

Product Information

VESTAKEEP® DC 4450 G

TOOTH-COLORED POLYETHER ETHER KETONE FOR DENTAL APPLICATIONS



VESTAKEEP® DC4450 G is a tooth-colored, high viscosity polyether ether ketone (PEEK) resin that is especially designed for removable and fixed dentures, crowns and bridges.

Biocompatibility of VESTAKEEP® Dental

For VESTAKEEP® DC4450 G, biocompatibility has been tested according to ISO 10993-1 recommendations for permanent mucous membrane contact. The compound composition is optimised for high biocompatibility and superior mechanical, thermal and chemical resistance.

Biocompatibility test reports available for VESTAKEEP® DC4450 G

Standard	Description
ISO 10993-03	Genotoxicity: Salmonella Typhimurium Reverse Mutation Test (Ames Test)
ISO 10993-05	Cytotoxicity: Quantitative Growth Inhibition Test
ISO 10993-10	Irritation: Intracutaneous Reactivity
ISO 10993-10	Sensitization: Local Lymph Node Assay
ISO 10993-11	Acute Systemic Toxicity
ISO 10993-11	Subacute / Subchronic Toxicity 14 days
ISO 10993-18	Extraction Tests
USP Class VI	Acute Systemic Toxicity Intracutaneous Reactivity Muscle Implantation

Processing of VESTAKEEP® Dental

VESTAKEEP® DC4450 G can be processed by common melt processing techniques like injection molding and extrusion.

For injection molding, we recommend a melt temperature in the 380°C to 400°C range. The mold temperature should be within 160°C to 200°C, preferably 180°C.

Delivery of VESTAKEEP® Dental

VESTAKEEP® DC4450 G is supplied as granules in 25 kg boxes with moisture-proof polyethylene liners.

Key Features

Industrial Sector
Medical Devices

Optics
Opaque

Processing

Injection molding, Extrusion

Delivery form

Pellets, Granules

Resistance to

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

Conformity

Biocompatibility, Medical application

Mechanical properties ISO

	dry	Unit	Test Standard
Tensile modulus	595000	psi	ISO 527
Tensile strength	13800	psi	ISO 527
Yield stress	13800	psi	ISO 527
Yield strain	4.8	%	ISO 527
Stress at break	10900	psi	ISO 527
Nominal strain at break, tB	20	%	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	3.23	ftlb/in ²	ISO 179/1eA
Type of failure	C	-	-

Thermal properties

	dry	Unit	Test Standard
Melting temperature	639	°F	ISO 11357-1/-3
Glass transition temperature, DSC	309	°F	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	311	°F	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	410	°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	2.5E-5	in/in/°F	ISO 11359-1/-2
Melting Temperature	639	°F	ASTM D 3418

Physical properties

	dry	Unit	Test Standard
Density	1.51	g/cm ³	ISO 1183

Water absorption	0.4	%	Sim. to ISO 62
Humidity absorption	0.3	%	Sim. to ISO 62
Density	1.51	g/cm ³	ASTM D 792

Electrical properties	dry	Unit	Test Standard
Volume resistivity, V	>1E13	Ohm*m	IEC 62631-3-1
Surface resistivity, C, circular electrodes	>1E15	Ohm/sq	IEC 62631-3-2
Relative permittivity, 50Hz	3.5	-	IEC 62631-2-1
Relative permittivity, 100Hz	3.6	-	IEC 62631-2-1
Relative permittivity, 1MHz	3.6	-	IEC 62631-2-1
Dielectric strength, AC, S20/S20, t. 1 mm	744	kV/in	IEC 60243-1

Optical properties	dry	Unit	Test Standard
Color L	86	-	CIE
Color a	1.5	-	CIE
Color b	16	-	CIE

Rheological properties	dry	Unit	Test Standard
Melt volume-flow rate, MVR	11	cm ³ /10min	ISO 1133
Temperature	380	°C	-
Load	5	kg	-
Molding shrinkage, parallel	0.9	%	ISO 294-4, 2577
Molding shrinkage, normal	1.0	%	ISO 294-4, 2577
Mold temperature	356	°F	-
Melt temperature	716	°F	-

Polymer analytics	dry	Unit	Test Standard
Ash content	21.2	%	ISO 3451

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

Semi-crystalline, High viscosity

Regulatory

US Pharmacopeia Class VI conformity

Color

Tooth-colored

Chemical Resistance

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