

eFil TPU FOAM

eFil TPU FOAM belongs to the eFil family of flexible TPU-based filaments. Its main feature is its ability to expand during 3D printing thanks to active foaming technology: when the right temperature is reached, the material increases its volume up to 1.6 times, allowing the final part density to be reduced by up to 40% and producing lighter parts with a pleasant soft-touch surface. Its Shore hardness in the unfoamed state is 98A, and decreases progressively as the foaming level increases.

The activation of the foaming agent is progressive within the 240–260 °C range. The higher the temperature, the greater the material expansion and, therefore, the lower the density and hardness of the final part. To preserve the volume and geometry of the part during foaming, the extrusion flow rate must be adjusted as a function of temperature: the more the material expands, the lower the flow needed. This combined control makes it possible to obtain parts with tailor-made mechanical properties and hardness from a single filament.

Make sure your printer is compatible with flexible filaments. Extruders with adjustable filament traction grade are recommended; the ideal traction point is one where the extruder grips the filament firmly without strangling it. Bowden extruders are not advisable. Due to its foaming nature, this material tends to produce more stringing than standard TPU; we recommend increasing travel speed and fine-tuning retraction. You can improve its performance with a 4 to 6 hour drying cycle at 70 °C prior to printing.

It is a material specifically suited for applications where weight, flexibility and soft-touch comfort are critical: footwear, insoles and soles, sports components, handlebar grips and handles, gaskets and dampening elements, technical packaging, protective gear, functional prototyping and parts with a matte, fabric-like finish.

Physical Properties	Conditions	Test Method	Typical Values
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Density		ASM D792	1.21 g/cc
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Thermal Properties	Conditions	Test Method	Typical Values
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Tg		ASM D3417	-27 °C
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Mechanical Properties	Conditions	Test Method	Typical Values
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100% Modulus		D412	17 MPa
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300% Modulus		D412	32 MPa
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Tensile strength		D412	40 MPa
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Elongation at break		D412	400 %
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Tear strength		D624	170 N/mm
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Printing parameters	Typical Values
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Printing temperature	240 - 260 °C
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Bed temperature	50 - 60 °C
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Printing speed	20 - 40 mm/s
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Retraction	2 - 4 mm
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Adhesion	Spray
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Quality parameters	Typical Values
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Tolerance	max	0.05 mm
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Tolerance	average	+/- 0.05 mm
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Standard deviation	max	0.02 mm
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Ovality	max	2 %
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The test values provided in this technical data sheet should be considered indicative and do not represent any contractual specification. Please note that, under certain conditions, properties may be affected. The application, use and processing of our products are the responsibility of the user.