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 (X Direction)	**6100**	MPa	ISO 527-1/-2
Tensile Modulus (Y Direction)	**3400**	MPa	ISO 527-1/-2
Tensile Modulus (Z Direction)	**2200**	MPa	ISO 527-1/-2
Tensile Strength (X Direction)	**72**	MPa	ISO 527-1/-2
Tensile Strength (Y Direction)	**56**	MPa	ISO 527-1/-2
Tensile Strength (Z Direction)	**25**	MPa	ISO 527-1/-2
Strain at break (X Direction)	**4.1**	%	ISO 527-1/-2
Strain at break (Y Direction)	**6.3**	%	ISO 527-1/-2
Strain at break (Z Direction)	**1.3**	%	ISO 527-1/-2
Charpy impact strength (+23°C, X Direction)	**20.5**	kJ/m	ISO 179/1eU
Charpy impact strength (+23°C, Y Direction)	**27.5**	kJ/m	ISO 179/1eU
Charpy impact strength (+23°C, Z Direction)	**5.5**	kJ/m	ISO 179/1eU
Charpy notched impact strength (+23°C, X Direction)	**5.3**	kJ/m	ISO 179/1eA
Charpy notched impact strength (+23°C, Y Direction)	**4.4**	kJ/m	ISO 179/1eA
Charpy notched impact strength (+23°C, Z Direction)	**2.1**	kJ/m	ISO 179/1eA
Volume resistivity (X Direction)	**0.0463**	Ohm*m	IEC 60093
Volume resistivity (Y Direction)	**0.107**	Ohm*m	IEC 60093
Volume resistivity (Z Direction)	**3.08**	Ohm*m	IEC 60093

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/m	EOS Method

Characteristics

Processing

Laser Sintering, Rapid Prototyping

Special Characteristics

Increased electrical conductivity