Product Information

VESTAKEEP® iC 4612 3DF

IMPLANTABLE-GRADE POLYETHER ETHER KETONE FILAMENT FOR 3D PRINTING WITH 12% CARBON FIBER FOR LONG TERM IMPLANTABLE MEDICAL DEVICES

VESTAKEEP® iC4612 3DF is an opaque, medium viscosity polyether ether ketone (PEEK) filament. It contains 12% 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® iC4612 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® iC4612 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® iC4612 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® iC4612 G resin used in the manufacture of VESTAKEEP® iC4612 3DF. The performance and the purity of any parts manufactured from VESTAKEEP® iC4612 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® iC4612 3DF directly.

The values presented are typical or average values, they do not constitute a specification.

Key Features

Industrial Sector
Medical Devices, 3D Printing

Processing
3D Printing

Delivery form
(Mono)filament

Conformity
Biocompatibility

Additives
Carbon fibers

Mechanical properties ISO	dry	Unit	Test Standard
Tensile modulus	**11500**	MPa	ISO 527
Stress at break	**170**	MPa	ISO 527
Strain at break, B	**2.7**	%	ISO 527

Thermal properties	dry	Unit	Test Standard
Melting temperature	**340**	°C	ISO 11357-1/-3

Physical properties	dry	Unit	Test Standard
Density	**1330**	kg/m^3	ISO 1183

Rheological properties	dry	Unit	Test Standard
Melt volume-flow rate, MVR	**62**	$cm^3/10min$	ISO 1133
Temperature	**400**	°C	-
Load	**21.6**	kg	-

Characteristics

Applications
Medical implants

Processing
Additive manufacturing

Features
Resistance to steam

Regulatory
US Pharmacopeia Class VI conformity, Cytotoxicity ISO 10993-5

Special Characteristics
High impact strength, Semi-crystalline, High heat resistant, 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.