SNAPSHOOT
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현장을 이해하고, 필요한 솔루션을 연결합니다.

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제품 제안부터 공급·시공·설치·교육까지



COMPANY INFORMATION

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제품의 규격과 성능, 인증 및 적용 조건을 확인하기 위한 자료입니다.

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제품 공급을 넘어, 현장에 맞는 해결책으로

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English-US

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Technical Data Sheet

3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling

Product Details

Regulatory Info/SDS

Product Description

3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling is a gray, rapid setting, two component polyurethane. It is packaged as 1:1 ratio liquids in a duo-pak cartridge. With the squeeze of a trigger, the components are automatically mixed and easily dispensed as a bubble-free self-leveling or non-sag liquid.

Product Features

- Fast Setting
- 1:1 Mix Ratio
- Easy Mixing
- Tough, non-brittle bonding

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
Color	Medium-Gray [1]
Mix Ratio by Volume (B:A)	1:1
Mix Ratio by Weight (B:A)	1:1

[1] Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.

Attribute Name	Temperature	Value
Base Color		Opaque Black
Accelerator Color		Clear Yellowish
Base Density		8.5 — 8.9 lb/gal
Accelerator Density		9.5 — 9.9 lb/gal
Base Viscosity	23 °C (73 °F)	1100 — 6000 cP [1]
Accelerator Viscosity	23 °C (73 °F)	1000 — 3000 cP [1]

[1] Brookfield CP #52 @ 100 rpm

Typical Mixed Physical Properties

Attribute Name	Temperature	Test Condition	Value
Open Time			1 min [1]
Tack Free Time	23 °C (73 °F)	10 g, 6 mm (1/4 in) thick	4 min
Time to Full Cure	23 °C (73 °F)	10 g, 6 mm (1/4 in) thick	1 h
Worklife, 10g mixed	23 °C (73 °F)		70 s

[1] 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 Physical Properties

Attribute Name	Value
Cured Color	Medium-Gray

Typical Cured Characteristics

Attribute Name	Test Method	Temperature	Test Condition	Value
Temperature Range			Continuous	-51-121 °C (-60-250 °F)
Shore D Hardness	ASTM D2240	23 °C (73 °F)		70

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	2,300 lb/in² [1]
Cold Rolled Steel	MEK/Abrade/MEK	2,250 lb/in² [1]
ABS	IPA Wipe/Abrade/IPA Wipe	500 lb/in² [1]
Polycarbonate (PC)	IPA Wipe/Abrade/IPA Wipe	300 lb/in² [1]
Acrylic (PMMA)	IPA Wipe/Abrade/IPA Wipe	430 lb/in² [1]
Fiber-Reinforced Plastic	IPA Wipe/Abrade/IPA Wipe	340 lb/in² [1]
Polyvinyl chloride (PVC)	IPA Wipe/Abrade/IPA Wipe	430 lb/in² [1]

[1] 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)

Attribute Name	Value
Long Term Temperature Resistance	121 °C (250 °F) [1]
Minimum Long Term Temperature Resistance	-51 °C (-60 °F) [1]

[1] Long Term (day, weeks)

Substrate: Etched Aluminum
Temperature: 23 °C (73 °F)

Attribute Name	Test Method	Value
Bell Peel	ASTM D3167	20 lb/in width [1]

[1] 25 mm (1 in) wide bonds. 0.5 mm (0.02 in) thick, 1.7 mm (0.065 in) bondline
Jaw separation rate 15 mm/min (6 in/min)
AF: adhesive failure CF: cohesive failure SF: substrate failure

Handling/Application Information

Directions for Use

3M™ Scotch-Weld™ Urethane Adhesives DP601 Self-Leveling and DP601NS are 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.

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.

Application Examples

• Rapid repair of spalled or cracked concrete floors or pool decks in high traffic areas
• Custom tapping of bolts and screws into wood, concrete and masonry
• Tough, non-brittle bonding of wood, metal, glass and plastic
• Bonding of dis-similar substrates
• Non-brittle bonding to primed PVC and to ABS pipe
Self-Leveling:
• Re-installing posts and rails
• Fixturing of hand/grabrails into pool decks
• Rapid repair of pool decks prior to being coated
Non-Sag:
• Used as a vertical grade repair material and adhesive for numerous substrates such as concrete, ceramic, wood, metal and glass
• Repairing leading edges of stairs
• Fixturing bolts

Instructions for Concrete Repair

Preparation
Prepare the Concrete for the Vertical Repair and/or Custom Tap
1. Remove all loose aggregate, dust, old caulks, grease and waterproofing compounds from repair surface. (Grind away any absorbed oils to ensure a clean surface.)
2. Clean repair surface with a bristle brush and use moisture and oil-free compressed air to blow out debris.
3. Mask off area surrounding repair.

Repairing Concrete Damage from Corrosion
1. Apply a pre-coat of cement corrosion inhibitor or protectant to excessively corroded areas.
2. Allow pre-coat to dry thoroughly.
3. Follow the procedure for general concrete repairs.

Self-Leveling Procedure for Doing Concrete Repairs
1. Keeping the mixer tip at the deepest portion of the repair area, dispense into the prepared cavity, depression, void, groove or crack.
2. Keep the end of the mix tip immersed in the product as the repair is being filled.
3. Use a spreader to cover the repair and leave an excess of at least 1" around the repair edges.

Overfilling 3M™ Scotch-Weld™ Urethane Adhesive DP601 and allowing it to overlap approximately one inch along the edges of the repair tapering to just a few mils thickness provides a substantial tie into the concrete and increases the lifetime of the repair.
4. Place the spreader over the filled repair.
5. Press down and hold for about 30 seconds to spread the repair compound.
6. Let repair cure before removing the spreader.
7. 3M™ Scotch-Weld™ Urethane Adhesive DP601 will self-level and set approximately within one minute and leave a slight meniscus. If desired, one can create a repair flush and level to the concrete floor on smaller areas up to 6 inches square by overlaying a slightly stiff polyethylene sheet (approximately the modulus of a plastic spreader) just prior to the set of 3M™ Scotch-Weld™ Urethane Adhesive DP601.
8. At 75°F (24°C), a 1/4"-thick section sets and becomes tack-free within 4 minutes and will cure within one hour. Note: Thicker masses or substrates at higher temperature take less time to cure. Thinner masses or substrates at lower temperature take more time to cure.

Repairing Leading Edges on Steps and Stairways
1. For sharp edges: Follow the procedures above and shape edge by using two spreaders. Use one spreader to flatten the vertical edge of repair and the other spreader for the top of repair.
2. For round edges: Form round edges with a piece of plastic contouring sheet on small repairs (less than 3" x 3"). Plastic must be at least 1" larger around than the edges of the repair.

Repair Clean-up and Finishing
1. Remove masking tape from repair.
2. Shave or grind cured product with 36 grit sandpaper to achieve desired shape.
3. Sand with 80 grit sandpaper to remove any scratches.
4. If 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS is applied in a traffic area, apply sand or some type of grip to repaired surface area.

Instructions for Custom Tapping and Fastening

Custom Tapping and Fastening
Custom tapping is a form of chemical anchoring where cupboards, wall hangers or other heavy cabinetry can be secured in place. However, the bolts or screws holding heavy cantilevered items can be easily removed facilitating the re-location
of the cabinetry. Custom tapping is done by molding the threads of bolts and screws into an adhesive plug, rather than being mechanically anchored into lag shields. The tough molding properties of this product allow it to form and retain a high-strength, non-brittle interlock between holes cored into concrete, wood or masonry and the threads of the inserted bolt or screw. The release characteristics, upon removal, are achieved by simply spraying the bolt or screw with 3M™ 5-Way Penetrant (or another release agent) before the bolt or screw is inserted into the liquid 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS prior to its setting. To achieve a more permanent fixture, the bolts and screws simply are not lubricated before embedding into the liquid 3M™ Scotch-Weld™ Urethane Adhesive DP601NS prior to curing.

Preparation For Custom-tapping:
1. Drill holes into the concrete, wood or masonry to the specified depth using the chart below.

Bolt Width (in.)	Minimum Hole Diameter (in.)	Minimum Hole Depth (in.)
1/4	3/8	2
3/8	1/2	3-1/2
1/2	5/8	4-1/4
5/8	3/4	5
3/4	7/8	6-3/8
7/8	1	7-1/2
1	1-1/8	8-1/4
1-1/8	1-1/4	9
1-1/4	1-3/8	9-3/4
1-3/8	1-1/2	10-1/2
1-1/2	1-5/8	11-1/4

2. Use a round bristle brush to clean the cored holes if they have not been freshly drilled.

3. Use moisture-free and oil-free compressed air to blow out the debris.

4. Lightly coat the bolts or screws with 3M™ 5-Way Penetrant.

Procedure for Custom Tapping Concrete:
1. Dispense 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS into the hole nearly halfway full. To obtain a consistent fill, judge for under-fill or overfill by counting the number of squeezes of the trigger.

2. Insert the bolt or screw within the first 20 seconds after dispensing. The paste characteristic of 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS will hold the bolt or screw in place until it cures. Once the work life has been exceeded, do not disturb the bolt.

3. Move to the next hole to keep 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS flowing in the mixer tip. If material sets in the mixer tip, replace the tip and start dispensing again.

4. 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS will become tack-free within 2 minutes and cure within one hour. Note: It is best to wait for one full hour before extracting the bolt or screw for securing the cupboards, wall hangers or other cabinetry in place.

5. Allow 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS to fully cure before applying a load. The maximum torque recommended is 9.5 pounds.

Procedures for Custom Tapping Hollow Concrete Blocks, Wood or Masonry:
1. Use a reinforcement patch to create a mesh net around the bolt. Leave at least a 1 in excess of mesh abound the diameter of the bolt. Push the bolt and mesh through the hole.

2. Remove the bolt and then fill the net 3/4-full with 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS while slowly backing the nozzle out of the hole.

3. Place the bolt in the hole and complete the fill, if necessary, to adjust for any under-fill.

4. Allow 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS to fully cure before removing the bolt and reinstalling it along with the supported load.

Instructions for Re-Anchoring Handrails

Note: Not for use in repairing or anchoring diving boards.

Re-Anchoring Handrails and Grabrails

Preparation of Hand/Grabrails
1. Bore a hole through the base of the hand/grabrail just above grade level to allow introduction of the product.
2. Using 80 grit sandpaper, roughen the footing surface of the hand/grabrail which is to be imbedded below the concrete grade.
3. Refer to instructions on cartridge for dispensing.

Preparation of Concrete for Re-anchoring
1. Chip away the cracked or broken concrete to allow removal of the hand/grabrail.
2. Leave the concrete as close as possible around the hand/grabrail. It is best to allow the concrete to remain intact as close as possible (within 1/2 to 1 inch all around) to the base of the hand/grabrail.
3. Dig down to the base of the concrete, typically 4- to 6-inches deep.
4. Expose any rebar, if possible, in order to create a ground connection to the rebar.
5. Create as much as a 1-inch undercut under the concrete in a smooth taper from the concrete surface.
6. Remove all of the loose concrete particles and dust prior to encasing the replacement hand/grabrail.
7. Attach the replacement hand/grabrail to surrounding rebar using a copper wire.

Cinch the connection down tightly, allowing a slight amount of slack in the wire connection.
8. Create a shield to corrosion at the base of the hand/grabrail by laying a piece of polyethylene plastic at the base of the hole.
9. Insert the hand/grabrail in the hole. Align the hand/grabrail for its elevation and vertical plumb.

Encasement Procedure
1. Dispense 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS into the concrete hole. Product will remain liquid for approximately 50 seconds, and fully cure in 1 hour. Dispense more cartridges as necessary to bring the fill level up to the concrete surface level.
2. Dispense 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS into the inside of the hand/grabrail. Fill with product up to and slightly above the grade level. (Filling the inside of the post provides extra strength and protection against corrosion.)
3. Apply cement dust or sand, if desired, to blend the surface appearance into the surrounding concrete.
4. If 3M™ Scotch-Weld™ Urethane Adhesive DP601 Self-Leveling or DP601NS is applied in a traffic area, apply sand or some type of grit to repaired surface area.

Repair Clean-up and Finishing
Shave or grind cured product with 36 grit sandpaper to achieve desired shape.

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 18 months from date of manufacture.

Automotive Disclaimer

Select Automotive Applications:
This product is an industrial product and has not been designed or tested for use in certain automotive applications, such as automotive electric powertrain battery or high voltage applications, which may require the product to be manufactured in a IATF certified facility, meet a Ppk of 1.33 for all properties, undergo an automotive production part approval process (PPAP), or fully adhere to automotive design or quality system requirements (e.g., IATF 16949 or VDA 6.3). Customer assumes all responsibility and risk if customer chooses to use this product in these applications.

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