

Product Information

VESTAKEEP® i5 G

IMPLANTABLE GRADE POLYETHER ETHER KETONE RESIN FOR PERMANENT IMPLANTS



VESTAKEEP® i5 G is a natural colored, very high viscosity polyether ether ketone (PEEK) that is especially designed for long term implantable medical devices.

Proven Biocompatibility of VESTAKEEP® i-Grades

The extra high purity and extended quality measures make VESTAKEEP® i-Grade materials an excellent choice for permanent implants.

For VESTAKEEP® i5 G, biocompatibility has been tested following ISO 10993-1 recommendations for permanent tissue/bone contact and USP Class VI.

VESTAKEEP® i5 G complies ASTM F2026 "Standard Specification for Polyetheretherketone (PEEK) Polymers for Surgical Implant Applications".

A summary of biocompatibility test results is available upon request.

Biocompatibility tests available for i5 G

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	Subchronic Systemic Toxicity
ISO 10993-3	Genotoxicity: Ames Test
ISO 10993-3	Genotoxicity: Chromosome Aberration test
ISO 10993-3	Genotoxicity: Mouse Lymphoma test
ISO 10993-6	Test for local effects after Implantation in bone (90 days)

Delivery of VESTAKEEP® i-Grades

VESTAKEEP® i5 G is supplied as cylindrical pellets in 10 kg boxes with moisture-proof polyethylene liners.

Key Features

Industrial Sector

Medical Devices

Processing

Extrusion

Delivery form

Pellets, Granules

Resistance to

Heat (thermal stability), Hydrolysis / hot water, Wear / abrasion, Fatigue resistance, Oil / fuels

Conformity

Biocompatibility, Medical application

Additives

Unfilled

Mechanical properties ISO

	dry	Unit	Test Standard
Tensile modulus	508000	psi	ISO 527
Tensile strength	13800	psi	ISO 527
Yield stress	13800	psi	ISO 527
Yield strain	5	%	ISO 527
Stress at break	11200	psi	ISO 527
Nominal strain at break, tB	34	%	ISO 527
Charpy impact strength, +23°C	N	ftlb/in ²	ISO 179/1eU
Charpy impact strength, -30°C	N	ftlb/in ²	ISO 179/1eU
Charpy notched impact strength, +23°C	4.52	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-
Charpy notched impact strength, -30°C	3.81	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-

Thermal properties

	dry	Unit	Test Standard
Melting temperature	640	°F	ISO 11357-1/-3
Glass transition temperature, DSC	307	°F	ISO 11357-1/-2
Glass transition temperature, 2 nd heating, onset	293	°F	ISO 11357
Glass transition temperature, 2 nd heating, midpoint	311	°F	ISO 11357
Recrystallization temperature, 10 K/min	545	°F	ISO 11357
Temp. of deflection under load A, 1.80 MPa	302	°F	ISO 75-1/-2

Temp. of deflection under load B, 0.45 MPa	401	°F	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	635	°F	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	581	°F	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	3.33E-5	in/in/°F	ISO 11359-1/-2
Melting Temperature	640	°F	ASTM D 3418

Physical properties	dry	Unit	Test Standard
Density	1.3	g/cm ³	ISO 1183
Water absorption	0.4	%	Sim. to ISO 62
Humidity absorption	0.12	%	Sim. to ISO 62
Density	1.3	g/cm ³	ASTM D 792

Burning Behav.	dry	Unit	Test Standard
Oxygen index	36	%	ISO 4589-1/-2
Limiting Oxygen Index	36	%	ASTM D 2863

Rheological properties	dry	Unit	Test Standard
Melt volume-flow rate, MVR	7	cm ³ /10min	ISO 1133
Temperature	380	°C	-
Load	5	kg	-
Molding shrinkage, parallel	0.9	%	ISO 294-4, 2577
Molding shrinkage, normal	1.1	%	ISO 294-4, 2577
Mold temperature	356	°F	-
Melt temperature	716	°F	-

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	716	°F	ISO 294
Injection Molding, mold temperature	356	°F	ISO 294
Injection Molding, injection velocity	7.87	in/s	ISO 294

Characteristics

Special Characteristics

High impact strength, Semi-crystalline

Regulatory

US Pharmacopeia Class VI conformity

Color

Natural color

Chemical Resistance

Acid resistance, Alkali resistance, Solvent resistance, Grease resistance, Hydrolytically stable, Oil resistance, Oxidation resistance, General chemical resistance