

DIN 1628-84 WELDED CIRCULAR TUBES OF NON ALLOY STEELS WITH VERY HIGH QUALITY REQUIREMENTS

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 seamless circular tubes and pipes (hereinafter briefly referred to as "tubes") made of unalloyed steels as listed in table 1. These tubes are predominantly used in the construction of chemical plant, vessels, pipework and for general mechanical engineering purposes. They are designed to meet high performance requirements. Normally there are no limiting values or the maximum permissible working pressure of these tubes. The permission working temperature shall not exceed 300°C are specified in Appendix A.)

The limits of application and other specifications given in this standard shall apply except in cases here other specifications are contained in codes of practice for specific fields of application, e.g. the Technische Regeln für Dampfkessel (TRD) (Technical rules on steam boilers) or the Technische Regeln für Druckbehälter (TRB) (Technical rules on pressure vessels), AD-Merkblätter (AD Instruction sheets).

Example:

a) A welded tube conforming to this standard, with an outside diameter of 168,3 mm and a wall thickness of 4mm as specified in DIN2458, made from St52.4 steel (material number 1.0581) shall be designated as follows:

	Tube	DIN 2458 - 168,3 x 4
		DIN 1628 - St 52.4
or	Tube	DIN 2458 - 168,3 x 4
		DIN 1628 - 1,0581

b) A welded tube conforming to this standard. with an outside diameter of 114.3 mm and a wall thickness of 3.2 mm as specified in DIN 258, made from St37.4 Steel (Material number 1.0255) in the normalized condition(N) SHALL BE DESIGNATED AS FOLLOWS:

	Tube	DIN 2458 - 114,3 x 3.2
		DIN 1628 - St 37.4 N
or	Tube	DIN 2458 - 114,3 x 3.2
		DIN 1628 - 1,0255 N

Table 1. Chemical composition (cast analysis) of steels for high-performance welded tubes

Steel grade		Type of deoxidation (RR, fully killed)	Chemical composition, % by mass					Addition of nitrogen fixing elements (e.g. not less than 0.020 % Al total)
Symbol	Material number		C max	Si max	Mn	P max	S max	
St37.4	1.0255	RR	0.17	0.35	≥ 0.35	0.040	0.040	Yes

St44.4	1.0257	RR	0.20	0.35	≥0.40	0.040	0.040	Yes
St52.4	1.0581	RR	0.22	0.55	≥1.60	0.040	0.035	Yes

Table 2. Amounts by which the chemical composition in the product analysis may deviate from the limiting values applicable to the cast analysis (see table 1)

Element	Amounts by which the product analysis may deviate from the limiting values applicable to the cast analysis % by mass
C	+0.02
Si	+0.03
Mn	+0.06 or -0.06
P	+0.010
S	+0.010

Table 3. Mechanical properties of tubes in the as delivered condition at room temperature

- For wall thicknesses exceeding 40 mm, the values shall be agreed at the time of ordering.

Steel grade	Upper yield stress ReH for wall thicknesses, in mm,	Tensile strength Rm		Elongation after fracture A5 N/mm ² min		Diameter of bending mandrel for the bend test on fusion welded tubes 1) N/mm ²	Impact energy 2) of the parent metal (ISO V-notch test pieces AT + 20°C)		
		up to 16 N/mm ² min	over 16 up to 40 N/mm ²	Longitudinal %	Transverse %		Longitudinal J min	Transverse 3) J min	
Symbol	Material number								
St 37.4	1.0255	235	255	350 5) to 480	25	23	2 s	43	27
St 44.4	1.0257	275 4)	265 4)	420 5) to 550	21	19	3 s	43	27
St 52.4	1.0581	355	345	500 5) to 650	21	19	4 s	43	27

1) s is the wall thickness of tube (see sub clause 5.5.5).

2) Average value from three tests; only one individual value may fall short of the specified minimum value by not more than 30 %

3) These values apply also if the impact energy is tested in the center of the weld for tubes having outside diameters exceeding 500 mm, and wall thicknesses not smaller than 10mm.

4) For cold finished tubes in the NBK condition (annealed above the upper transformation point under shielding gas or in a vacuum), minimum values of yield stress lower than these values by 20N/mm² are permitted.

5) For cold finished in the NBK condition, minimum values of tensile strength lower than these values by 10N/mm² are permitted.