# Technical datasheet
# varioShore TPU

colorFabb

Date of issue: November 28th , 2023
Version: v1.0

## Description

colorFabb varioShore TPU is a high quality, expanding, 3D printable TPU filament. varioShore TPU has a Shore Hardness of 92A. This special formulation has an active foaming technology to achieve light weight parts, soft touch surface, and a variable Shore Hardness depending on the foaming.

At roughly 230°C, the foaming technology is activated, expanding the material up to 1,6x its volume. Users can lower the flow rate (60-70%) to achieve light weight parts, or use the foaming properties to effectively lower the Shore Hardness.

## Typical Properties

### Mechanical Properties – 3D Printed

| | *Method* | *Value @ foaming* | | *Unit* |
|---|---|---|---|---|
| | | 210˚C; 100% | 230°C; 70% | |
| Youngs Modulus | Tensile, ISO 527-1A | 50 | 40 | MPa |
| Tensile Strength | Tensile, ISO 527-1A | 24 | 12 | MPa |
| Elongation at break | Tensile, ISO 527-1A | 465 | 450 | % |
| Flexural Modulus | Flexural, ISO 178 | 50 | 40 | MPa |
| Flexural Strength | Flexural, ISO 178 | 3 | 2 | MPa |
| Impact Strength | Charpy Notch, ISO 179 | 40 | 20 | kJ/m$^2$ |

### Mechanical Properties – Injection Molded*

| | *Method* | *Value* | *Unit* |
|---|---|---|---|
| Youngs Modulus | Tensile, ISO 527-1A | - | MPa |
| Tensile Strength | Tensile, ISO 527-1A | 59 | MPa |
| Elongation at break | Tensile, ISO 527-1A | 490 | % |
| Flexural Strength | Flexural, ISO 178 | N/A | MPa |
| Charpy Impact Strength | Charpy Notch, ISO 179 | N/A | kJ/m$^2$ |
| Density | ISO 1183 | 1,2 | g/cm$^3$ |
| Hardness | Shore A, ASTM D-2240 | 92 | |

### Thermal Properties*

| | *Method* | *Value* | *Unit* |
|---|---|---|---|
| Glass Transition Temp. | DSC, ISO 11357 | -20 | ˚C |
| Melting Temp. | DSC, ISO 11357 | 130 | ˚C |
| Decomposition Temp. | TGA, ISO 11358 | N/A | ˚C |
| Heat Deflection Temp. | HDT-B, ISO 75 | N/A | ˚C |
| Melt Flow Index | MFI, (210˚C/2.16 kg), ISO 1133-A | N/A | g/10min |
| Melt Flow Index | MFI, (190˚C/1,16 kg), ISO 1133-A | N/A | g/10 min |

*These results are obtained from the information provided by the supplier of the raw material, and are based on UNFOAMED material data.

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### Filament Specifications

| | *Unit* | | |
|---|---|---|---|
| Diameter | mm | 1.75 | 2.85 |
| Max. roundness deviation | mm | ± 0.05 | ± 0.1 |
| Net. Filament weight | g | 750 | 750 |

### Guideline for print settings

| | *Unit* | |
|---|---|---|
| Nozzle Temp. | ˚C | 195-260 |
| Bed Temp. | ˚C | 50-60 |
| Bed / surface modification | - | - |
| Active cooling fan | % | - |
| Print Speed | mm/s | 40-100 |

## Notes

The reported properties are an average of a batch of 3D specimens.
The specimens have been printed in XY plane, using 0.15 mm layer height, 100% infill, 0,4 mm nozzle, 200-250°C nozzle temperature and 50˚C bed temperature.

**Disclaimer**
The product- and technical information provided in this datasheet is correct to the best of our knowledge. The information given is provided as a guidance for good use, handling and processing, and is not to be considered as a quality specification. The information only relates to the specific product and the material properties.

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