February, 2019

3M™ Scotch-Weld™ Urethane Adhesive DP605NS Off White

Product Description

3M™ Scotch-Weld™ Urethane Adhesive DP605 NS Off-White is a two-part, non-sag urethane adhesive. It provides tough, flexible bonds with good adhesion to a wide variety of substrates, especially wood and many properly abraded and cleaned plastics. Good adhesion can also be obtained on painted metals and ceramics and glass. For maximum bond durability under moisture conditions, priming of glass is required.



Product Features

- Tough, flexible bonds
- Non-Sag/Thixotropic
- 1:1 Mix Ratio
- 5 minute worklife
- Bonds wood and many plastics
- Low Halogen Content

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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	Notes	Test Condition
Color	Off-White	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.	
Base Color	White		
Accelerator Color	Tan		
Base Density	8.8 to 9.2 lb/gal		
Accelerator Density	9.7 to 10.2 lb/gal		
Base Viscosity	11 to 20 s	(Approx.) time to deliver 20 gms @ 20 psi through a .104" orifice	Room Temperature
Accelerator Viscosity	11 to 20 s	(Approx.) time to deliver 20 gms @ 20 psi through a .104" orifice	Room Temperature
Mix Ratio by Volume (B:A)	1:1		
Mix Ratio by Weight (B:A)	1:1		

Typical Mixed Physical Properties

Property	Values	Test Condition	Method	Substrate	Notes
Worklife, 10g mixed	5 min	@ Room Temperature, 10 g, 1/4" thick			
Time to Handling Strength	15 to 20 min	Room Temperature	3M C3179	Aluminum	Time to handling strength taken to be that required to achieve a 50 psi overlap shear (OLS) strength using aluminum substrates.
Time to Full Cure	48 h	Room Temperature			The cure time is defined as that time required for the adhesive to achieve a minimum of 80% of the ultimate strength as measured by aluminum-aluminum OLS.

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Typical Physical Properties

Color: Off-White

Conditions
Attribute Modifier: Cured

Typical Cured Characteristics

Property	Values	Notes	Method	Dwell/Cure Time	Test Condition
Total Chlorine	670 ppm	Halogen content measured using ion chromatography; “low halogen” defined by International Electrotechnical Commission (IEC) Standard 61249-2-21 as having less than 900 ppm chlorine, less than 900 ppm bromine, and less than 1,500 ppm total halogens.			
Total Bromine	<10 ppm	Halogen content measured using ion chromatography; “low halogen” defined by International Electrotechnical Commission (IEC) Standard 61249-2-21 as having less than 900 ppm chlorine, less than 900 ppm bromine, and less than 1,500 ppm total halogens.			
Total Halogens	<800 ppm	Halogen content measured using ion chromatography; “low halogen” defined by International Electrotechnical Commission (IEC) Standard 61249-2-21 as having less than 900 ppm chlorine, less than 900 ppm bromine, and less than 1,500 ppm total halogens.			
Shore D Hardness	62		ASTM D2240	60 min @ Room Temperature	
Weight Loss by Thermal Gravimetric Analysis (TGA)	5 %	Weight loss by Thermal Gravimetric Analysis reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C (9°F) rise per minute.	ASTM E1131		572°F(300°C)

Typical Performance Characteristics

Property	Values	Method	Test Condition	Substrate	Substrate Notes	Notes
Elongation	100 %	ASTM D882				
Bell Peel	33 lb/in width	ASTM D3167	Room Temperature	Aluminum	0.025in thick; 0.064in bondline	Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. The bonds were made with 0.064 in. bonded to 0.025 in. thick adherends.

Overlap Shear Strength	Substrate	Surface Preparation
650 lb/in²	Aluminum	MEK/Abrade/MEK
660 lb/in²	Cold Rolled Steel	MEK/Abrade/MEK
640 lb/in²	ABS	IPA Wipe/Abrade/IPA Wipe
620 lb/in²	Polyvinyl chloride (PVC)	IPA Wipe/Abrade/IPA Wipe
720 lb/in²	Polycarbonate (PC)	IPA Wipe/Abrade/IPA Wipe
700 lb/in²	Acrylic (PMMA)	
640 lb/in²	Fiber-Reinforced Plastic	IPA Wipe/Abrade/IPA Wipe

Property: Overlap Shear Strength
Method: ASTM D1002
Dwell/Cure Time: 7
Dwell Time Units: days
Temp C: 23C
Temp F: 73F
Environmental Condition: 52%RH
Substrate Notes: 0.005-0.008in bondline
notes: 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)

Electrical and Thermal Properties

Property	Values	Test Condition	Notes	Method
Glass Transition Temperature (Tg)	41 °C	Mid-Point	Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.	
Dielectric Constant	3.1	1 KHz, Room Temperature		ASTM D150

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Electrical and Thermal Properties (continued)

Property	Values	Test Condition	Notes	Method
Dissipation Factor	0.021	1 KHz, Room Temperature		ASTM D150
Volume Resistivity	1.0 × 10^14 Ω-cm	Room Temperature		ASTM D257
Coefficient of Thermal Expansion	121 × 10^-6 m/m/°C	below 41°C	TCE determined with TMA Analyzer using a heating rate of 50°F (10°C) per minute. Second heat values given.	
Coefficient of Thermal Expansion	219 × 10^-6 m/m/°C	above 41°C	TCE determined with TMA Analyzer using a heating rate of 50°F (10°C) per minute. Second heat values given.	

Handling/Application Information

Directions for Use

3M™ Scotch-Weld™ Urethane Adhesive DP605NS is supplied in dual syringe plastic duo- pak cartridges as part of the 3M™ EPX™ Applicator System. The duo-pak cartridges are supplied in 48.5 ml and 200 ml configurations. To use the EPX cartridge system simply insert the duo-pak cartridge into the EPX applicator. Next, remove the duo-pak cartridge cap and expel a small amount of adhesive to be sure both sides of the duo-pak cartridge are flowing evenly and freely. If simultaneous mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive.
When mixing Part A and Part B manually the components must be mixed in the ratio indicated in the typical uncured properties section of this data sheet. Complete mixing of the two components is required to obtain optimum properties.
Two-part mixing/proportioning/dispensing equipment is available for intermittent or production line use. These systems are ideal for line uses because of their variable shot size and flow rate characteristics and are adaptable to most applications.
Apply adhesive to clean, dry surfaces, joint parts and secure until adhesive sets.

Handling/Application Information (continued)

Surface Preparation

The following surface preparations were used for substrates described in this Technical Data Sheet.
A. Aluminum Etch
Optimized FPL Etch - 3M (test method C-2803)
1. Alkaline degrease – Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water (3M test method C-2802).
2. Optimized FPL Etch Solution (1 liter):
Material Amount
Distilled Water 700 ml plus balance of liter (see below)
Sodium Dichromate 28 to 67.3 grams
Sulfuric Acid 287.9 to 310.0 grams
Aluminum Chips 1.5 grams/liter of mixed solution
To prepare 1 liter of this solution, dissolve sodium dichromate in 700 ml of distilled water. Add sulfuric acid and mix well. Add additional distilled water to fill to 1 liter.
Heat mixed solution to 66 to 71°C (150 to 160°F).
Dissolve1.5 grams of 2024 bare aluminum chips per liter of mixed solution. Gentle agitation will help aluminum dissolve in about 24 hours.
To FPL etch panels, place them in the above solution at 150 to 160°F (66 to 71°C) for 12 to 15 minutes.
Note: Review and follow precautionary information provided by chemical suppliers prior to preparation of this etch solution.
Rinse immediately in large quantities of clear running tap water.
Dry – air dry approximately 15 minutes followed by force dry at 140°F (60°C) maximum for 10 minutes (minimum).
3. Both surface structure and chemistry play a significant role in determining the strength and permanence of bonded structures. It is therefore advisable to bond or prime freshly primed clean surfaces as soon as possible after surface preparation in order to avoid contamination and/or mechanical damage. Please contact your 3M sales representative for primer recommendations.
B. Oakite Degrease
Oakite 164 solutions (9-11 oz./gallon of water) at 190°F ± 10°F (88°C ± 5°C) for 2 minutes. Rinse immediately in large quantities of cold running water.
C. MEK/Abrade/MEK
Wipe surface with a methyl ethyl ketone (MEK) soaked swab, abrade and wipe with a MEK soaked swab.* Allow solvent to evaporate before applying adhesive.
*Note: When using solvents, extinguish all ignition sources, including pilot lights,
and follow the manufacturer's precautions and directions for use.
D. Isopropyl Alcohol Wipe Only Surface Preparation
Wipe surface with an isopropyl alcohol soaked swab.* Allow solvent to evaporate before applying adhesive.
*Note: When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.
E. Isopropyl Alcohol/Abrade/Isopropyl Alcohol Surface Preparation
Wipe surface with an isopropyl alcohol soaked swab, abrade using clean fine grit abrasives, and wipe with an isopropyl alcohol soaked swab.* Then allow solvent to evaporate before applying adhesive.
*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 products at 60-80°F (15-27°C) for maximum shelf life.
These products have a shelf life of 18 months from date of manufacture in original duo-pak containers at room temperature.

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-Urethane-Adhesive-DP605NS?N=5002385+3293242126&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=DP605NS Off White

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

Information

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3M United States
3M Center
St. Paul, MN 55144-1000
800-362-3550
www.3M.com

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