
**Ductile iron pipes, fittings, accessories
and their joints for water applications**

*Tuyaux, raccords et accessoires en fonte ductile et leurs assemblages
pour l'eau*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2531 was prepared by Technical Committee ISO/TC 5, *Ferrous metal pipes and metallic fittings*, Subcommittee SC 2, *Cast iron pipes, fittings and their joints*.

This sixth edition cancels and replaces the fifth edition (ISO 2531:1998), of which it constitutes a technical revision. A new classification system for pipes and fittings based on pressure is introduced with minimum wall thickness determined by allowable operating pressure.

Ductile iron pipes, fittings, accessories and their joints for water applications

1 Scope

This International Standard specifies the requirements and test methods applicable to ductile iron pipes, fittings, accessories and their joints for the construction of pipelines:

- to convey water (e.g. for human consumption and raw water),
- operated with or without pressure, and
- installed below or above ground.

NOTE In this International Standard, all pressures are relative pressures expressed in bar ¹⁾.

This International Standard specifies materials, dimensions and tolerances, mechanical properties and standard coatings of pipes, fittings and accessories. It also gives performance requirements for all components including joints.

This International Standard applies to pipes, fittings and accessories cast by any type of foundry process or manufactured by fabrication of cast components, as well as corresponding joints in the size range DN 40 to DN 2600 inclusive.

It is applicable to pipes, fittings and accessories which are

- manufactured with socketed, flanged or spigot ends (joint design and gasket shapes are outside the scope of this International Standard),
- normally delivered internally and externally coated.

Pipes and fittings are classified according to allowable operating pressure.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4016, *Hexagon head bolts — Product grade C*

ISO 4034, *Hexagon nuts — Product grade C*

ISO 4633, *Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 7005-2, *Metallic flanges — Part 2: Cast iron flanges*

1) 100 kPa = 1 bar

ISO 7091, *Plain washers — Normal series — Product grade C*

ISO 10803, *Design method for ductile iron pipes*

ISO 10804, *Restrained joint systems for ductile iron pipelines — Design rules and type testing*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

accessory

any casting other than a pipe or fitting, which is used in a pipeline

EXAMPLE 1 Glands and bolts for mechanical flexible joints (see 3.18).

EXAMPLE 2 Glands, bolts and locking rings or segments for restrained joints (see 3.24).

NOTE The term accessory is not relevant for valves or hydrants of any type.

3.2

allowable operating pressure

PFA

maximum internal pressure, excluding surge, which a component can safely withstand in permanent service

3.3

allowable site test pressure

PEA

maximum hydrostatic pressure that a newly installed component can withstand for a relatively short duration, when either fixed above ground level or laid and backfilled underground, in order to measure the integrity and tightness of the pipeline

NOTE This test pressure is different from the system test pressure, which is related to the design pressure of the pipeline.

3.4

batch

quantity of castings from which a sample may be taken for testing purposes during manufacture

3.5

component

any product defined as an element of a pipe, fitting or accessory

See 3.1, 3.9 and 3.22.

3.6

deviation

amount by which the design length may differ from the standardized length of a pipe or a fitting

NOTE Pipes and fittings are designed to a length selected in the range of standard length plus or minus the deviation (see Table 6); they are manufactured to this length plus or minus the tolerance given in Table 7.

3.7

diametral stiffness of a pipe

characteristic of a pipe allowing it to resist diametral deflection under loading