Scotch-Weld™
Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS

Technical Data Sheet **October 2018**

Product Description

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS are multi-purpose urethane adhesives for bonding a variety of composites, plastics, metals and wood. They are high-strength bonders with some flexibility to accommodate thermal expansion and contraction differences with dissimilar material bonding

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS can replace rivets and screws in attaching composites to other substrates, providing a more aesthetically-pleasing, fatigue-resistant bond line. They also bond well to most metals without requiring priming.

Note: The following data are taken from tests conducted on a limited number of production runs. 3M will continue to test samples from additional manufacturing lots and issue a new technical data sheet if the results change.

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

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.

3M Scotch-Weld™

Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS

Typical Uncured Properties

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

Property		3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Color	Base (B)	Green	Green
	Accelerator (A)	Off-White	Off-White
Viscosity[1]	Base (B)	15,000-35,000 cP	15,000-27,000 cP
	Accelerator (A)	12,000-20,000 cP	12,000-20,000 cP
Density (lbs/gal)	Base (B)	10-11	10-11
	Accelerator (A)	10.5-11.5	10.5-11.5
Mix ratio	By volume	1 : 1	1 : 1
	By weight	1:1.09	1:1.09
Open time[2]		10 minutes	30 minutes
Time to handling strength[3]		45 minutes	2 hours

1. Viscosity measured using Brookfield RTV, spindle #7, 20 RPM @ 80°F (27°C)
2. Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place.
3. Minimum time required to achieve 50 psi of overlap shear strength.

Typical Mixed Physical Properties

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

Property	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Full strength cure time	24 hours at 72°F (22°C)	7 days at 72°F (22°C)
Mixed Viscosity	Non-sag paste	Non-sag paste
Modulus[1]	86,000 PSI	142,000 PSI
Elongation at Break[1]	12%	7%
Stress at Break[1]	2700 PSI	2900 PSI
Glass Transition temperature	60°C[2] (RT Cure)	TBD

[1] Stress/Strain properties for DP6330NS measured after 2 months room temp cure.
[2]Measured via double cantilever DMA; 15 Hz

Typical Cured Physical Properties

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

Overlap Shear (psi)[7]

Substrate	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Carbon Fiber Epoxy (IPA/abrade/IPA)	3200 CF	3360 SF
SMC (IPA/abrade/IPA)	900 SF	1000 SF
Glass Filled Epoxy LW (IPA/abrade/IPA)	2400 CF	3000 SF
Glass Filled Polyester (IPA/abrade/IPA)	1000 SF	1200 SF
Kalix ™ 9950 (glass fiber nylon composite) (IPA wipe)	TBD	TBD
Phenolic/Cotton Fiber Composite (IPA/abrade/IPA)	1200 SF	1200 SF
Aluminum (MEK/abrade/MEK)	2600 CF	3300 CF
Cold-rolled steel (MEK/abrade/MEK)	1900 AF	2100 AF
Stainless Steel (MEK/abrade/MEK)	3000 CF	3000 CF
Galvanized steel (MEK/abrade/MEK)	1200 AF	1700 AF
PC (IPA wipe)	710 AF	1100 SF
ABS (IPA wipe)	230 AF	650 AF

SF: Substrate Failure
AF: Adhesive Failure
CF: Cohesive Failure
MF: Mixed failure modes

Overlap Shear (psi); Etched Aluminum, at Temperature [7]

Temperature	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
-40°F (-40°C)	3500	3600
73°F (23°C)	3600	3600
120°F (49°C)	1700	1700
180°F (82°C)	900	1000

7. Overlap shear values measured using ASTM D1002; adhesives allowed to cure for 7 days at room temperature; ½" overlap; 0.005" bond line thickness; 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.

Typical Cured Physical Properties

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

Environmental Resistance[8], Percent Retention of Strength, 30 day exposure except as noted

Condition	Substrate	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Control	SMC	100%	100%
65°C/80% RH		75%	80%
Salt Spray (14 days)		65%	90%
Gasoline		85%	90%
Antifreeze		TBD	100%

8. Values indicate overlap shear test performance retained after 1,000 hours of continuous exposure relative to a control sample left at room temperature; samples conditioned for 7 days at room temperature and 50% relative humidity prior to tests.

Floating Roller Peel (lb/inch width)[9], etched Aluminum

Substrate	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Etched Aluminum	20 lbs/inch width	20 lbs/inch width

[9] Floating roller peel values measured using ASTM D3167; allowed to cure for 24 hours at room temperature; 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.

AF: adhesive failure CF: cohesive failure SF: substrate failure

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

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6310NS and DP6330NS are 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.**

3M Scotch-Weld™
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DP6310NS and DP6330NS

Storage	Store product at 73°F (21°C). Do not freeze. Allow product to reach room temperature prior to use.
Shelf Life	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.
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.
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/compositebonding. 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. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.
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Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550 • 877-369-2923 (Fax)
www.3M.com/compositebonding