

Technical information

Welded round precision tube according to EN 10305-3 (DIN 2394)

Delivery condition

	Designation according to EN 10305-3	Designation according to DIN 2394	Description
Welded and cold sized	+ CR1	BKM	Not normally heat treated, but intended for final annealing
Welded and cold sized	+ CR2	BKM	Not intended for heat treatment
Annealed	+ A	GBK	Annealed in a controlled atmosphere
Normalised	+ N	NBK	Normalised in a controlled atmosphere

We mainly stock tubes in accordance with +CR2.
Tube in accordance with +CR 1 may be available in certain dimensions in the outer areas.
Tube in accordance with +A and +N can be offered on request.

Surface characteristic

The tube has, with regard to the manufacturing method, a high surface fineness. Small surface faults, such as ridges and depressions, scratches, etc. due to the manufacturing method, can occur.

	Designation	Surface fineness Ra value*	Use
Unpickled hot strip	S1	-	
Pickled hot strip	S2	2.0 my	Painting, electro-galvanizing, suitable for hot galvanizing
Cold rolled strip	S3	0.6 my	Painting, electro-galvanizing, suitable for hot galvanizing
Surface treated strip	S4	-	For demanding corrosion conditions

* The Ra values given in the table do not apply to the weld seam area.

Galvanized tube

Designation	Surface pattern	Zinc coating mass	Zinc coating thickness
Z275	M	275g/m ²	20 my

Galvanized tubes can be delivered in other thicknesses depending on your needs, 100-350 g/m²

Mechanical characteristics

Material	Delivery condition	Strength		Elongation A ₅ %	Former designation DIN 2394
		R _{eH} MPa	R _m MPa		
E220 ¹⁾	+CR2	220	310	23	Fe PO1
E235	+CR1	-	390	7	R St 37-2
E370	+CR2	370	450	15	St 44
E355	+CR1	-	540	5	St 52-3

The mechanical values apply to completed tubes. The designation of the steel gives the nominal yield strength for complete tube.

1) Standard material

Tolerances

For tube of type +CR1 and +CR2, the diametrical deviation in the table below applies. Permitted diametrical deviation includes any ovality.

Heléns comment: For heat treated tube, e.g. annealed (+A) or normalised (+N), the diametrical tolerance dependant on the dimension can be larger.

Tolerances, wall thickness according to EN 10305-3

Tolerance for wall thickness (T) is at T less than or equal to 1.5 mm +/- 0,15 mm and with T greater than 1.5 mm +/- 10% of nominal size - but at the most, 0.35 mm. The stated size deviations do not apply to the weld zone.

Heléns comment: Inner diameter not given.

Tolerances, OD according to EN 10305-3	
Nominal size mm	Permitted deviation
6-19 mm	+/- 0.12 mm
20-30 mm	+/- 0.15 mm
32-42.4 mm	+/- 0.20 mm
44-51 mm	+/- 0.25 mm
55-63.5 mm	+/- 0.30 mm
70-76 mm	+/- 0.35 mm
80-90 mm	+/- 0.40 mm

Tolerance for height of internal weld bead according to Heléns' standard specification

The tolerance for the height of the internal weld bead for material with wall thickness (T) up to 1.5 mm, is max. 0.6 mm. For material with T between 1.5 mm to 4.0 mm, the maximum height of the internal weld seam is 0.4 x T.

Straightness

Straightness deviation may be 0.20% of the total length for tubes with OD greater than 15 mm. The straightness tolerance shall never exceed 3 mm per meter. This tolerance is measured between the tube and a straight line that connects any two points at a distance of 1000 mm. With fixed lengths up to max. 1000 mm, the straightness deviation may be up to 0.3% of any tube length. Tubes that have an outer diameter that is less than 15 mm, are delivered commercially straightened.

Heléns comment: Demands in excess of the above measuring method, straightness tolerance, etc. shall be the subject of an agreement.

Tube ends

Tubes are cut wherever possible at right angles to the axis of the tube. Tubes can be delivered with the ends produced by the cutting method usually used. Depending on the cutting method, diametrical changes outside the normal tolerances can occur. For fixed lengths, the characteristics of the ends shall be the subject of agreement.

Tolerance of delivered quantities

With fixed lengths, delivery of quantities less than ordered is not allowed. Delivery of excess quantities is permitted in accordance with the ordered quantity as below:

Up to 500 m,	permitted deviation +20%
500-2000 m,	permitted deviation +15%
greater than 2000 m,	permitted deviation +10%