes: 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.

Applied Open Time	~10 hr	View

Temp C: 23C
Temp F: 72F

Notes: Approximate time after application of adhesive that bonds can be made without adversely affecting wetting out of adhesive and ultimate performance levels.

Applied Open Time	>70 min	View

Temp C: 49C
Temp F: 120F

Notes: Approximate time after application of adhesive that bonds can be made without adversely affecting wetting out of adhesive and ultimate performance levels.

Worklife	~10 hr	View

Temp C: 23C
Temp F: 73F

Notes: 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.

Time to Handling Strength	16 hr	View

Temp C: 23C
Temp F: 73F

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

Time to Full Cure	7 day	View

Temp C: 23C
Temp F: 73F

Typical Physical Properties

Property	Values	Additional Information
Color	Green	View
Test Name: Cured		

Typical Performance Characteristics

Property	Values	Additional Information
90° Peel Adhesion Cushioned Sleeve A	3110 N/cm	View
Test Method: ASTM D3330 (modified) Test Name: 90° Peel Adhesion Substrate: Cushioned Sleeve A Failure Mode: CF		
Bell Peel	8 lb/in width	View
Test Method: ASTM D3167 Temp C: -55C Temp F: -67F Substrate: Etched Aluminum Failure Mode: CF Notes: Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. AF: adhesive failure CF: cohesive failure SF: substrate failure		
Bell Peel	31 lb/in width	View
Test Method: ASTM D3167 Temp C: 23C Temp F: 72F Substrate: Etched Aluminum Failure Mode: CF Notes: Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. AF: adhesive failure CF: cohesive failure SF: substrate failure		
Bell Peel	12 lb/in width	View
Test Method: ASTM D3167 Dwell/Cure Time: 4.0 Dwell Time Units: hr Temp C: 82C Temp F: 180F Substrate: Etched Aluminum Failure Mode: CF Notes: Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. AF: adhesive failure CF: cohesive failure SF: substrate failure		
Overlap Shear Strength 7day Aluminum	3525 lb/in²	View
Test Method: ASTM D1002 Test Name: Overlap Shear Strength Dwell/Cure Time: 7.0 Dwell Time Units: day Temp C: 23C Temp F: 73F Environmental Condition: 50%RH Substrate: Aluminum Surface Preparation: MEK/Abrade/MEK Failure Mode: CF		

Notes: 1in wide 1/2in overlap specimens. 2 panels of 0.05-0.064in x 4in x 7in 2024T-3 clad aluminum bonded and cut to 1in wide samples after 24hr. Jaw separation 0.1 in/min, 0.005-0.008in bondline. Cohesive (CF), Adhesive (AF), and Substrate (SF) Failure

Overlap Shear Strength 7day Cold Rolled Steel	2730 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Environmental Condition: 50%RH
Substrate: Cold Rolled Steel
Surface Preparation: MEK/Abrade/MEK
Failure Mode: CF

Notes: Overlap shear (OLS) strengths were measured on 1in wide 1/2in overlap specimens on 1in x 4in x .060in substrates. Jaw separation 0.1 in/min. 0.005-0.008in bondline. Cohesive (CF), Adhesive(AF), and Substrate(SF) Failure

Overlap Shear Strength 7day Fiber-Reinforced Plastic	3000 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Environmental Condition: 50%RH
Substrate: Fiber-Reinforced Plastic
Surface Preparation: IPA Wipe/Abrade/IPA Wipe
Failure Mode: CF

Notes: Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. 1" x 4" x 0.125" substrate Jaw separation 2 in/min; 0.005-0.008in bondline. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

Overlap Shear Strength 7day Galvanized Steel	3210 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Environmental Condition: 50%RH
Substrate: Galvanized Steel
Surface Preparation: MEK/Abrade/MEK
Failure Mode: CF

Notes: 0.5in overlap, 0.1 in/min for metals and 2 in/min for plastics, substrates lightly abraded and solvent wiped, substrates used were 1/16in thick, 0.010in bondline Substrate (SF), Adhesive (AF), Cohesive (CF), and Mixed (MF) Failure modes

Overlap Shear Strength 7day FRP (Epoxy)	3000 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Substrate: FRP (Epoxy)
Surface Preparation: IPA Wipe/Abrade/IPA Wipe
Failure Mode: CF

Notes: Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. 1" x 4" x 0.125" substrates 0.005in bondline Jaw separation 2in/min Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

Overlap Shear Strength 7day SMC (raw side)	1280 lb/in²	View

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 73F
Substrate: SMC
Surface Preparation: IPA Wipe/Abrade/IPA Wipe
Failure Mode: SF

Notes: Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. 1" x 4" x 0.125" substrates 0.005in bondline Jaw separation 2in/min Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

Storage and Shelf Life

Store products at 60-80°F (15-27°C) for maximum shelf life.
These products have a shelf life of 18 months from date of manufacture.

Automotive Disclaimer

Automotive Applications: This product is an industrial product and has not been designed or tested for use in certain automotive applications, including, but not limited to, automotive electric powertrain battery or high voltage applications. This product does not fully adhere to typical automotive design or quality system requirements, such as IATF 16949 or VDA 6.3. This product may not be manufactured in an IATF certified facility and may not meet a Ppk of 1.33 for all properties. The product may not undergo an automotive production part approval process (PPAP). Customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's automotive application and for conducting incoming inspections before use of the product. Failure to do so may result in injury, death, and/or harm to property. No written or verbal statement, report, data or recommendation by 3M related to automotive use of the product shall have any force or effect unless in an agreement signed by the Technical Director of 3M's Automotive Division. Customer assumes all responsibility and risk if customer chooses to use this product in an automotive electric powertrain battery or high voltage application, and 3M will not be liable for any loss or damage arising from or related to the 3M product or customer's use of the product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity or recall costs), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability. In no event shall 3M be liable for any damages in excess of the purchase price paid for the product.
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For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit www.3M.com/structuraladhesives. Address correspondence to 3M Industrial Adhesives and Tapes Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244.

Bottom Matter

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Trademarks

Handling/Application Information

Directions for Use

1. For 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, environmental aging resistance desired by user. For suggested surface preparations on common substrates, see the section on surface preparation.

2. Mix thoroughly by weight or volume in the proportions specified on the product label or in the typical uncured properties section. Mix approximately 15 seconds after a uniform color is obtained.

3. For maximum bond strength, apply adhesive evenly to both surfaces to be joined.

4. Application to the substrates should be made within 15-20 minutes. Larger quantities and/or higher temperatures will reduce this working time.

5. Join the adhesive coated surfaces and allow to cure at 60oF (16oC) or above until completely firm. Heat up to 120oF - 150oF (49oC - 66oC) will speed curing.

6. Keep parts from moving during cure. Apply contact pressure if necessary. Maximum shear strength is obtained with a 3-5 mil bond line.

7. 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™ Toughened Epoxy Adhesives LSB360NS is designed to be used on plastic or metal surfaces. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must me completely removed. The amount of surface preparation depends on the required bond strength, environmental aging resistance desired by the user. The following cleaning methods are suggested for common surfaces:

Steel:

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents*.

2. Sandblast or abrade using clean fine grit abrasives.

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.

Aluminum:

1. Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol solvents*.

2. Sandblast or abrade using clean fine grit abrasives

3. Wipe again with oil-free solvent such as acetone or isopropyl alcohol solvents*

Plastics/Rubber:

1. Wipe with isopropyl alcohol*.

2. Abrade using fine grit abrasives.

3. Wipe with isopropyl alcohol*

Glass:

1. Solvent wipe surface using acetone or MEK*.

2. Apply a thin coating (0.0001 in. or less) of 3M™ Scotch-Weld™ Metal Primer EC3901 to the glass surfaces to be bonded and allow the primer to dry before bonding.

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

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b40066539/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=LSB360NS Green

Family Group

Link Tags:

LSB360NS Green

Products	Open Time (min)	Applied Open Time	Color	Worklife	Time to Handling Strength
LSB360NS Green	600 min	>70 min	Green	~10 hr	16 hr

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

Information

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