Preparation date: 09-06-2016 Version No.: 2.0

Technical Data Sheet

ABS by Innofil3D BV

Filament suitable for all commercially available leading brands 3D FDM/FFF printers

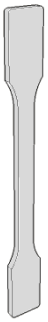
IDENTIFICATION OF THE MATERIAL	
Trade name	Innofil3D ABS
Chemical name	Acrylonitrile Butadiene Styrene
Chemical family	Thermoplastic Copolymers
Use	3D-Printing
Origin	Innofil3D BV

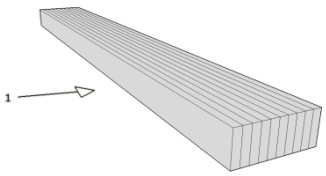
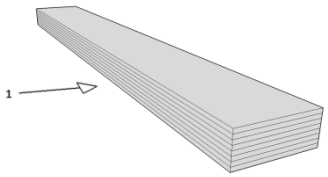
GUIDELINE FOR PRINT SETTINGS	
Nozzle temperature	240 ± 10 °C
Bed temperature	80 – 100 °C
Bed modification	Tape
Active cooling fan	No/Yes (up to 25%)
Layer height	0.08 – 0.2 mm
Shell thickness	0.4 – 0.8 mm
Print speed	40 – 80 mm/s

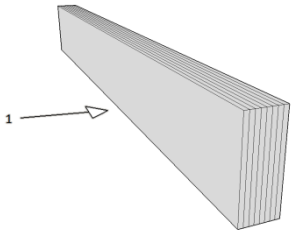
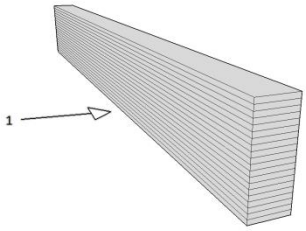
Settings are based on a 0.4 mm nozzle

MATERIAL PROPERTIES		Test Method
Melt temperature	Not applicable	ASTM D3418
Glass transition temperature	~ 105 °C	ASTM D3418
Melt Flow Rate[1]	43.1 g/10min	ISO 1133
Melt Volume Rate[1]	45.9 cm3/10min	ISO 1133
Density	1.04 g/cm3	ASTM D1505
Odor	Little odor	/
Solubility	Insoluble in water	/

[1]Test conditions: T = 210 °C; m = 2.16 kg

MECHANICAL PROPERTIES | TENSILE TEST			Test Method	ISO 527
All test specimens were printed using an Ultimaker 2+ under the following conditions: Printing temperature: 210 °C Heated bed temperature: 60 °C Print speed: 40 mm/s Number of shells: 2 Infill under 45°	 Printed vertical (Z-axis)		 Printed horizontal (X,Y-axis)	
Infill	50%	100%	50%	100%
Tensile strength (MPa)	4.4 ± 0.6	6.5 ± 1.8	17.0 ± 0.8	29.3 ± 0.8
Force at break (MPa)	2.7 ± 1.8	7.8 ± 1.3	13.6 ± 0.8	26.4 ± 1.8
Elongation at max force (%)	0.5 ± 0.1	0.7 ± 0.1	2.3 ± 0.1	2.4 ± 0.1
Elongation at break (%)	0.5 ± 0.2	0.7 ± 0.1	4.8 ± 0.9	3.7 ± 0.9
Relative tensile strength (MPa/g)	0.7 ± 0.1	0.8 ± 0.2	2.5 ± 0.1	3.0 ± 0.1
Emodulus (MPa)	1031 ± 53	1358 ± 139	1072 ± 38	2030 ± 45

MECHANICAL PROPERTIES | IMPACT TEST		Test Method	ISO 179
All test specimens were printed using an Ultimaker 2+ under the following conditions: Printing temperature: 210 °C Heated bed temperature: 60 °C Print speed: 40 mm/s Number of shells: 2 Infill under 45° 1→: impact direction	 Charpy (en)	 Charpy (ep)	
Infill	100%	100%	
Impact strength (kJ/m^2)	39.3 ± 3.3	35.4 ± 3.4	
Impact energy (mJ)	1500.0 ± 134.4	1371.6 ± 125.9	

MECHANICAL PROPERTIES | FLEXURAL TEST		Test Method ISO 178
All test specimens were printed using an Ultimaker 2+ under the following conditions: printing temperature: 210 °C heated bed temperature: 60 °C print speed: 40 mm/s number of shells: 2 Infill under 45° 1→: bending direction	 Normal	 Parallel
Infill	100%	100%
Flexural modulus (MPa)	1965.3 ± 115.5	1680.8 ± 127.9
Maximum force (MPa)	67.3 ± 2.3	72.6 ± 1.0
Deformation (%)	4.3 ± 0.1	4.4 ± 0.1

FILAMENT SPECIFICATIONS		Test Method
Diameter 1.75	1.75 ± 0.05 mm	Innofil3D
Diameter 2.85	2.85 ± 0.10 mm	Innofil3D
Max. roundness deviation 1.75	0.05 mm	Innofil3D
Max. roundness deviation 2.85	0.10 mm	Innofil3D
Net weight on reel	750 g ± 2%	Innofil3D

LIST OF COLORS AND CERTIFICATIONS*						
			Certifications/approvals			
Colour	Code	RAL nr.	10/2011[1]	FDA[2]	2011/65[3]	EN 71-3[4]
Naturel	0001	N/A	Yes	Yes	Yes	Yes
Black	0002	9005	Yes	Yes	Yes	Yes
Red	0004	3020	Yes	No	Yes	Yes
Blue	0005	5002	Yes	Yes	Yes	Yes
Yellow	0006	1003	Yes	Yes	Yes	Yes
Green	0007	6018	Yes	Yes	Yes	Yes
Orange	0009	2008	Yes	No	Yes	Yes
Pink	0020	N/A	Yes	No	Yes	Yes
Silver	0021	9006	Yes	Yes	Yes	Yes

* This overview is generated using information obtained from the raw material suppliers.

Certifications/approvals	Description
[1] Regulation EU No 10/2011:	Union Guidelines on Regulation (EU) No 10/2011 on plastic materials and articles intended to come into contact with food (Europe)
[2] FDA:	Food and Drug administration approval (U.S.A.)
[3] Directive 2011/65/EU:	The restriction of the use of certain hazardous substances in electrical and electronic equipment (Europe)
[4] Directive 2009/48/EC; EN 71-3:	Safety of toys – Part 3: Migration of certain elements (Europe)