



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

## Preliminary Product Data Sheet

Date: May 2017  
Supersedes: NEW

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### 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 and metals. 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.

**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 22°C

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### Key Features

- Ability to bond most composites and dissimilar substrates
- Primerless to most surfaces
- Non-sag formulation resists running and slumping of adhesive
- EPX 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.

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## Physical Properties

Property	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Colour Base (B) Accelerator (A)	Green Off-White	Green Off-White
Viscosity <sup>1</sup> Base (B) Accelerator (A)	15,000-35,000 cP 12,000-20,000 cP	15,000-27,000 cP 12,000-20,000 cP
Density Base (B) Accelerator (A)	1.1 1.15	1.1 1.15
Mix ratio By volume By weight	1:1 1:1.09	1:1 1:1.09
Open time <sup>2</sup>	10 minutes	30 minutes
Time to handling strength <sup>3</sup>	45 minutes	2 hours

<sup>1</sup>Viscosity measured using Brookfield RTV, spindle #7, 20 RPM @ 27°C

<sup>2</sup>Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place.

<sup>3</sup>Minimum time required to achieve 0.35 MPa of overlap shear strength.

## Typical Mixed Physical Properties

Property	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
Full strength cure time at 22 °C	24 hours	7 days
Mixed Viscosity	Non-sag paste	Non-sag paste
Modulus <sup>1</sup>	0.59 GPa	0.98 GPa
Elongation at Break <sup>1</sup>	12 %	7 %
Stress at Break (after 2 months' room temp cure)	18.6 MPa	20.0 MPa
Glass Transition temperature	TBD	TBD

**Typical Cured  
Physical Properties**

<b>Substrate</b>	<b>3M™ Scotch-Weld™ Multi-Material &amp; Composite Urethane Adhesive DP6310NS</b>	<b>3M™ Scotch-Weld™ Multi-Material &amp; Composite Urethane Adhesive DP6330NS</b>
Carbon Fiber Epoxy (IPA/abrade/IPA)	22.1 CF	23.2 SF
SMC (IPA/abrade/IPA)	6.2 SF	6.9 SF
Glass Filled Epoxy LW (IPA/abrade/IPA)	16.6 CF	20.7 SF
Glass Filled Polyester (IPA/abrade/IPA)	6.9 SF	8.3 SF
Kalix™ 9950 (glass fiber nylon composite) (IPA wipe)	TBD	TBD
Phenolic/Cotton Fiber Composite (IPA/abrade/IPA)	8.3 SF	8.3 SF
Aluminum (MEK/abrade/MEK)	17.9 CF	22.8 CF
Cold-rolled Steel (MEK/abrade/MEK)	13.1 AF	14.5 AF
Stainless Steel (MEK/abrade/MEK)	20.7 CF	20.7 CF
Galvanized steel (MEK/abrade/MEK)	8.3 AF	11.7 AF
PC (IPA wipe)	4.9 AF	7.9 SF
ABS (IPA wipe)	1.6 AF	4.5 AF

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

**Typical Cured  
Physical Properties**

**Overlap Shear (MPa); Etched Aluminum, at Temperature <sup>4</sup>**

<b>Temperature</b>	<b>3M™ Scotch-Weld™ Multi-Material &amp; Composite Urethane Adhesive DP6310NS</b>	<b>3M™ Scotch-Weld™ Multi-Material &amp; Composite Urethane Adhesive DP6330NS</b>
-40 °C	24.1	24.8
23 °C	24.8	24.8
49 °C	11.7	11.7
82 °C	6.2	6.9

<sup>4</sup>Overlap shear values measured using ASTM D1002; adhesives allowed to cure for 7 days at room temperature; 13 mm overlap; 0.127 mm bond line thickness; samples pulled at 2.54 mm/min for metals and 50 mm/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1.6 mm thick aluminum and 3 mm thick plastics; composites varied.

**Environmental Resistance<sup>5</sup>, Percent Retention of Strength, 30-day exposure except as noted**

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

<sup>5</sup> 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 (N/mm)<sup>6</sup>, etched Aluminum**

Temperature	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS	3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6330NS
-40 °C	24.1	24.8
23 °C	24.8	24.8
49 °C	11.7	11.7
82 °C	6.2	6.9

<sup>6</sup> Floating roller peel values measured using ASTM D3167; allowed to cure for 24 hours at room temperature; 25 mm wide samples; 0.43 mm bond line thickness. The testing jaw separation rate was 150 mm. per minute. The bonds are made with 1.6 mm. bonded to 0.635 mm thick adherents.

AF: adhesive failure

CF: cohesive failure

SF: substrate failure

**Directions For Use**

- 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.
- 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.

### **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 16 °C or above until completely firm. Applying heat up to 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 0.127 to 0.508 mm; 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**

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### **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.

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**Storage & Shelf Life**

Store product at 21 °C or below. Do not freeze. Allow product to reach room temperature prior to use.

The product can be stored up to 12 months after production in unopened, original containers kept at recommended storage conditions.

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**Precautionary Information**

Refer to product label and Material Safety Data Sheet for health and safety information before using the product.

For information please contact your local 3M Office.

[www.3M.com](http://www.3M.com)

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**For Additional Information**

To request additional product information or to arrange for sales assistance, call.....

Address correspondence to: 3M

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**Important Notice**

All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method or application. All questions of liability relating to this product are governed by the terms of the sale subject, where applicable, to the prevailing law

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Values presented have been determined by standard test methods and are average values not to be used for specification purposes. Our recommendations on the use of our products are based on tests believed to be reliable but we would ask that you conduct your own tests to determine their suitability for your applications. This is because 3M cannot accept any responsibility or liability direct or consequential for loss or damage caused as a result of our recommendations

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