STANDARD/SPECIFICATION	NUMBER
ALUMINIUM AND ALUMINIUM ALLOY ROLLED AND DRAWN TUBES	GOST 18475-73*
	SUPERSEDES GOST 4773-65 GOST 1947-56 **
	SHT 1 OF 22

This standard is applicable to cold-rolled and cold-drawn tubes of aluminum grades ADO, AD1, and aluminium alloys of grades AMts, AMg 2, AMg 3, AMg 5, AMg 6, AV, D1, D 16.

The standard is worked out in conformity with the requirement of recommendation of Economical Mutual Aid Council of standardization RS 2009-69.

(Revised edition- "Information catalogue of standards"No.2, 1976).

1. G R A D E S

1.1. As regards shape and condition of material the tubes are produced.

Round tubes.

Annealed - M(ADOM, ADIM, AMts, AMg2M, AMg3M, AMg5M, AMg6M, ABM, D1M, D16M);
hardened and naturally aged - T (AVT, D1T, D16T)
hardened and artificially aged - T1 (AVT1);

Cold-hardened - N(ADON, AD1N, AMts N, AMg2N, AMg3N, AMg5N, AMg 6 N);

Irregular - shaped tubes.
annealed - M (AVM, AMg2M, D1M, D16M);
hardened and naturally aged -T (AVT, D1T, D16T);
hardened & artificially aged-T1, (AVT1),

(Revised edition- "Information catalogue of standards " No.2,1976.)

1.2. The dimensions and theoretical weight of the rolled and drawn tubes should meet the values indicated in the table 1.

* Amendment No.1, published in 1976, has been incorporated in the text.
** as regards rolled and drawn tubes..

Table 1

Outer dia in mm		Theoretical wt. of 1 m tube kgs. for wall thickness in mm.														
Nominal	Toler-ance	0.5±0.05	0.75±0.08	1.0 ±0.10	1.5±0.14	2.0±0.18	2.5±0.20	3.0±0.25	3.5±0.25	4.0±0.28	5.0±0.40	6.0±0.50	8.0±0.70	10.0±0.90		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
6		0.025	0.035	0.045	0.060	-	-	-	-	-	-	-	-	-		
7		0.029	0.042	0.054	0.074	-	-	-	-	-	-	-	-	-		
8		0.034	0.049	0.063	0.087	0.107	-	-	-	-	-	-	-	-		
9		0.038	0.055	0.072	0.101	0.125	-	-	-	-	-	-	-	-		
10		0.042	0.062	0.081	0.114	0.143	0.168	-	-	-	-	-	-	-		
11		0.047	0.069	0.089	0.128	0.161	0.190	-	-	-	-	-	-	-		
12	-0.15	0.051	0.075	0.098	0.141	0.179	0.213	0.242	-	-	-	-	-	-		
13		0.056	0.082	0.107	0.154	0.197	0.235	0.269	-	-	-	-	-	-		
14		0.060	0.089	0.116	0.168	0.215	0.257	0.295	-	-	-	-	-	-		
15		0.065	0.096	0.125	0.181	0.233	0.280	0.322	-	-	-	-	-	-		
16		0.069	0.102	0.134	0.195	0.251	0.302	0.349	0.392	-	-	-	-	-		
17		0.074	0.110	0.143	-	0.268	0.319	0.375	0.437	-	-	-	-	-		
18		0.078	0.116	0.152	0.222	0.286	0.347	0.403	0.454	-	-	-	-	-		
19		0.082	0.123	0.161	-	0.304	0.358	0.429	0.469	-	-	-	-	-		
20		0.087	0.129	0.170	0.248	0.322	0.392	0.457	0.517	0.573-		-	-			

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
22		0.096	0.143	0.188	0.275	0.358	0.436	0.510	0.580	0.645	0.761	-	-	-
23		0.100	0.147	0.196	-	0.375	0.448	0.537	0.595	0.680	0.805	-	-	-
24		0.105	0.156	0.206	0.302	0.394	0.481	0.564	0.642	0.716	0.851	-	-	-
25	0.20	0.110	0.163	0.215	0.316	0.412	0.504	0.591	0.674	0.752	0.895	-	-	-
26		0.114	0.170	0.224	0.324	0.430	0.526	0.618	0.705	0.788	0.940	-	-	-
27		-	0.176	0.233	0.342	0.448	0.548	0.645	0.736	0.824	0.985	-	-	-
28		-	0.183	0.242	0.356	0.466	0.571	0.671	0.768	0.859	1.030	-	-	-
30		-	0.196	0.260	0.383	0.501	0.615	0.725	0.830	0.931	1.119	-	-	-
32		-	0.210	0.278	0.410	0.537	0.660	0.779	0.893	1.003	1.209	1.397	-	-
33		-	0.217	0.286	0.423	0.555	0.683	0.806	0.924	1.039	1.253	1.450	-	-
34		-	0.223	0.296	0.436	0.573	0.705	0.833	0.956	1.074	1.298	1.504	-	-
35	0.25	-	0.230	0.304	0.450	0.591	0.727	0.859	0.987	1.110	1.343	1.558	-	-
36		-	0.237	0.313	0.463	0.609	0.750	0.886	1.018	1.146	1.388	1.612	-	-
37		-	0.243	0.322	0.477	0.627	0.772	0.913	1.050	1.182	1.433	1.665	-	-
38		-	0.250	0.331	0.490	0.645	0.795	0.940	1.081	1.218	1.477	1.719	-	-
40		-	0.264	0.349	0.517	0.680	0.839	0.994	1.144	1.289	1.567	1.826	2.292	-
42		-	0.277	0.367	0.544	0.716	0.884	1.048	1.206	1.361	1.656	1.934	2.435	-
43	0.25	-	0.284	0.376	0.557	0.734	0.906	1.074	1.238	1.397	1.701	1.988	2.507	-
45		-	0.297	0.394	0.584	0.770	0.951	1.128	1.300	1.468	1.791	2.095	2.650	-

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
48		0.317	0.421	0.624	0.824	1.018	1.209	1.394	1.576	1.925	2.256	2.865	–	–
50	-0.25	–	0.331	0.439	0.651	0.859	1.063	1.262	1.457	1.847	2.214	2.864	3.908	5.381
52		–	0.344	0.457	0.678	0.896	1.108	1.316	1.520	1.719	2.104	2.471	3.152	3.760
53		–	0.348	0.465	–	0.912	1.120	1.342	1.534	1.754	2.148	2.524	3.222	3.848
54		–	0.358	0.474	0.705	0.931	1.153	1.370	1.582	1.791	2.194	2.579	3.295	3.939
55	-0.30	–	0.364	0.483	0.718	0.949	1.175	1.397	1.614	1.826	2.238	2.632	3.366	4.029
58		–	0.384	0.510	0.759	1.003	1.242	1.477	1.708	1.934	2.373	2.795	3.581	4.258
60		–	0.398	0.528	0.786	1.039	1.287	1.531	1.771	2.006	2.462	2.901	3.725	4.477
62		–	0.408	0.545	0.804	1.074	1.321	1.584	1.816	–	–	3.007	3.866	4.564
63		–	0.418	0.555	0.826	1.092	1.354	1.612	1.865	2.113	2.596	3.062	3.959	4.745
65		–	–	–	0.853	1.128	1.399	1.665	1.927	2.185	2.686	3.169	4.083	4.924
68	-0.35	–	–	–	0.884	1.181	1.456	1.745	2.004	2.291	–	3.330	4.296	5.191
70		–	–	–	0.920	1.218	1.511	1.800	2.084	2.364	2.910	3.438	4.441	5.372
75		–	–	–	0.987	1.307	1.623	1.934	2.241	2.543	3.134	3.707	4.799	5.820
80		–	–	–	–	1.397	1.735	2.068	2.397	2.722	3.358	3.975	5.157	6.267
85		–	–	–	–	1.486	1.847	2.203	2.554	2.901	3.581	–	–	–
90		–	–	–	–	1.576	1.959	2.337	2.711	3.080	3.805	–	–	–
95		–	–	–	–	1.665	2.070	2.471	2.867	3.259	4.029	–	–	–
100	0.50	–	–	–	–	1.755	2.181	2.605	3.024	3.438	4.253	–	–	–
105		–	–	–	–	1.844	2.294	2.740	3.181	3.617	4.477	–	–	–
110		–	–	–	–	1.934	2.406	2.874	3.337	3.796	4.701	–	–	–
115		–	–	–	–	2.023	2.516	3.008	3.494	3.975	4.924	–	–	–
120		–	–	–	–	2.113	2.630	3.143	3.651	4.154	5.148	–	–	–

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
125		-	-	-	-	-	-	3.277	3.807	4.333	5.372	-	-	-
130	-	-	-	-	-	-	-	3,411	3,964	4,513	5.596	-	-	-
135	-	-	-	-	-	-	-	3,546	4.121	4,692	5.820	-	-	-
140	-1.5	-	-	-	-	-	-	3.680	4.277	4,871	6.044	-	-	-
150		-	-	-	-	-	-	3,948	4,591	5,229	6,491	-	-	-
160		-	-	-	-	-	-	4,217	4,904	5.587	6.939	-	-	-
165		-	-	-	-	-	-	4,551	5,061	5,766	7,163	-	-	-
180		-	-	-	-	-	-	4,754	5,531	6,303	7,834	-	-	-

* Do not use in new developments.

NOTE: The tubes from alloys of grades AMg 5, AMg 6, are produced with outer dia, of not less than 12 mm, with wall thickness of not less than:

1.0 mm with external diameter 12-35 mm.

1.5 mm with external diameter 36-60 mm.

2.0 mm with external diameter 60-120 mm.

3.0 mm with external diameter above 120 mm.

(Revised edition "Information Catalogue of Standards", No.2, 1976).

1.3. Dimensions and the theoritical weight of rolled and drawn square tubes should meet the values indicated in fig. 1 and table 2.

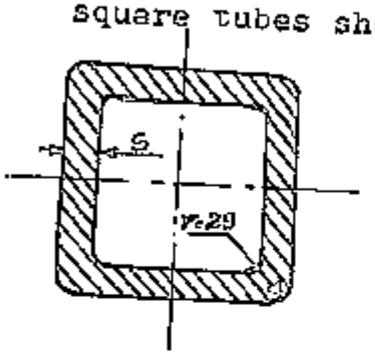

Fig. 1

Table 2.

Side of square, mm.		Theoritical wt. of 1 M tube in kg. with wall thickness s, mm.						
1	2	3	4	5	6	7	8	9
Nominal	Max. tole.	1.0±0.10	1.5±0.14	2.0±0.18	2.5±0.20	3.0±0.23	4.0±0.28	5.0±0.40
10	±0.50	0.095	0.129	-	-	-	-	-
12	±0.50	0.118	0.163	-	-	-	-	-
14	±0.50	0.140	0.197	0.244	-	-	-	-
16	±0.50	0.164	0.231	0.290	-	-	-	-
18	±0.50	0.186	0.266	0.336	0.396	-	-	-
20	±0.50	0.209	0.300	0.381	0.453	-	-	-
22	±0.50	-	0.334	0.426	0.510	0.584	-	-
25	±0.50	-	0.386	0.496	0.595	0.686	-	-
28	±0.50	-	0.437	0.564	0.681	0.789	0.977	-
30	±0.50	-	0.442	0.609	0.738	0.857	1.068	-
32	±0.50	-	0.505	0.654	0.795	0.926	1.159	-
36	±0.50	-	0.573	0.746	0.909	1.063	1,341	-
40	±0.50	-	0.642	0.837	1.023	1.199	1,524	-
42	±0.50	-	0.677	0.882	1.080	1.268	1.615	1,926
45	+0.50	-	0.728	0.951	1.165	1.370	1,752	2,097

1)	2)	3)	4)	5)	6)	7)	8)	9)
50	±0.50	-	0.813	1.064	1.308	1.541	1.980	2.382
55	±0.55	-	-	1.179	1.450	1.712	2.208	2.667
60	±0.60	-	-	1.293	1.593	1.823	2.436	2.952
65	±0.65	-	-	1.407	1.735	2.054	2.664	3.237
70	±0.70	-	-	1.521	1.878	2.225	2.892	3.522
75	±0.75	-	-	1.635	2.020	2.396	3.120	3.807
80	±0.80	-	-	1.749	2.163	2.567	3.347	4.092
90	±0.90	-	-	1.977	2.448	2.909	3.803	4.661

1.4 Dimensions and theoritical weight of rolled and drawn rectangular tubes should meet the values indicated in fig.2 and table 3.

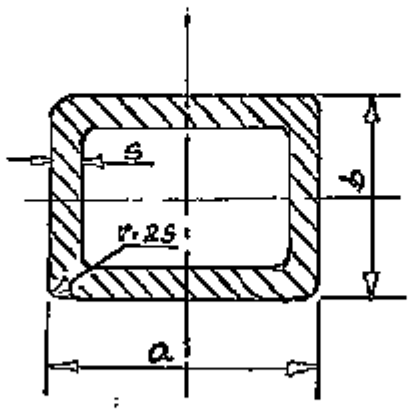

Fig. 2

Table 3.

a		b		Theoritical wt. of 1m tube in kgs. with wall thickness S, mm.						
Nominal	Tolerance	Nominal	Tolerance	±0.10 (1.0)	±0.14 (1.5)	±0.18 (2.0)	±0.20 (2.5)	±0.25 (3.0)	±0.28 (4.0)	±0.40 (5.0)
mm										
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
14	±0.5	10	±0.5	0.118	0.163	0.198	-	-	-	-
16	±0.5	12	±0.5	0.140	0.197	0.244	-	-	-	-
18	±0.5	10	±0.5	0.140	0.197	0.244	-	-	-	-
18	±0.5	14	±0.5	0.164	0.231	0.290	0.339	-	-	-
20	±0.5	12	±0.5	0.164	0.231	0.290	0.339	-	-	-
22	±0.5	14	±0.5	0.186	0.266	0.335	0.396	-	-	-
25	±0.5	15	±0.5	0.210	0.300	0.381	0.463	0.515	-	-
28	±0.5	16	±0.5	0.232	0.334	0.426	0.510	0.584	-	-
28	±0.5	22	±0.5	0.267	0.386	0.496	0.595	0.686	0.840	-
32	±0.5	18	±0.5	0.267	0.386	0.496	0.595	0.686	0.840	-
32	±0.5	25	±0.5	0.306	0.445	0.575	0.695	0.806	1.000	1.156
36	±0.5	20	±0.5	0.300	0.437	0.564	0.681	0.789	0.977	1.128
36	±0.5	28	±0.5	0.346	0.505	0.654	0.795	0.926	1.159	1.356
40	±0.5	25	±0.5	-	0.514	0.666	0.809	0.942	1.182	1.384
40	±0.5	30	±0;5	-	0.557	0.723	0.880	1.028	1.297	1.527
45	±0.5	30	±0.5	-	0.599	0.780	0.952	1.113	1.410	1.669
50	±0.5	30	±0.5	-	0.642	0.837	1.023	1.199	1.525	1.812
55	±0.5	40	±0.5	-	0.770	1.008	1.237	1.455	1.867	2.239
60	±0.6	40	±0.5	-	-	1.065	1.308	1.541	1.981	2.382
70	±0.7	40	±0.5	-	-	1.179	1.450	1.712	2.208	2.660
70	±0.7	50	±0.5	-	-	1.293	1.593	1.883	2.436	2.951
80	±0.8	50	±0.5	-	-	1.407	1.735	2.054	2.664	3.236
80	±0.8	60	±0.6	-	-	1.521	1.878	2.225	2.892	3.521
90	±0.9	60	±0.6	-	-	1,635	2.020	2.396	3.121	3.807
100	±1.0	50	±0.5	-	-	1.635	2.020	2.396	3.121	3.807
100	±1.0	60	±0.6	-	-	1.749	2.163	2.567	3.349	4.092
110	±1.0	55	±0.6	-	-	-	-	2.653	-	-
120	±1.2	60	±0.6	-	-	-	2.448	2.909	3.804	4.661

1.6 Dimensions and theoritical weight of drop shaped roller & drawn tubes should meet the values indicated in fig. 3 and table 4.

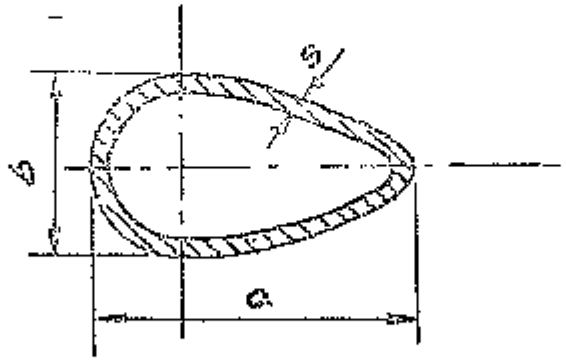

Fig. 3

Table-4

a		b		c		Theoritical wt of 1 m tube in kgs.
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
27.0	±1.0	11.5	±0.5	1.0	±0.10	0.170
33.5	±1.0	14.5	±0.5	1.0	±0.10	0.217
40.5	±1.0	17.0	±0.5	1.0	±0.10	0.256
40.5	±1.0	17.0	±0.5	1.5	±0.14	0.376
47.0	±1.5	20.0	±0.8	1.0	±0.10	0.303
47.0	±1.5	20.0	±0.8	1.5	±0.14	0.447
54.0	±1.5	23.0	±0.8	1.5	±0.14	0.546
54.0	±1.5	23.0	±0.8	2.0	±0.18	0.681
60.5	±1.5	25.5	±0.8	1.5	±0.14	0.576
60.5	±1.5	25.5	±0.8	2.0	±0.18	0.759
67.5	±2.0	28.5	±1.0	1.5	±0.14	0.646
67.5	±2.0	28.5	±1.0	2.0	±0.18	0.862
74.0	±2.0	31.5	±1.0	1.5	±0.14	0.715
74.0	±2.0	31.5	±1.0	2.0	±0.18	0.944
81.0	±2.0	34.0	±1.0	2.0	±0.18	1.023
81.0	±2.0	34.0	±1.0	2.5	±0.20	1.268
87.5	±2.5	37.0	±1.0	2.0	±0.18	1.117

1	2	3	4	5	6	7
87.5	±2.5	40.0	±1.0	2.5	±0.20	1.365
94.5	±2.5	40.0	±1.0	2.5	±0.20	1.501
101.0	±2.5	43.0	±1.0	2.5	±0.20	1.619
108.0	±2.5	45.5	±1.0	2.5	±0.20	1.716
114.5	±2.5	48.5	±1.0	2.5	±0.20	1.833
121.0	±2.5	51.5	±1.5	2.5	±0.20	1.950
128.0	±3.0	54.5	±1.5	3.5	±0.25	2.861
131.0	±3.0	57.0	±1.5	2.5	±0.20	2.163
135.0	±3.0	57.0	±1.5	3.5	±0.25	2.998

1.6. As regards length, the tubes are produced of:non-standard length - from 1 to 6 M.

Standard length or its multiple - within the limits of non-standard length.

Note: Tubes having dia.140 - 180 mm are produced in length of not more than 4 m.

1.7. Tolerances for round,square,rectangular and drop-shaped tubes of standard length should not exceed +15 mm.

Tubes of multiple standard length are supplied with an allowance 5mm per cut (if other allowance is not stipulated in order), and with maximum deviation for total length established for the tube of standard length.

1.8. While calculating the theoretical weight of 1 m tubes, the wall thickness and diameter are taken as nominal and the density of aluminium alloy is equal to 2.85 gm/cm^3, which corresponds to the density of aluminium alloy of grade V95.

For calculating the weight of other aluminium alloy tubes it is necessary to use the following conversion factors:

for alloy of grade	AMts	- 0.958;
for alloy of grade	AMg 2	- 0.940;
for alloy of grade	AMg3	- 0.937;
for alloy of grade	AMg5	- 0.930;
for alloy of grade	AMg6	- 0.926;
for alloy of grade	AV	- 0.947;
for alloy of grade	D1	- 0.982;
for alloy of grade	D16	- 0.976;

for aluminium alloy of grades ADO, AD1, - 0.950.

Method of calling :

The round tube with the outer diameter 40 mm, wall thickness 3mm, non-standard length from alloy of grade D1, annealed;

Round tube 40X3 DIM GOST 18475 - 73.

Same, square with side 50 mm, wall thickness 4 mm, length 2500 mm, from alloy of grade D1, annealed;

Square tube 50 X 4 X 2500 DIM GOST 18475-73.

Same, rectangular with sides 50 X 30 mm, wall thickness 2 mm length nmultiple to 1500 mm, from alloy of grade D1 annealed.

Rectangular tube 50 X 30 X2 X 1500 Kr. DIM as per GOST 18475-73.

Same, drop-shaped tube with sides 54 X 23 mm, wall thickness 2 mm, 3000 mm length from alloy of grade D1, annealed.

Drop-shaped tube δ4 X23 X 2 X 3000 DIM as per GOST 18475-73

2. TECHNICAL REQUIREMENTS.

2.1. The chemical composition of tubes from aluminium of grades ADO, AD1, and aluminium alloys of grades AMts, AMg2 AMg3, AMg5, AMg6, AV, D1, D16 should meet the requirements indicated in GOST 4784-74.

(Revised edition-"Information catalogue of standards" No.2, 1976).

2.2. Mechanical Properties of tubes should meet the requirements indicated in table 5.

2.3. Curvature (deflection) of tubes with wall thickness upto 5 mm inclusively and diameter upto 120 mm inclusively per 1 m length should not exceed 1 mm.

Curvature(deflection) of tubes with wall thickness more than 5 mm and dia. more than 120 mm per 1 M length should not exceed 4 mm.

For annealed tubes the curvature (deflection) which can be eliminated by hand pressing is allowed.

Total curvature (deflection) of tubes should not exceed the product of allowable curvature per meter and length of tube.

2.4. Surface of the tubes (external & internal) should be clean (free from impurities which are difficult for the inspection). Cracks, exfoliations (spills), lateral scratches slag and foreign inclusions, spots of corrosive origin and coarse traces of drawing should not be on the tube surface.

Fine seams, nicks, bulgings due to blisters, traces of technological grease, scratches, traces of dressing (cleaning defects) are not allowed if they lead the tube beyond the negative permissible deviations on wall thickness.

Circular and spiral traces of finish and dents are not allowed if they lead the tube beyond the permissible deviations on diameter.

Longitudinal scratches in quantity of not more than two over 10 mm, perimeter to a depth of not more than 0.04 mm. are allowed on the surface of tubes having wall thickness upto 2 mm. and to a depth of not more than 0.05 mm. - tubes having wall thickness more than 2 mm.

Temper color, dark & bright spots without roughness are not the rejection reasons.

Note: Quality of the tube surface can be specified by the standards (masters) approved by both the parties.

2.5 Tubes should be trimmed uniformly and there should not have burrs. The obliquity(slope) of cut should not exceed 1/3 the tolerance on length of tube.

NOTE: Square, rectangular and drop shaped tubes of all dimensions and round tubes having dia upto 32 mm are produced without deburring.

2.6. Difference in wall thickness of tubes should not lead the wall thickness beyond permissible deviations.

Table 5.

Grade of alloy	Shape of the tubes.	Supply condition of test specimens.	code indicating the grade of alloy & supply condition	Wall thickness, mm.	Diameter, mm.	Tensile properties. Ultimate strength σ_v kg/mm^2	Yield point σ 0.2 kgs/mm^2	Percentage elogation.
						not less than		
1	2	3	4	5	6	7	8	9
AD0	Round	Annealed	AD0M	Up to 5.0 incl.	of all diameters	6	-	20
		Cold-hardened	AD0N	Upto 2.0 incl.		8	-	4
				2.5-5.0		8	-	3
AD 1		Annealed	AD1M	Upto5.0 incl		6 - 11	-	20
		Cold-hardened	AD1N	Upto 2.0 incl.		11	-	4
				2.5 - 5.0		10	-	5
		Annealed	AMTSM	Upto 5.0 incl.		9-14	-	-
		Cold-hardened	AMTSN			14	-	-
AMg2	Round irregular shaped	Annealed	AMG2M			16-22.5	-	-
	Round	Cold-hardened	AMG2N			23	-	-

1	2	3	4	5	6	7	8	9
AMg5	Round	Annealed	AMg5M	Upto 5.0 mm incl.	Of all diameters	19	7	15
		Cold-hardened	AMg5N			23	16	-
AMg5	Round	Annealed	AMg5M			27	13	15
		Cold-hardened	AMg5N			32	17	-
AMg6	Round	Annealed	AMg6M			32	15	15
		Cold-hardened	AMg6N			35	20	-
AV	Round & Irregular-shaped	Annealed	AVM			Not more than 15	-	17
		Hardened & naturally aged	AVT			21	-	14
		Hardened & artificially aged	AVT1			31	-	8
D1	Round & Irregular-shaped	Annealed	D1M			Not more than 25	-	10
	Round	Hardened & naturally aged	D1T	Upto 1.0 incl.	Upto 22	38	20	13
				1.5-5.0		38	20	14
				Upto 1.0 incl.	Above 22 upto 50	40	23	12
				1.5 - 5.0				13

1	2	3	4	5	6	7	8	9
D1	Round	Hardened & naturally aged.	D1T	Upto 5.0 incl	Above 50	40	23	11
	Irregular-shaped				Of all dia.	40	23	12
D16	Round & irregular-shaped	Annealed	D16M			Not more than 25	-	10
	Round	Hardened & naturally aged	D16T	Upto 1.0 incl	Upto 22	42	26	13
				1-5 - 5.0				14
				Upto 5.0 incl.	Above 22 Upto 50	43	29	12
					Above 50	43	29	10
	Irregular shaped				Of all dia.	45	27	10

NOTES: 1. For the hardened tubes made from alloy of grade AV with the content of copper and zinc not more than 0.1% of each, the ultimate strength can be lowered by not more than 3 kg/mm^2.

2. Mechonical properties of tubes with wall thickness 6, 8, 10mm can be set on an agreement of both the parties.

(Revised edition - "Information catalogue of Standards" No. 8, 1976)

2.7. Ovality of the tubes should not exceed the dimensions beyond limit deviations on outer diameter.

The following deviations (maximum) on local ovality of round tubes are allowed:

±1% diameter-for tubes of dia. upto 52 mm.

±0.8% diameter-for tubes of dia. above 52 to 80 mm;

±0.6% diameter-for tubes of dia. above 80 mm.

Lateral deflection of square and rectangular tubes should not exceed:-

0.5 mm-for a side upto 50 mm;

0.75mm-for a side above 50 to 75 mm(inclusive);

1.00mm-for a side above 75 mm

(Revised edition-"Information catalogue of standards", No.2, 1976).

2.8. Smooth twisting of irregular-shaped tubes should not exceed 1° over a length of 1 M tube.

2.9. Micro-structure of tubes after hardening should not have burnt traces.

2.10. Structure of the tubes should not be coarse-crystallined.

2.11 Annealed tubes made from alloy of grade AMg2 should withstand flattening till the walls touch each other without formation of cracks.

3. ACCEPTANCE RULES.

3.1. Tubes are presented for acceptance in batches. The batches should be produced from the tubes of same grade of alloy, same dimensions, same condition of material and same charge of heat treatment.

NOTE: Grouping of batch from several charges of heat treatment is allowed, providdd that every charge should be checked according to the requirement of this standard.

3.2. Chemical composition of material is determined while casting the in-gots (blanks) on samples taken from pouring furnance. It is allowed to determine the chemical composition on specimens taken from not less than two tubes from a batch.

3.3. Two specimens each from two tubes of each charge of heat treatment or batch of tubes supplied without heat treatment, are taken for testing the mechanical properties.

3.4. Each tube is subjected to checking of dimensions and quality of external & internal surfaces, with the exception of tubes with external dia 20 mm & less, checking the internal surface of which is carried out at random at least on 5 specimens from a batch in the form of pieces of tubes not less than 100 mm in length, which have been cut in longitudinal direction.

3.5. Checking the microstructure of hardened tubes for burnt traces is carried out on two specimens cut from two tubes of the same charge. In case there is burnt traces, the repeated checking of microstructure is not allowed.

3.6. The checking of tubes in hardened & annealed condition for the presence of coarse-crystalline structure (on requirement of customer) is carried out on tensile specimens in quantity specified for checking the mechanical properties.

3.7. Flattening test of annealed tubes made from the alloy of grade AMg2 is carried on customer's request.

The test is carried out at least on two specimens from charge.

3.8. If the test results obtained are unsatisfactory even for one of the properties, the repeated test is carried out on double the quantity of tubes taken from the same batch(charge).

The results of the repeated tests are final and cover whole batch.

4. TEST METHODS.

4.1. Chemical analysis of aluminium alloys should be carried out according to GOST 11739-66- · GOST 11760-66, and aluminium as per GOST 12697-67 - GOST 12706-67.

(Revised edition - "Information catalogue of standards", No. 2, 1976.

4.2. Testing of the mechanical properties should be carried out according to GOST 10006 - 73 on longitudinal specimens. The specimens from the tubes having gauge length $l_0 = 11{,}3\sqrt{F_o}$ - the specimens in the form of out portions of tubes and in the form of strips, where Fo is the initial cross-sectional area of the selected specimens.

4.3. The measurement of diameter and sides of the tubes should be carried out at a minium distance of 75 mm from the tube end.

Measurement of dimensions should be carried out with measuring tool, which ensures the required accuracy of determination.

4.4. The examination of internal surface of tubes having dia more than 20 mm is carried out on illuminated screen.

The examination should be carried out without using the magnifying devices.

4.5. The flattening test of annealed tubes made from alloy of grade AMg2 must be carried out according to GOST 8695-75.

The specimens taken from the tubes should be smooth without burrs with nicely cleaned faces.

4.6. Presence of coarse crystalline structure is determined according to the surface roughness of tensile specimens after tensile test. Permissible roughness is set by documents, approved in an established order.

(Additionally introduced-"Information catalogue of standards" No.2 1976).

5. MARKING, PACKING, TRANSPORTATION AND STORAGE

5.1. The following information either should be stamped or marked with indelible paint on the end of each tube having dia. (side) above 30 mm:

a) grade and condition of metal

b) batch No.

c) stamp of inspection dept. of manufacturer.

(Revised edition - "Information catalogue of Standards" No.2,(1976).

5.2. Preservation, packing, marking of container and transportation are carried out as per GOST 9.011-73.

(Revised edition "Information catalogue of Standards". No.2, 1975).

5.3. Every batch of tubes should be furnished with a document certifying the conformity of tubes to the requirements of this standard, in which the following information is indicated:

a) Name or trade mark of manufacturing-plant

b) Name of consignee;

c) Destination;

d) Grade of metal & condition of metal;

e) Tube dimensions;

f) Batch No.;

g) Weight of batch;

h) Test results;

i) No.of packed items;

j) Designation of this standard.

(Revised edition-"Information catalogue of standards" No. 2, 1976).

5.4 The tubes must be protected from mechanical damage, moisture and active chemical reagents during storage and transportation.

5.5.-5.9. (Cancelled - " "Information catalogue of standards" No.2,1976).

Other standards referred to in this standard:

GOST 12256-66,	GOST 14192-71	GOST 4784-65
GOST 11739-66 to	GOST 11760-66	GOST 10006-62
GOST 8695-58	GOST 12328-66	GOST 1707 -51
GOST 15171-70	GOST 782-59	GOST 8828 -61
GOST 515-56	GOST 3553-60	GOST 8273 -57
GOST 11601-65	GOST 16711-71	