

Product Information

**VESTAKEEP® DC 4420 G**

**WHITE PIGMENTED POLYETHER ETHER KETONE FOR DENTAL APPLICATIONS**



**VESTAKEEP® DC4420 G** white pigmented polyether ether ketone for dental applications 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® DC4420 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® DC4420 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® DC4420 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® DC4420 G is supplied as granules in 25 kg boxes with moisture-proof polyethylene liners.

**Key Features**

**Industrial Sector**

Medical Devices

**Processing**

Injection molding, Extrusion

**Delivery form**

Pellets, Granules

**Optics**

Opaque

**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	<b>4100</b>	MPa	ISO 527
Tensile strength	<b>95</b>	MPa	ISO 527
Yield stress	<b>95</b>	MPa	ISO 527
Yield strain	<b>4.8</b>	%	ISO 527
Stress at break	<b>75</b>	MPa	ISO 527
Nominal strain at break, tB	<b>18</b>	%	ISO 527
Charpy impact strength, +23°C	<b>N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy impact strength, -30°C	<b>N</b>	kJ/m <sup>2</sup>	ISO 179/1eU
Charpy notched impact strength, +23°C	<b>6.8</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C</b>	-	-
Charpy notched impact strength, -30°C	<b>6</b>	kJ/m <sup>2</sup>	ISO 179/1eA
Type of failure	<b>C</b>	-	-
Flexural modulus, 23°C	<b>4230</b>	MPa	ISO 178
Flexural stress at conv. deflection, 23°C	<b>130</b>	MPa	ISO 178
Flexural strength, 23°C	<b>154</b>	MPa	ISO 178
Flexural strain at flexural strength, 23°C	<b>6</b>	%	ISO 178
Flexural stress at break, 23°C	<b>N</b>	MPa	ISO 178
Flexural strain at break, 23°C	<b>N</b>	%	ISO 178

**Thermal properties**

	dry	Unit	Test Standard
Melting temperature	<b>336</b>	°C	ISO 11357-1/-3

Glass transition temperature, DSC	<b>155</b>	°C	ISO 11357-1/-2
Temp. of deflection under load A, 1.80 MPa	<b>155</b>	°C	ISO 75-1/-2
Temp. of deflection under load B, 0.45 MPa	<b>210</b>	°C	ISO 75-1/-2
Vicat softening temperature A, 10 N, 50 K/h	<b>335</b>	°C	ISO 306
Vicat softening temperature B, 50 N, 50 K/h	<b>305</b>	°C	ISO 306
Coeff. of linear therm. expansion, 23°C to 55 °C, parallel	<b>45</b>	E-6/K	ISO 11359-1/-2
Melting Temperature	<b>336</b>	°C	ASTM D 3418

<b>Physical properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Density	<b>1490</b>	kg/m <sup>3</sup>	ISO 1183
Water absorption	<b>0.4</b>	%	Sim. to ISO 62
Density	<b>1490</b>	kg/m <sup>3</sup>	ASTM D 792

<b>Optical properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Color L	<b>89</b>	-	CIE
Color a	<b>0.5</b>	-	CIE
Color b	<b>5</b>	-	CIE

<b>Rheological properties</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Melt volume-flow rate, MVR	<b>11</b>	cm <sup>3</sup> /10min	ISO 1133
Temperature	<b>380</b>	°C	-
Load	<b>5</b>	kg	-
Molding shrinkage, parallel	<b>1.0</b>	%	ISO 294-4, 2577
Molding shrinkage, normal	<b>1.1</b>	%	ISO 294-4, 2577
Mold temperature	<b>180</b>	°C	-
Melt temperature	<b>360</b>	°C	-

<b>Polymer analytics</b>	<b>dry</b>	<b>Unit</b>	<b>Test Standard</b>
Ash content	<b>19.7</b>	%	ISO 3451

Test specimen production	dry	Unit	Test Standard
Injection Molding, melt temperature	<b>385</b>	°C	ISO 294
Injection Molding, mold temperature	<b>180</b>	°C	ISO 294
Injection Molding, injection velocity	<b>200</b>	mm/s	ISO 294

### Characteristics

#### Special Characteristics

Semi-crystalline

#### Regulatory

US Pharmacopeia Class VI conformity

#### Color

White

#### Chemical Resistance

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