

# Technical Data Sheet

## ASA by Innofil3D BV

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

### IDENTIFICATION OF THE MATERIAL

Trade name	Innofil3D ASA
Chemical name	Acrylonitrile Styrene Acrylate
Chemical family	Thermoplastic Copolymer
Use	3D-Printing
Origin	Innofil3D BV

### GUIDELINE FOR PRINT SETTINGS

Nozzle temperature	260 ± 10 °C
Bed temperature	100 ± 10 °C
Bed modification	Ultra-hold hairspray
Active cooling fan	Yes (up to 100%)
Layer height	0.1 – 0.2 mm
Shell thickness	0.8 – 1.0 mm
Print speed	40 – 80 mm/s

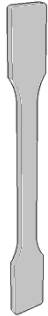

Settings are based on a 0.4 mm nozzle

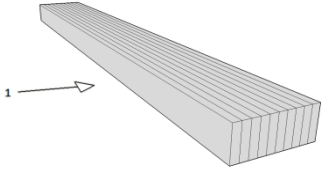
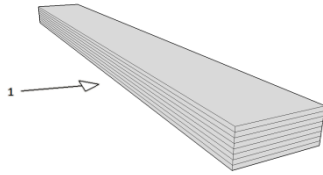
### MATERIAL PROPERTIES

MATERIAL PROPERTIES		Test Method
Melt temperature	N/A	ASTM D3418
Glass transition temperature	103 °C	ASTM D3418
Melt Flow Rate <sup>1</sup>	14.2 g/10 min	ASTM D1238
Melt Volume Rate <sup>1</sup>	14.7 cm <sup>3</sup> /10 min	ISO 1133
Density	1.06 g/cm <sup>3</sup>	ASTM D1505
Odor	Almost odorless	/
Water solubility	Insoluble	/

<sup>1</sup>Test conditions: T = 220 °C ; m = 10 kg



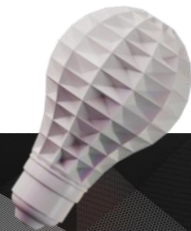
MECHANICAL PROPERTIES   TENSILE TEST			Test Method	ISO 527
<p>All test specimens were printed using an Ultimaker 2+ under the following conditions:                      printing temperature: 210°C                      heated bed temperature: 60°C                      print speed: 40 mm/s                      number of shells: 2                      Infill under 45°</p>	 <p>Printed vertical (Z-axis)</p>		 <p>Printed horizontal (X,Y-axis)</p>	
	Infill	50%	100%	50%
Tensile strength (MPa)	4.9 ± 2.6	12.4 ± 1.4	16.9 ± 2.9	26.8 ± 1.4
Force at break (MPa)	6.5 ± 1.0	12.7 ± 1.3	17.7 ± 0.5	25.1 ± 1.4
Elongation at max force (%)	0.8 ± 0.1	1.0 ± 0.1	2.8 ± 0.1	2.6 ± 0.1
Elongation at break (%)	0.8 ± 0.1	1.1 ± 0.1	3.8 ± 0.3	3.5 ± 0.7
Relative tensile strength (MPa/g)	0.6 ± 0.3	1.2 ± 0.1	2.3 ± 0.4	2.7 ± 0.1
Emodulus (MPa)	916 ± 30	1367 ± 128	987 ± 52	1370 ± 52

MECHANICAL PROPERTIES   IMPACT TEST			Test Method	ISO 179
<p>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</p>	 <p>Charpy (en)</p>		 <p>Charpy (ep)</p>	
	Infill	100%	100%	100%
Impact strength (kJ/m <sup>2</sup> )	20.5 ± 1.6	21.8 ± 1.1	21.8 ± 1.1	21.8 ± 1.1
Impact energy (mJ)	820.9 ± 66.8	867.3 ± 43.9	867.3 ± 43.9	867.3 ± 43.9



<b>MECHANICAL PROPERTIES   FLEXURAL TEST</b>		Test Method	ISO 178
<p>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</p>	<p>Normal</p>	<p>Parallel</p>	
	Infill	100%	100%
	Flexural modulus (MPa)	2903.4 ± 212.8	2591.6 ± 285.4
	Maximum force (MPa)	53.1 ± 0.8	63.7 ± 2.0
	Deformation (%)	7.4 ± 0.4	7.7 ± 0.7

<b>FILAMENT SPECIFICATIONS</b>		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\*

Colour	Code	RAL nr.	Certifications/approvals			
			10/2011 <sup>1</sup>	FDA <sup>2</sup>	2011/65 <sup>3</sup>	EN 71-3 <sup>4</sup>
Natural White	4201	N/A	Yes	Unknown	Unknown	Yes

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

\*\* RAL number used to manufacture the semi-transparent colour.

Certifications/approvals	Description
<sup>1</sup> 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)
<sup>2</sup> FDA:	Food and Drug administration approval (U.S.A.)
<sup>3</sup> Directive 2011/65/EU:	The restriction of the use of certain hazardous substances in electrical and electronic equipment (Europe)
<sup>4</sup> Directive 2009/48/EC; EN 71-3:	Safety of toys – Part 3: Migration of certain elements (Europe)