

# Technical data sheet ABS

Ultimaker

Chemical name	Acrylonitrile butadiene styrene
Description	Used by an array of industries worldwide, ABS is known for its exceptional mechanical properties. Our ABS is specifically formulated to minimize warping and ensure consistent interlayer adhesion.
Key features	Excellent mechanical properties and interlayer adhesion (especially when using the front enclosure add-on), nice aesthetics, minimal warping and reliable bed adhesion.
Applications	Visual and functional prototyping and short run manufacturing.
Non-suitable for	Food contact and in-vivo applications. Long term UV exposure can negatively affect properties of an ABS print. Applications where the printed part is exposed to temperatures higher than 85 °C.

## Filament specifications

	<u>Value</u>	<u>Method</u>
Diameter	2.85±0.10 mm	-
Max roundness deviation	0.10 mm	-
Net filament weight	750 g	-
Filament length	~107 m	-

## Color information

<u>Color</u>	<u>Color code</u>
ABS Black	RAL 9017
ABS White	RAL 9003
ABS Red	RAL 3020
ABS Blue	RAL 5002
ABS Silver	RAL 9006
ABS Pearl Gold	RAL 1036
ABS Green	RAL 6018
ABS Orange	RAL 2008
ABS Yellow	RAL 1023
ABS Gray	RAL 7011

## Mechanical properties (\*)

	<u>Injection molding</u>		<u>3D printing</u>	
	Typical value	Test method	Typical value	Test method
Tensile modulus	2030 MPa	ISO 527 (1 mm/min)	1681.5 MPa	ISO 527 (1 mm/min)
Tensile stress at yield	43.6 MPa	ISO 527 (50 mm/min)	39.0 MPa	ISO 527 (50 mm/min)
Tensile stress at break	-	-	33.9 MPa	ISO 527 (50 mm/min)
Elongation at yield	4.8 %	ISO 527 (50 mm/min)	3.5 %	ISO 527 (50 mm/min)
Elongation at break	34 %	ISO 527 (50 mm/min)	4.8 %	ISO 527 (50 mm/min)
Flexural strength	-	-	70.5 MPa	ISO 178
Flexural modulus	-	-	2070.0 MPa	ISO 178
Izod impact strength, notched (at 23°C)	-	-	10.5 kJ/m <sup>2</sup>	ISO 180
Charpy impact strength (at 23°C)	58 kJ/m <sup>2</sup>	ISO 179	-	-
Hardness	-	-	76 (Shore D)	Durometer

## Thermal properties

	<u>Typical value</u>	<u>Test method</u>
Melt mass-flow rate (MFR)	41 g/10 min	ISO 1133 (260 °C, 5 kg)
Heat deflection (HDT) at 0.455 MPa	-	-
Heat deflection (HDT) at 1.82 MPa	-	-
Vicat softening temperature at 10N	97 °C	ISO 306
Glass transition	-	-
Coefficient of thermal expansion	-	-
Melting temperature	225-245 °C	ISO 294
Thermal shrinkage	-	-

## Other properties

	<u>Typical value</u>	<u>Test method</u>
Specific gravity	1.10	ISO 1183
Flame classification	-	-

(\*) See notes.

## Notes

Properties reported here are average of a typical batch. The 3D printed test specimens were printed in the XY plane, using the normal quality profile in Cura 2.1, an Ultimaker 2+, a 0.4 mm nozzle, 90% infill, 250 °C nozzle temperature and 80 °C build plate temperature. The values are the average of 5 white and 5 black specimens for the tensile, flexural, and impact tests. The Shore hardness D was measured in a 7-mm-thick square printed in the XY plane, using the normal quality profile in Cura 2.5, an Ultimaker 3, a 0.4 mm print core and 100% infill. Ultimaker is constantly working on extending the TDS data.

## Disclaimer

Any technical information or assistance provided herein is given and accepted at your risk, and neither Ultimaker or its affiliates make any warranty relating to it or because of it. Neither Ultimaker nor its affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product; and nothing herein waives any of Ultimaker's conditions of sale. Specifications are subject to change without notice.

Version

Version 3.012

Date

06/06/2017

**Ultimaker**