

Down-Hole Applications



Why use Epoxies for Down-Hole Applications?

Epoxies are very robust materials that can withstand harsh conditions, such as high temperature, high pressure, and mechanical shock.

Down-hole applications include:

- Electrical connections within a microelectronic package (die attach, capacitor attach)
- Protected thermal connections (heat sinking, capacitor attach)
- Potting compound to encapsulate electronics and protect them from the environment
- Fiber optic cabling and interconnected sensor devices

Which EPO-TEK® Products Are Best Suited for Down-Hole Applications?

- Electrically Conductive Component Attach
 - *High Temperature Exposure:* [H20E](#), [H20E-175](#), [H24](#), [H35-175MP](#), [H37-MP](#)
 - *Heat Sinking:* [EK1000-1](#)
- Non-Conductive Component Attach
 - *High Temperature Exposure:* [H65-175MP](#), [H67-MP](#), [H74](#), [H77](#)
 - *Heat Sinking:* [T905BN-3](#), [930-4](#)
- Potting & Protection
 - *Small Volume:* [302-3M](#), [353ND](#), [OD2002](#)
 - *Thermally Conductive:* [H77](#), [T905BN-3](#)
- High Temperature Resistant Materials (260°C-300°C)
 - *Low Viscosity Pourable Liquid:* [118-150-2](#)
 - *Thixotropic Paste:* [120-183-3](#)
- Fiberoptic Bundles
 - *Low Viscosity and Wicking:* [353ND](#), [377](#)

Characteristics To Help Choose the Correct EPO-TEK® Product

EPO-TEK	Key advantages/ Characteristics
118-150-2	Pourable liquid with enhanced performance above 260°C
120-183-3	Thixotropic paste with enhanced performance above 260°C
302-3M	Proven saline resistance for a harsh chemical environment
353ND	Strong chemical and moisture resistance (reliable industry standard)
377	Strong chemical and moisture resistance, long pot life
930-4	Non conductive, high ThK with small particle filler for small gaps
EK1000-1	ECA with highest measured ThK
H20E	ECA with high ThK, rheology ideal for multiple application types
H20E-175	ECA, higher temperature rated version of H20E
H24	ECA with very high degradation temperature
H35-175MP*	High strength ECA
H37-MP*	High strength and high thixotropy ECA
H65-175MP*	ThK version of H35-175MP
H67-MP*	High thixotropy, ThK version of H37-MP
H74	Strong chemical resistance, plus ThK
H77	Potting compound with good chemical resistance for protection of parts
OD2002	Strong chemical, moisture and impact resistance
T905BN-3	High ThK, designed for large volume potting

ECA – Electrically Conductive Adhesives, * MP – Military Approved, ThK – Thermally Conductive



How Do The EPO-TEK Properties Compare?

EPO-TEK®	NO. of COMPONENTS	COLOR Before/ After CURE (thin film)	CURE TEMPERATURE (min/hal)	VISCOSITY @ 23°C	GLASS TRANSITION TEMPERATURE (Tg)	DIE SHEAR STRENGTH @ RT (80mil x 80mil)	INDEX OF REFRACTION (nd)	SPECTRAL TRANSMISSION	TGA DEGRADATION TEMPERATURE	GTE Below Tg/Above Tg (In/In ²)	POT LIFE (@ room temp.)	SHELF LIFE (@ room temp. unless noted)
118-150-2	One	Clear/Amber	80°C - 1 hour + 150°C - 1 hour + 177°C - 2 hours	8,724 cPs @ 20 rpm	264°C	13 kg/4,420 psi	1.5850 (uncured)	N/A	264°C	47 x 10 ⁻⁶ 219 x 10 ⁻⁶	16 hours	1 year @ -40°C
120-183-3	One	Off White/Tan	120°C - 1 hour + 177°C - 1 hour + 265°C - 2 hours	124,928 cPs @ 1 rpm	255°C	≥ 7 kg/2,380 psi	N/A	N/A	443°C	46 x 10 ⁻⁶ 85 x 10 ⁻⁶	16 hours	1 year @ -40°C
302-3M	Two	Clear/Colorless	65°C - 3 hours 23°C - 24 hours	800 - 1,600 cPs @ 100 rpm	≥ 55°C	≥ 10 kg/3,400 psi	1.5446 (uncured)	>95% @ 460-1620nm	351°C	56 x 10 ⁻⁶ 193 x 10 ⁻⁶	1 hour	1 year
353ND	Two	Amber/ Dark Red	150°C - 1 min 80°C - 30 min	3,000 - 5,000 cPs @ 50 rpm	≥ 90°C	≥ 15 kg/5,100 psi	1.5694 (uncured)	>50% @ 550nm >98% @ 800-1000nm >95% @ 1100-1600nm	412°C	54 x 10 ⁻⁶ 206 x 10 ⁻⁶	≤ 3 hours	1 year
377	Two	Clear/Amber	150°C - 1 hour	150 - 300 cPs @ 100 rpm	≥ 95°C	≥ 10 kg/3,400 psi	1.5195 (uncured)	>90% @ 600-1000nm >98% @ 1000-6800nm	375°C	57 x 10 ⁻⁶ 210 x 10 ⁻⁶	24 hours	1 year
930-4	Two	Ivory/Amber	150°C - 10 min 100°C - 4 hours 80°C - 6 hours	12,000 - 17,000 cPs @ 20 rpm	≥ 90°C	≥ 15 kg/5,100 psi	N/A	N/A	425°C	27 x 10 ⁻⁶ 136 x 10 ⁻⁶	1 day	1 year
EK1000-1	One	Silver/Silver	150°C - 1 hour + 200°C - 1 hour 200°C - 30 min	13,000 - 21,000 cPs @ 10 rpm	≥ 80°C	≥ 10 kg/3,556 psi	N/A	N/A	372°C	41 x 10 ⁻⁶ 162 x 10 ⁻⁶	2 weeks	1 year @ -40°C
H20E	Two	Silver/Silver	175°C - 45 sec 80°C - 3 hours	2,200 - 3,200 cPs @ 100 rpm	≥ 80°C	> 10 kg/3,400 psi	N/A	N/A	425°C	31 x 10 ⁻⁶ 158 x 10 ⁻⁶	2.5 days	1 year
H20E-175	Two	Silver/Silver	180°C - 1 hour 150°C - 2 hours	2,800 - 3,800 cPs @ 100 rpm	≥ 85°C	≥ 10 kg/3,400 psi	N/A	N/A	450°C	20 x 10 ⁻⁶ 88 x 10 ⁻⁶	3.5 days	1 year
H24	Two	Silver/Silver	150°C - 5 min 80°C - 45 min	15,000 - 23,000 cPs @ 10 rpm	≥ 100°C	≥ 5 kg/1,700 psi	N/A	N/A	470°C	28 x 10 ⁻⁶ 104 x 10 ⁻⁶	18 hours	6 months
H35-175MP*	One	Silver/Silver	180°C - 1 hour 165°C - 90 min	22,000 - 28,000 cPs @ 10 rpm	≥ 100°C	≥ 10 kg/3,400 psi	N/A	N/A	372°C	31 x 10 ⁻⁶ 97 x 10 ⁻⁶	28 days	1 year @ -40°C
H37-MP*	One	Silver/Silver	150°C - 1 hour	22,000 - 26,000 cPs @ 10 rpm	≥ 90°C	≥ 10 kg/3,400 psi	N/A	N/A	358°C	52 x 10 ⁻⁶ 148 x 10 ⁻⁶	28 days	1 year @ -40°C
H65-175MP*	One	Ivory/Ivory	180°C - 1 hour	80,000 - 120,000 cPs @ 2.5 rpm	≥ 100°C	≥ 20 kg/6,800 psi	N/A	N/A	397°C	38 x 10 ⁻⁶ 136 x 10 ⁻⁶	28 days	1 year @ -40°C
H67-MP*	One	Ivory/Ivory	150°C - 1 hour	300,000 - 400,000 cPs @ 1 rpm	≥ 90°C	≥ 20 kg/6,800 psi	N/A	N/A	350°C	16 x 10 ⁻⁶ 68 x 10 ⁻⁶	28 days	1 year @ -40°C
H74	Two	Grey/ Dark Grey	150°C - 5 min 100°C - 20 min	45,000 - 65,000 cPs @ 5 rpm	≥ 100°C	≥ 15 kg/5,100 psi	N/A	N/A	425°C	21 x 10 ⁻⁶ 95 x 10 ⁻⁶	2 hours	1 year
H77	Two	Grey/Grey	150°C - 1 hour	6,000 - 12,000 cPs @ 20 rpm	≥ 80°C	≥ 5 kg/1,700 psi	N/A	N/A	405°C	33 x 10 ⁻⁶ 130 x 10 ⁻⁶	6 hours	1 year
002002	Two	Cloudy/Ivory	150°C - 5 min 100°C - 30 min	24,000 - 42,000 cPs @ 2.5 rpm	> 140°C	≥ 10 kg/3,400 psi	1.5728 (uncured)	>98% @ 800-1640nm	443°C	45 x 10 ⁻⁶ 187 x 10 ⁻⁶	4 hours	1 year
T905BN-3	Two	Grey/Grey	80°C - 2 hours	2,000 - 7,000 cPs @ 50 rpm	≥ 40°C	≥ 10 kg/3,400 psi	N/A	N/A	347°C	37 x 10 ⁻⁶ 151 x 10 ⁻⁶	3 hours	1 year

* MP - Military Approved, N/A - not available/applicable

Please consult our *Application Experts* at Epoxy Technology to find the most suitable adhesives for specific technical challenges at: techserv@epotek.com.



DISCLAIMER: Data presented is provided only to be used as a guide. Properties listed are typical, average values, based on tests believed to be accurate. It is recommended that users perform a thorough evaluation for any application based on their specific requirements. Epoxy Technology makes no warranties (expressed or implied) and assumes no responsibility in connection with the use or inability to use these products. Please refer to the product data sheets and safety data sheets (SDS) for more detailed information.

Epoxy Technology Inc. • 14 Fortune Drive • Billerica, MA 01821
 phone 978-667-3805 fax 978-663-9782 techserv@epotek.com
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