

COLD DRAWN SEAMLESS STEEL TUBES FOR HYDRAULIC CYLINDERS EN 10305-1

Steel tubes for precision applications:
Seamless cold-drawn tubes

Chemical composition

Steel designation	Elements content, %						
	C max	Si max	Mn max	P max	S max	V max	Al min
E355	0.22	0.55	1.60	0.025	0.025		0,02
E410	0,16-0.22	0,10-0.55	0,30-1.70	0.025	0.025	0,08-0.15	0,01-0,06



Mechanical properties

Steel designation	Delivery condition	Yield strength, R _{EH} N/mm ²	Tensile strength R _m , N/mm ²	Elongation A, %	Impact test, KV, J
		Not less than			
Test temperature, -20°C Longitudinal direction					
E355	+SR	450	580	10	27
E355	+N	355	490-530	22	27
E410	+SR	590	690	12	27
E410	+N	410	550-700	22	27

Inside diameter, mm	Wall thickness					
	5 mm	6 mm	7,5 mm	10 mm	12,5mm	15 mm
50	60	62				
55	65	67	70	75		
60	70	72	75	80	85	
63	73	75	78	83	88	
65	75	77	80	85	90	
70	80	82	85	90	95	
75	85	87	90	95	100	
80	90	92	95	100	105	
85		97	100	105	110	115
90			105	110	115	120
95			110	115	120	125
100			115	120	125	130
105			120	125	130	135
110			125	130	135	140
115			130	135	140	145
120			135	140	145	
125			140	145		

The value inside boxes represents the OD.

Dimensional tolerances

Inside diameter permissible deviation				
-0.20 ÷ -0.45	-0.30 ÷ -0.70	-0.25 ÷ -0.55	-0.40 ÷ -0.70	-0.50 ÷ -0.90

Length supplied

- random from 4.5 up to 12.5 meters
- fixed within the random length range

Concentricity

The following concentricity values are guaranteed:

OUTSIDE DIAMETER	CONCENTRICITY
≤ 125 mm	0.06
> 125 mm	0.07

Concentricity is measured according to the formula:

$$\frac{(WT_{max} - WT_{min})}{(WT_{max} + WT_{min})}$$

Where WT_{max} and WT_{min} are understood to be measured on the same tube cross-section.

Ovality

Ovality is guaranteed within the diameter tolerances.

Straightness

Local deviation from straight line max 1 mm per each meter length.

Total deviation from straightness:

max 3.5 mm for tubes with lengths of less than 6 m; for tubes with lengths greater than 6 m, the tolerance will be increased by 0.5 mm for each 1 m over 6 m.

Protection

Pipes are supplied:

- black and bare
- oiled internally and externally

Upon request pipes ends are protected with plastic caps

Marking

Pipes are supplied with marking according to standards and customer requests.

Marking is painted and/or hard stenciled on pipe ends. The same data, as well as additional information according to customer's request, are indicated on the bundle tags.

Certification

Pipes are supplied with 3.1. inspection certificate, in conformity with EN 10204.



DIN 2391-1, 2 Seamless precision steel tubes

Chemical composition

Steel designation	Elements content, %				
	C max	Si max	Mn max	P max	S max
St 52	0.22	0.55	1.60	0.025	0.025

Mechanical properties at t=20±2°C

Steel designation	Delivery condition							
	BK		BKS				NBK	
	Tensile strength R _m , N/mm ²	Percent elongation A, %	Tensile strength R _m , N/mm ²	Yield strength, R _{EH} , N/mm ²	Necking A, %	Tensile strength R _m , N/mm ²	Upper yield strength, R _{EH} , N/mm ²	Percent elongation A, %
	Not less							
St 52	640	4	580	420	10	490-630	355	22

Inside diameter, mm	Wall thickness					
	5 mm	6 mm	7,5 mm	10 mm	12,5mm	15 mm
50	60	62				
55	65	67	70	75		
60	70	72	75	80	85	
63	73	75	78	83	88	
65	75	77	80	85	90	
70	80	82	85	90	95	
75	85	87	90	95	100	
80	90	92	95	100	105	
85		97	100	105	110	115
90			105	110	115	120
95			110	115	120	125
100			115	120	125	130
105			120	125	130	135
110			125	130	135	140
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120			135	140	145	
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