DIN 2393-81 Part 1 WELDED PRECISION STEELL TUBES

1.Field of application

This Standard applies to seamless precision steel tubes; and, in compliance with ISO/DIS 3304, those tube dimensions have been selected from the range of manufacture dimensions which are mainly used as design elements

If tubes having the tolerances and are produced according to the technical conditions of delivery as specified in this Standard are to e used as pipelines, then the dimensions specified in DIN 2448 may from time to time be used. These tubes must be ordered according to quality grade C.

Grade	Mfg. Process	Chemical composition (%)									
		C	Si	Mn	P	S	Ni	Cr	Mo	Others	
St28 USt28 RSt28	W	0.13Max	-	-	0.50Max	0.50Max	-	-	-	-	① ② ③ ④
St34.2 US34.2 RSt34.2	W	0.15Max	-	-	0.50Max	0.50Max	-	-	-	-	① ② ③ ④
St37.2 USt37.2 RSt37.2	W	0.17Max	-	-	0.50Max	0.50Max	-	-	-	-	① ② ③ ④
St44.2	W	0.21Max	-	-	0.50Max	0.50Max	-	-	-	-	① ② ③ ④
St52.3	W	0.22Max	0.55Max	1.60Min	0.040Max	0.040Max	-	-	-	-	① ②

											③ ④

①Cold-finished/hard ②Cold-finished/soft ③Annealed ④Normalized

Grade	Material number	Tensile Test MPa or N/mm^2		Remarks (Similar to JIS)
		Min Yield point	Tensile Strength	
St28 USt28 RSt28	- 1.0357 1.0326	-	400Min	(STKM11) (STAM80G)
		-	325Min	
		-	265Min	
		175	275~380	
St34-2 US34-2 RSt34-2	- 1.0028 1.0034	-	410Min	-
		-	350Min	
		-	305Min	
		205	315~410	
St37-2 USt37-2 RSt37-2	1.0037 1.0036 1.0038	-	440Min	(STKM12)
		-	370Min	
		-	315Min	
		235	340~470	
St44-2	1.0044	-	570Min	(STKM13) (STAM40G)
		-	450Min	
		-	390Min	
		255	410~540	
St52-3	1.0570	-	590Min	(STKM19)
		-	540Min	
		-	490Min	
		350	490~630	

2. Other relevant standards

DIN 2393 Part 2 Welded precision steel tubes; technical conditions of delivery

3. Dimensions, designation

The tubes are, as a general rule, ordered in terms of outside diameter and wall thickness. In cases where the inside diameter is of major significance to the purchaser, the tubes may also be ordered in terms of inside diameter and wall thickness, or also in terms of outside diameter and inside diameter Such tubes must be ordered in accordance with quality grade C.

If the permissible deviations in diameter are desired to be shifted in one direction only, this must be stated in the purchase order ; in such cases, the total range of ± tolerance is the permissible deviation shifted in one direction only, e.g. in lieu of (55±0.25) mm, either

$(55\ ^{+0.5}_{0})$ mm or $(55\ ^{0}_{-0.5})$ mm.

The deviations in diameter as quoted in the table of dimensions apply to the 'cold-finished/hard' (BK) and 'cold-finished/soft' (BKW) delivery conditions.

In the case of annealed (GBK) and normalized (NBK) tubes, the tolerances on diameter are greater, as a result of distortion during the annealing, the permissible values being as follows:

wall thickness / outside diameter			
	$\geqslant \frac{1}{20}$		the values quoted as specified in the table of dimensions
less than $\frac{1}{20}$	to $\frac{1}{40}$		1.5 times the values specified in the table of dimensions
less than $\frac{1}{40}$	to $\frac{1}{60}$		twice the values specified in the table of dimensions
less than $\frac{1}{60}$			2.5 times the values specified in the table of dimensions

The permissible deviations in diameter include ovality.

In the case of special heat treatments (e.g. heat-treated tubes), the permissible dimensional deviations must be mutually agreed separately.

Designation of a welded precision steel tube in St 52-3, condition at delivery: BK, outside diameter da = 18 mm and wall thickness s = 2.5 mm:

Tube DIN 2393 - St 52-3 BK 2.5

Designation of a welded precision steel tube, quality grade C, in St 52-3, condition at delivery: BK, outside diameter da = 18 mm and inside diameter d1 = 13 mm (D 13);

Tube DIN 2393 - C -St 52-3 BK 18 x D13

Designation of a welded precision steel tube, quality grade C, in St 52-3, condition at delivery: BK, inside diameter di = 13 mm (D 13) ad wall thickness s = 2.5 mm:

Tube DIN 2393 - C - St 52-3 BK D13 x 2.5

4. Technical conditions of delivery

Technical conditions of delivery according to DIN 2393 Part 2.

Wall thickness s	Nominal dimension	0.5	0.8	1	1.2	1.5	1.8	2	2.5	2.8	3	3.5	4	4.5	5	5.5	6	7
	Permissible deviation	± 7.5% the nominal dimension 1) The deviation of centers (eccentricity) is included in the permissible wall thickness deviation.																
Outside diameter da		Outside diameter d *i* dimension and permissible deviation.																
Nominal dimension	permissible deviation																	
4	±0.1										The full-drawn black stepped lines in the table indicate the ratios of wall thickness/outside diameter for 1/20,1/40 and 1/60							
5																		
6																		
7																		
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10																		
12	±0.08																	
14																		
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95
100
110
±0.15
±0.20
±0.25
±0.30
±0.35
±0.40
±0.45
±0.50

120																		
130	±0.70																	
140	±0.70																	
150	±0.80																	
											↑S/D = 1/40		↑S/D = 1/20		S/D = 1/20 ↑			

1) For outside diameter nominal dimension 4 mm, permissible deviation from nominal dimension s of the wall thickness ± 20%

For outside diameter, nominal dimension 6 and 8 mm, permissible deviation from nominal dimension s of the wall thickness: ± 15%