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## HIGH PERFORMANCE PULTRUDED PROFILES

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### 1. Benefits of high-performance fiber/epoxy profiles:

#### Benefits of carbon fiber / epoxy profiles::

- Low weight
- High bending strength
- Good resistance to aging and fatigue
- Good dimensional stability
- Good corrosion resistance



#### Special advantages of 1C high-performance carbon profiles:

Thanks to the special orientation and weave of their fibers, in contrast to conventional profiles, it is possible to avoid sharp edges in 1C profiles. This eliminates critical notch effects at these edges. The special fiber structure also significantly improves bending strength as well as torsional and impact toughness.

#### Advantages of 1C high-performance carbon plates:

In a system designed specifically for the production of epoxy-carbon plates, our 1C high-strength epoxy-carbon plates are pressed under a strictly monitored curing cycle and high pressure. HT fibers are used exclusively for the weave and fabric in various directional orientations, which guarantee high form stability on the one hand, and an interesting visual surface appearance on the other. The resin system that is used exhibits elasticity and form stability. Together with the HT fibers it delivers an optimal profile of properties for the 1C carbon plates.

## 2. Engineering and physical properties of the profiles:

A carbon fiber / epoxy profile (T300 carbon fiber) with 60 %-vol. fiber content.

	Dichte	Zugfestigkeit	Biegefestigkeit	Druckfestigkeit	Druckmodul	Scherfestigkeit	Zugmodul	Biegemodul	Wärmedehnung s-koeffizient	Elektrischer Wiederstand	
Einheit	g/cm <sup>3</sup>	MPa	MPa	MPa	GPa	MPa	GPa	GPa	1/K	μΩm	Unit
Längsrichtung	1,55	1400	1700	1200	125	90	130	125	0,25·10 <sup>-6</sup>	30a50	Length direction
Querrichtung		80					7,9		36·10 <sup>-6</sup>	70000	Transverse
	density	Tensile strength	Flexual strength	Compressive strength	Compressive modulus	LL.S.S	Tensile modulus	Flexual modulus	Thermal expansion coefficient	Electrical resistance	

$$1\text{MPa} = 1\text{N/mm}^2$$

$$1\text{GPa} = 1000\text{N/mm}^2$$

### For comparison: key properties of aluminum:

	Density g/cm <sup>3</sup>	Tensile strength MPa
AlMg 3 – wrought alloy	2.7	180-260
AlZnMgCu 0.5 – wrought alloy	2.7	460

## 3. Engineering and physical properties of the resin:

	Dichte	Bruchfestigkeit	Elastizitätsmodul	Bruchdehnung	Wärmeleit-fähigkeit	Wärmedehnungs- koeffizient	Martens DIN 53458	Dynamischer Modul	Glasübergangstem- peratur (T <sub>g</sub> )	
Einheit	g/cm <sup>3</sup>	MPa	MPa	%	W/(m·K)	1/K	°C	MPa	°C	Unit
Epoxy	1,2	60	3500	2	4·10 <sup>-4</sup>	108·10 <sup>-6</sup>	120	4000	130	Epoxy
Polyester	1,2	60	1200	6	45·10 <sup>-4</sup>	70·10 <sup>-6</sup>	60			Polyester
	density	Ultimate break. strength	Elasticity modulus	Ultimate elongation	Thermal conduction	Thermal expansion coefficient	MARTENS DIN 53458	Dynamic	T <sub>g</sub>	