e-Manufacturing Solutions

CarbonMide

PA12-CF — EOS GmbH - Electro Optical Systems

Product Texts

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The anthracite black, carbon-fibre filled polyamide 12 material stands out for excellent stiffness and a maximised weight-strength-ratio. Laser-sintered parts made from CarbonMide possess excellent material properties:

- extreme stiffness
- excellent strength and hardness
- light weight
- electric conductivity

Due to the process related orientation of the fibres the mechanical properties varies in the three axis directions. Typical applications of the material are mechanically stressed parts which are optimised considering the self-weight of the part. Surface finished CarbonMide laser-sinter parts are suited for e.g. usage as aerodynamic components in motor sports application.

3D Data	Value	Unit	Test Standard
The properties of parts manufactured using additive manufacturing technology (e.g. laser sintering, stereolithography, Fused Deposition Modelling, 3D printing) are, due to their layer-by-layer production, to some extent direction dependent. This has to be considered when designing the part and defining the build orientation.			
Tensile Modulus			ISO 527-1/-2
X Direction	**6100**	MPa	
Y Direction	**3400**	MPa	
Z Direction	**2200**	MPa	
Tensile Strength			ISO 527-1/-2
X Direction	**72**	MPa	
Y Direction	**56**	MPa	
Z Direction	**25**	MPa	
Strain at break			ISO 527-1/-2
X Direction	**4.1**	%	
Y Direction	**6.3**	%	
Z Direction	**1.3**	%	
Charpy impact strength			ISO 179/1eU
+23°C, X Direction	**20.5**	kJ/m²	
+23°C, Y Direction	**27.5**	kJ/m²	
+23°C, Z Direction	**5.5**	kJ/m²	
Charpy notched impact strength			ISO 179/1eA
+23°C, X Direction	**5.3**	kJ/m²	
+23°C, Y Direction	**4.4**	kJ/m²	
+23°C, Z Direction	**2.1**	kJ/m²	
Volume resistivity			IEC 60093
X Direction	**0.0463**	Ohm*m	
Y Direction	**0.107**	Ohm*m	
Z Direction	**3.08**	Ohm*m	

Thermal properties	Value	Unit	Test Standard
Melting temperature (20°C/min)	**176**	°C	ISO 11357-1/-3

Other properties	Value	Unit	Test Standard
Density (lasersintered)	**1040**	kg/m³	EOS Method

Characteristics

Processing

Laser Sintering, Rapid Prototyping

Special Characteristics

Increased electrical conductivity