

INTERNATIONAL STANDARD

ISO
4200

Fourth edition
1991-02-15

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*



Reference number
ISO 4200 : 1991 (E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4200 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*, Sub-Committee SC 1, *Steel tubes*.

This fourth edition cancels and replaces the third edition (ISO 4200 : 1985), tables 2 and 3 of which have been technically revised by the addition of the outside diameter of 12,7 mm to series 2.

Annex A of this International Standard is for information only.

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Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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.

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1 Scope

This International Standard gives tables of dimensions, in millimetres, and 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 tables 2 and 3 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 tables 2 and 3 be required, it has to be calculated using the formula given in clause 4.

This International Standard is not applicable to tubes primarily intended to be screwed in accordance with ISO 7-1^[1]. The masses of such tubes, both screwed and plain end, are given in ISO 65^[2].

2 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.

3 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; range D, however, is not applicable to butt-welding accessories.

4 Method of calculation of masses per unit length

The values given in tables 2 and 3 have been calculated using the formula given below to at least five significant figures and have then been rounded to three significant figures for values below 100, and to the nearest whole number for larger values.

$$M = (D - T) \times T \times 0,024\ 661\ 5$$

where

M is the mass per unit length, in kilograms per metre;

D is the specified outside diameter, in millimetres;

T is the specified thickness, in millimetres;

the coefficient 0,024 661 5 takes into account a density equal to 7,85 kg/dm³.

The calculated values may also be applied to tubes of steels having different density values by multiplying them by an appropriate factor, i.e.

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

These coefficients may be modified or changed as a result of current studies, in particular those being carried out in ISO/TC 17, *Steel*.

Table 1 — Dimensions for tubes and accessories

Dimensions in millimetres

Outside diameter Series 1	Ranges of preferred thickness						
	A	B	C	D	E	F	G
10,2	1,6	—	—	—	1,6	2	2,3
13,5	1,6	—	—	1,6	2	2,3	2,6
17,2	1,6	—	—	1,6	2	2,3	3,2
21,3	1,6	—	—	1,8	2	3,2	4
26,9	1,6	—	—	1,8	2	3,2	4
33,7	1,6	2	—	2	2,3	3,2	4,5
42,4	1,6	2	—	2,3	2,6	3,6	5
48,3	1,6	2	—	2,3	2,6	3,6	5
60,3	1,6	2	2,3	2,3	2,9	4	5,6
76,1	1,6	2,3	2,6	2,6	2,9	5	7,1
88,9	2	2,3	2,9	2,9	3,2	5,6	8
114,3	2	2,6	2,9	3,2	3,6	6,3	8,8
139,7	2	2,6	3,2	3,6	4	6,3	10
168,3	2	2,6	3,2	4	4,5	7,1	11
219,1	2	2,6	3,6	4,5	6,3	8	12,5
273	2	3,6	4	5	6,3	10	14,2
323,9	2,6	4	4,5	5,6	7,1	10	16
355,6	2,6	4	5	5,6	8	11	17,5
406,4	2,6	4	5	6,3	8,8	12,5	20
457	3,2	4	5	6,3	10	14,2	22,2
508	3,2	5	5,6	6,3	11	16	25
610	3,2	5,6	6,3	6,3	12,5	17,5	30
711	4	6,3	7,1	7,1	14,2	20	32
813	4	7,1	8	8	16	22,2	36
914	4	8	8,8	10	17,5	25	40
1 016	4	8,8	10	10	20	28	45
1 067	—	8,8	10	11	—	—	—
1 118	—	8,8	10	11	—	—	—
1 219	—	10	11	12,5	—	—	—
1 422	—	12,5	14,2	14,2	—	—	—
1 626	—	14,2	16	16	—	—	—
1 829	—	14,2	16	17,5	—	—	—
2 032	—	16	17,5	20	—	—	—
2 235	—	17,5	20	22,2	—	—	—
2 540	—	20	22,2	25	—	—	—

NOTE — The preferred thicknesses listed in ranges D and E are used particularly for plain end commercial quality steel tubes for general use. The ranges A, B and 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 the preparation of new standards the same designation of ranges of thickness shall be used as in this table.

5 Dimensions and masses per unit length

5.1 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 having the preferred thicknesses of ranges A, B, C, D, E, F and G respectively.

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

5.2 Group 2

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

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