ecm engineered ceramic materials GmbH

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Cesic® Material Properties

Type MF

Starting material	**Micro-fiber carbon felt**
Fiber orientation	**Isotropic**
Max. temperature at permanent operation	**1400 ° C (1673 K)**

Mechanical Properties

Density	**2.65 – 2.70 g/cm³**		
3-Point bending strength			
293 K	**164 MPa**	**22 Std. Dev.**	
90 K	**163 MPa**	**20 Std. Dev.**	
4-Point bending strength			
293 K (samples: 150 x 30 x 3 mm)	**111 MPa**	**16 Std. Dev.**	**11 Weibull**
293 K (samples: 80 x 10 x 3 mm)	**149 MPa**	**13 Std. Dev.**	**14 Weibull**
Young's modulus	**249 GPa**	**20 Std. Dev.**	
Fracture toughness K_{IC}	**4.62 MPa m$^{1/2}$**		
Poisson's ratio	**0.17**		

Thermal Properties

CTE		
20 K - 85 K	**0.00**	**10^{-6} / K**
85 K - 120 K	**0.06**	**10^{-6} / K**
120 K - 180 K	**0.43**	**10^{-6} / K**
180 K - 220 K	**1.07**	**10^{-6} / K**
220 K - 300 K	**2.09**	**10^{-6} / K**
313 K - 393 K	**2.74**	**10^{-6} / K**
Thermal conductivity (λ)		
293 K	**121**	**W / (m K)**
Specific heat capacity		
293 K	**0.8**	**J / (g K)**
1473 K	**1.2**	**J / (g K)**
Thermal shock parameter R_1	**169**	**K**

(R_1 equals the max. temperature increase, ΔT, applied suddenly to the surface that Cesic® can tolerate without damage.)

Thermal shock parameter $R_2 = \lambda R_1$	**2.04**	**10^4 W / m****

Electrical Properties

Specific electrical resistance, 293 K	**6.45 10^{-5} Ω m**
Specific electrical conductivity (293 K)	**15.503 S / m**

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