

FDM TPU 92A

FDM[®] TPU 92A is a thermoplastic polyurethane with a Shore A value of 92. The material exhibits high elongation, superior toughness, durability and abrasion resistance.

FDM TPU 92A brings the benefits of elastomers to FDM 3D printing and offers the capability to quickly produce large and complex elastomer parts. Typical applications include flexible hoses, tubes, air ducts, seals, protective covers and vibration dampeners.

FDM TPU 92A is available on the F123 and F123CR (composite-ready) Series 3D printers and is compatible with QSR[™] soluble support material.

| Mechanical Properties | Test Method | Value | |
|---|-------------|---------------------------|-------------------------|
| | | XY Orientation | XZ Orientation |
| Shore Hardness (molded) | ASTM D2240 | 92 Shore A | 92 Shore A |
| Tensile Strength, Yield (Type 1, 0.125", 0.2"/min) | ASTM D412 | 15.6 MPa (2,265 psi) | 16.1 MPa (2,332 psi) |
| Tensile Strength, Ultimate (Type 1, 0.125", 0.2"/min) | ASTM D412 | 16.8 MPa (2,432 psi) | 17.4 MPa (2,519 psi) |
| Tensile Modulus (Type 1, 0.125", 0.2"/min) | ASTM D412 | 15.3 MPa (2,212 psi) | 20.7 MPa (3,000 psi) |
| Elongation at Break (Type 1, 0.125", 0.2"/min) | ASTM D412 | 552% | 482% |
| Elongation at Yield (Type 1, 0.125", 0.2"/min) | ASTM D412 | 466% | 385% |
| Tensile Stress at 100% Elongation (PSI) | ASTM D412 | 6.9 MPa (999 psi) | 7.6 MPa (1,096 psi) |
| Tensile Stress at 300% Elongation (PSI) | ASTM D412 | 11.0 MPa (1,598 psi) | 11.9 MPa (1,722 psi) |
| Flexural Strength (Method 1, 0.05"/min) | ASTM D790 | 1.8 MPa (255 psi) | 2.4 MPa (351 psi) |
| Flexural Modulus (Method 1, 0.05"/min) | ASTM D790 | 25.6 MPa (3,719 psi) | 36.9 MPa (5,349 psi) |
| Flexural Strain at Break (Method 1, 0.05"/min) | ASTM D790 | No break | No break |
| Tear Strength - Stamped | ASTM D624-C | 84.6 N/mm (483 lbF/in) | NA |
| Compressive Strength, Yield (Method 1, 0.05"/min) | ASTM D695 | 2.6 MPa (384 psi) | 2.6 MPa (384 psi) |
| Compressive Strength, Ultimate (Method 1, 0.05"/min) | ASTM D695 | 2.6 MPa (384 psi) | 2.6 MPa (384 psi) |
| Compressive Modulus (Method 1, 0.05"/min) | ASTM D695 | 16.9 MPa (2,457 psi) | 16.9 MPa (2,457 psi) |
| Compression Set at 22 Hours @ 23 °C | ASTM D395 | 21% | NA |
| Compression Set at 22 Hours @ 70 °C | ASTM D395 | 44% | NA |



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| Thermal Properties | Test Method | Value | • |
|--|-------------|--|-----------------|
| Heat Deflection (HDT) @ 66 psi | ASTM D648 | 38 °C (100.4 °F) | |
| Heat Deflection (HDT) @ 15 psi | NA | 56 °C (132.8 °F) | |
| Vicat Softening Temperature (Rate B/50) | ASTM D1525 | 95 °C (203 °F) | |
| Glass Transition Temperature (Tg) | DMA (SSYS) | -42 °C (-43.6 °F) | |
| Coefficient of Thermal Expansion (x-direction) | ASTM E831 | 139 μm/(m·°C) (7.72E-05 in/(in·°F)) | |
| Coefficient of Thermal Expansion (y-direction) | ASTM E831 | 159 μm/(m·°C) (8.83E-05 in/(in·°F)) | |
| Coefficient of Thermal Expansion (z-direction) | ASTM E831 | 176 μm/(m·°C) (9.78E-05 in/(in·°F)) | |
| | | | |
| Electrical Properties | Test Method | Value | |
| | | XY Orientation | XZ Orientation |
| Volume Resistivity | ASTM D257 | 6.09E+10 ohm-cm | 7.17E+13 ohm-cm |

| Other | Test Method | Value |
|------------------|-------------|---------|
| Specific Gravity | ASTM D792 | 1.13502 |

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, test conditions, etc. Actual values will vary with build conditions. Tested parts were built on a Stratasys F370[™] @ 0.010" (0.254 mm) slice.

The performance characteristics of these materials may vary according to application, operating conditions or end use. Each user is responsible for determining that the Stratasys material is safe, lawful and technically suitable for the intended application, as well as for identifying the proper disposal (or recycling) method consistent with applicable environmental laws and regulations. Stratasys makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use or warranty against patent infringement.

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