

International Standard



4200

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Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length

Tubes lisses en acier, soudés et sans soudure — Tableaux généraux des dimensions et des masses linéiques

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Descriptors : pipes (tubes), precision tubes, steel tubes, welded tubes, seamless tubes, smooth tubes, dimensions, linear density, classification.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4200 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*.

This third edition cancels and replaces the second edition (ISO 4200-1981), of which it constitutes a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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0 Introduction

This International Standard has two main purposes :

- to give guidance on the selection of sizes for all activities concerned with the standardization of steel tubes, both nationally and internationally;
- to serve as a ready reckoner and to avoid the use by different countries of different masses for a tube of the same size.

1 Scope and field of application

This International Standard gives tables of dimensions in millimetres and the masses per unit length in kilograms per metre of plain end steel tubes.

It covers two groups of tubes :

- Group 1 : tubes for general purpose use (see table 2);
- Group 2 : precision tubes (see table 3).

The outside diameters are classified into three series for group 1 and into two series for group 2.

The classification of outside diameters and the selection of preferred thicknesses offers information on which tube dimensions should be selected for national and international standards for either general purposes or particular use and application. The use of this information will ensure the selection of the most favourable dimensions for particular purposes.

It should be noted that the inclusion in the tables of a mass for a given size of tube, which does not have a series 1 outside diameter and preferred thickness, does not necessarily mean that it is available.

Should the mass of a tube of dimensions other than those given in the table be required, it has to be calculated by the formula given in clause 5.

This International Standard is not applicable to tubes primarily intended to be screwed in accordance with ISO 7/1. The masses of such tubes, both screwed and plain end, are given in ISO 65.

2 References

ISO 7/1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 65, *Steel tubes suitable for screwing in accordance with ISO 7/1.*

3 Classification of outside diameters

In International Standards on steel tubes, the outside diameters of tubes are classified into three series defined as follows :

- **Series 1** : Series for which all the accessories needed for the construction of piping systems are standardized.
- **Series 2** : Series for which not all accessories are standardized.
- **Series 3** : Series for special application for which very few standardized accessories exist; some of these diameters may be withdrawn in due course.

4 Selection of preferred dimensions for tubes of group 1

Table 1 gives seven ranges of preferred thicknesses, related to series 1 outside diameters, based upon the principle of isobaric series and applicable to tubes and butt-welding accessories; the three strongest ranges are common to all steel grades. The four ranges of thicknesses D, E, F and G are normally in use for tubular products of non-alloy and alloy steels, and the six

ranges of thicknesses A, B, C, E, F and G are normally in use for stainless steel tubular products.

Table 1 gives a reduced selection of dimensions standardized and available for tubes and accessories; series D, however, is not applicable to butt-welding fittings.

5 Method of calculation of masses per unit length

The values, to at least five significant figures, have been calculated by the formula given below, and then rounded to three significant figures for values below 100, and to the nearest whole number for larger values.

$$M = (D - T) \times T \times 0,024\,661\,5^{1)} \text{ kg/m}$$

where

M is the mass per unit length;

D is the specified outside diameter, in millimetres;

T is the specified thickness, in millimetres.

The calculated values may also be applied to tubes of steels having different density values, but they require to be multiplied by a factor

- 1,015 for austenitic stainless steels;
- 0,985 for ferritic and martensitic stainless steels.

These coefficients may be modified or changed in accordance with the studies being carried out in ISO/TC 17, *Steel*.

Table 1 — Dimensions for tubes and accessories

Dimensions in millimetres

Outside diameter Series 1	Preferred thickness for series						
	A	B	C	D	E	F	G
10,2	1,6	—	—	—	1,6	2,0	2,3
13,5	1,6	—	—	1,6	2,0	2,3	2,6
17,2	1,6	—	—	1,6	2,0	2,3	3,2
21,3	1,6	—	—	1,8	2,0	3,2	4,0
26,9	1,6	—	—	1,8	2,0	3,2	4,0
33,7	1,6	2,0	—	2,0	2,3	3,2	4,5
42,4	1,6	2,0	—	2,3	2,6	3,6	5,0
48,3	1,6	2,0	—	2,3	2,6	3,6	5,0
60,3	1,6	2,0	2,3	2,3	2,9	4,0	5,6
76,1	1,6	2,3	2,6	2,6	2,9	5,0	7,1
88,9	2,0	2,3	2,9	2,9	3,2	5,6	8,0
114,3	2,0	2,6	2,9	3,2	3,6	6,3	8,8
139,7	2,0	2,6	3,2	3,6	4,0	6,3	10
168,3	2,0	2,6	3,2	4,0	4,5	7,1	11
219,1	2,0	2,6	3,6	4,5	6,3	8,0	12,5
273	2,0	3,6	4,0	5,0	6,3	10	14,2
323,9	2,6	4,0	4,5	5,6	7,1	10	16
355,6	2,6	4,0	5,0	5,6	8,0	11	17,5
406,4	2,6	4,0	5,0	6,3	8,8	12,5	20
457	3,2	4,0	5,0	6,3	10	14,2	22,2
508	3,2	5,0	5,6	6,3	11	16	25
610	3,2	5,6	6,3	6,3	12,5	17,5	30
711	4,0	6,3	7,1	7,1	14,2	20	32
813	4,0	7,1	8,0	8,0	16	22,2	36
914	4,0	8,0	8,8	10	17,5	25	40
1016	4,0	8,8	10	10	20	28	45
1067	—	8,8	10	11	—	—	—
1118	—	8,8	10	11	—	—	—
1219	—	10	11	12,5	—	—	—
1422	—	12,5	14,2	14,2	—	—	—
1626	—	14,2	16	16	—	—	—
1829	—	14,2	16	17,5	—	—	—
2032	—	16	17,5	20	—	—	—
2235	—	17,5	20	22,2	—	—	—
2540	—	20	22,2	25	—	—	—

NOTE — The preferred thickness listed in series D and E are used particularly for plain end commercial quality steel tubes for general use. The series A, B, C are normally used only for stainless steels but may in certain circumstances be used for other types of steel. In the revision of existing standards or in preparing new standards the same designation of series of thickness shall be used as in table 1.

1) This coefficient takes into account a density equal to 7,85 kg/dm³.

6 Dimensions and masses per unit length

6.1 Group 1

Table 2 gives the dimensions and masses per unit length of tubes for general purpose use and for use as components of piping systems.

Values of masses per unit length printed in heavy type correspond to tubes of series 1 outside diameters and the preferred thicknesses of series A, B, C, D, E, F and G respectively.

For use as components of piping systems, it is recommended to apply only those dimensions given in table 2, series 1 outside diameters.

6.2 Group 2

Table 3 gives the dimensions and masses per unit length of precision tubes.

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Table 2 – Dimensions

Outside diameter mm Series			0,5	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,4	5,8
1	2	3																			
10,2			0,120	0,142	0,185	0,227	0,266	0,304	0,339	0,373	0,404	0,448	0,487								
	12		0,142	0,169	0,221	0,271	0,320	0,366	0,410	0,453	0,493	0,550	0,603	0,651	0,694						
13,5			0,160	0,191	0,251	0,308	0,364	0,418	0,470	0,519	0,567	0,635	0,699	0,758	0,813	0,879					
		14	0,166	0,198	0,260	0,321	0,379	0,435	0,489	0,542	0,592	0,664	0,731	0,794	0,852	0,923					
	16		0,191	0,228	0,300	0,370	0,438	0,504	0,568	0,630	0,691	0,777	0,859	0,937	1,01	1,10	1,18				
17,2			0,206	0,246	0,324	0,400	0,474	0,546	0,616	0,684	0,750	0,845	0,936	1,02	1,10	1,21	1,30	1,41			
		18	0,216	0,257	0,339	0,419	0,497	0,573	0,647	0,719	0,789	0,891	0,987	1,08	1,17	1,28	1,38	1,50			
	19		0,228	0,272	0,359	0,444	0,527	0,608	0,687	0,764	0,838	0,947	1,05	1,15	1,25	1,37	1,48	1,61	1,73		
	20		0,240	0,287	0,379	0,469	0,556	0,642	0,726	0,808	0,888	1,00	1,12	1,22	1,33	1,46	1,58	1,72	1,85		
21,3			0,256	0,306	0,404	0,501	0,595	0,687	0,777	0,866	0,952	1,08	1,20	1,32	1,43	1,57	1,71	1,86	2,01	2,12	
		22	0,265	0,317	0,418	0,518	0,616	0,711	0,805	0,897	0,986	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10	2,21	
	25		0,302	0,361	0,477	0,592	0,704	0,815	0,923	1,03	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,28	2,47	2,61	
		25,4	0,307	0,367	0,485	0,602	0,716	0,829	0,939	1,05	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52	2,66	
26,9			0,326	0,389	0,515	0,639	0,761	0,880	0,998	1,11	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70	2,86	
	30		0,364	0,435	0,576	0,715	0,852	0,987	1,12	1,25	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,28	
		31,8	0,386	0,462	0,612	0,760	0,906	1,05	1,19	1,33	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,52	
	32		0,388	0,465	0,616	0,765	0,911	1,06	1,20	1,34	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,54	
33,7			0,409	0,490	0,649	0,806	0,962	1,12	1,27	1,42	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,77	
		35	0,425	0,509	0,675	0,838	1,00	1,16	1,32	1,47	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	3,94	
	38		0,462	0,553	0,734	0,912	1,09	1,26	1,44	1,61	1,78	2,02	2,27	2,51	2,75	3,05	3,35	3,72	4,07	4,34	
	40		0,487	0,583	0,773	0,962	1,15	1,33	1,52	1,70	1,87	2,14	2,40	2,65	2,90	3,23					

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Table 2 — Dimensions and masses per unit length, group 1

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