

Composite Welder FS

Flexible, Fast Fixturing, Methacrylate Adhesive

PRODUCT DESCRIPTION

Composite Welder FS is an advanced non-conductive two-part methacrylate adhesive designed for the structural bonding of various electronic assemblies. In addition, Composite Welder FS does a superb job of bonding of metals without primers, and engineered thermoplastics and composite assemblies with little to no surface preparation. Combined at a 10:1 ratio by volume, Composite Welder FS has a working time of approximately 3-5 minutes and achieves a handling strength of 50 psi in approximately 8 minutes on polycarbonate³, with following benefits:

- Fast cure at room temp.
- Self-priming to metals¹
- High toughness
- High strength
- Little to no surface preparation

This product provides a unique combination of high strength, excellent fatigue endurance, outstanding impact resistance, and superior toughness.

PRODUCT CHARACTERISTICS

Chemical Class	Acrylic
Appearance(uncured)	Off-white/Blue paste
Components	2 components
Viscosity	Very high
Operating Temperature:	-40°F to 250°F (-40°C to 121°C)
	Approx. 3-5 minutes

Physical Properties (Uncured) –Room Temperature

Adhesive Part

Viscosity, cps	100,000 – 130,000
Color	off-white
Density, lbs./gal (g/cc)	8.00 (0.96)

Activator Part

Viscosity, cps	15,000 – 35,000
Color	Blue
Density, lbs./gal (g/cc)	8.90 (1.07)

Mixed

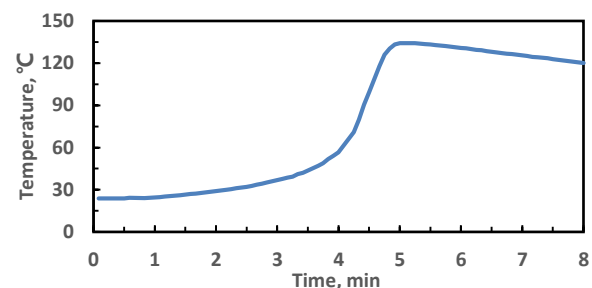
Mix Ratio by Volume	10:1.0
Mix Ratio by Weight	9.0:1.0
Density, lbs./gal (g/cc)	8.09(0.97)
Gap Fill, in(mm)	up to 0.25 (6.4)
Working Time ² , min	Approx. 3-5
Handling Strength (50psi) ³	Approx. 8 on polycarbonate

Typical mechanical properties (cured) at various temperatures ^{5a}

Lap Shear Strength, 73°F (23°C)		ASTM D 1002
ABS ^b (SF), psi(MPa)		880 (6.1)
Polycarbonate ^c (SF, CF), psi(MPa)		1,500 (10.3)
Aluminum 6061 ^d (CF) , psi(MPa)		2,500(17.1)
Lap Shear Strength 180°F (82°C)		ASTM D 1002
Aluminum 6061 ^d (CF) , psi(MPa)		1,000 (6.8 MPa)
T-Peel Strength, 73°F (23°C)		ASTM D 1876
Aluminum 6061 ^d (CF)		42 lbf/inch(73.6N/10mm)

Typical Exotherm curve at Room temperature

The exotherm testing was conducted at room temperature on 10 grams of mass with mix ratio of 10:1 by volume for adhesive to activator, which is plotted as following.



Typical Exotherm Curve at 23±2°C (10 grams) at 10:1 mix ratio by volume⁶

RECOMMENDED FOR:

Metals⁴: Aluminum, Magnesium, Stainless, CRS

Plastics: ABS, Polycarbonate, PVC, Acrylics

FRP: VE, Polyesters (including DCPD modified), Epoxies

CHEMICAL RESISTANCE

Excellent resistance to

- Hydrocarbons
- Acids and Bases (3-10 pH)
- Salt Solutions

Susceptible to

- Polar Solvents
- Strong Acids and Bases

PROCESSING

On clean, sound and degreased surfaces, it can be used on wet (not soaked) surfaces. This product can be applied with a manual or pneumatic gun between +18°C and +30°C. Cut nozzle at 45° angle to desired thickness.

For uncured product, it can be easily eliminated by alcohol. Once cured, it can be eliminated only by mechanical means.

PRECAUTIONS

Please refer to the appropriate material safety data sheet (MSDS) prior to using this product.

The following is explanation of above test method:

1. ITW Devcon strongly recommends that all substrates be tested with the selected adhesive in the anticipated service conditions to determine suitability. For severe corrosion durability to metals, use of PC120 offers superior durability and performance.
2. Working Time: The time elapsed between the moment when Parts A and B of the adhesive system are combined and thoroughly mixed and the time when the adhesive is no longer useable at approximate 0.25 inches. Times presented were tested at 75°F.
3. Handling strength: Varies with ambient temperature, bondline gap thickness, and nature of substrates. Typically at 75°F, Composite Welder FS with 0.012-inch gap at a 10:1 ratio by volume reaches 500 psi in 9 minutes and 1,000 psi in 10 minutes on polycarbonate (ASTM D1144). Substrate, temperature and gap may also affect fixture time.
4. Although not necessary, ITW Devcon recommends the removal of all oxides on the metal surface.
5. (a) Cure condition for lap shear and T-peel samples: 4 hrs. RT, then 16 hrs. At 110°F, and finally 4 hrs. At RT. Crosshead speed for lap shear testing was 0.05 inch/min. Overlap was about 0.5 inches. There is no surface treatment. ASTM D1002 for lap shear and ASTM D1876 for T-peel are followed. SF-Substrate Failure; CF-Cohesive Failure. (b) Thickness of the ABS is 0.116 inches. (c) Thickness of the PC (polycarbonate) is 0.096 inches. (d) Thickness of the Al 6061 is 0.058 inches. (e) Thickness of the Al 6061 is 0.029 inches.
6. In a typical bond line, exotherm temperatures will be lower than the temperatures shown.

STORAGE

Store the unopened product in a cool, dry, well ventilated location away from sources of heat. Optimal storage temperatures should range between **13°C and 23°C**. Product removed from the containers during use should not be returned to original containers in order to avoid potential contamination.

ORDER INFORMATION

14167-NC-50 50ML
14167-NC-250 250ML
14167-NC-490 490ML

CONVERSIONS

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

WARRANTY

ITW will replace any material found to be defective. Because the storage, handling and application of this material are beyond our control, we can accept no liability for the results obtained.

NOTE

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For technical assistance, please call: 86-021-54265119

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