

ABS Medical

MATERIAL PROPERTIES

Specific Gravity	1.06 g/cm ³	ISO 1183-1
Melt Flow Rate (220°C, 10kg)	18 cm ³ /10'	ISO 1133

Mechanical Properties

Yield Stress (50mm/min)	47 MPa	ISO 527-1,2
Elongation at Break (1mm/min)	16,00%	ISO 527-1,2
Tensile Modulus (1mm/min)	2450 MPa	ISO 527-1,2
Flexural Modulus (2mm/min)	2500 MPa	ISO 178
Izod Impact Strength, Notched @ 23°C	14 KJ/m ²	ISO 180-1A
Izod Impact Strength, Notched @ -30°C	7 KJ/m ²	ISO 180-1A
Ball Indentation Hardness	120 N/mm ²	ISO 2039-1

Thermal Properties

Vicat Softening Temperature	97°C	ISO 306
Burning behavior (1,6mm)	HB	UL94

GUIDELINE FOR PRINT SETTINGS*

Nozzle temperature	235-255°C
Bed temperature	100°C
Active cooling fan	0 - 25%
Layer height**	0.05 - 0.30 mm
Shell thickness**	0.40 - 2.70 mm
Print speed**	30-150 mm/s
Closed chamber	recommended for larger prints
Dry box	not necessary
Ruby or hardened nozzle	not necessary

* settings are based on a 0.4 mm nozzle.

** depending on the geometrical complexity

DESCRIPTION

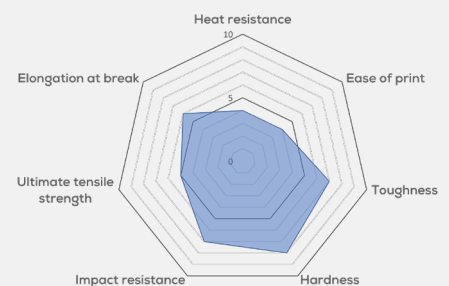
Filament Spectrum Medical ABS is a highest-quality material designed specifically for medical applications. This 3D printing filament has been manufactured using ABS pellets that meet the biocompatibility requirements of USP Class VI or ISO 10993-1 certifications, which guarantees that it is biocompatible up to 30 days in contact with the human body (topical use). Spectrum Medical ABS filament is food contact approved according to EU No 10/2011 and 21 CFR FDA regulations.

FEAUTURES

- biocompatible up to 30 days in contact with the human body
- 3D print of personalized, lightweight prostheses
- manufacturing of support structures for rehabilitation
- high speed printing without quality losses
- very robust lamination of layers

STORAGE AND SHELF LIFE

Filament should be stored in a dry room at room temperature. Recommended storage temperature is ca. 18-25°C (64.4 -77.0°F). Keep out of moisture, sunlight and direct heat. When stored properly, product has a shelf life of 24 months.



SUPPORT

If you have any questions or experience any issues, please do not hesitate to contact us at support@spectrumfilaments.com

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To whom it may concern

Biocompatibility

Spectrum Filaments ABS Medical 3D printing filament has been manufactured using ABS pellets, that meet the biocompatibility USP Class VI and ISO 10993-1 requirements up to 30 days in human contact.

Test	Reference	Results
USP Class VI with Histopathology	USP 39 NF 34	passed the test
Physicochemical Test for Plastics	USP <381>	passed the test
Analysis for Metals	ICP-OES Elemental testig after acid digestion	not detected at the detection limit
Rabbit Pyrogen (Material Mediated) 30-minute intervals between 1 and 3 hours observation	ISO 10993-11 ISO 10993-12 ISO/IEC 17025/2005	non-pyrogenic
Systemic Injection 72-hours exposure 0,9% sodium chloride USP solution extract Cottonseed Oil (CSO) Ethanol in saline, 1:20 solution extract Polyethylene glycol 400 extract	ISO 10993-11 ISO 10993-12 ISO/IEC 17025/2005	non-toxic
In Vitro Hemocompatibility	ISO 10993-4	passes the test
Short Term Intramuscular Implantation 14-days exposure	ISO 10993-6 ASTM F 981-93	non-toxic
Rabbit blood Hemolysis	ASTM F756-13	non- hemolytic

MEM Elution – Cytotoxicity 48-hours exposure	USP 39 NF 34	non-cytotoxic
L929 Neutral Red Uptake -NRU - Cytotoxicity	ISO 10993-5 ISO 10993-12	non-cytotoxic
Kligman Maximisation < 30-days Cottonseed Oil (CSO) 0,9% sodium chloride USP solution extract	ISO 10993-10 ISO 10993-12	no evidence of sensitization
Intracutaneous Injection 72-hours exposure 0,9% sodium chloride USP solution extract Cottonseed Oil (CSO) Ethanol in saline, 1:20 solution extract Polyethylene glycol 400 extract	ISO 10993-10 ISO 10993-12 ISO/IEC 17025/2005	negligible irritant
Ames Assay Salmonella typhimurium and Escherichia coli Reverse Mutation Assay	ISO 10993-3 ISO 10993-12	non-mutagenic

Prior to testing the sample plaques were sterilized by Gamma Irradiation at 25.0 to 40.0 KGy dosage at Steris Corp. Tests conducted by Toxikon, Bedford MA, USA in accordance with Good Laboratory Practice.

It is the responsibility of the end manufacturer to ensure that the final product is suitable for its intended use.

The above mentioned information and results apply to pellet (raw material).

Spectrum Group Sp. z o.o. ensures that the raw material has not been modified in the filament manufacturing process.