RICKSON Carbon Fiber Store · Dongguan Rickson Technology Co., Ltd.

Technical Datasheet — T300 3K Woven Finish Roll Wrapped Carbon Fiber Tube

Product Family CF26-TB · Roll Wrapped · OD 6–30 mm · Standard Wall 1.0 mm

Document No.	Revision	Issue Date	Status	Supersedes
RICKSON-TDS-CF26-TB	2.5	2026-10-31	Issued — controlled copy	Rev 2.4 (2026-10-31)

1. Scope and Product Identification

This datasheet specifies the construction, dimensional tolerances, mechanical properties and handling requirements of the Rickson CF26-TB series of round carbon fiber tubes: roll-wrapped, 100 % T300 carbon fiber reinforcement, 3K woven outer finish, standard wall thickness 1.0 mm, outside diameter 6 mm to 30 mm in 2 mm steps. It is issued for engineering evaluation and for the preparation of purchase specifications.

Where a project requires values or tolerances beyond this datasheet, a project-specific technical agreement shall be signed and shall take precedence over this document.

1.1 Limits of Use

The following applications are outside the intended use of the standard product and require separate engineering review and written agreement before supply:

- Continuous service above 120 °C, or any excursion approaching the glass transition temperature of 130 °C.
- Pressure vessels, compressed gas containment, hydraulic accumulators.
- Safety-critical or fatigue-critical structures, where cyclic life data for the specific size, wall thickness and joint configuration are not available.
- Continuous contact with strong acids, alkalis, ketones or chlorinated solvents.
- Applications requiring an electrically conductive path or electrical insulation as a designed function; the laminate is neither a rated conductor nor a rated insulator.
- Threaded or press-fit assembly cut directly into the tube wall without a bonded or mechanically restrained insert.

2. Key Features

- Roll-wrapped construction, 100 % T300 carbon fiber reinforcement, epoxy matrix
- 3K woven outer finish: 2 × 2 Twill or Plain weave, Glossy or Matte
- Standard wall thickness 1.0 mm, held to ±0.13 mm on standard sizes
- Outside diameter tolerance ±0.10 mm across the full 6–30 mm range
- Straightness ≤1.0 mm per meter, suitable for rotating and linear motion members
- Custom diameters, wall thicknesses, lengths and secondary machining available
- Low MOQ — suitable for prototypes, pilot batches and volume production

CF26-TB series · 3K woven finish · OD 6–30 mm · standard wall 1.0 mm

3. Construction and Materials

Item	Description
Reinforcement	T300-grade carbon fiber, 3K woven fabric, outer surface ply; unidirectional or woven intermediate plies as required by wall thickness
Matrix	Thermoset epoxy, elevated-temperature cure
Process	Prepreg roll wrapping on a precision mandrel, vacuum-bag or shrink-tape consolidation, elevated-temperature cure, mandrel extraction, outer surface machining and coating
Fiber volume fraction	55–60 % (nominal 57 %)
Surface finish	Clear-coated Glossy or Matte; cut ends machined with diamond tooling
Inner bore	As-cured epoxy surface released from the mandrel; no liner and no internal coating; smooth, uniform, without a weave pattern
End condition	Cut square and deburred; ends are not sealed or capped unless specified. End caps, inserts or sealed ends available on request
Color	Natural carbon black, clear coat (no pigment)

4. Standard Size Range

Thirteen standard outside diameters, 2 mm steps, standard wall 1.0 mm. Mass per meter is calculated at a nominal density of 1.55 g/cm³ and is for reference only.

Nominal OD (mm)	Nominal ID (mm)	Wall (mm)	Mass (g/m, approx.)	Nominal OD (in)
6	4	1.0	24.3	0.236
8	6	1.0	34.1	0.315
10	8	1.0	43.8	0.394
12	10	1.0	53.6	0.472
14	12	1.0	63.3	0.551
16	14	1.0	73.0	0.630

Nominal OD (mm)	Nominal ID (mm)	Wall (mm)	Mass (g/m, approx.)	Nominal OD (in)
18	16	1.0	82.8	0.709
20	18	1.0	92.5	0.787
22	20	1.0	102.3	0.866
24	22	1.0	112.0	0.945
26	24	1.0	121.7	1.024
28	26	1.0	131.5	1.102
30	28	1.0	141.2	1.181

Weave options: 3K 2 × 2 Twill or 3K Plain. Finish options: Glossy or Matte. Weave and finish are cosmetic options and do not affect the mechanical ratings.

5. Dimensional Tolerances

Outside diameter is the controlled dimension and is verified on 100 % of parts. Inside diameter is governed by the mandrel. Wall thickness is a derived value and its tolerance follows from the OD and ID tolerances.

Nominal OD (mm)	OD Tolerance	ID Tolerance	Derived Wall Tolerance	Unit
6 – 10	±0.10	±0.15	±0.13	mm
12 – 16	±0.10	±0.15	±0.13	mm
18 – 24	±0.10	±0.20	±0.15	mm
26 – 30	±0.10	±0.20	±0.15	mm

5.1 Additional Dimensional Requirements

Characteristic	Requirement	Remarks
Straightness	≤1.0 mm / 1000 mm	Method and supports as defined in Clause 5.3
Ovality (out-of-round)	≤1.0 % of nominal OD, maximum 0.20 mm	Same cross-section, maximum minus minimum diameter
Wall thickness variation	≤0.15 mm	Max minus min around one circumference
Cut length, up to 500 mm	±1.0 mm	Cut-to-length orders only
Cut length, above 500 mm	±2.0 mm	Cut-to-length orders only
Squareness of cut end	≤0.5 mm deviation	Measured against a square reference

Tolerances tighter than those stated above are available on request for machined and 100 % inspected lots. Feasibility is confirmed per size and wall thickness before quotation.

5.2 Basis of Acceptance

- **Outside diameter and inside diameter are the acceptance dimensions.** Wall thickness is a derived value and shall not be used as a stand-alone acceptance criterion unless separately agreed in writing.
- **Ovality is contained within the OD tolerance zone.** On any single cross-section, both the maximum and the minimum diameter shall lie within the OD tolerance limits stated above. Where ovality is measured separately, it shall be calculated as the difference between those two diameters and shall not be added to the OD tolerance.
- **The OD tolerance of ±0.10 mm applies to the full 6–30 mm range without size-based exception.** No wider tolerance is offered as a standard concession. Tighter tolerances are available on request and are quoted per size and wall thickness.

- Where a drawing or purchase order specifies a dimensional requirement not covered by this datasheet, that requirement shall be confirmed in writing by Rickson before the order is accepted.

5.3 Measurement Method

- **Outside diameter:** outside micrometer, resolution 0.001 mm, at two orthogonal axes, at both ends and at mid-length.
- **Inside diameter:** internal micrometer, bore gauge or plug gauge, at both ends.
- **Wall thickness:** ultrasonic thickness gauge or mechanical gauge on a sectioned sample; the value is reported for information under Clause 5.2.
- **Straightness:** tube placed on a surface plate supported at two points 200 mm from each end, rotated to the position of maximum deviation, total indicator reading (TIR) taken at mid-span with a dial indicator, expressed in mm per 1000 mm of length.
- **Cut length and squareness:** measured with a calibrated steel rule or caliper and a square reference, on a minimum of three tubes per lot.
- All measurements shall be taken at 20 ± 5 °C. Instruments shall be calibrated and traceable to national standards.

6. Mechanical and Physical Properties

The values below are typical values obtained from production batch testing of CF26-TB tubes with a 1.0 mm wall at 23 °C. They are provided for engineering reference. They are not guaranteed minimum values and shall not be used as design allowables without a project-specific qualification program.

Property	Unit	Typical Value	Test Method
Density	g/cm³	1.55	ASTM D792
Fiber volume fraction	%	55 – 60	ASTM D3171
Tensile strength, axial (0°)	MPa	600	ASTM D3039
Tensile modulus, axial (0°)	GPa	60	ASTM D3039
Flexural strength, axial	MPa	700	ASTM D7264
Flexural modulus, axial	GPa	50	ASTM D7264
Compressive strength, axial	MPa	380	ASTM D3410
Interlaminar shear strength (ILSS)	MPa	40	ASTM D2344
Glass transition temperature, Tg	°C	130	DMA, ASTM D7028
Maximum continuous service temperature	°C	120	Derated from Tg

Mechanical values are laminate properties and are affected by wall thickness, lay-up and specimen geometry. Tubes with wall thickness below 0.8 mm or above 2.0 mm will differ from the values above; request a size-specific data sheet. A batch test report can be supplied with each shipment on request.

Guaranteed minimum values. This datasheet states typical values only. Where a purchase specification requires guaranteed minimum values (lower specification limits), these shall be established by a qualification test program on the specific diameter, wall thickness and lay-up, and shall then be stated in the project technical agreement. Guaranteed values are not implied by this document and shall not be inferred from the table above.

7. Surface Finish and Appearance

- **Glossy:** clear-coated, high-gloss finish, distinct weave visible through the coating.
- **Matte:** clear-coated satin, low sheen, weave visible without specular reflection.
- Cut ends are machined with diamond tooling; a light film of resin dust may be present on delivery and can be wiped off with a dry cloth.

- Slight variation in weave alignment, color depth and sheen between production lots is inherent to the roll-wrapping and coating process and shall not be treated as a defect.
- The following are **not** acceptable and are grounds for a claim: delamination, visible voids or pinholes larger than 0.3 mm, cracks, exposed or frayed fiber at cut ends, and scratches longer than 10 mm on the visible surface.

8. Part Number Designation

Every item is identified by an 18-character part number in the form **CF26-TB-OOO-WW-NNN**.

Field	Example	Meaning
Family	CF26	Carbon fiber tube, CF26 series
Type	TB	Tube, roll wrapped, round
Outside diameter	008	Nominal OD in mm, three digits (008 = 8 mm)
Weave and finish	TM	TM = 3K Twill Matte · TG = 3K Twill Glossy · PM = 3K Plain Matte · PG = 3K Plain Glossy
Item serial	005	Three-digit item number; each OD is allocated four consecutive numbers in the order TM, TG, PG, PM

Example: CF26-TB-008-TM-005 is a 3K twill matte tube, 8 mm OD, 1.0 mm wall. Wall thickness and length are stated separately on the order, since they are not encoded in the part number.

9. Custom Options and Engineering Limits

Parameter	Standard Capability	Boundary Condition
Outside diameter	6 – 30 mm, 2 mm steps	Other diameters require a dedicated mandrel; minimum order quantity applies
Wall thickness	0.5 – 3.0 mm	Subject to OD/ID feasibility; walls below 0.5 mm not offered
Length	Up to 2500 mm as standard practice	Longer lengths only by prior agreement on handling and freight
Weave / finish	2 × 2 Twill or Plain; Glossy or Matte	Other weaves or colors on request, tooling lead time applies
Tolerance	Tighter than Clause 5 on request	Machined and 100 % inspected; cost and lead-time impact
Secondary operations	Cutting, drilling, slotting, chamfering, bonding, insert fitting	Drawing required; machining of cured laminate may expose fiber at features

Custom parts are produced to the drawing and technical agreement approved by the buyer. Rickson is responsible for conformity to the approved drawing; suitability of the design for the end application remains the responsibility of the buyer. Any change requested after approval of the drawing is treated as a new order.

10. Bonding and Assembly Recommendations

The following guidance is indicative and is provided to support customer assembly. It does not constitute a warranty of joint performance; joint design and validation remain the responsibility of the buyer.

- Abrade the bonded surfaces with 120–240-grit abrasive, remove dust, wipe with acetone or isopropanol and allow to dry fully.
- Use a toughened two-part structural epoxy adhesive suitable for composite-to-metal and composite-to-composite joints (for example 3M DP460 NS or Loctite Hysol 9466).
- Maintain an adhesive bond line of 0.1–0.3 mm; avoid starved or excessively thick joints.

- Recommended insert or sleeve engagement: at least 2 × OD for tensile joints, at least 3 × OD where bending or vibration dominates.
- Cure in accordance with the adhesive datasheet; a typical schedule is 24 h at 23 °C or 1 h at 80 °C.
- Support the tube internally with a close-fitting mandrel or plug during clamping to avoid ovalizing the section.
- Do not drill or machine within 2 × OD of a tube end unless the joint has been designed for it.
- Avoid local point loads and sharp-edged clamps; use collars or saddle clamps with an elastomer interface.

11. Inspection, Packaging and Storage

11.1 Inspection

- Outside diameter and wall thickness: 100 % verification at both ends, two axes, using the instruments and method defined in Clause 5.3.
- Straightness, ovality, length and appearance: sampling inspection in accordance with ISO 2859-1, AQL 1.0.
- An inspection report and certificate of conformity can be issued with each shipment on request. Third-party inspection (SGS, BV, TUV) can be arranged at the buyer's cost.
- Where the purchase order specifies a sampling plan, acceptance limits or a witness point, these shall be agreed in writing before production.

11.2 Packaging

- Each tube is sleeved in PE film with end protection; tubes separated by dividers in cartons.
- Lengths above 1500 mm are packed in plywood cases.
- Export packing is suitable for sea and air freight; a packing list is issued per shipment.

11.3 Storage

Store in a dry, shaded location between 5 °C and 35 °C at relative humidity below 70 %, away from direct sunlight, solvents and sources of ignition. Under these conditions the product has a shelf life of 24 months from the date of manufacture; mechanical properties are not affected by storage within this period, but dimensional re-verification is recommended before use following extended storage.

12. Regulatory and Compliance Statements

Item	Statement
RoHS	Complies with Directive 2011/65/EU as amended by (EU) 2015/863. Declaration available on request.
REACH	No SVHC above 0.1 % w/w on the current ECHA candidate list at the date of issue. Declaration issued per shipment on request.
Safety data	Safety Data Sheet (SDS) available on request. Cured laminate dust from machining is a respiratory irritant; local exhaust ventilation (LEV) and suitable PPE are required for any secondary machining.
Transport	Cured carbon fiber tube is not classified as dangerous goods. Not a restricted article for air transport.
Export control	This is a general-purpose composite product. Classification remains subject to end-use and end-user review; the buyer shall provide end-use information where requested.

13. Ordering Information

- **Standard products:** 13 stock diameters from 6 mm to 30 mm, wall 1.0 mm, four weave/finish combinations per diameter.
- **Order content:** part number, wall thickness, cut length and quantity. Length is not encoded in the part number and must be stated.

- **Dimensional acceptance:** where dimensional acceptance is critical to the application, the purchase order shall state the acceptance limits, the sampling plan and any agreed concession under Clause 5.2.
- **Samples:** short cut lengths available for evaluation before a volume order.
- **Lead time, freight and payment terms:** quoted per order; not covered by this datasheet.
- **Technical support:** drawing review, lay-up advice and joint design guidance available on request.

14. Disclaimer

The values in this datasheet are typical values obtained from production batch testing. They are provided for engineering reference only, do not constitute guaranteed minimum or maximum values, and shall not be used as the sole basis for design allowables or for safety-critical sizing.

Contractual acceptance shall be based on the dimensions, tolerances and properties stated in the agreed purchase order or project technical agreement, and on the inspection report issued for the delivered batch. In case of conflict between this datasheet and a signed technical agreement, the technical agreement prevails.

The buyer is responsible for determining the suitability of the product for its particular application and for all aspects of design, assembly, testing and safe use. Dongguan Rickson Technology Co., Ltd. gives technical advice in good faith but accepts no liability for the proper use and service of the product, nor for the safeguarding of personnel or property, all of which remain the duty of the user.

This datasheet is subject to revision without notice. The revision in force is the one issued with the current quotation or order confirmation.

Revision History

Revision	Date	Description of Change
1.0	2026-10-31	First issue
2.0	2026-10-31	Major technical revision: OD tolerance tightened to ±0.10 mm; derived wall, straightness and ovality limits added; construction, part numbering, custom capability, bonding, inspection and compliance sections added
2.1	2026-10-31	Added limits of use, inner bore and end condition statements, acceptance basis (OD/ID as acceptance dimensions), ovality rule, measurement method and instrument requirements, guaranteed minimums and purchase-order acceptance
2.2	2026-10-31	Editorial revision: part numbering, terminology (TIR), instrument traceability, US English and cross-reference consistency. No technical change
2.3	2026-10-31	Product photograph replaced (artifact removed). No technical change
2.4	2026-10-31	Product photograph re-arranged (ascending diameter, parallel axes). No technical change
2.5	2026-10-31	Removed the ±0.15 mm concession for OD 26 mm and above; ±0.10 mm now applies across the full 6–30 mm range, matching the website specification. No other technical change

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