# TPU HARDNESS+

## TECHNICAL DATA SHEET VERSION 1.0

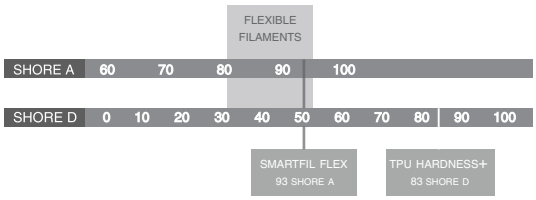
INNOVATEFIL® by smart materials 3D

## INNOVATEFIL® TPU HARDNESS+

INNOVATEFIL® TPU HARDNESS+, is a thermoplastic polyurethane that combines hardness, elasticity and mechanical strength, so it maintains all the advantages of this elastomer, in order that we can make completely rigid parts. Its main features are:

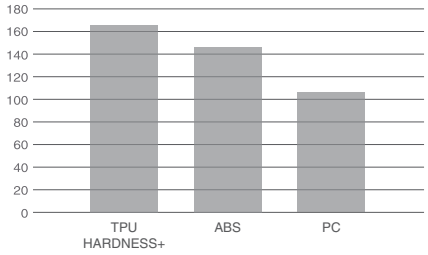
- High resistance to wear and abrasion.
- Decreases impact and vibrations.
- High resistance against fats, oils, oxygen and ozone.
- Great resistance against hydrolysis and stabilized in UV light.
- High resistance against microorganisms.

SHORE SCALE




THERMAL RESISTANCE

VICAT SOFTENING POINT (A/10N) ISO 306




| | TIPICAL VALUE | UNITS | TEST METHOD |
|---|---|---|---|
| **PHYSICAL PROPERTIES** | | | |
| Chemical Name | Polyurethane thermoplastic | | |
| Material Density | 1.22 | g/cm3 | ISO 1183-1-A |
| Hardness | 83 | Shore D | ISO 7619-1 |
| Tensile Strength | 67 | MPa | DIN 53504-S2 |
| Elongation at break | 170 | % | DIN 53504-S2 |
| Tear Strength | 310 | N/mm | ISO 527 |
| Modulus of elasticity - Tensile test | 2000 | MPa | ISO 527 |
| Vicat Softening Point (A/10N) | 164 | ºC | ISO 306 |

| | | |
|---|---|---|
| **PRINTING PROPERTIES** | | |
| Print Temperature | 210-230 | ºC |
| Bed Temperature | 80-100 | ºC |
| Fan Layer | ON (20-100) | % |
| Print Speed | 40-60 | mm/s |

| SIZE | NET W. | GROSS W. | DIAMETERS | COLOR | PACKAGING |
|---|---|---|---|---|---|
| M | 750 g | 785 g | 1’75 mm/2’85 mm | Natural | Box, Multilayer vacuum bag |

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# USE RECOMENDATIONS

## PROTECT FROM MOISTURE

Innovatefil® TPU HARDNESS+ is delivered in a vacuum bag with a great barrier against moisture so that the filament cannot absorb humidity. Before bagging, the filament follows the strictest quality controls by dehumidifying the raw material until the moisture content is lower than 0.02%.

Once the product is unpacked we recommend to keep it in a dry and dark environment. If not maintained in a suitable environment the material can absorb up to 0.5% atmospheric moisture, this can create water vapour in the extrusion that can end up in a bad surface finish.

## KEEP THE EXTRUDER IN GOOD CONDITION

Once printing is finished it is recommendable to clean the nozzle eliminating the excess of material to avoid seals and defects unwanted, if several materials are used it is advisable to have a nozzle for each material to avoid being mixed.