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3M™ Scotch-Weld™ Urethane Adhesive EC-3549 B/A NF

Technical Data Sheet

Product Description

3M™ Scotch-Weld™ Urethane Adhesive EC-3549 B/A NF 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 moist conditions, priming of glass is required.

Features

- Tough, flexible bonds
- Non-Sag/Thixotropic
- 40 minute worklife
- Bonds wood and many plastics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Property	Condition	3M™ Scotch- Weld™ EC-3549 B/A NF
Appearance	Part B Part A	Pink/Purple Tan
Mix Ration (B:A)	By volume By weight	1:1 1:1
Viscosity[1]	Part B Part A	10,000-40,000 15,000-55,000
Density	Part B Part A	10.0 – 10.5 11.1 – 11.5
Work Life @ 73°F (23°C)	10 g, 1/4" thick	40 minutes

[1]Viscosity measured using Brookfield RVF, spindle #6, 10 RPM @ 80°F (27°C)

Note: The data in this sheet were generated using the 3M™ EPX™ Applicator System equipped with an EXP static mixer, according to manufacturer's directions. Thorough hand-mixing will afford comparable results.

Typical Cured Physical Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Property	EC-3549 B/A NF
Appearance	Brown
Shore A Hardness (ASTM D 2240)	70-80
Time to Handling Strength[1]	6-8 hrs @ 23°C (73°F)
Cure Time[2]	7 days @ 23°C (73°F)
Elongation[3]	100%

Electrical	EC-3549 B/A NF
Dielectric Constant (ASTM D 150)	5.9 @ 1 KHz @ 23°C
Dissipation Factor (ASTM D 150)	0.12 @ 1 KHz @ 23°C
Dielectric Strength (ASTM D 149)	470 volts/mil
Volume Resistivity (ASTM D 257)	2.6 x 1014 ohm-cm

[1]Handling strength determined per 3M test method C-3179. Time to handling strength taken to be that time required to achieve 50 psi OLS strength using aluminum substrates.
[2]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.
[3]Elongation is determined using 3M test method C-3094/ASTM D 882.

Typical Adhesive Performance Characteristics

I. Aluminum, Overlap Shear, at Temperature (PSI) (ASTM D1002)

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Temperature	EC-3549 B/A NF
-40°F (-40°C)	3300
73°F (23°C)	2160
180°F (82°C) (15 min.)1	450

[1]Represents time in test chamber oven before test.

II. Overlap Shear, Tested @ 73°F (23°C) (PSI) (ASTM D1002)

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Product		EC-3549 B/A NF
Aluminum	MEK/abrade/MEK	2160
Cold Rolled Steel	MEK/abrade/MEK	1960
Nylon	IPA/abrade/IPA	740
Polycarbonate	IPA/abrade/IPA	1210
Acrylic	IPA/abrade/IPA	1150
SMC	IPA/abrade/IPA	900
Rigid PVC	IPA/abrade/IPA	1180
ABS	IPA/abrade/IPA	1160
HIPS	IPA/abrade/IPA	460

III. Aluminum, Floating Roller Peel, Tested @ 73°F (23°C) (PIW) (ASTM D3167)

Temperature	EC-3549 B/A NF
73°F (23°C)	64

IV. Environmental Resistance, Aluminum (etched)
Measured by Overlap Shear Tested @ 73°F (23°C) (PSI) (ASTM D1002

Environment	Conditions	EC-3549 B/A NF
Room Temperature	73°F(23°C)/50% RH, 30 days	100%
Water Vapor	150°F (66°C)/ 80% RH, 30 days	100%
IPA	73°F(23°C, 30 days, tested on ABS	100%

Substrates and Testing

I. Overlap Shear (ASTM D1002)

Overlap Shear (ASTM D1002, 3M Test Method C-244) strength was measured on 1" wide x 1/2" overlap specimen. These bonds were made individually using 1" x 4" pieces of substrates 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 thickness of the adhesive bond line was approximately 0.005". All strengths were measured at 73°F (23°C) except when noted.

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, 0.125in.; plastics, 0.125 in. and samples were allowed to cure at 75°F (24°C) and approximately 50% RH for 1 week before tested. The separation rate of the testing jaws was 0.1 inch per minute for metals and 2 inches per minute for plastics.

II. Floating Roller Peel (Bell Peel) (ASTM D3167)

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.

III. Cure Cycle

All bonds were cured 7 days at 73°F (23°C) at 50% RH before testing or subjected to further conditioning or environmental aging.

Handling and Application Information

Product Application

Note: This information is provided as a general application guideline based upon typical conditions. No two applications are identical due to differing assemblies, method of heat and pressure application, production equipment and other limitations. It is therefore suggested that experiments be run, within the actual constraints imposed, to determine optimum conditions for your specific application and to determine suitability of product for particular intended use.

I. Surface Preparation

A thoroughly cleaned, dry, and grease-free surface is essential for maximum performance. Cleaning methods that will produce a break-free water film on metal surfaces are generally satisfactory.

For aluminum, the best performance will be achieved with the surface preparation by alkaline degreasing, then FPL etching according to ASTM D2674, and followed by phosphoric acid anodizing according to ASTM D3933.

II. Directions for Use

3M™ Scotch-Weld™ Urethane Adhesive EC-3549 B/A NF is supplied in dual syringe plastic cartridges as part of the 3M™ EPX™ Applicator System. To use the EPX cartridge system, simply insert the cartridge into the EPX applicator. Next, remove the cartridge cap and expel a small amount of adhesive to be sure both sides of the cartridge are flowing evenly and freely. If simultaneous mixing of Part A and Part B is desired, attach the mixing nozzle to the -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.

Shelf Life and Storage Conditions

3M™ Scotch-Weld™ Urethane Adhesive EC-3549 B/A NF shelf life is 12 months from the date of shipment from 3M when stored between 60° to 80°F (15° to 27°C) in the original unopened container.

Additional Information

In the U.S. call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M representative.

**These products were manufacture under a 3M Quality Management System registered to the AS9100 standard*

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