

Tough 1500 V2

STIFF AND COMPLIANT MATERIAL FOR TOUGH FUNCTIONAL PARTS

Tough 1500 V2 is a resilient engineering resin designed to balance strength, stiffness, ductility, and impact resistance. Its post-cured mechanical response is comparable to polypropylene for functional prototypes, compliant mechanisms, rugged enclosures, jigs, fixtures, and selected end-use components. Published values should be verified for the intended geometry and service environment.

Design Advantages

- Post-cured tensile strength of 34 MPa with 155% elongation at break
- Post-cured flexural modulus of 1,370 MPa for a useful balance of stiffness and compliance
- High unnotched impact performance and documented fracture-toughness data
- Snap-fit, latch, flexure, damper, and self-tapping screw-boss applications

Material Specifications

ITEM	PUBLISHED VALUE
Material family	Tough engineering photopolymer
Published hardness	Shore 76D, post-cured
Bulk density	1.12 g/mL, post-cured
Ultimate tensile strength	34 MPa, post-cured
Elongation at break	155%, post-cured
Heat deflection temperature	66 C at 0.45 MPa, post-cured

Application Fit

- Rugged housings and enclosures with snap fits or screw bosses
- Impact-resistant manufacturing jigs and fixtures
- Compliant mechanisms including latches, flexures, and dampers
- Functional prototypes requiring polypropylene-like toughness and resilience

Mechanical Properties

PROPERTY	GREEN	POST-CURED	METHOD
Ultimate tensile strength	30 MPa	34 MPa	ASTM D638-14
Tensile modulus	1,250 MPa	1,460 MPa	ASTM D638-14
Tensile strength at yield	30 MPa	34 MPa	ASTM D638-14
Elongation at yield	5.6%	6.1%	ASTM D638-14
Elongation at break	210%	155%	ASTM D638-14
Flexural strength	26 MPa	41 MPa	ASTM D790-17
Flexural modulus	900 MPa	1,370 MPa	ASTM D790-17
Notched Izod	45 J/m	42 J/m	ASTM D256-10
Unnotched Izod	1,080 J/m	910 J/m	ASTM D4812-11
Notched Charpy	8.9 kJ/m ²	7.5 kJ/m ²	ISO 179-1
Unnotched Charpy	63 kJ/m ²	57 kJ/m ²	ISO 179-1
Fracture toughness K _{max}	1.7 MPa-m ^{1/2}	1.7 MPa-m ^{1/2}	ASTM D5045-14
Work of fracture	1,090 J/m ²	1,011 J/m ²	ASTM D5045-14

Thermal Properties

PROPERTY	GREEN	POST-CURED	METHOD
HDT at 1.8 MPa	42 C	53 C	ASTM D648-16
HDT at 0.45 MPa	54 C	66 C	ASTM D648-16
Thermal expansion, 0 to 150 C	116 um/m/C	99 um/m/C	ASTM E831-19
Flammability	Not tested	UL 94 HB	UL 94

Post-Cured Electrical and General Properties

PROPERTY	PUBLISHED VALUE	METHOD
Dielectric strength	23.4 kV/mm	ASTM D149-20
Dielectric constant	4.5 at 50 Hz; 3.9 at 1 kHz	ASTM D150
Dissipation factor	0.018 at 50 Hz; 0.013 at 1 kHz	ASTM D150
Volume resistivity	2.91 x 10 ¹⁵ ohm-cm	ASTM D257-14
Shore hardness	76D	ASTM D2240

Chemical Compatibility

FLUID	24 H WEIGHT GAIN
Acetic acid, 5%	0.22%
Acetone	29.64%
Isopropyl alcohol	6.54%
Bleach, about 5% NaOCl	-0.05%
Butyl acetate	41.35%
Diesel fuel	0.04%
Diethylene glycol monomethyl ether	5.71%
Hydraulic oil	0.04%
Skydrol 5	2.41%
Hydrogen peroxide, 3%	0.31%
Isooctane, gasoline analogue	42.92%
Mineral oil, light	0.02%
Mineral oil, heavy	0.04%
Salt water, 3.5% NaCl	0.24%
Sodium hydroxide, 0.025% pH 10	0.17%
Water	0.21%
Xylene	72.57%
Concentrated hydrochloric acid	2.15%
TPM	5.90%

Skin Contact Biocompatibility Endpoints

Published testing reports the material as not cytotoxic under ISO 10993-5 and not an irritant or sensitizer under ISO 10993-10. These endpoints do not by themselves establish finished-device compliance.

Design and Qualification Notes

Chemical immersion can change mass, tensile modulus, strength, and elongation; qualify the intended fluid, concentration, duration, and temperature. Published evaluations also include heat aging at 50 C, indoor xenon-arc exposure, accelerated outdoor weathering, and flexural creep at 22 C under 4 MPa. DMA data report a glass transition at 109.6 C and a storage-modulus inflection at 60.8 C; these values do not replace load-specific temperature qualification.

Published Data and Qualification

The values in this sheet are based on published green and post-cured specimen data and are provided for design reference and material comparison. Lucent Additive has not independently generated every published value. Properties can vary with geometry, orientation, process settings, post-curing, temperature, and exposure history. Validate final-part performance using the intended production process and service environment.

Start an Application Review

Send Lucent Additive your CAD model, quantity, load conditions, operating temperature, impact needs, chemical exposure, compliance requirements, and target schedule. Our team can review material fit, production strategy, and validation needs before quoting.

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