

## GOST 22897-86 SEAMLESS COLD-FINISHED TUBES OF TITANIUM BASED ALLOYS

Size range of tubes to this standard is given in Table 1.

Table 1 Size range of tubes, mm

Outside diameter	Wall thickness	Outside diameter	Wall thickness
5.8	1.0; 1.2; 1.4; 1.5	42	0.5-5.0; 5.5; 6.0
6	0.5; 0.6; 0.8; 1.0-1.5	45	0.5-6.0; 6.5; 7.0
7	0.5-1.5	48	0.5-7.0
8	0.5-1.5	50	0.5-7.0
9	0.5-1.5	51	0.5-7.0
10	0.5-1.5; 1.6; 1.8; 2.0	53	0.5-7.0
11	0.5-2.0	54	0.5-7.0
12	0.5-2.0	56	0.5-7.0
13	0.5-2.0; 2.2; 2.5; 2.8	57	0.5-7.0
14	0.5-2.8	60	0.5-7.0
15	0.5-2.8	63	0.5-7.0
16	0.5-2.8	65	0.5-7.0
18	0.5-2.8; 3.0	68	0.5-7.0
20	0.5-3.0	70	0.5-7.0
21	0.5-3.0	73	0.5-7.0
22	0.5-3.0; 3.2; 3.5	75	0.5-7.0
23	0.5-3.5	76	0.5-7.0
24	0.5-3.5	80	0.6-7.0
25	0.5-3.5	83	2.5-7.0; 7.5; 8.0; 8.5; 9.0
27	0.5-3.5	85	3.0-9.0
28	0.5-3.5; 4.0	89	3.0-6.0
29	0.5-4.0	90	3.0-6.0
30	0.5-4.0	95	3.2-6.0
32	0.5-4.0; 4.5; 5.0	102	3.2-6.0
34	0.5-5.0	105	3.2-6.0
35	0.5-5.0	108	3.5-6.0
36	0.5-5.0	110	4.0-6.0
38	0.5-5.0	120	4.0-6.0
40	0.5-5.0	130	4.0-6.0

The length of tubes to this standard is given below:

- random 0.8 to 8.0 m for wall thickness 0.5 mm to 0.8 mm and 1.0 to 8.0 m for wall thickness over 1.0 mm;
- specified 2.5 to 7.0 m depending on wall thickness and diameter;
- multiple within specified with 5 mm allowance per cut.

Maximum tolerance for length (multiple and specified) shall not be over +15 mm.

Tolerances for outside diameter and wall thickness are given in Table 2.

Table 2.

Outside diameter, mm	Tolerance for diameter for different accuracy levels		Wall thickness, mm	Tolerance for wall thickness for different accuracy levels	
	normal	improved		normal	improved
6-10	± 0.30 mm	± 0.20 mm	0.5-0.6	± 0.12 mm	± 0.10 mm
11-30	± 0.45 mm	± 0.30 mm	0.8-1.0	± 0.15 mm	± 0.12 mm
свыше 30 over 30	± 1.5 %	± 1.0 %	1.2-3.0	± 15 %	+12.5 % -10.0 %
			3.2-7.0	± 12.5 %	+12.5 % -10.0 %
			свыше 7.0 over 7.0	+12.5 % -10.0 %	± 10.0 %

Other sizes are available on request. Tube ovality and wall thickness variations shall leave tube sizes within specified limits.

Tube curvature shall not be over 1.5 mm per meter length; for tubes with improved accuracy level and diameters below 80 mm - not over 1.0 mm per meter length.  
 Technical requirements.

Tubes shall be produced of alloys VT1-0, PT7-M and OT4 with chemical composition to GOST 19807-74.

Depending on surface quality tubes shall be of normal type (B) and improved type (A).

Hydrogen content in tube metal VT1-0 and PT7-M (type A) shall not be over 0.008 %. Hydrogen content in alloy OT4 is given in GOST 19807-74.

Hydrogen content in tubes type B is not specified.

Tubes shall be delivered in heat treated condition; mechanical properties of tube metal are given in Table 3.

Table 3.

Марка сплава	Временное сопротивление разрыву, МПа при			Предел текучести, МПа при			Относительное удлинение, МПа при		
	+20° C	+150° C	+350° C	+20° C	+150° C	+350° C	+20° C	+150° C	+350° C
	не менее								
Alloy grade	Tensile strength, MPa at temperatures			Yield point, MPa, at temperatures			Elongation, %, at temperatures		
	+20° C	+150° C	+350° C	+20° C	+150° C	+350° C	+20° C	+150° C	+350° C
	not lower								
BT1-0	343-568	216	-	245	147	-	24	-	-
PT-7M	470-666	-	235	372	-	-	20	-	-
OT4	686-833	-	-	-	-	-	10	-	-

## Notes.

1. For tubes of alloy PT-7M having wall thickness under 0.8 mm tensile strength may be decreased by 29.4 MPa.
2. Properties not specified in Table are subject to agreement.

Tube surface shall be pickled or ground.

Tube ends shall be cut at right angle.

Tubes shall withstand hydraulic test to GOST 3845-75.

Tubes of alloys VT1-0 and PT-7M shall withstand flattening test without cracks or tears between plates; distance H between the plates for tubes with OD/wt ratio below 15 is calculated from the formula:

$$H = \frac{(K+1)t}{K+t/D},$$

where t is the nominal wall thickness, mm;

D is the nominal outside diameter, mm;

K is the rigidity factor taken from the formula:

$$K = 0.033 + \frac{0.001}{t/D}.$$

K values for different D/t ratios are given below:

15 < D/t ≤ 20 H=0.5D;

20 < D/t ≤ 30 H=0.4D;

30 < D/t H=0.3D;

On customer's request, tubes with diameters below 40 mm shall withstand a drifting test without cracks or tears up to 10% increase in outside diameter.

Quantity of tubes in a lot is given below:

for OD up to 30 mm: 300 lengths;

for OD 30 to 75 mm: 200 lengths;

for OD over 76 mm: 100 lengths.