

DIN 1615-84 WELDED CIRCULAR UNALLOYED STEEL TUBES NOT SUBJECT TO SPECIAL REQUIREMENT

The sub clauses marked with a single dot ● give specifications which are to be agreed upon at the time of ordering.

The sub clauses marked with two dots give ●● specifications which are optional and may be agreed upon at the time of ordering.

1. Field of application

1.1 This standard applies to welded circular tubes and pipes (hereinafter briefly referred to as "tubes") made of St 33 unalloyed steel and with the mechanical properties specified in table 1. These tubes are not designed to withstand internal pressure stresses. Bending, flanging of the tubes and similar forming processes, and welding (see sub clause 3.4) are only possible to a limited extent.

1.2 This standard does not apply to

- welded circular unalloyed steel tubes subject to special requirements (see DIN 1626);
- high-performance welded circular unalloyed steel tubes (see DIN 1628);
- welded circular steel tubes for structural steelwork (see DIN 17 120).

2. Designation and ordering

2.1 The standard designation for tubes complying with this standard shall give in the following order;

- the term "tube";
- DIN number of dimensional standard (DIN 2458);
- characteristic dimensions of tube (outside diameter X wall thickness);
- number of DIN Standard giving the technical delivery conditions (DIN 1615);
- symbol or material number for the steel grade (see table 1)

Example:

A welded tube conforming to this standard, with an outside diameter of 168,3 mm and a wall thickness of 4 mm as specified in DIN 2458, made from St 33 steel (material number 1.0035) shall be designated as follows:

Tube DIN 2458 - 168,3 X 4

DIN 1615 - St 33

or

Tube DIN 2458 - 168,3 X 4

DIN 1615 - 1.0035

In addition to the standard designation as given in sub clause 2.1, the purchaser shall always state in his order the required quantity (e.g. total length to be supplied), the type of length (see table 2), the length of the individual tube in the case of specified lengths and exact lengths.

Example of an order:

1000 m tube DIN 2458 - 168,3 x 4
 DIN 1615 - St 33
 in specified lengths of 8 m.

3.3 Mechanical properties

The yield stress, tensile strength and elongation after fracture determined for the parent metal of the tubes shall conform to the values specified in table 1.

Table 1. Mechanical properties of tubes at room temperature

Steel grade		Upper yield stress ¹⁾	Tensile strength	Elongation after fracture	
		ReH	Rm	longs	quer
Symbol	Material number	N/mm ²	N/mm ²	%	
		min.		min.	
St 33	1.0035	175	290-540	17	15
1) The value applies for wall thicknesses not exceeding 25mm.					

Table 2. Types of length and permissible deviations in length

Type of length		Permissible deviations in length, in mm for outside diameters	
		≤ 500	> 500
Manufacturing length ¹⁾		1)	1)
Specified length		±500	±500
Exact lengths	up ≤ 6m	+10 0	+25 0
	up > 6m ≤ 12m	+15 0	+50 0
	up > 12m	By agreement	By agreement
1) The products are supplied in the manufacturing lengths occurring in production. ● These lengths differ according to the diameter, wall thickness and manufacturer's works and shall be agreed at the time of ordering.			

The permissible deviations in outside diameter da shall be as follows:

	da < 200mm: ± 1%(jedoch ± 0.5mm zulässig)
200mm ≤	da < 1000mm: ± (0.005·da + 1)mm
	da ≥ 1000mm: ± 6mm.

At points where the surface of the tubes has been repaired by mechanical means, e.g. by grinding, the diameter may fall slightly short of the permissible lower deviation provided that the permissible minimum wall thickness is observed.

3.6.2.2 The permissible deviations in wall thickness shall be as follows:

3mm <	s ≤ 3mm:	+ 0.30	mm
		- 0.25	
	s ≤ 3mm:	+ 0.45	1) mm
		- 0.35	
	s > 10mm:	-0.50	mm;

The upper limit being given by the permissible deviation in mass.

The permissible undersize on the basis of the minimum wall thickness may fall short by further 5% at isolated outside diameter of the tube, and for not more than a maximum of 300 mm. This is intended to take account of the removal of defects by grinding at isolated points.

The tubes shall be as circular as possible. The out of roundness shall be 2 %. This value cannot be ensured for tubes with a da/s ratio exceeding 100(da is the outside diameter, s the wall thickness).

The out of roundness R shall be determined using the following formula:

R = 200 ·	da max - da min	in %
	da max + da min	

Where da max is the greatest measured outside diameter, da min the smallest measured outside diameter.

Finish of tube ends

The tube ends shall be cut perpendicular to the tube axis; they need not be deburred.

Masses per unit length and permissible deviations DIN 2458 specifies the values of masses per unit length for tubes. The following deviations from these values are permitted;

+12	% for an individual tube;
- 8	
+10	% for a batch of tubes not less than 10 t by mass..
- 7.5	

Standards referred to

DIN	1626		Welded circular unalloyed steel tubes subject to special requirements; technical delivery conditions
DIN	1628		High-performance welded circular unalloyed steel tubes; technical delivery conditions
DIN	2458		Welded steel tubes; dimensions, masses per unit length
DIN	8528	Part 1	Weldability; metallic materials, concepts
DIN	17100		General structural steels; quality standard
DIN	17120		Welded circular steel tubes for structural steelwork; technical delivery conditions
DIN	50049		Documents on materials testing

Previous editions

DIN 1626: 12.52x; DIN 1626 Teil 1: 01.65; DIN 1626 Teil 2: 01.65

Restructuring standards

In order to improve clarity and to facilitate the application of the standards to the particular use of the products, it appeared expedient to change the existing numbering system and to revise the contents of the various standards. On this basis, for the field of welded tubes the following breakdown was introduced;

DIN 1615	(tubes not subject to special requirements), superseding DIN 1626 Part 2 (tubes for general applications)
DIN 1626	(tubes not subject to special requirements), superseding DIN 1626 Part 3 (tubes subject to quality specifications) and
DIN 1628	(high-performance tubes), superseding DIN 1626 Part 4 (specially tested tubes subject to quality specifications)
The content	of DIN 1626 Part 1 has been incorporated into DIN 1615, DIN 1626 and DIN 1628, as appropriate.

Classification and designation of steel grades

The classification of the steels has been based on DIN 17 100 as before. The revised edition of the standard for general structural steels (January 1980 edition) however necessitated a corresponding change in the classification of steel grades in the tube standards. In addition to this, the symbols for the steels for welded tubes subject to special requirements and high-performance welded tubes have been changed to bring them into line with the designation of steels for seamless tubes assigned to the same requirements class.

The following table compares the former steel grades for welded tubes with those specified in DIN 1615, DIN 1626 and DIN 1628. However, in some cases it is necessary to take

account of differences, particularly in the types of deoxidation used for the steels.

Steel grade		Comparable steel grade	
Symbol	Specified in DIN 1626 1)	Symbol	Specified in DIN
St33	Part 2	St 33	1615
St37	Part 2	-	-
St42	Part 2	-	-
St34.2	Part 3	-	-
St37.2	Part 3	USt37.0	1626
		St37.0	1626
St42.2	Part 3	-	-
		St44.0	1626
St52.3	Part 3	St52.0	1626
St34.2	Part 4	-	-
St37.2	Part 4	St37.4	1628
St 42.2	Part 4	-	-
		St44.4	1628
St 52.3	Teil 4	St52.4	1628

1) January 1965 edition, in each case.