Manufacturer:
Epoxy Technology

Product Name:
EPO-TEK® 353ND High Temperature Black Epoxy, Heat Cure- Pre-Mixed and Frozen (3cc Syringe)

Manufacturer Part Number:
ET353NDBLK-3CC

EPO-TEK® 353ND Black

Technical Data Sheet
For Reference Only
High Temperature Epoxy

Date:	February 2022
Rev:	XII
No. of Components:	Two
Mix Ratio by Weight:	10 : 1
Specific Gravity:	Part A: 1.22 Part B: 1.02
Pot Life:	< 2 Hours
Shelf Life- Bulk:	One year at room temperature
Shelf Life- Syringe:	Six months at -40°C

Recommended Cure: 150°C / 1 Hour

Minimum Alternative Cure(s):
May not achieve performance properties listed below
150°C / 1 Minute
120°C / 5 Minutes
100°C / 10 Minutes

NOTES:
- Container(s) should be kept closed when not in use.
- Filled systems should be stirred thoroughly before mixing and prior to use.
- Performance properties (rheology, conductivity, others) of the product may vary from those stated on the data sheet when bi-pak/syringe packaging or post-processing of any kind is performed. Epoxy's warranties shall not apply to any products that have been reprocessed or repackaged from Epoxy's delivered status/container into any other containers of any kind, including but not limited to syringes, bi-paks, cartridges, pouches, tubes, capsules, films or other packages.
- Syringe packaging will impact initial viscosity and effective pot life, potentially beyond stated parameters.
- *TOTAL MASS SHOULD NOT EXCEED 25 GRAMS*
- Black color is cosmetic only, and not intended to be photonic, spectral, or lampblack. All users need to confirm its opacity versus wavelength.

Product Description: EPO-TEK® 353ND Black is a two component, high temperature epoxy designed for semiconductor, hybrid, fiber optic, and medical applications.

Typical Properties: Cure condition: 150°C / 1 Hour Different batches, conditions & applications yield differing results.
Data below is not guaranteed. To be used as a guide only, not as a specification. * denotes test on lot acceptance basis

PHYSICAL PROPERTIES:			
* Color (before cure):	Part A: Black	Part B: Amber	
* Consistency:	Pourable liquid		
* Viscosity (23°C) @ 50 rpm:	3,000 - 5,000	cPs	
Thixotropic Index:	N/A		
* Glass Transition Temp:	≥ 90	°C (Dynamic Cure: 20-200°C/ISO 25 Min; Ramp -10-200°C @20°C/Min)	
Coefficient of Thermal Expansion (CTE):			
Below Tg:	54	x 10^{-6} in/in°C	
Above Tg:	206	x 10^{-6} in/in°C	
Shore D Hardness:	85		
Lap Shear @ 23°C:	> 2,000	psi	
Die Shear @ 23°C:	≥ 15	Kg 5,334 psi	
Degradation Temp:	420	°C	
Weight Loss:			
@ 200°C:	0.92	%	
@ 250°C:	1.24	%	
@ 300°C:	1.83	%	
Suggested Operating Temperature:	< 325	°C (Intermittent)	
Storage Modulus:	516,912	psi	
Ion Content:	Cl^-: 595 ppm	Na^+: 52 ppm	
	NH_4^+: 1149 ppm	K^+: 16 ppm	
Particle Size:	N/A		

ELECTRICAL AND THERMAL PROPERTIES:		
Thermal Conductivity:	N/A	
Volume Resistivity @ 23°C:	≥ 1.6 x 10^{13}	Ohm-cm
Dielectric Constant (1KHz):	3.09	
Dissipation Factor (1KHz):	0.005	

OPTICAL PROPERTIES @ 23°C:		
Spectral Transmission:	< 3 % @ 1500	nm

Epoxies and Adhesives for Demanding Applications™

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Refractive Index:	N/A

EPO-TEK® 353ND Black Advantages & Suggested Application Notes:

- EPO-TEK® 353ND Black has been color-coded black for optical applications requiring opacity against light in IR and VIS region.
- Reasonable pot-life that allows for low temperature curing to be realized.
- Semiconductor suggested applications: wafer-wafer bonding of CSP, fabrication of MEMs devices, flip chip underfill.
- Hybrid suggested applications: providing near hermetic seals in sensor devices, resisting high temperature packaging.
- Fiber optic adhesive designed to meet Telecordia 1221 - suggested applications:
  - Sealing fiber into ferrules, transmitting light in the optical pathway from 800- 1550 nm range.
  - Fiber component packaging; adhesive for active alignment of optics, environmental seal of opto-package, V-groove arrays.
  - Down-Hole petrochemical fiber optic sensors, resisting >200 C field conditions
- Electronics Assembly suggested applications:
  - Used as dielectric layer in the fabrication of capacitors; laminating PZT ferroelectrics found in ultrasound or ink-jetting devices.
  - Impregnating and insulating copper coil windings in motors and inductor coils. Bonding ferrite cores and magnets.
  - Structural grade epoxy found in hard-disk drive devices; bonding of SST metals, kapton, and magnets.