



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

Preliminary Product Data Sheet

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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

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.

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 ¹ 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 ²	10 minutes	30 minutes
Time to handling strength ³	45 minutes	2 hours

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

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

³Minimum 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 ¹	0.59 GPa	0.98 GPa
Elongation at Break ¹	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

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)	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 ⁴

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

⁴Overlap 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 ⁵, 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%

⁵ 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) ⁶, 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

⁶ 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**

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.

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.

Precautionary Information

Refer to product and Material Safety Data Sheet for health and safety information before using the product. For information please see below for contact details.

For Additional Information

To request additional product information or to arrange for sales assistance, please see below for contact details.

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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**3M Svenska AB
Industri**

Bollstanäsvägen 3
191 89 Sollentuna
Tel: 08-92 21 00
Fax: 08-92 22 88
E-post:
kundservice@mmm.com
www.3M.se/lim

**3M a/s
Industri**

Hannemanns Allé 53
2300 København S
Tlf.: 43 48 01 00
Fax.: 43 20 15 65
E-mail:
dkindustri@mmm.com
www.3Mindustri.dk

**3M Norge AS
Avd. Industri**

Hvamveien 6
2013 Skjetten
Tel: 0 63 84
Fax: 63 84 17 88
E-post:
Kundeservice@mmm.com
www.3M.no/lim

**Suomen 3M Oy
Teollisuustuotteet**

PL 600
Keilaranta 6
02151 Espoo
Puh: 09-525 21
Fax: 09-525 2279
www.3M.fi/teollisuus