

Date: August 2024
Rev: XXXII
No. of Components: Two
Mix Ratio by Weight: 10 : 1
Specific Gravity: Part A: 1.20 | Part B: 1.02 **Syringe:** 1.18
Pot Life: ≤3 Hours **Syringe:** 1.18
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
 150°C / 1 Minute
 120°C / 5 Minutes
 100°C / 10 Minutes
 80°C / 30 Minutes

Product Description:

EPO-TEK® 353ND is a two component, high temperature epoxy designed for semiconductor, hybrid, and fiber optic applications. It is one of the most popular EPO-TEK® brand products, and is known throughout the world for its performance and reliability. Also available in single component frozen syringe.

Typical Properties:

Cure condition: 150°C / 1 Hour

Different batches, conditions, and 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.

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.
- If product crystallizes in storage, place container in warm oven until crystallization disappears. Please refer to Tech Tip #7 on website
- TOTAL MASS SHOULD NOT EXCEED 25 GRAMS


| Physical Properties | Details |
|--|---|
| * Color (before cure) | Part A: Clear (Gardner < 5), Part B: Amber (Gardner < 18) |
| * Consistency | Pourable liquid |
| * Viscosity (23°C) @ 100 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 | 412 °C |
| Weight Loss: | @ 200°C: 0.22%, @ 250°C: 0.39%, @ 300°C: 0.87% |
| Suggested Operating Temperature | < 350 °C (Intermittent) |
| Storage Modulus: | 508,298 psi |
| Ion Content | Cl ⁻ : 329 ppm, NH ₄ ⁺ : 409 ppm, K ⁺ : 5 ppm |
| *Particle Size | N/A |

| Electrical & Thermal Properties | Details |
|---------------------------------|----------------------------------|
| Thermal Conductivity | N/A |
| Volume Resistivity @ 23°C | $\geq 1.8 \times 10^{13}$ Ohm-cm |
| Dielectric Constant (1KHz) | 3.17 |
| Dissipation Factor (1KHz) | 0.005 |

| Optical Properties @23°C | Details |
|--------------------------|----------------------------|
| Spectral Transmission: | $\geq 50\%$ @ 550 nm |
| | $\geq 95\%$ @ 1100-1600 nm |
| | $\geq 98\%$ @ 800-1000 nm |
| Refractive Index: | 1.5694 @589 nm |

EPO-TEK® 301-2 Advantages & Suggested Application Notes

- Reasonable pot-life that allows for low temperature curing to be realized. It has an amber color change upon cure.
- Passes NASA low outgassing standard ASTM E595 with proper cure - <http://outgassing.nasa.gov/>
- Semiconductor suggested applications: wafer-wafer bonding of CSP; fabrication of MEMs devices; flip chip underfill.
- Hybrid suggested applications: providing near hermetic seals and UHV seals in sensor devices, resisting high temperature packaging.
 - Down-Hole petrochemical fiber optic sensors, resisting >200°C field conditions.
- 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.
- 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.
- For an ISO 10993 biocompatible version, see EPO-TEK® MED-353ND.

| | |
|---|---|
| UNDERWRITERS LABORATORIES INC. LISTED ADHESIVES 16UK UL 181 B-M For use with UL Listed flexible air ducts or connectors |  |
|---|---|



EPOXY TECHNOLOGY, INC.
 14 FORTUNE DRIVE | BILLERICA
 MA 01821 (978) 667-3805
 FAX (978) 663-9782 | www.epotek.com