

INTERNATIONAL STANDARD

**ISO
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Steel tubes for water and sewage

Tubes en acier pour eaux et eaux résiduelles



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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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 559 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*.

This second edition cancels and replaces the first edition (ISO 559:1977), of which it constitutes a technical revision.

Annexes A and B of this International Standard are for information only.

Steel tubes for water and sewage

1 Scope

This International Standard specifies the technical conditions for delivery of seamless and welded steel tubes for the conveyance of water and sewage at temperatures between $-10\text{ }^{\circ}\text{C}$ and $120\text{ }^{\circ}\text{C}$.

It does not apply to steel tubes in accordance with ISO 65 and similar plain end tubes (for service distribution).

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 below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 404:—¹⁾, *Steel and steel products — General technical delivery requirements*.

ISO 4200:1991, *Plain end steel tubes, welded and seamless — General tables of dimensions and masses per unit length*.

ISO 5252:1991, *Steel tubes — Tolerance systems*.

ISO 6761:1981, *Steel tubes — Preparation of ends of tubes and fittings for welding*.

ISO 6892:1984, *Metallic materials — Tensile testing*.

ISO 7438:1985, *Metallic materials — Bend test*.

ISO 8492:1986, *Metallic materials — Tube — Flattening test*.

ISO 9302:1989, *Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes — Electromagnetic testing for verification of hydraulic leak-tightness*.

3 Definitions and symbols

3.1 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1.1 seamless tube: Pierced solid product, hot worked and hot or cold finished.

3.1.2 welded tube: Flat product formed into a circular shape and longitudinally or spirally welded.

3.2 Symbols

For the purposes of this International Standard, the following symbols apply; these symbols are in accordance with those specified in ISO 3545-1, ISO 6708 and ISO 6892.

DN	nominal size
D	outside diameter of the tube, in millimetres
T	thickness of the tube, in millimetres
H	distance between the platens of the test machine, in millimetres
M	mass per unit length, in kilograms per metre
R_m	tensile strength, in newtons per square millimetre
R_{eH}	upper yield stress, in newtons per square millimetre

1) To be published. (Revision of ISO 404:1981)

R_{eL}	lower yield stress, in newtons per square millimetre
$R_{p0,2}$	proof stress (0,2 % non-proportional elongation), in newtons per square millimetre
$R_{t0,5}$	proof stress (0,5 % total elongation), in newtons per square millimetre
A	percentage elongation after fracture, expressed as a percentage of the original gauge length (L_0), $L_0 = 5,65\sqrt{S_0}$
S_0	original cross-sectional area of the parallel length, in square millimetres
PE	test pressure, in bar ²⁾
S	stress which occurs in the metal during the hydraulic test, in newtons per square millimetre
K	flattening test constant; it varies depending on the grade of steel

4 Information to be supplied by the purchaser

4.1 Mandatory information

The purchaser shall specify or confirm in his enquiry and order

- the quantity ordered (total tonnage, total length or number of tubes);
- the number of this International Standard;
- the grade of steel;
- the outside diameter and thickness;
- the length;
- the end preparation (bevelled ends or special joints);

NOTE 1 Until International Standards for special joints are available the purchaser should indicate in the enquiry and order the national standards or other specifications which the manufacturer is required to meet.

- the type of external coating and/or interior lining, as agreed previously with the manufacturer;
- the document to be supplied when the tubes are delivered, which is usually either a statement of compliance or an inspection certificate (see 4.2 and clause 12).

2) 1 bar = 0,1 MPa

4.2 Optional requirements

Certain options and supplementary requirements may be specified, including the following:

- the steel-making processes and deoxidation procedures (see 5.1);
- the tube-making process (see 5.2);
- removal of inside seam reinforcement (see 5.2.2);
- delivery of jointers (see 5.2.2);
- delivery condition (see 5.3.1 and 5.3.2);
- ladle analysis (see 6.1.1);
- product analysis (see 6.1.2);
- delivery lengths (see 7.1.3);
- end preparation (see 7.1.4);
- special tolerances on outside diameters (see 7.2.1.2);
- the removal of inside seam reinforcement of both ends of submerged arc welded tubes (see 5.2.2);
- the selection of samples and tests in the presence of the purchaser or of a representative of the purchaser (see 9.1.1);
- special hydraulic test pressure (see 9.2.4.1);
- type of lining or coating (see clause 11);
- type of documents (see clause 12).

The purchaser should specify his requirements in the enquiry and order.

If the options and particular requirements are not specified in the enquiry and order, their choice will be at the discretion of the manufacturer.

4.3 Designation

The tubes shall be designated, in the sequence given, by the following:

- the type of product (seamless or welded tube);
- the number of this International Standard;
- the grade of steel;
- the outside diameter and the thickness.