

Tough 2000 V2

RUGGED, ABS-LIKE ENGINEERING RESIN

Tough 2000 V2 is a rugged engineering photopolymer with strength and stiffness comparable to ABS, combined with high ductility, temperature resistance, and creep resistance. Its dark matte finish supports presentation-ready functional prototypes, durable housings, manufacturing aids, and selected end-use parts. Final performance should be verified for the intended geometry, loading, temperature, chemical exposure, and service duration.

Design Advantages

- Post-cured tensile strength of 40.4 MPa with 79% elongation at break
- Post-cured flexural modulus of 1,701 MPa and HDT of 70 °C at 0.45 MPa
- Published impact, fracture-toughness, flex-fatigue, creep, and DMA data
- Dark matte finish for rugged enclosures, jigs, fixtures, and production-ready parts

Material Specifications

ITEM	PUBLISHED VALUE
Material family	Tough ABS-like engineering photopolymer
Ultimate tensile strength	40.4 MPa, post-cured
Tensile modulus	1,800 MPa, post-cured
Elongation at break	79%, post-cured
Shore hardness	76D, post-cured
HDT at 0.45 MPa	70 °C, post-cured

Application Fit

- Robust housings and enclosures exposed to mechanical or thermal stress
- Jigs, fixtures, assembly aids, and durable factory-floor tooling
- ABS-like functional prototypes requiring strength, stiffness, and ductility
- Selected end-use components with a smooth, dark matte appearance

Mechanical, Impact, and Fracture Properties

PROPERTY	GREEN	POST-CURED	METHOD
Ultimate tensile strength	26.1 MPa	40.4 MPa	ASTM D638-14
Tensile modulus	1,235 MPa	1,800 MPa	ASTM D638-14
Tensile strength at yield	26.1 MPa	40.4 MPa	ASTM D638-14
Elongation at yield	5.0%	4.5%	ASTM D638-14
Elongation at break	149%	79%	ASTM D638-14
Flexural strength	38 MPa	67 MPa	ASTM D790-17
Flexural modulus	1,040 MPa	1,701 MPa	ASTM D790-17
Notched / unnotched Izod	24 / 323 J/m	25 / 325 J/m	ASTM D256 / D4812
Notched / unnotched Charpy	2 / 20 kJ/m ²	2.4 / 31 kJ/m ²	ISO 179-1
Gardner impact, 0.79 mm	4.8 J	1.6 J	ASTM D5420-21
Ross flex fatigue	11,900 cycles	3,560 cycles	23 °C, 30°, 1 Hz
Stress intensity Kmax	1.4 MPa·m ^{1/2}	1.65 MPa·m ^{1/2}	ASTM D5045-14
Work of fracture	330 J/m ²	305 J/m ²	ASTM D5045-14

Thermal, Electrical, and General Properties

PROPERTY	GREEN	POST-CURED	METHOD
HDT at 1.8 / 0.45 MPa	45 / 53 °C	57 / 70 °C	ASTM D648-16
Thermal expansion, 0–150 °C	142.6 µm/m/°C	134.2 µm/m/°C	ASTM E831-19
Flammability	Not tested	HB	UL 94
Dielectric strength	—	15.5 kV/mm	ASTM D149-20
Dielectric constant	—	3.46 at 50 Hz; 3.38 at 1 kHz	ASTM D150
Dissipation factor	—	0.018 at 50 Hz; 0.012 at 1 kHz	ASTM D150
Volume resistivity	—	3 × 10 ¹⁸ Ω·cm	ASTM D257-14
Shore D hardness	61D	76D	ASTM D2240
Bulk / liquid density	—	1.09 / 1.03 g/mL	ASTM D792-20
Liquid viscosity at 25 °C	—	2,680 cP	Published

24-Hour Chemical Weight Gain

FLUID	GAIN	FLUID	GAIN
Acetic acid, 5%	0.17%	Isooctane	21.24%
Acetone	22.92%	Mineral oil, light	0.12%
Isopropyl alcohol	4.21%	Mineral oil, heavy	0.07%
Bleach, about 5% NaOCl	0.11%	Salt water, 3.5% NaCl	0.16%
Butyl acetate	18.65%	Sodium hydroxide, pH 10	0.18%
Diesel fuel	0.08%	Water	0.19%
Diethylene glycol monomethyl ether	4.65%	Xylene	27.69%
Hydraulic oil	0.06%	Concentrated HCl	1.96%
Skydrol 5	0.96%	TPM	1.86%
Hydrogen peroxide, 3%	0.21%		

ASTM D543 Property Retention After Immersion

FLUID	MODULUS 1D / 1W	STRENGTH 1D / 1W	MASS 1D / 1W
IPA	63 / 18%	66 / 27%	107 / 119%
Acetone	37 / 45%	43 / 39%	139 / 137%
NaOH, pH 10	93 / 100%	101 / 97%	100 / 101%
HCl, 10%	100 / 104%	102 / 99%	100 / 100%
DI water	103 / 106%	102 / 97%	100 / 101%
Hydrogen peroxide, 3%	100 / 92%	102 / 93%	100 / 101%
Bleach, about 5% NaOCl	98 / 95%	100 / 92%	100 / 100%
Diesel	93 / 97%	101 / 92%	100 / 101%
Motor oil	92 / 98%	101 / 96%	100 / 100%
Skydrol 5	93 / 98%	101 / 94%	102 / 103%

Processing and Design Notes

Published specimens used 100 μ m layers, a two-stage 10+5 minute wash in at least 99% isopropyl alcohol, and a 12-minute post-cure at 70 °C. Published creep testing used 4 MPa at 22 °C for 14 days. DMA identified a glass transition at 112.2 °C and storage-modulus inflection at 76.96 °C; these values are not continuous-use ratings.

Published Data and Qualification

Values are published specimen data for design reference; Lucent Additive has not independently generated every value. Geometry, orientation, process settings, post-curing, temperature, and exposure history can change performance. Chemical results do not establish long-term compatibility. Validate representative finished parts under intended loads, duty cycles, temperatures, and fluids.

Start an Application Review

Send Lucent Additive your CAD model, quantity, loads, temperature range, duty cycle, chemical exposure, inspection needs, and target schedule. We can review material fit, production strategy, and validation needs before quoting.

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