

ABS Filament

Acrylonitrile-Butadiene-Styrene (ABS) is a thermoplastic and a copolymer that is used for rigid objects. It consists of 5-30% Butadiene, around 50% Styrene and the rest is Acrylonitrile. ABS is a strong material with high toughness and impact resistance. The maximum operating temperature is between 85 °C and 100 °C, depending on the modifications. The minimum operating temperature is -35 °C. ABS is a flammable polymer to which flame retardant can be added. It is also subject to ageing by being exposed to the weather conditions (UV light, oxygen, moisture, heat) because Polybutadiene stimulates the oxidation of Polystyrene. This causes discolouration and the plastic loses its mechanical strength. In order to improve this UV stabilisers can be added.

The 3D4MAKERS ABS Filament contains unique properties because the material has an extremely constant diameter and roundness. On top of that the ABS Filament does not come into contact with water during the production process and is directly packaged in a vacuum packaging. These properties make the 3D4MAKERS ABS Filament particularly suitable for FDM and FFF 3D printers.

PHYSICAL	CONDITIONS	TEST METHOD	TYPICAL VALUE
Density		ISO 1183/B	1.05 g/cm ³
Apparant Density		ISO 60	0.65 g/cm ³
Melt volume-Flow Rate (MVR)	220 °C/10.0 kg	ISO 1133	15 g/10 min
Molding Shrinkage-Flow		ISO 294-4	0.40 to 0.70 %
MECHANICAL			
Tensile modulus	3.20 mm,	ISO 527-2	2280 MPa
Tensile Stress	Yield, 3.20 mm	ISO 527-2/50	45.0 MPa
Tensile Strain	Yield, 3.20 mm	ISO 527-2/50	2.5 %
Flexural Modulus	3.20 mm	ISO 178	2300 MPa
Flexural Strength	3.20 mm	ISO 178	68.0 MPa
IMPACT			
Notched Izod Impact Strength	23 °C	ISO 180/A	19 kJ/m ²
Charpy Notched Impact Strength	23 °C	ISO 179 1eA	20 kJ/m ²
THERMAL			
Heat Deflection Temperature	1.8 MPa, Unannealed	ISO 75-2/A	100 °C
Vicat Softening Temperature		ISO 306/B50	97.0 °C
ELASTOMERS			
Fogging		ISO 294-4	97%
FLAMMABILITY			
Burning rate	2.00 mm	ISO 75-2/A	55 mm/min
Flame Rating		UL 94	
	1.50 mm		HB

	3.00 mm		HB
Carbon Emission		VDA 277	25.0 µg/g

PRINT RECOMMENDATIONS	
Nozzle Temperature	220 - 260 °C
Bed Temperature	90 - 110 °C
Print Speed	30 - 70 mm/s
Bed Adhesion	PEI sheet, Buildtak, Adhesion spray, ABS juice

Our experience while printing with the 3D4MAKERS ABS Filament is that it gives better results when used at higher temperatures than other ABS Filaments. This can vary with different printers. To get the best results while printing we advise you to keep the 3D printer in a room where there is hardly any draft and/or temperature fluctuations. This cannot be a room where people sleep. When the 3D printer is not being used it is important to keep the 3D4MAKERS ABS Filament in a bag and stored in a cool, dry and dark place.

Disclaimer: 3D4Makers makes no warranties what so ever, expressed or implied, including but not limited to, any implied fitness for any particular purpose. From the moment the product is shipped it is beyond our control. The information in this document is believed to be correct at the time of writing. However, handling, processing, settings, the type of 3D printer, slicing and other variables are completely up to the user. The method through which the product is used can be varied. It is up for the customer to determine how it is 3D printed and whether it is fit for purpose or suited to a particular application.