

High impact polystyrene, or HIPS, is a material blend of polystyrene and rubber. Because it dissolves in limonene solution, it's often used for support material, eliminating the need for removal via abrasives, cutting tools, or any other such things that leave your print less-than-perfect.

## Pros

- durable
- recyclable, food safe
- impact and water resistant
- low costs
- dissolvable in d-limonene

## Cons

- Heated bed required
- Heated chamber recommended
- High printing temperature
- Ventilation required

## Uses

- Support material
- Objects that might be dropped
- toys
- Electronic applications

## 1. Identification of the material

Trade name	tm filament HIPS
Chemical name	High impact polystyrene
Use	3D printing
Origin	tm filament Netherlands

## 2. Material properties

Melt temperature	240	°C	ASTM D3418
Heat deflection temperature 0.46 MPa	89	°C	ISO 75
Vicat Softening Temperature	94	°C	ISO 306
Flame Rating (1.5 mm, ALL)	HB		UL 94
Met Flow Rate (220 C/10.0 kg)	7	g/10 min	ISO 1133
Density	1.08	g/cm <sup>3</sup>	ASTM D790
Water absorption, 24 u	0.2	%	ASTM D570
Shrink rate	0.5	%	ASTM D955

### 3. Mechanical properties

Tensile Strength (yield, 3.20 mm/50 mm/min)	34	MPa	ASTM D638
Tensile Modulus (3.20 mm/1.0 mm/min)	1900	MPa	ASTM D638
Tensile elongation, (yield, 3.20 mm/50 mm/min)	4.0	%	ASTM D638
Flexural Modulus (3.20 mm/15 mm/min)	1900	MPa	ASTM D790
Flexural Strength (3.20 mm/15 mm/min)	43	MPa	ASTM D790
Rockwell hardness (R-scale)	109		ASTM D785

### 4. Thermal properties

Heat Deflection temperature	89	°C	ISO 75
Vicat Softening Temperature	94	°C	ISO 306

### 5. Printer settings

Printer	Desktop FFF printer
Nozzle	0.4 mm A2 hardened
Layer height	0.2 mm
Infill	100%
Extrusion Temperature	230 - 245 °C
Bed temperature	100 - 115 °C
Bed preparation	Glue stick, Glass plate, Kapton Tape, PET sheets
Print speed	

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