

**Oxide/oxide ceramic matrix composite “Keramiklech”,  
Overview, (as of 2021)**

Keramiklech Type, old name	SvM1514N/SvM-Alu	MvM1415N	MvM1415N-2220	AvM 1415N	AvM 1415N-3000	FW12			FW30		
Keramiklech Type, new name	SvM	MvM-3025	MvM-2220	AvM/610-1500	AvM/610-3000	N610-DF11-1500/ FW12	N610-DF11-3000/ FW12	N610-DF13-4500/ FW12	N610-DF19/FW30	N720-EF11/FW12	N720-EF19/FW30
Fibre (Fabric)	Silika	Nitivy-3025T	Nitivy-2220S	Nextel 610/ 1500 denier (DF11-1500)	Nextel 610/ 3000 denier (DF19-3000)	Nextel 610/ 1500 denier (DF11-1500)	Nextel 610/ 3000 denier (DF11-3000)	Nextel 610/ 4500 denier (DF13-4500)	Nextel 610/ 3000 denier (DF19-3000)	Nextel 720/ 1500 denier (EF11-1500)	Nextel 720/ 3000 denier (EF19-3000)
Matrix	65% Al <sub>2</sub> O <sub>3</sub> 35% SiO <sub>2</sub>	70% Al <sub>2</sub> O <sub>3</sub> 30% SiO <sub>2</sub>	70% Al <sub>2</sub> O <sub>3</sub> 30% SiO <sub>2</sub>	70% Al <sub>2</sub> O <sub>3</sub> 30% SiO <sub>2</sub>	70% Al <sub>2</sub> O <sub>3</sub> 30% SiO <sub>2</sub>	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ	85% Al <sub>2</sub> O <sub>3</sub> 15% 3YSZ
Thickness per layer [mm]	0,75	0,5	0,75	0,3	0,5	0,25	0,28	0,35	0,45	0,3	0,55
Density [g/cm <sup>3</sup> ]	1,5	1,9	1,9	2,3	2,3	2,5	2,6	2,6	2,6	2,6	2,5
Bending strength [MPa] anisotrop 0/90° at RT*	20-30	60-70	60-70	160-170 <sup>(2)</sup>	120-130	350 <sup>(3)</sup>	300 <sup>(3)</sup>	330 <sup>(3)</sup>	273 <sup>(5)</sup>	213,5	152,1
Young's modulus (bending) [GPa] at RT*	–	–	–	78 <sup>(2)</sup>	50	92 <sup>(2), (1), (3)</sup>	92 <sup>(3)</sup>	100 <sup>(3)</sup>	85 <sup>(5)</sup>	–	–
Bending strength [MPa] anisotrop +/-45° at RT*	–	–	–	–	–	180	–	–	–	82	55,7
Bending strength [MPa] isotrop 0/90° at RT*	–	–	–	–	–	321	–	–	–	153,8	138,3
Tensile strength [MPa] anisotrop 0/90° at RT*	–	–	–	60-65 <sup>(2), (3)</sup>	–	280 <sup>(3)</sup>	230 <sup>(3)</sup>	250 <sup>(3)</sup>	153 <sup>(5)</sup>	146,8 <sup>(3)</sup>	–
Young's modulus (tension) [GPa] at RT*	–	–	–	78 <sup>(2)</sup>	–	97 <sup>(3)</sup>	85 <sup>(3)</sup>	83 <sup>(3)</sup>	74 <sup>(5)</sup>	51,5 <sup>(3)</sup>	–
Tensile strength [MPa] anisotrop +/-45° at RT*	–	–	–	–	–	88,5 <sup>(3)</sup>	–	–	–	33 <sup>(3)</sup>	–
Tensile strength [MPa] at 1000 °C	–	–	–	35 <sup>(3)</sup>	–	215 <sup>(3)</sup>	–	–	–	167,7 <sup>(3)</sup>	–
Tensile strength [MPa] at 1200 °C	–	–	–	35 <sup>(3)</sup>	–	73 <sup>(3)</sup>	–	–	–	157,2 <sup>(3)</sup>	–
Compression strength [MPa] at RT*	–	–	–	62 <sup>(2)</sup>	–	207 <sup>(2)</sup>	–	–	216 <sup>(5)</sup>	–	–
Young's modulus (compression) [GPa] at RT*	–	–	–	93 <sup>(2)</sup>	–	123 <sup>(2)</sup>	–	–	70 <sup>(5)</sup>	–	–
Shear strength (ILSS) [MPa] at RT*	–	–	–	10,5 <sup>(2)</sup>	–	17 <sup>(2), (1), (3)</sup>	17 <sup>(3)</sup>	15,5 <sup>(3)</sup>	17 <sup>(5)</sup>	8,4 <sup>(3)</sup>	–
Thermal expansion coefficient [10 <sup>-6</sup> 1/K]	2	6-8	6-8	6-8	6-8						
25–300 °C	–	–	–	–	–	6,94 <sup>(1)</sup>	6,94 <sup>(1)</sup>	6,94 <sup>(1)</sup>	6,94 <sup>(1)</sup>	–	–
25–600 °C	–	–	–	–	–	7,69	7,69	7,69	7,69	–	–
25–900 °C	–	–	–	–	–	8,17	8,17	8,17	8,17	–	–
25–1100 °C	–	–	–	–	–	8,49	8,49	8,49	8,49	–	–
Thermal conductivity [W/mK]	< 1	< 1,5	< 1,5								
300 °C	–	–	–	2,44 <sup>(4)</sup>	–	3,80 <sup>(1)</sup>	3,80 <sup>(1)</sup>	3,80 <sup>(1)</sup>	3,80 <sup>(1)</sup>	–	–
600 °C	–	–	–	1,89	–	2,81	2,81	2,81	2,81	–	–
900 °C	–	–	–	1,63	–	2,30	2,30	2,30	2,30	–	–
1100 °C	–	–	–	1,52	–	2,02	2,02	2,02	2,02	–	–
Recommended continuous service temperature [°C]	< 950 °C	< 1150 °C	< 1150 °C	< 1300 °C	< 1300 °C	< 1300 °C	< 1300 °C	< 1300 °C	< 1300 °C	< 1300 °C	< 1300 °C
Recommended continuous service temperature [°C] with mechanical load	< 900 °C	< 1100 °C	< 1100 °C	< 1200 °C	< 1200 °C	< 1200 °C	< 1200 °C	< 1200 °C	< 1200 °C	< 1200 °C	< 1200 °C
Maximum continuous service temperature [°C] with high mechanical load	< 900 °C	< 1100 °C	< 1100 °C	< 1000 °C	< 1000 °C	< 1000 °C	< 1000 °C	< 1000 °C	< 1000 °C	< 1200 °C	< 1200 °C

(\*at room temperature) Measured by FhG-ISC <sup>(1)</sup>, FhG-IWM <sup>(2)</sup>, Universität Bremen, Advanced Ceramics <sup>(3)</sup>, TU Freiberg <sup>(4)</sup>, Berner Fachhochschule TI <sup>(5)</sup>