

February, 2019

3M™ Scotch-Weld™ Urethane Adhesive DP620NS Black

Product Description

3M™ Scotch-Weld™ Urethane Adhesive DP620NS is a black, rapid setting, two-component polyurethane. It is packaged as 1:1 ratio liquids in a duo-pak cartridge. With the squeeze of the trigger, the components are automatically mixed and easily dispensed as a bubble-free non-sag paste.

Product Features

- Medium open time
- 1:1 Mix Ratio
- Bonds to a wide variety of substrates
- Easy Mixing, Non-Sag formulation
- Low Temperature Flexibility
- Low shrinkage



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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	Temp C	Temp F
Color	Black	Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.		
Base Color	Clear Yellowish			
Accelerator Color	Opaque Black			
Base Density	9.0 to 9.4 lb/gal			
Accelerator Density	9.5 to 9.9 lb/gal			
Base Viscosity	3000 to 6000 cP	Brookfield CP #52 @ 50 rpm	23C	72F
Accelerator Viscosity	1000 to 5000 cP	Brookfield CP #52 @ 50 rpm	23C	72F
Mix Ratio by Volume (B:A)	01:01:00			
Mix Ratio by Weight (B:A)	01:01:00			

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Typical Mixed Physical Properties

Property	Values	Temp C	Temp F	Notes
Worklife, 10g mixed	20 min	23C	73F	
Open Time	20 min			Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place. Cure times are approximate and depend on adhesive temperature. For hotmelts: The approximate bonding range of a 1/8" bead of molten adhesive on a non-metallic surface.
Time to Handling Strength	4 hr	23C	73F	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Typical Cured Characteristics

Property	Values		Method	Test Condition	Temp C	Temp F
Modulus	131000 lb/in ²		ASTM D638	Room Temperature		
Strain at Break	110 %		ASTM D638	Room Temperature		
Temperature Range	-60 to 250 °F	-51 to 121 °C		Continuous		
Shore D Hardness	50		ASTM D2240		23C	73F

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Typical Physical Properties

Color: Black

Conditions

Test Name: Cured

Typical Performance Characteristics

Property	Values	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Long Term Temperature Resistance	121 °C 250 °F	Long Term (day, weeks)									
Minimum Long Term Temperature Resistance	-51 °C -60 °F	Long Term (day, weeks)									
Bell Peel	30 lb/in width	ASTM D3167	72F	Aluminum	0.025in thick	Bell peel strengths were measured on 1 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. AF: adhesive failure CF: cohesive failure SF: substrate failure					

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Typical Performance Characteristics (continued)

Property	Value	Test Condition	Temp Method	Temp F	Temp Sub	Substrate Notes	Test Name	Dwell Time	Dwell Units	Env Cond	Surface Prep	Notes
Overlap Shear Strength 7day Aluminum	2880 lb/in ²	ASTM D1002	M3C	73F	Aluminum	0.006 in. 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 hour. 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)	Overlap Shear Strength	7 day	50%	MEK/Abrade		

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Typical Performance Characteristics (continued)

Property	Values	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Overlap Shear Strength	1700 lb/in ²	ASTM D1002	M3C	73F	Cold Rolled Steel	0.006 in. 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 hour. 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)	Overlap Shear Strength	7 day	day	50% MEK	Abrade

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Typical Performance Characteristics (continued)

Property	Values	Test Condition	Temp Method	Temp F	Temp Subs	Substrate Notes	Test Name	Dwell Time	Dwell Units	Env Cond	Surface Prep	Notes
Overlap Shear Strength 7day ABS	630 lb/in ²	ASTM D1002	M3C	73F	ABS	0.006 in. 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 hour. 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)	Overlap Shear Strength	7 day	50%	IPA Wipe/Abrade Wipe		

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Typical Performance Characteristics (continued)

Property	Value	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Overlap Shear Strength 7day Polyvinyl chloride (PVC)	480 lb/in ²	ASTM D1002	M3C	73F	Polyvinyl chloride (PVC)	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 hour. 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)	Overlap Shear Strength	7 day	50%	IPA Wipe/Abrade Wipe	

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Typical Performance Characteristics (continued)

Property	Value	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Overlap Shear Strength 7day Polycarbonate (PC)	430 lb/in ²	ASTM D1002	M3C	73F	Polycarbonate (PC)	0.006 in. 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 hour. 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)	Overlap Shear Strength	7 day	50%	IPA Wipe/Abrade Wipe	

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Typical Performance Characteristics (continued)

Property	Values	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Overlap Shear Strength 7day Acrylic (PMMA)	400 lb/in ²	ASTM D1002	M3C	73F	Acrylic (PMMA)	0.006 in. 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 hour. 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)	Overlap Shear Strength	7 day	50%RH		

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Typical Performance Characteristics (continued)

Property	Values	Test Condition	Temp Method	Temp F	Substrate	Notes	Test Name	Dwell Time	Dwell Units	Environment	Surface Preparation
Overlap Shear Strength 7day Fiber-Reinforced Plastic	700 lb/in ²	ASTM D1002	M3C	73F	Fiber Reinforced Plastic	0.063 in. thickness	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 hour. 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)	Overlap Shear Strength	7 day	50% RH	Wipe/Abrade

Handling/Application Information

Application Examples

- Prototype building
- Bonding of dis-similar substrates
- As a combination structural adhesive and sealant in construction applications
- General bonding and sealing (structural sealing)

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Handling/Application Information (continued)

Directions for Use

3M™ Scotch-Weld™ Urethane Adhesive DP620NS 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 configuration. 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.

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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).

Dissolve 1.5 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.

D. Isopropyl Alcohol Wipe Only Surface Preparation

Wipe surface with an isopropyl alcohol soaked swab.* Allow solvent to evaporate before applying adhesive.

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.

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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-DP620NS/?N=5002385+3293242469&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=DP620NS Black

ISO Statement

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

3M™ Scotch-Weld™ Urethane Adhesive DP620NS Black

Information

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