

Formlabs TPU 90A Powder

Selective Laser Sintering | TPU | powder

Compiled by FabDigit from manufacturer technical data. Values below belong to this named product; unreported properties are omitted.

Manufacturer: Formlabs

Source revision: Rev 01 2023-03-14

Recorded system family: Fuse 1+ 30W, Fuse 1

As-printed colour: Gray. Formlabs lists the as-printed colour as Grey

Test values are typical reported results, not guaranteed design allowables or finished-part certification. Review the complete source for specimen preparation, orientation and conditioning.

Test basis: The TDS says Fuse 1 and Fuse 1+ 30W results are equivalent within experimental uncertainty; it does not state a specimen-conditioning regime.

Direction: Tensile strength, elongation, stress at 50% and 100% elongation, and tear resistance report X/Y and Z values. The remaining rows do not state an orientation.

Mechanical

PROPERTY	VALUE	TEST / CONDITION
Tensile Strength (Ultimate)	8.7 MPa	per ASTM D412-16 Method A; X/Y 8.7 / Z 7.2
Elongation at Break	310 %	per ASTM D412-16 Method A; X/Y 310 / Z 110
Tear Strength	66 kN/m	per ASTM D624-00 (2020); X/Y 66 / Z 39
Compression Set (22 h, 70 deg C)	20.5 %	per ASTM D395-18 Method B; 23 deg C 20.5 / 70 deg C 59.9
Hardness, Shore A	90 Shore A	per ASTM D2240-15 (2021)

Thermal

PROPERTY	VALUE	TEST / CONDITION
Vicat Softening Point (B50)	94.3 deg C	per ASTM D1525

Physical

PROPERTY	VALUE	TEST / CONDITION
Water absorption (manufacturer test)	0.89 %	per ASTM D570; printed part
Density	1.14 g/cm3	per In-house method; Bulk density (sintered)

Manufacturability

PROPERTY	VALUE	TEST / CONDITION
Powder Moisture Content	0.19 %	per ISO 15512 Method D

Additional elastomer observations

Manufacturer TDS methods listed by row

Observation	Metric	Imperial	Method
Stress at 50% elongation (X/Y)	6.1 MPa	889 psi	ASTM D412-16, Method A
Stress at 50% elongation (Z)	5.9 MPa	860 psi	ASTM D412-16, Method A
Stress at 100% elongation (X/Y)	7.2 MPa	1050 psi	ASTM D412-16, Method A
Stress at 100% elongation (Z)	7.0 MPa	1020 psi	ASTM D412-16, Method A
Taber abrasion	122 mm3	7 x 10 ⁻³ in3	ISO 4649 (40 rpm, 10 N load)

These exact TDS observations supplement the normalized comparable properties; they do not replace part-level validation.

Solvent compatibility screen

24 h immersion mass change reported by the manufacturer

Solvent	24 h weight gain
Acetic acid 5%	1.3%
Acetone	28.6%
Isopropyl alcohol	4.8%
Bleach (~5% NaOCl)	0.8%
Butyl acetate	16.5%
Diesel fuel	2.0%
Diethyl glycol monomethyl ether	14.4%
Hydraulic oil	2.8%
Skydrol 5	6.5%
Hydrogen peroxide (3%)	1.0%
Isooctane (gasoline)	0.7%

Solvent compatibility screen - continued

Solvent	24 h weight gain
Mineral oil (light)	2.3%
Mineral oil (heavy)	2.1%
Salt water (3.5% NaCl)	0.9%
Sodium hydroxide solution (0.025%, pH 10)	0.9%
Water	0.9%
Xylene	20.8%
Strong acid (concentrated HCl)	-5.2%
TPM	9.9%

TDS test article: printed 1 x 1 x 1 cm cube. The source prints the HCl result as -5.2%; the displayed sign is not reinterpreted. Weight change alone does not establish sealing, retained strength, or long-term chemical life.

Biocompatibility endpoint results

ISO 10993 endpoints listed in the manufacturer TDS

Standard / endpoint	Result
ISO 10993-5:2009	Non-cytotoxic
ISO 10993-23:2021	Non-irritant
ISO 10993-10:2021	Non-sensitizer

Manufacturer material-sample result. It does not qualify a finished part or device for its intended use.

Selection and finishing

A Fuse-series Shore 90A TPU to consider for resilient, flexible SLS parts; geometry determines the response of the finished component.

Design: Prototype lattice and wall sections at the actual force and cycling regime. Review directions and post-processing before fixing a fatigue-critical design.

Finishing: Gray is the as-printed colour; a separate finish is required for a different colour. Test surface treatment where grip or skin-contact feel matters.

Source and document scope

Formlabs manufacturer source reference - Rev 01 2023-03-14

<https://formlabs-media.formlabs.com/datasheets/2301750-TDS-ENUS-0.pdf>

The reviewed reference copy contains the same checked data as the live official TDS, with the solvent table paginated separately.

FabDigit product page: <https://www.fabdigit.com/materials/polymer-tpu/formlabs-tpu-90a/>

FabDigit is the publisher of this reference summary. The named manufacturer remains the source of the material data. This document is not a manufacturer-issued TDS, a certificate of conformity or a test report for an ordered part. Confirm the exact product, system, orientation, conditioning and final finish with the quote.