

February, 2019

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6330NS

Product Description

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS is a multi-purpose urethane adhesive for bonding a variety of composites, plastics, metals and wood. It is a high-strength bonder with some flexibility to accommodate thermal expansion and contraction differences with dissimilar material bonding.

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS can replace rivets and screws in attaching composites to other substrates, providing a more aesthetically-pleasing, fatigue-resistant bond line. It also bonds well to most metals without requiring priming.

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

Product Features

- Ability to bond most composites and dissimilar substrates
- Primerless to most surfaces
- Non-sag formulation resists running and slumping of adhesive
- 3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS meets the following OEM strength requirements:
 - Freightliner; Standard No. 49-00093 Revision C
 - PACCAR; Specification No. CMT0038
- Excellent water and humidity resistance, very good chemical resistance.
- Solvent-free adhesive system
- Convenient hand-held applicator
- Room temperature cure
- Cure can be accelerated with heat
- Available in bulk

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.



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	Test Condition	Notes
Base Color	Green		
Accelerator Color	Off-White		
Base Density	10 to 11 lb/gal		
Accelerator Density	10.5 to 11.5 lb/gal		
Viscosity	Non-sag paste		
Base Viscosity	15,000-27,000 cP	80°F(27°C)	Viscosity measured using Brookfield RTV, spindle #7, 20 RPM
Accelerator Viscosity	12,000-20,000 cP	80°F(27°C)	Viscosity measured using Brookfield RTV, spindle #7, 20 RPM
Mix Ratio by Volume (B:A)	1:1		
Mix Ratio by Weight (B:A)	1:1.09		

Typical Mixed Physical Properties

Property	Values	Test Condition	Notes
Worklife	15 min	(Nozzle Mixed) @ Room Temperature	Maximum time that adhesive can remain in a static mixing nozzle and still be expelled without undue force on the applicator.
Open Time	30 min		Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place. Cure times are approximate and depend on adhesive temperature. For hotmelts: The approximate bonding range of a 1/8" bead of molten adhesive on a non-metallic surface.

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Typical Mixed Physical Properties (continued)

Property	Values	Test Condition	Notes
Time to Handling Strength	2 h	Room Temperature	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Typical Cured Characteristics

Property	Values	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Method
Modulus	142000 lb/in ²	2 months @ Room Temperature				
Stress at Break	2900 lb/in ²	2 months @ Room Temperature				
Elongation at Break	7 %	2	Month	23C	72F	
Shore D Hardness	77	60 min @ Room Temperature				ASTM D2240

Typical Performance Characteristics

Bell Peel: 20 lb/in width

Conditions

Dwell/Cure Time: 24 hours at Room Temperature
 Substrate: Etched Aluminum

Methods

ASTM D3167

Additional Information

Notes: 1" wide samples; 0.017" bond line thickness. The testing jaw separation rate was 6 in. per minute. The bonds are made with 0.064 in. bonded to 0.025 in. thick adherends.

Overlap Shear Strength	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Environmental Condition	Substrate	Substrate Notes	Surface Preparation	Failure Mode	Notes
3300 lb/in ²	7	days	23C	73F	50%RH	Aluminum	0.005-0.008in bondline	MEK/Abrasive	CF/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Environmental Condition	Substrate	Substrate Notes	Surface Preparation	Failure Mode	Notes
2100 lb/in ²	7	days	23C	73F	50%RH	Cold Rolled Steel	0.005-0.008in bondline	MEK/Abrade	AF/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
3000 lb/in ²	7	days	23C	73F	50%RH	Stainless Steel	0.005-0.008in bondline	MEK/Abrade	AF/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
1000 lb/in ²	7	days	23C	73F	50%RH	Fiber-Reinforced Plastic	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	SF	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)
1700 lb/in ²	7	days	23C	73F	50%RH	Galvanized Steel		MEK/Abrade	AF/MEK	½" overlap; 0.010" bond line thickness; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; substrates used were 1/16" thick metals and 1/8" thick plastics. AF: adhesive failure CF: cohesive failure SF: substrate failure mixed: AF/CF
3000 lb/in ²	7	days	23C	73F	50%RH	Glass Filled Epoxy LW	0.005-0.008in bondline	IPA Wipe/Abrade/IPA Wipe	SF	½" overlap; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1/16" thick aluminum and 1/8" thick plastics; composites varied. SF: Substrate Failure AF: Adhesive Failure CF: Cohesive Failure MF: Mixed failure modes

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Typical Performance Characteristics (continued)

Overlap Shear Strength	Dwell/Cure Time	Dwell Time Units	Temp C	Temp F	Environmental Condition	Substrate	Substrate Notes	Surface Preparation	Failure Mode	Notes
1200 lb/in ²	7 days at Room Temperature	days				Glass Filled Polyester	0.005in bondline thickness	IPA Wipe/Abrade/Wipe	SF/Adhesive/CF	½" overlap; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1/16" thick aluminum and 1/8" thick plastics; composites varied. SF: Substrate Failure AF: Adhesive Failure CF: Cohesive Failure MF: Mixed failure modes
1100 lb/in ²	7	days	23C	73F	50%RH	Polycarbonate (PC)	0.005in bondline thickness	MEK/Abrade/Wipe	SF/MEK	½" overlap; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1/16" thick aluminum and 1/8" thick plastics; composites varied. SF: Substrate Failure AF: Adhesive Failure CF: Cohesive Failure MF: Mixed failure modes
650 lb/in ²	7	days	23C	73F	50%RH	ABS	0.005-0.008in bondline	MEK/Abrade/Wipe	SF/MEK	Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in. Cohesive Failure (CF), Adhesive Failure (AF), Substrate Failure (SF)

Property: Overlap Shear Strength
Method: ASTM D1002

Electrical and Thermal Properties

Glass Transition Temperature (Tg): 55 °C

Additional Information

Notes: Measured at six weeks via DMA

Typical Physical Properties

Full Strength: 168 h

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6330NS

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 200°F (93°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

3MTM Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS is designed to be used on composites, metal, wood, and most plastic surfaces. The following cleaning methods are suggested for common surfaces:

Steel:

1. Wipe free of dust and dirt with pure solvent such as acetone or isopropyl alcohol.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with clean solvent to remove loose particles.*
4. For best results, apply a primer to bare steel before bonding, such as an epoxy-based primer or 3M™ Adhesion Promoter 111.

Aluminum:

1. Wipe free of dust and dirt with pure solvent such as acetone or isopropyl alcohol.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with clean solvent to remove loose particles.*

Plastics/Rubbers/Paints/Coatings:

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 of a silane adhesion promoter to the glass surfaces to be bonded and allow to dry completely before bonding.

*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 product at 73°F (21°C). Do not freeze. Allow product to reach room temperature prior to use.

3MTM Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS have a shelf life of 12 months from date of manufacture in unopened, original containers kept at recommended storage conditions.

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6330NS

Industry Specifications

Freightliner; Standard No. 49-00093 Revision C
PACCAR; Specification No. CMT0038
EN 45545 test report details (ISO 5659-2, ISO 9239-1, ISO 5660-1, ISO 5658-2)

Trademarks

3M, Scotch-Weld and EPX are trademarks of 3M Company.

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Scotch-Weld-Multi-Material-Composite-Urethane-Adhesive-DP6330NS?N=5002385+3291654795&rt=rud
Safety Data Sheet (SDS)	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP6330NS

Family Group

	DP6310NS	DP6330NS
Worklife (min) Test Condition: (Nozzle Mixed) @ Room Temperature	9	15
Time to Handling Strength (h) Test Condition: Room Temperature	0.75	2
Open Time (min)	10	30

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.

Information

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