

Technical Information

VESTAKEEP® Dental-Grades

VESTAKEEP® PEEK (polyether ether ketone) materials are driving high levels of innovation in medical devices and dental technology.

VESTAKEEP® Dental-Grades provide an innovative and metal-free solution for outstanding wear comfort. They are base materials for medical devices like crowns, bridges, and removable and permanent dentures alike. VESTAKEEP® Dental-Grades are offered in various colors to meet the aesthetic demands of the patient.

VARIOUS COLORS

VESTAKEEP® D4	natural colored
VESTAKEEP® DC4420	white colored
VESTAKEEP® DC4430	white colored, filled with 6% barium sulphate
VESTAKEEP® DC4450	tooth-colored
VESTAKEEP® DC4470	gingiva-colored

BIOCOMPATIBILITY TEST REPORTS AVAILABLE FOR VESTAKEEP® DENTAL GRADES

Standard	Description
ISO 10993-3	Genotoxicity: Salmonella Typhimurium Reverse Mutation Test (Ames Test)
ISO 10993-5	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 AND DELIVERY FORMS

VESTAKEEP® Dental Granules 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. VESTAKEEP® Dental Granules are supplied as cylindrical pellets in 25kg boxes with polyethylene liners. The compound composition is optimized for high biocompatibility and superior mechanical, thermal and chemical resistance.

VESTAKEEP® Dental rods are available in different diameters and lengths:

Dimensions of VESTAKEEP® Dental-Grades diameter standard length*

6 to 20 mm	3000 mm
25 to 60 mm	2000 mm
70 to 100 mm	1000 mm

* Custom lengths are also available

ADVANTAGES AT A GLANCE

- Excellent wear comfort due to being metal-free, tasteless, light weight, and with low thermal conductivity
- Biocompatible
- Biostabile
- Compatible with common veneer and composite materials
- X-ray opaque grades available
- For use with permanent and removable devices

SUPPORT

Please inquire if you need technical support regarding the processing or other technical information.

For further information, please contact us at evonik-hp@evonik.com.

VESTAKEEP® DENTAL- GRADES (R=RODS)

Properties	Test method	Unit	D4 R	DC4420 R	DC4430 R	DC4450 R	DC4470 R	
Density	23°C	ISO 1183	g/cm ³	1.30	1.51	1.51	1.52	1.36
Barium sulphate content			%	-	-	6.0	-	-
Tensile test 23°C	50 mm/min	ISO 527-1 ISO 527-2						
Stress at yield		MPa	110	110	110	110	110	
Strain at yield		%	4.8	4.2	4.2	4.2	4.5	
Strain at break		%	>100	>10	>10	>10	>10	
Tensile modulus		ISO 527-1/2	MPa	4000	5100	5100	5100	4400
Melting range, DSC, 2 nd heating		ISO 11357	°C	approx. 340	approx. 340	approx. 340	approx. 340	approx. 340
Flexural Test	23°C	ISO 178						
Flexural Modulus		MPa	4050	4700	5100	4800	4400	
Flexural Strength		MPa	165	178	178	178	175	
IZOD notched impact strength	23°C	ISO 180	kJ/m ²	5.5	5.4	5.4	5.1	5.4
Temperature of deflection under load								
Method A	1.8 MPa	ISO 75-1	°C		155	155	155	155
Method B	0.45MPa	ISO 75-2	°C		210	210	210	210
Vicat softening temperatue		ISO 306						
Method A	10N		°C		335	335	335	335
Method B	50N		°C		305	305	305	305
Linear thermal expansion longitudinal	23-55°C	ISO 11359	10 ⁻⁴ K ⁻¹	0.45	0.45	0.45	0.45	0.45
Flammability acc. UL94	1.6 mm	IEC 60695		V-0				
Water absorption, saturation		ISO 62	%	0.4	0.4	0.4	0.4	0.4

VESTAKEEP® DENTAL- GRADES (G=GRANULES)

Properties	Test method	Unit	D4 G	DC4420 G	DC4430 G	DC4450 G	DC4470 G	
Density	23°C	ISO 1183	g/cm ³	1.30	1.49	1.50	1.51	1.36
Barium sulphate content			%	-	-	6.0	-	-
Tensile test	23°C / 50 % r.h.							
Stress at yield	ISO 527-1	MPa	96	95	95	95	95	
Strain at yield	ISO 527-2	%	5.0	4.8	4.8	4.8	5.0	
Strain at break		%	>10	>10	>10	>10	>10	
Tensile modulus	ISO 527-1/2	MPa	3500	4100	4100	4100	3600	
Melting range, DSC, 2 nd heating	ISO 11357	°C	approx. 340	approx. 340	approx. 340	approx. 340	approx. 340	
CHARPY								
impact strength	23°C / 50% r.h.	ISO 179/1eU	kJ/m ²	N	N	N	N	
notched impact strength	23°C / 50% r.h.	ISO 179/1eA	kJ/m ²	8 C	6.8 C	6.8 C	6.8 C	
Temperature of deflection under load								
Method A	1.8 MPa	ISO 75-1	°C	155	155	155	155	
Method B	0.45MPa	ISO 75-2	°C	210	210	210	210	
Vicat softening temperature		ISO 306						
Method A	10N		°C	335	335	335	335	
Method B	50N		°C	305	305	305	305	
Linear thermal expansion longitudinal		ISO 11359	10 ⁻⁴ K ⁻¹	0.45	0.45	0.45	0.45	
23-55°C								
Melt volume-flow rate (MVR)380°C/kg		ISO 1133	cm ³ / 10min	12	9.5	9.5	9.5	
Water absorption, saturation		ISO 62	%	0.4	0.4	0.4	0.4	

C = Complete break, incl. hinge break H N = No break

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