

Technical Data Sheet Kronos - 10™

CHARACTERISTICS

Kronos-10 is a UL746A certified one-part, epoxy-based low coefficient of thermal expansion, high Tg adhesive for underfilling or encapsulating chip-on-board, bare die, BGA, flip-chip, CSP, and other electronic applications. A capillary flow formulation that cures at elevated temperature to provide strong bonding to silicon, flip-chip, BGA, ceramics, FR4, LTCC, aluminum, copper, stainless steel, etc. while minimizing thermal mismatch induced stress.

TYPICAL PROPERTIES

PROPERTIES	UNIT	VALUE	TEST METHOD
Appearance		Black	Visual
Density	g/mL	1.4	ASTM D792
Viscosity at 25°C	cps	~3600	ASTM D2196
Shelf Life (Stored at -40°C in original container)	months	12	

PROPERTY AS CURED

PROPERTIES	UNIT	VALUE	TEST METHOD
Color		Black	Visual
Tensile Strength	psi (MPa)	7334.6 (50.6)	ASTM D638
Flexural Strength	psi (MPa)	1363.4 (9.4)	ASTM D790
Dielectric Constant	@ 1MHz	3.8 - 4	ASTM D150
Dielectric Strength	volt/mil/AC	632.4 (>48hr at RT + 50% RH)	ASTM D149
		569.6 (96hr at 35°C + 90% RH)	
	KV/mm	24.98 (>48hr at RT + 50% RH) 22.5 (96hr at 35°C + 90% RH)	
Volumetric Resistivity	ohm-cm	4.83×10 ⁻¹⁴ (>48hr at RT + 50% RH) 8.09×10 ⁻¹⁴ (96hr at 35°C + 90% RH)	ASTM D257
Dimensional Stability	% shrinkage	0	ASTM D1204
Coefficient of Thermal Expansion	ppm/°C	54 (@ ≤ Tg)	TMA (IPC-TM-650)
		<172 (@ ≥ Tg)	
Glass Transition Temperature, Tg	°C	121	DMA or DSC (ASTM E1356)
	°C	130	
Service Temperature	°C	-65 to 220 (continuous)	TGA
		-65 to 280 (intermittent)	

CURE PROFILE

PROPERTY	UNIT	VALUE	TEST METHOD
Cure at 120°C	min	30	Durometer
Cure at 150°C	min	10	Durometer
Pot/Work Life at 25°C (after brought to room temperature)	hr	24	Viscosity doubles

SPECIAL FEATURES & BENEFITS

High performance underfill that can be tailored to a product's specific needs. Ability to use different dyes to accommodate various applications. Contact PRS for custom formulations*.

*Certifications only pertain to this formulation

TYPICAL APPLICATIONS

Military hardware (Portable, vehicle mounted, aerial, etc.)
Aerospace hardware
Medical hardware

Network/communications hardware
Consumer electronics

PROCESSING INSTRUCTIONS

Kronos-10 is a pre-mixed, one-part epoxy underfill. Material must be kept frozen at -40°C prior to usage, we recommend warming the applied surface to about 85°C, and/or the adhesive to about 50°C to promote faster capillary flow.