

Technical Data Sheet
Type: Polycaprolactone Thermoplastic Polyurethane (TPU)
Uses: Fused Filament Fabrication (FFF)
Material Information: Injection Molded (or Extruded) Part

| Physical Properties | Value (Metric) | Unit | Test Method |
|-------------------------|----------------|--------------------------|--------------|
| Hardness (5 sec) | 98 | Shore A | ASTM D-2240 |
| Specific Gravity | 1.21 | | ASTM D-792 |
| Tensile Strength | 4600 (32) | lb/in ² (MPa) | ASTM D-412 |
| Ultimate Elongation | 380 | % | ASTM D-412 |
| Tensile Stress at: | | | |
| - 100 % Elongation | 2400 (16) | lb/in ² (MPa) | ASTM D-412 |
| - 300 % Elongation | 4100 (28) | lb/in ² (MPa) | ASTM D-412 |
| T _m (by DSC) | 200 | °C | Lubrizol DSC |

- Prior to testing samples were conditioned at 23°C for 48 hours.
- Based on injection samples (80 mils or 2 mm).
- Listed values are "typical (average) values" and should/cannot be applied for specification purposes.

Application Information: Fused Filament Fabricated (FFF) Part

| Physical Properties | Value (Metric) | Unit | Test Method |
|---------------------|----------------|--------------------------|-------------|
| Specific Gravity | 1.09 | | ASTM D-792 |
| Tensile Strength | 4000 (28) | lb/in ² (MPa) | ASTM D-412 |
| Ultimate Elongation | 380 | % | ASTM D-412 |
| Tensile Stress at: | | | |
| - 100 % Elongation | 1800 (13) | lb/in ² (MPa) | ASTM D-412 |
| - 300 % Elongation | 3400 (23) | lb/in ² (MPa) | ASTM D-412 |

- Tested parts were printed in XY orientation via using MakerBot Replicator (80 mils or 2 mm).

Supply Form and Standard Packaging

- **Estane® 3D TPU F98A-030 CR HC** is supplied in pellet form and packaged in 25 kg bags.

Material Preparation

- Prior to processing, **Estane® 3D TPU F98A-030 CR HC** must be dried at **100°C** for 2-4 hours.
- It is recommended to dry the material in a desiccant type dryer. Target dew point should be **-40°C**.
- Depending on the applied processing technique, the maximum moisture level should be 0.02%.

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Extrusion Processing Conditions

- Estane® 3D TPU F98A-030 CR HC can be processed on any conventional extruder.

Fused Filament Fabrication Conditions

- Estane® 3D TPU F98A-030 CR HC can be printed on most commercial fused filament fabrication printers using 1.75 mm and 2.9 mm diameter filament

Recommended Starting Fused Filament Fabrication Conditions

| Printing Conditions | Values |
|----------------------|-----------|
| Extruder Temperature | 230 °C |
| Platform Temperature | 110 °C |
| Extrusion Speed | 90 mm/sec |
| Infill | Hexagonal |

- The starting FFF conditions are based on MakerBot Replicator.

For further information refer to Lubrizol Advanced Materials processing guides.

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