

## High Temperature, Thermally Conductive Epoxy

### PRODUCT DESCRIPTION

Incure Epo-Weld™ TC-9051 is a two-part (1:1) thermally conductive epoxy system designed for bonding and potting applications operating at high temperatures. Filled with < 10 um ultra-fine aluminium nitride particles, it offers up to 0.72 Btu-in/hr-ft<sup>2</sup>°F (1.25W/m-K) of thermal conductivity. Easy to use, it provides tensile strength of up to 1,400 PSI is achievable on full cure with or without heat cure. Incure TC-9051 delivers outstanding performance on applications within the -65°C to 205°C (-85°F to 400°F) temperature range.

### UNCURED PROPERTIES

Chemical Type	Epoxy	Mix Ratio	1:1
Appearance	Grey	Density, g/ml	1.90
Viscosity, cP (rpm)	35,000 - 45,000	Pot-Life @25°C (hrs)	4.0

### CURE SCHEDULE

Recommended Curing Temperature			
First Cure	2h @ 95°C (2h @ 203°F)	Followed By	2d @ 25°C (2d @ 77°F)
Followed By	N.A.	Followed By (with Liquid Binder)	N.A.

### CHEMICAL RESISTANCE TABLE (Not Applicable for this Product)

ACIDS		SALTS	
CH3COOH Acetic Acid, 5%	Softens	NaCl Sodium Chloride, 5%	No Effect
CH3COOH Acetic Acid, Bath	Destroyed	ALKALIS	
H2CrO4 Chromic Acid, 10%	Discolored	NH4OH Ammonia Hydroxide, 5%	No Effect
C6H8O7 Citric Acid, 50%	No Effect	NaOH Sodium Hydroxide, 10%	No Effect
HCl Hydrochloric Acid, 50%	No Effect	NaOH Sodium Hydroxide, 50%	No Effect
HCl Hydrochloric Acid, 50%	No Effect	ORGANIC FLUIDS	
C3H6O3 Lactic Acid, 5%	No Effect	Fuel Oil	No Effect
HNO3 Nitric Acid, 10%	No Effect	C8H18 Gasoline	No Effect
HNO3 Nitric Acid, 10%	No Effect	Hydraulic Oil	No Effect
H3PO4 Phosphoric Acid, Concent	No Effect	Jet Fuel	No Effect
H2SO4 Sulphuric Acid, 10%	No Effect	Mineral Spirits	No Effect
H2SO4 Sulphuric Acid, 50%	No Effect	Toluene	No Effect
H2SO4 Sulphuric Acid, Concentra	Etched	Xylene	No Effect

### CURED PROPERTIES

Hardness, Shore	D70 to D80
Linear Shrinkage, in/in	-
Chemical Resistance	-
Service Temperature, °C (°F)	-65°C to 205°C (-85°F to 400°F)
Flexural Strength, PSI (ASTM D790)	-
Tensile Shear, PSI (ASTM D1002-94)	1,400
CTE, in/in°F x 10 <sup>-6</sup> °C	-
Thermal Conductivity, Btu-in/hr-ft <sup>2</sup> °F	0.72
Volume Resistivity, ohms-cm@RT	1.0E+15
Dielectric Strength, volts/mil	-
Dielectric Constant, 1.0kHz	N.A.
Dissipation Factor	N.A.

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### APPLICATION PROCEDURES

For two part epoxy systems should be thoroughly mixed until it is uniform. High viscosity systems, pre-heat Part A and Part B separately to 35° - 50°C (95°F to 122°F) to facilitate ease of mixing. Apply product using a spatula, putty knife or caulking gun. Apply to both surfaces and maintain glue line of less than 250 microns (10 mils). Pressure should be applied to the assembled parts to get rid of any air trapped and minimise any warpage.

For HTCP products, cross sections of 3.2mm to 6.4mm (1/8" - 1/4"), consider applications in multiple times to prevent blistering. As a guide, all cross-section joints should not exceed 12.5mm to 20mm (1/2" - 3/4").

### SURFACE PREPARATION

All bonding surfaces must be free from contaminants such as grease, loose particles, oils, corrosive chemical stains etc. Rough or porous material such as metal castings should be baked at high temperature to burn off any embedded contaminants, especially trapped oils and chemicals. Smooth metal surfaces should ideally be abrasive blasted to 0.25mm (0.001") for optimum results.

### STORAGE AND PREPARATION FOR USE

All Epo-Weld™ products should be stored in original containers (or replacement containers of similar material) in room temperature. Use a bigger container (twice the volume of the mixed contents) and leave mixed materials to settle (possibly some out-gassing) for 24hours.

### NOTE

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