



TÜNKERS Carbon Fibre Tube Systems (TCR)

From a technical viewpoint, the force-closed TÜNKERS® Carbon Fibre Tube System makes use of the optimum moment of inertia of tubes and, at the same time, the special properties of carbon fibres.

Right at the beginning of the project phase and without knowledge of the component or gripper weight in question, the maximum permissible weight category is defined by determining the type of robot. If this weight category of the gripper solution designed for the actual application is exceeded, apart from selective measures to reduce weight, the designer must resort to using a larger robot, with negative consequences in terms of investment, space requirement (footprint) and cycle time.

With potential weight savings of up to 50%, the TÜNKERS® Carbon Fibre Tube System is a genuine alternative and creates new design leeway, as both a complete system and a hybrid solution, in which aluminum, steel and carbon fibre components can be flexibly combined in one product.

- System consisting of precision carbon fibre tubes in diameters of 25, 40 and 60 mm
- Combination and integration in existing gripper systems possible → similar offset between aluminum and carbon fibre joints
- Weight reduction → Use of a lower category of robot
- In comparison with an aluminum system: weight reduction of 40%, price supplement approx. 20% in terms of the complete gripper system

GRIPPING



Precision carbon fibre tubes - GRC Ø 25, 40 and 60 mm



Carbon fibre cross joints - GKC



'Stingray' – the lightweight carbon fibre bracket
Weight: from 6 kg



Stingray as gripper system – total weight approx. 30 kg



Example application – transporting 115 kg floor pan



Type	Material	Weight	Geometrical moment of inertia I _x	Section modulus W _x	Surface treatment
GRC 60	CFK	0,85 kg/m	218780 mm ⁴	7293 mm ³	ground

Ordering information: GRC60-...

Profile lengths in 10 mm increments (maximum length 3000 mm)



Type	Material	Weight	Geometrical moment of inertia I _x	Section modulus W _x	Surface treatment
GRC 40	CFK	0,64 kg/m	67450 mm ⁴	3372 mm ³	ground

Ordering information: GRC40-...

Profile lengths in 10 mm increments (maximum length 3000 mm)



Type	Material	Weight	Geometrical moment of inertia I _x	Section modulus W _x	Surface treatment
GRC 25	CFK	0,33 kg/m	12778 mm ⁴	1022 mm ³	ground

Ordering information: GRC25-...

Profile lengths in 10 mm increments (maximum length 3000 mm)

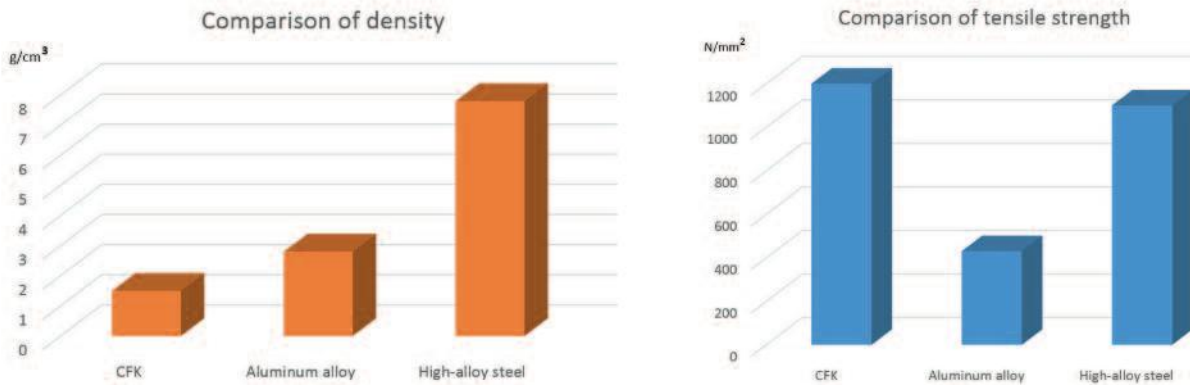
Please Note:

All technical data relating to the profiles have been determined using Autodesk Inventor Professional 2014. Tünkers does not guarantee that the actual product exactly corresponds to the technical data provided. Tünkers accepts no liability for damage which may occur as the result of individual use of the product.

Characteristics of CFK in comparison with steel or aluminum

- Exceptional strength to weight ratio (low weight, high tensile strength)
- High modulus of elasticity, high strength, rigidity and dynamic load-bearing capacity
- Good vibration absorption and dimensional stability
- Heat and corrosion resistance
- Minimal heat expansion
- High fatigue strength, high residual safety

Properties of construction materials in comparison with CFK



* Exact values are dependent on the alloy material

Tube Ø	Steel (kg/m)	Aluminum (kg/m)	Carbon (kg/m)
25 mm	1,63	1,40	0,33
40 mm	2,31	1,83	0,64
60 mm	(6,78)	2,50	0,85

100 % ≈ 52 - 86 % ≈ 18 - 26 %

Weight reduction of more than 50 %

GSKN – Cross Joint (Aluminum)



GSKN 60-60
Weight: 1400 g

GKC – Cross Joint (Carbon & Aluminum)



GKC 60-60
Weight: 750 g



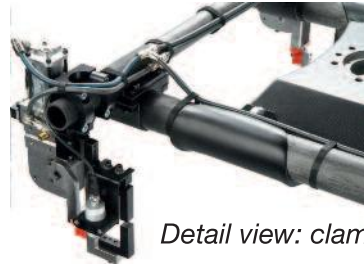
- + Rigidity – optimised design
- + Installation space – low interference contour
- + Flexibility – integration into existing systems possible
- + Compatibility – transfer of the existing design

Stingray

- Innovative gripper console
- Weight from 6 kg
- Integral tube clips, robot mounting face and centring sleeve for gripper station



Stingray gripper



Detail view: clamp connection

