



# Technical Data Sheet

## 3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesives DP6310NS



Additional Info

### Product Description

3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS 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 DP6310NS 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
  - 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

Attribute Name	Value
Mix Ratio by Weight (B:A)	1:1.09
Mix Ratio by Volume (B:A)	1:1
Viscosity	Non-sag paste

Attribute Name	Temperature	Value
Base Color		Green
Accelerator Color		Off-White
Base Density		1.2 – 1.32 g/cm <sup>3</sup> (10 – 11 lb/gal)
Accelerator Density		1.26 – 1.38 g/cm <sup>3</sup> (10.5 – 11.5 lb/gal)
Base Viscosity	27 °C (80 °F)	11,000-35,000 cP <sup>1</sup>
Accelerator Viscosity	27 °C (80 °F)	9,000-25,000 cP <sup>1</sup>

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

## Typical Mixed Physical Properties

Attribute Name	Temperature	Value
Worklife		9 min <sup>1</sup>
Open Time		10 min <sup>2</sup>
Time to Full Cure	23 °C (73 °F)	24 h
Time to Handling Strength		45 min

<sup>1</sup> 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.

<sup>2</sup> 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 3.2 mm (1/8 in) bead of molten adhesive on a non-metallic surface.

## Typical Cured Characteristics

Temperature: 23 °C (73 °F)

Attribute Name	Test Method	Value
Young's Modulus	DIN EN ISO 527-2	543 MPa <sup>1</sup>
Elongation at Break	DIN EN ISO 527-2	54 % <sup>1</sup>
Shore D Hardness	ASTM D2240	77
Stress at Break	DIN EN ISO 527-2	18.5 MPa <sup>1</sup>

<sup>1</sup> Tested according to DIN EN ISO 527-2 Sample type 1B. Specimens were cut using a waterjet. Test rate was 1% / minute.

## Typical Performance Characteristics

### Overlap Shear Strength

Temperature: 23 °C (73 °F)

Dwell Time: 7 d

Test Method: ASTM D1002, ISO 4587

Substrate	Surface Prep	Value
Aluminum	MEK/Abrade/MEK	18.5 MPa (2680 lb/in <sup>2</sup> ) (CF) <sup>1</sup>
Cold Rolled Steel	MEK/Abrade/MEK	15.7 MPa (2282 lb/in <sup>2</sup> ) (CF) <sup>1</sup>
Stainless Steel	MEK/Abrade/MEK	21.5 MPa (3124 lb/in <sup>2</sup> ) (CF) <sup>1</sup>
Galvanized Steel	MEK/Abrade/MEK	8.3 MPa (1200 lb/in <sup>2</sup> ) (AF) <sup>1</sup>
Polycarbonate (PC)	MEK/Abrade/MEK	4.9 MPa (710 lb/in <sup>2</sup> ) (AF) <sup>1</sup>
Fiber-Reinforced Plastic	IPA Wipe/Abrade/IPA Wipe	6.2 MPa (900 lb/in <sup>2</sup> ) (SF) <sup>1</sup>
ABS	MEK/Abrade/MEK	1.6 MPa (230 lb/in <sup>2</sup> ) (AF) <sup>1</sup>
Glass Filled Epoxy LW	IPA Wipe/Abrade/IPA Wipe	16.5 MPa (2400 lb/in <sup>2</sup> ) (CF) <sup>1</sup>
Glass Filled Polyester	IPA Wipe/Abrade/IPA Wipe	6.9 MPa (1000 lb/in <sup>2</sup> ) (SF) <sup>1</sup>

<sup>1</sup> 25 mm (1") wide, 12.7 mm (1/2") overlap samples, 25 mm (1") x 102 mm (4") substrates, bondline thickness: 0.13-0.20 mm (5-8 mil)

Separation rate 2.5 mm/min (0.1 in/min) metal, 51 mm/min (2 in/min) plastic, 510 mm/min (20 in/min) rubber.

Substrate thickness: steel 1.5 mm (60 mil), other metal 1.3-1.6 mm (50-64 mil), rubber and plastic 3.2 mm (125 mil)

Cohesive Failure (CF), Adhesive Failure (AF), Mixed Failure (MF), Substrate Failure (SF)

Substrate: Etched Aluminum

Temperature: 23 °C (73 °F)

Dwell Time: 24 h

Attribute Name	Test Method	Value
Bell Peel	ASTM D3167	49 N/cm (28 lb/in) <sup>1</sup>

<sup>1</sup> 25 mm (1 in) wide samples; 0.4 mm (0.017 in) bond line thickness. The testing jaw separation rate was 15 cm/min (6 in/min). The bonds are made with 1.6 mm (0.064 in) bonded to 0.64 mm (0.025 in) thick adherends.

## **Electrical and Thermal Properties**

<b>Attribute Name</b>	<b>Value</b>
Glass Transition Temperature (Tg)	41 °C (106 °F) <sup>1</sup>

<sup>1</sup> Measured at one week via DMA

## **Product Uses**

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## **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 DP6310NS 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.

## Industry Specifications

[EN 45545 test report for details \(ISO 5659-2, ISO 9239-1, ISO 5660-1, ISO 5658-2\)](#)

## Storage and Shelf Life

Store under normal conditions of 16° to 27°C (60° to 80°F) and 40 to 60% relative humidity in the original packaging, out of direct sunlight. For best performance, use this product within 12 months from date of manufacture.

## Product Family

This product is a part of the the Composite Urethane Family which includes: 3M™ Scotch-Weld™ Multi-Material Composite Urethane Adhesive DP6310NS, 3M™ Scotch-Weld™ Multi-Material Composite Urethane Adhesive DP6330NS

## 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

**Intended Use:** 3M™ Scotch-Weld™ Multi-Material & Composite Urethane Adhesive DP6310NS and DP6330NS are intended for use in general industrial bonding applications to metals, high surface energy plastics, and composites, when used in accordance with the guidance provided by 3M in this Technical Data Sheet and other product instructions. Since there are many factors that can affect a product's use, the customer remains responsible for determining whether the 3M product is suitable and appropriate for the customer's specific application and system, including customer conducting an appropriate risk assessment and evaluating the 3M product in customer's application and system.

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

3M™ Industrial Adhesives and Tapes Division  
3M Center, St. Paul, MN 55144-1000  
[3M.com/iatd](http://3M.com/iatd)

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