

Product Information

**VESTAKEEP® iC 4620 3DF**

**IMPLANTABLE-GRADE POLYETHER ETHER KETONE FILAMENT FOR 3D PRINTING WITH 20% CARBON FIBER FOR LONG TERM IMPLANTABLE MEDICAL DEVICES**



VESTAKEEP® iC4620 3DF is an opaque, medium viscosity polyether ether ketone (PEEK) filament. It contains 20% carbon fiber to enhance stiffness.

**Biocompatibility**

The base resin VESTAKEEP® i4 G is especially designed for long term implantable medical devices. The compound composition is optimised for high biocompatibility and mechanical, thermal and chemical resistance.

VESTAKEEP® iC4620 3DF is a provisional material, biocompatibility testing is ongoing.

The biocompatibility testing program follows ISO 10993-1 recommendations for permanent tissue/bone contact and USP Class VI.

**Planned biocompatibility reports for VESTAKEEP® iC4620 3DF**

STANDARD	DESCRIPTION
ISO 10993-12	GC/MS Fingerprint of extractable organic substances
USP CLASS VI	Acute Systemic Toxicity Intracutaneous Reactivity Muscle Implantation
ISO 10993-5	Cytotoxicity
ISO 10993-10	Irritation: Intracutaneous Reactivity
ISO 10993-10	Sensitization: Maximization test according to Magnusson and Kligman
ISO 10993-11	Acute Systemic Toxicity
ISO 10993-3	Genotoxicity: Ames Test
ISO 10993-3	Genotoxicity: Mouse Lymphoma test
ISO 10993-11	Subchronic Systemic Toxicity (28 days)
ISO 10993-6	Test for local effects after Implantation in bone (28, 90, 180 days)
ISO 10993-11	Material-mediated pyrogenes

**Delivery**

VESTAKEEP® iC4620 3DF filament has a diameter of 1.75 mm and is supplied on TROGAMID® spools with 500g or 1000g. The spools are packaged in double bags to facilitate transfer into clean areas.

The properties listed are for information only and only apply to the VESTAKEEP® iC4620 G resin used in the manufacture of VESTAKEEP® iC4620 3DF. The performance and the purity of any parts manufactured from VESTAKEEP® iC4620 3DF are highly dependent on any 3D- or additive-printing processes, or any other processing, to which the filament is subjected. Only density and filament diameter apply to VESTAKEEP® iC4620 3DF directly.

**Key Features**

**Industrial Sector**

Medical Devices, 3D Printing

**Conformity**

Biocompatibility

**Processing**

3D Printing

**Additives**

Carbon fibers

**Delivery form**

(Mono)filament

**Mechanical properties ISO**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Tensile modulus	<b>16000</b>	MPa	ISO 527
Stress at break	<b>200</b>	MPa	ISO 527
Strain at break, B	<b>1.9</b>	%	ISO 527

**Thermal properties**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Melting temperature	<b>340</b>	°C	ISO 11357-1/-3
Melting Temperature	<b>340</b>	°C	ASTM D 3418

**Physical properties**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Density	<b>1350</b>	kg/m <sup>3</sup>	ISO 1183

**Rheological properties**

	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Melt volume-flow rate, MVR	<b>44</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>400</b>	°C	-
Load	<b>21.6</b>	kg	-

**Characteristics**

**Applications**

Medical implants

**Features**

Resistance to steam

**Processing**

Additive manufacturing

**Regulatory**

US Pharmacopeia Class VI conformity, Cytotoxicity ISO 10993-5

VESTAKEEP®

**Special Characteristics**

High impact strength, Semi-crystalline, High heat resistant,  
Medium viscosity, MRT compatible, Sterilizable

**Color**

Black

**Other extrusion**

**Drying recommendations**

We recommend to dry the filament prior to usage to avoid stringing, bubbles, or other defects.

- a) Filament on spool: minimum 12 hours at 80°C to 100°C. 100°C must not be exceeded to avoid distortion of the spool.
- b) Filament removed from spool: minimum 4 hours at 130°C to 140°C.

The maximum drying temperature of the filament is 140°C. Please also pay attention to the instructions of your drying device.