SNAPSHOOT
ENGINEERED FOR A SAFER TOMORROW

현장을 이해하고, 필요한 솔루션을 연결합니다.

산업안전 · 추락방지 시스템
산업용 소재 · 건축자재
제품 제안부터 공급·시공·설치·교육까지



COMPANY INFORMATION

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TECHNICAL DOCUMENTS

인증서 · 데이터시트 · 기술자료

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

ABOUT SNAPSHOOT

제품 공급을 넘어, 현장에 맞는 해결책으로

스냅슛은 산업현장의 작업 환경과 요구 조건을 바탕으로
적합한 제품과 시스템을 제안합니다. 현장 실사를 통해 설치 조건을 확인하고,
공급부터 시공·설치 및 사용 교육까지 필요한 과정을 함께합니다.

추락방지 시스템

안전대부착설비 · 수평·수직 라이프라인
레일 시스템 · 리지드 포스트

밀폐공간 진입·구조 솔루션

데빗암 · 삼각대 · 구조용 윈치
윈치 안전블록 · 구조장비

산업안전 보호구

전신형 안전대 · 랜야드 · 안전블록
작업 환경에 맞춘 개인보호구

산업용 소재·건축자재

산업용 테이프 · 접착제 · 기능성 소재
구조용 스크류 · 목조건축 자재

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홈페이지 바로가기 →
문서 라이브러리 바로가기 →
시공사례 바로가기 →
문의하기 →

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Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Adhesive
6011NFNS

Product Description

3M™ Scotch-Weld™ One-Part Epoxy Adhesive 6104 Black is a one-part epoxy exhibiting a low temperature cure with long room temperature pot life and low viscosity. It is flexible and toughened resulting in high impact performance.

Product Features

- One-part with stability at room temperature
- Low temperature cure and fast cure
- Low Viscosity
- Excellent impact resistance
- Bonds a variety of plastics and metals

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	Test Method	Value
Color		Black
Components		1-Part
Density - Liquid		1.12 g/mL [1]
UV Tracer		No
Pot Life	ASTM D7867	4 weeks [2]
Halogens (Cl, Br)		Representative samples have been tested and meet the chlorine and bromine content requirements of IEC 61249-2-21 [3]

[1] Measured by Helium gas pycnometer at 23°C
[2] Determined by meeting minimum application viscosity requirements of the adhesive over time @ 23°C
[3] Per IEC 61249-2-21

Temperature: 25 °C
Test Method: ASTM D7867

Attribute Name	Test Condition	Value
Viscosity - Cone and Plate	0.1 Hz	29 Pa·s [1]
Viscosity - Cone and Plate	1 Hz	19 Pa·s [1]
Viscosity - Cone and Plate	10 Hz	15 Pa·s [1]
Thixotropic Index	0.1 Hz / 1 Hz	1.5 [1]
Thixotropic Index	1 Hz / 10 Hz	1.3 [1]

[1] 40mm, 2.0°, 50um truncation cone and Peltier plate. 60s pre-shear at 100 Hz. 5 min flow ramp form 0.01 to 100 Hz @ 25°C

Typical Cure Profiles

Temperature: 65 °C
Test Method: ASTM D4473

Attribute Name	Value
Time to Double Complex Viscosity	3.8 min [1]
Time to 1,000 Pa.s Complex Viscosity	6.1 min [1]
Time to 0.1 MPa Storage Modulus	6.7 min [1]
Time to 1 MPa Storage Modulus	7.4 min [1]
Time to 90% Storage Modulus Max	9.6 min [1]

[1] Parallel Plate Rheometer: Isothermal - 25mm parallel plate, 1 Hz

Substrate: Etched Aluminum
Temperature: 65 °C
Test Condition: 22°C
Test Method: ASTM D1002, ISO 4587

Attribute Name	Dwell Time	Value
Time to Handling Strength		15 min [1]
Time to Cure		20 min [2]
Overlap Shear Strength	15 min	18 MPa [3]
Overlap Shear Strength	20 min	20 MPa [3]
Overlap Shear Strength	60 min	26 MPa [4]

[1] 2mm thick substrate. Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Dwell time refers to time coupons are exposed to condition in oven. Time to consistent >50 psi (0.34 MPa) overlap shear strength. Tested 5±1 minutes out of oven.

[2] 2mm thick substrate. Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Dwell time refers to time coupons are exposed to condition in oven. Time to 80% overlap shear full strength

[3] 2mm thick substrate. Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Temperature refers to dwell time coupons are exposed to condition in oven. Coupons are tested 5±1 minutes after removing from oven. Pull rate 10 mm/min.

[4] 2mm thick substrate. Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Temperature refers to dwell time coupons are exposed to condition in oven. Coupons are tested 24 hours after removing from oven. Pull rate 10 mm/min.

Typical Cured Characteristics

Temperature: 23 °C

Attribute Name	Test Method	Value
Density - Cured Solid	ASTM D1875	1.17 g/mL [1]
Volume Shrinkage	ASTM D1875	4.1 % [1]
Peak Stress	ASTM D638	27 MPa [2]
Young's Modulus	ASTM D638	560 MPa [2]
Poisson's Ratio	ASTM D638	0.45 [2]
Toughness	ASTM D638	17 J/m³ [2]
Elongation at Break	ASTM D638	120 % [2]
Shore D Hardness	ASTM D2240	66 [3]
Notched Izod Impact	ASTM D256-10	140 J/m [4]
Notched Izod Impact @ -20°C	ASTM D256-10	100 J/m [4]

[1] Measured by Helium gas pycnometer

[2] 0.5mm film cured at 65°C for 1 hour. Conditioned for >5 days in 23°C/50%RH. Die cut type IV dog bone. 100mm/min pull rate. Digital Image Correlation (DIC) used for strain measurements.

[3] 1 mm films stacked to 6 mm

[4] 3 mm thick sample

Attribute Name	Test Method	Test Condition	Value
Storage Modulus: DMA Master Curve	ASTM D4065	0.1 Hz	230 MPa [1]
Tg: DMA Temp Ramp	ASTM D7028	1 Hz	42 °C [1]
Storage Modulus: DMA Master Curve	ASTM D4065	1 Hz	350 MPa [1]
Storage Modulus: DMA Master Curve	ASTM D4065	10 KHz	1,200 MPa [1]
Storage Modulus: DMA Temp Ramp	ASTM D7028	1 Hz	1,100 MPa [1]

[1] 0.5mm film cured at 65°C for 1 hour. Conditioned for >5 days in 23°C/50%RH (CTH). 1Hz film tension DMA Heat from -20°C to 100°C at 3°C/min. Tg reported as peak of Tan Delta.

Typical Performance Characteristics

Overlap Shear Strength

Test Condition: 1 hr at 65°C + 24 hr at 22°C
Test Method: ASTM D1002, ISO 4587

Substrate	Value
Etched Aluminum	26 MPa (Mixed Mode Failure) [1]
Stainless Steel	23 MPa (Mixed Mode Failure) [2]
FR-4	33 MPa (Mixed Mode Failure) [3]
PC/ABS Glass-filled	>11 MPa (Substrate Failure) [3]
PC/Siloxane	8.7 MPa (Adhesive Failure) [3]
PBT Glass-filled	13 MPa (Mixed Mode Failure) [3]
Polyamide Glass-filled	12 MPa (Adhesive Failure) [3]

[1] Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Pull rate: 10 mm/min.

[2] Bond dimensions: 12.7mm x 25.4mm x 0.15mm. Pull rate: 10 mm/min. Substrate grit blasted with AC130-2 3M Surface Treatment Solution.

[3] Bond dimensions: 6.4mm x 25.4mm x 0.15mm. Pull rate: 10 mm/min.

Electrical and Thermal Properties

Attribute Name	Test Method	Temperature	Test Condition	Value
Dielectric Strength	ASTM D149	25 °C		62 kV/mm [1]
Dielectric Constant (Dk)	ASTM D150	23 °C	100 KHz	4.2
Dissipation Factor (Df)	ASTM D150	23 °C	100 KHz	0.039
Volume Resistivity	ASTM D1257	23 °C	500v 60s	1.8^{15} Ω-cm

[1] Measured at 0.26 mm

Handling/Application Information

Directions for Use

Thaw for one to two hours at room temperature before using. Do not heat syringe above 27°C when warming.

Application Examples

- Mobile device bonding
- Wearable electronic device bonding
- Electronic Assembly
- Encapsulation

Application Techniques

- Dispensing
- Molding

Storage and Shelf Life

Store product at -20°C (-4°F) in the original, unopened packaging. For best performance, use this product within 12 months from date of manufacture.

Available Sizes

Attribute Name	Value
Packaging	30 mL syringe, 591 mL cartridge

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is commercially available from 3M. The commercially available product will have a COA specification established. The COA contains the 3M specifications and test methods for the products performance limits that the product will be supplied against. The 3M product is supplied to 3M COA test specifications and the COA test methods. Contact your local 3M representative for this product's COA.

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