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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Stainless steel tubes suitable for screwing in accordance with ISO 7-1

Tubes en acier inoxydable filetables selon l'ISO 7-1

Reference number
ISO 7598 : 1988 (E)

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 7598 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*.

This second edition cancels and replaces the first edition (ISO 7598 : 1982) and ISO 7598 : 1982/A1 : 1984, of which it constitutes a minor revision.

Annex A of this International Standard is for information only.

Printed in Switzerland

Stainless steel tubes suitable for screwing in accordance with ISO 7-1

1 Scope

This International Standard specifies the dimensions and characteristics of seamless and welded austenitic stainless steel tubes with dimensions corresponding to the medium series of ISO 65.

The tubes may be delivered with plain ends or threaded in accordance with ISO 7-1 and fitted with one screwed socket. The limits of application for these tubes may be laid down on a national basis in accordance with the regulations in force in each country.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1 : 1982, *Pipe threads where pressure-tight joints are made on the threads — Part 1 : Designation, dimensions and tolerances.*

ISO 404 : 1981, *Steel and steel products — General technical delivery requirements.*

ISO 2604-2 : 1975, *Steel products for pressure purposes — Quality requirements — Part 2 : Wrought seamless tubes.*

ISO 2604-5 : 1978, *Steel products for pressure purposes — Quality requirements — Part 5 : Longitudinally welded austenitic stainless steel tubes.*

ISO 4144 : 1979, *Stainless steel fittings threaded to ISO 7-1.*

ISO 9302 : —[1], *Seamless and welded (except submerged arc welded) steel tubes for pressure purposes — Electromagnetic testing for verification of hydraulic leak-tightness.*

1) To be published.

3 Calculation of masses

The values for masses per unit length for plain end tubes have been calculated on the basis of the mean of the maximum and minimum diameters given in table 2 and using the basis for calculation as given in ISO 4200 and have been modified for screwed and socketed tubes by an amount based on the mean mass of a tube of length 7 m with a socket.

4 General requirements

4.1 The tubes shall be made by a seamless or welded process.

4.2 The tubes shall be supplied in the heat-treated condition. The heat-treatment procedure shall consist of heating the tubes at 950 °C to 1 100 °C and rapidly cooling.

4.3 The tubes shall be suitable for fabrication and shaping by normal techniques.

5 Material

The steel shall have a chemical composition and mechanical properties in accordance with ISO 2604-2 and ISO 2604-5.

These standards cover the following steels :

TS 46, TS 47, TS 58, TS 61;

TW 46, TW 47, TW 58, TW 61.

6 Appearance

6.1 The tubes shall have smooth internal and external surfaces, the degree of smoothness depending on the method of manufacture. Unless otherwise agreed in the order, the internal weld bead shall not be removed.

The tubes shall have a workmanlike finish but small imperfections are permissible provided that the thickness remains within the lower tolerance limit.

6.2 Surface imperfections may be dressed provided that the thickness after dressing remains within the lower tolerance limit.

6.3 Peening of surface defects is not permitted.

6.4 The tubes shall be cut nominally square to the axis of the tube, and shall be free from excessive burrs and shall be reasonably straight.

7 Dimensions

7.1 Main data

The nominal size DN (see ISO 6708), the thread designation, the specified outside diameter, the thickness and the masses per unit length are given in table 1.

Table 1 — Dimensions and masses per unit length

DN	Designation of thread	Outside diameter [1] D	Thickness T	Mass per unit length M	
				Plain end	Threaded socketed
		mm	mm	kg/m	kg/m
6	1/8	10,2	2	0,41	0,413
8	1/4	13,5	2,3	0,644	0,651
10	3/8	17,2	2,3	0,858	0,866
15	1/2	21,3	2,6	1,22	1,24
20	3/4	26,9	2,6	1,58	1,6
25	1	33,7	3,2	2,45	2,49
32	1 1/4	42,4	3,2	3,14	3,19
40	1 1/2	48,3	3,2	3,61	3,68
50	2	60,3	3,6	5,11	5,22
65	2 1/2	76,1	3,6	6,54	6,72
80	3	88,9	4	8,5	8,75
100	4	114,3	4,5	12,4	12,7
125	5	139,7	5	16,9	17,4
150	6	165,1 [2]	5	20	20,7

1) See table 2 and 8.1.

2) This diameter is not listed in ISO 4200 but the mass per unit length for this tube has been calculated according to the rules laid down in clause 3.

7.2 Thread

All screwed tubes shall have threads in accordance with the requirements of ISO 7-1.

The tubes shall be screwed with taper threads and, unless otherwise specified, fitted with one screwed socket.

7.3 Sockets

The sockets shall comply with the requirements of ISO 4144, socket M2.

7.4 Random lengths

Unless otherwise specified, random lengths shall be between 4 m and 7 m.

8 Tolerances

8.1 On outside diameter

Tolerances on outside diameter are given in table 2.

Table 2 — Tolerances on outside diameter

Dimensions in millimetres

DN	Designation of thread	Outside diameter	
		max.	min.
6	1/8	10,6	9,8
8	1/4	14	13,2
10	3/8	17,5	16,7
15	1/2	21,8	21
20	3/4	27,3	26,5
25	1	34,2	33,3
32	1 1/4	42,9	42
40	1 1/2	48,8	47,9
50	2	60,8	59,7
65	2 1/2	76,6	75,3
80	3	89,5	88
100	4	115	113,1
125	5	140,8	138,5
150	6	166,5	163,9

8.2 On thickness

\+ not limited

− 12,5 %

(− 15 % on isolated areas, on a length not exceeding twice the specified outside diameter, provided that this reduction in thickness only affects the external surface)

8.3 On mass per unit length

± 10 % for each tube

± 7,5 % per lot of 10 t minimum

9 Testing

9.1 An analysis of each melt of steel shall be made by the steel manufacturer to determine the percentages of the elements specified in ISO 2604-2 and ISO 2604-5.

9.2 The tubes shall be submitted to visual inspection.

9.3 One tensile test shall be made on a test piece for lots of not more than 100 tubes.

Tensile tests shall be made on test pieces from two tubes for lots of more than 100 tubes.

The test pieces shall be cut out longitudinally from the tube, outside the welded area. The mechanical properties shall conform to the requirements given in ISO 2604-2 and ISO 2604-5.

NOTE — A lot is a number of tubes of the same diameter, the same thickness and the same steel grade.

9.4 Each tube shall be tested for leak tightness at the manufacturer's plant.

9.4.1 Each tube shall be subjected to a hydraulic test at a pressure of 50 bar [1].

9.4.2 This hydraulic test may, at the option of the manufacturer, be replaced by a non-destructive test carried out in accordance with ISO 9302.

9.5 Tubes which do not satisfy the tests shall be deemed not to comply with this International Standard.

10 Designation

A tube in accordance with this International Standard shall be designated by

a) "Tube";

b) reference to this International Standard;

c) its grade of steel;

d) its nominal size;

e) its type of end (plain or threaded socketed).

EXAMPLE

A tube of grade TS 46, of nominal size DN 20, and having a threaded end fitted with a screwed socket is designated as follows :

Tube ISO 7598 - TS 46 - DN 20 - threaded socketed

11 Certificate

11.1 When specified by the purchaser on the order, the manufacturer shall supply a certificate stating that the tubes comply with this International Standard.

11.2 This certificate shall comply with the requirements of ISO 404 : 1981, 5.2.1.

1) 1 bar = 10^5 Pa

Annex A
(informative)

Bibliography

ISO 65 : 1981, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1.*

ISO 1127 : 1980, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length.*

ISO 4200 : 1985, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length.*

ISO 6708 : 1980, *Pipe components — Definition of nominal size.*