SELECTIVE LASER SINTERING

TPU 88A

Flexible & Durable Excellence



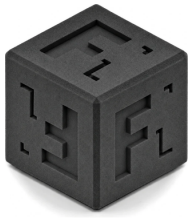
Ultrasint TPU 88A is a thermoplastic polyurethane powder specifically developed for selective laser sintering. This material delivers an exceptional balance of flexibility, strength, and durability, making it ideal for applications requiring elastomeric properties. With Shore A hardness of 88-90, TPU 88A provides excellent shock absorption, fatigue resistance, and the ability to print fine details and complex geometries.

SURFACE FINISHES



Standard Finish Natural white

Parts are depowdered and bead blasted to an even, fine-textured matte finish in natural white. Detail stays clear and well defined, and the durable surface suits functional and end-use parts.



Deep Color Dye Enhanced Finish

DyeMansion deep colour dyeing gives a rich, uniform colour across the entire part, even on complex geometries and intricate designs. The dye also improves scratch resistance, making parts more durable in handling and use.

BUILD VOLUME	LEAD TIME	LAYER HEIGHT	TOLERANCE
340 × 340 × 600 mm	2-4 business days	0.10 mm	±0.3% (min ±0.3 mm)

MECHANICAL PROPERTIES

Strength, stiffness and elongation show how far TPU 88A parts stretch and how firmly they recover, giving flexible gaskets and seals, sports protective equipment and custom footwear components the durability they need in production. Hardness, stiffness, rebound and compression set are the same along and across the layers, while elongation at break is lower in the build direction, so parts that must stretch furthest are best oriented along the build plane.

Tear, abrasion, impact and Ross flex results show how parts hold up to repeated stretching, scuffing and flexing, including results below freezing, so TPU 88A keeps its integrity under repetitive stress across automotive, sports and medical applications.

PROPERTY	VALUE	TEST STANDARD
Shore A Hardness (X / Z)	**88–90**	DIN ISO 7619-1
Tensile Strength (X)	**8 MPa**	DIN 53504, S2
Tensile Strength (Z)	**7 MPa**	DIN 53504, S2
Elongation at Break (X)	**270 %**	DIN 53504, S2
Elongation at Break (Z)	**130 %**	DIN 53504, S2

Tensile Modulus (X / Z)	**75 MPa**	ISO 527-2, 1A
Flexural Modulus (X / Z)	**70 MPa**	DIN EN ISO 178
Tear Resistance, Propagation (Trouser) (X / Z)	**26 kN/m**	DIN ISO 34-1, A
Tear Resistance, Initiation (Graves) (X / Z)	**43 / 37 kN/m**	DIN ISO 34-1, B
Compression Set B (23 °C, 72 h) (X / Z)	**24 %**	DIN ISO 815-1
Rebound Resilience (X / Z)	**63 %**	DIN 53512
Abrasion Resistance, Volume Loss (X / Z)	**86 / 95 mm³**	DIN ISO 4649
Charpy Impact Strength, Notched, 23 °C (X / Z)	**No break**	DIN EN ISO 179-1
Charpy Impact Strength, Notched, −10 °C (X / Z)	**60 / 58 kJ/m²**	DIN EN ISO 179-1
Flex Fatigue, Ross Flex (100,000 cycles, 23 °C)	**No cut growth**	ASTM D1052
Flex Fatigue, Ross Flex (100,000 cycles, −10 °C)	**No cut growth**	ASTM D1052

THERMAL PROPERTIES

The low glass transition temperature keeps TPU 88A rubbery and impact resistant in cold conditions, and the Vicat softening temperature marks where loaded parts begin to soften, guiding design for automotive and sports parts that see repeated thermal cycling.

PROPERTY	VALUE	TEST STANDARD
Glass Transition Temperature (DSC, 20 K/min)	**-48 °C**	ISO 11357
Melting Temperature (DSC, 20 K/min)	**120–150 °C**	ISO 11357
Vicat Softening Temperature A/10 N (X / Z)	**98 °C**	DIN EN ISO 306

PHYSICAL PROPERTIES

Consistent density and surface quality keep critical features in tolerance and downstream finishing predictable.

Bulk density and particle size describe the powder. Values are measured after three days at 23 °C and 50% relative humidity and represent stable part performance at the recommended 20% fresh / 80% recycled powder refresh.

PROPERTY	VALUE	TEST STANDARD
Part Density	**1.1 g/cm³**	DIN EN ISO 1183-1
Bulk Density (powder)	**0.5 g/cm³**	DIN EN ISO 60
Mean Particle Size d50 (powder)	**70–90 µm**	ISO 13320
Colour (as printed)	**Natural white**	—

CHEMICAL PROPERTIES

Forward AM immersed TPU 88A for 42 days at 23 °C. Tensile strength and elongation stay stable in grease, hydraulic fluid, engine oil, gear oil and coolant, while brake fluid and repeated 40 °C detergent washing reduce elongation. The stabilised ester base holds its properties in water at 40 °C for more than 70 days, but parts should not stay in water hotter than 60 °C, where mechanical properties decline.

Chemical ratings are screening guidance; confirm them with application-specific testing before production release.

CHEMICAL	TENSILE STRENGTH	ELONGATION AT BREAK
Lubricating grease	**Good**	**Good**
Hydraulic fluid	**Good**	**Good**
Engine oil	**Good**	**Good**
Gear oil (ATF)	**Good**	**Good**
Glycol engine coolant	**Good**	**Good**
Detergent wash (15 cycles, 40 °C)	**Good**	**Moderate**
Brake fluid DOT 4	**Moderate**	**Poor**

BIOCOMPATIBILITY AND COMPLIANCE

Each status comes from Forward AM test reports and declarations for Ultrasint TPU 88A, so teams can start skin-contact and automotive material reviews from supplier data. Forward AM asks for the skin-contact tests to be repeated on the final part, and states no sterilization method, USP Class VI rating or food contact approval.

It passes the FMVSS 302 vehicle interior burn rate test without flame retardants, is listed in IMDS, and Forward AM provides REACH, RoHS, ELV and GADSL declarations.

STANDARD	STATUS
ISO 10993-5 (Cytotoxicity) Printed specimens passed neutral red cytotoxicity testing (EN ISO 10993-5:2009); retest on the final part	Forward AM tested
OECD 439 (In vitro skin irritation) Printed specimens passed reconstructed human skin model irritation testing	Forward AM tested
ISO 10993-10 (Sensitization) Printed specimens passed the local lymph node assay (ISO 10993-10:2013, OECD 429)	Forward AM tested
FMVSS 302 (Vehicle interior flammability) 84 mm/min burn rate on 1.08 mm XY and 1.2 mm Z plates, below the 102 mm/min limit; contains no flame retardants	Forward AM tested
REACH (including SVHC) Regulatory document available from Forward AM	Forward AM declaration
RoHS Restriction of hazardous substances document available from Forward AM	Forward AM declaration
ELV and GADSL End-of-Life Vehicle and Global Automotive Declarable Substance List documents available	Forward AM declaration
IMDS Listed in the International Material Data System for automotive supply chains	IMDS listed

SUPPORTING DOCUMENTS

RoHS declaration