

## DIN 1630-84 SEAMLESS 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 a two dots give specifications which 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).

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

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

	+ 0.010
--	---------

Table 3. Mechanical properties of tubes in the as delivered condition at room temperature  
 For wall thickness exceeding 65mm, 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		Impact energy 1 (ISO V-notch test pieces at +20°)	
Symbol	Material number	up to 16	over 16 up to 40	over 40 up to 65	N/mm <sup>2</sup>	Longitudinal	Transverse	Longitudinal	Transverse
		N/mm <sup>2</sup> min.				% min.	J min.		
St 37.4	1.0255	235	225	215	350 3) to 480	25	23	43	27
St 44.4	1.0257	275 2)	265 2)	255 2)	420 3) to 550	21	19	43	27
St 52.4	1.0581	355	345	335	500 3) to 650	21	19	43	27

1) Average value from three tests; only one individual value may fall short of the specified minimum value by no more than 30%.  
 2) 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/mm<sup>2</sup> are permitted.  
 3) For cold finished tubes in the NBK condition, minimum values of tensile strength lower than these values by 10N/mm<sup>2</sup> are permitted.

Grade	Mfg. Process	Chemical composition (%)								
		C	Si	Mn	P	S	Ni	Cr	Mo	Others
St37.4	W	0.17Max	0.35Max	0.35Max	0.040Max	0.040Max	-	-	-	N-stabilizing element (e.g. Al 0.020)
St44.4	W	0.20Max	0.35Max	0.40Max	0.040Max	0.040Max	-	-	-	
St52.4	W	0.22Max	0.35Max	1.60Max	0.040Max	0.040Max	-	-	-	

Grade	Material number	Tensile Test MPa or N/mm <sup>2</sup>				Remarks (Similar to JIS)
		Min Yield point			Tensile Strength	
		t 16Max	16<t 40Max	40<t 45Max		
St37.4	1.0255	235	225	215	350~480	(STS370)
St44.4	1.0257	275	265	255	420~550	(STS410)
St52.4	1.0581	350	340	335	500~650	(STS480)

