
**Petroleum and natural gas industries —
Induction bends, fittings and flanges for
pipeline transportation systems —**

**Part 2:
Fittings**

*Industries du pétrole et du gaz naturel — Coudes d'induction, raccords
et brides pour systèmes de transport par conduites —*

Partie 2: Raccords



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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 15590-2 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

ISO 15590 consists of the following parts, under the general title *Petroleum and natural gas industries — Induction bends, fittings and flanges for pipeline transportation systems*:

— *Part 1: Induction bends*

— *Part 2: Fittings*

The following part is under preparation:

— *Part 3: Flanges*

Introduction

Users of this part of ISO 15590 should be aware that further or differing requirements may be needed for individual applications. This part of ISO 15590 is not intended to inhibit a manufacturer from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the manufacturer should identify any variations from this part of ISO 15590 and provide details.

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Petroleum and natural gas industries — Induction bends, fittings and flanges for pipeline transportation systems —

Part 2: Fittings

1 Scope

This part of ISO 15590 specifies the technical delivery conditions for unalloyed or low-alloy steel seamless and welded pipeline fittings for use in pipeline transportation systems for the petroleum and natural gas industries as defined in ISO 13623.

This part of ISO 15590 is applicable to welding-end fittings such as elbows, caps, tees, single or multiple extruded headers, reducers, and transition sections made from seamless and welded pipe of unalloyed or low-alloy steels.

This part of ISO 15590 specifies three classes of fitting corresponding to increasing quality requirements in accordance with the technical delivery conditions of ISO 3183 for pipe as indicated in Table 1.

Table 1 — Fitting class and corresponding pipe standard

Fitting class	Corresponding pipe standard
Class A	ISO 3183-1
Class B	ISO 3183-2
Class C	ISO 3183-3

This part of ISO 15590 is not applicable to the selection of the fitting class.

This part of ISO 15590 is not applicable to the materials for, or the attachment of, factory-welded extensions.

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 148 (all parts), *Steel — Charpy impact test (V-notch)*

ISO 377:1997, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing*

ISO 783, *Metallic materials — Tensile testing at elevated temperature*

ISO 2566-1, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels*

ISO 3183-1, *Petroleum and natural gas industries — Steel pipe for pipelines — Technical delivery conditions — Part 1: Pipes of requirement class A*

ISO 3183-2, *Petroleum and natural gas industries — Steel pipe for pipelines — Technical delivery conditions — Part 2: Pipes of requirement class B*

ISO 3183-3, *Petroleum and natural gas industries — Steel pipe for pipelines — Technical delivery conditions — Part 3: Pipes of requirement class C*

ISO 3834-2, *Quality requirements for welding — Fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

ISO 4885, *Ferrous products — Heat treatments — Vocabulary*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO 7438, *Metallic materials — Bend test*

ISO/TR 7705:1991, *Guidelines for specifying Charpy V-notch impact prescriptions in steel specifications*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 11496, *Seamless and welded steel tubes for pressure purposes — Ultrasonic testing of tube ends for the detection of laminar imperfections*

ISO 12095, *Seamless and welded steel tubes for pressure purposes — Liquid penetrant testing*

ISO 12096, *Submerged arc-welded steel tubes for pressure purposes — Radiographic testing of the weld seam for the detection of imperfections*

ISO 13623, *Petroleum and natural gas industries — Pipeline transportation systems*

ISO 13664, *Seamless and welded steel tubes for pressure purposes — Magnetic particle inspection of the tube ends for the detection of laminar imperfections*

ASME¹⁾ B16.9, *Factory-made wrought butt welding fittings*

ASME B31.8, *Gas transmission and distribution piping systems*

ASME IX, *Boiler and pressure vessel code, Section IX — Welding and brazing procedures, welders, brazers, and welding and brazing operators*

ASTM²⁾ E 112, *Standard test methods for determining average grain size*

ASTM E 709, *Standard guide for magnetic particle examination*

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

EN 288-3, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels*

1) American Society of Mechanical Engineers, 345 East 47th Street, NY 10017-2392, USA

2) American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19428-2959, USA

MSS³⁾ SP-75, *Specification for high test wrought butt welding fittings*

EFC Publication 16:1995⁴⁾, *Guidelines on materials requirements for carbon and low alloy steels for H₂S containing environments in oil and gas production*

3 Terms and definitions

For the purposes of this part of ISO 15590 the terms and definitions given in ISO 4885 and the following apply.

3.1

by agreement

agreed between manufacturer and purchaser

[ISO 15590-1:2001]

3.2

extrados

outer curved section of the elbow

NOTE Adapted from ISO 15590-1:2001.

3.3

heat, noun

batch of steel prepared in one steel-making process

NOTE Adapted from ISO 15590-1:2001.

3.4

intrados

inner curved section of the elbow

NOTE Adapted from ISO 15590-1:2001.

3.5

manufacturing procedure specification

MPS

document which specifies the process control parameters and the acceptance criteria to be applied for all manufacturing, inspection and testing activities performed during fitting manufacture

3.6

tangent

straight section at the ends of the fitting

NOTE Adapted from ISO 15590-1:2001.

3.7

test unit

fitting or test piece of the same designation, starting material wall thickness, heat, manufacturing procedure specification, and heat treatment condition

3) Manufacturers Standardization Society of the Valve & Fittings Industry, 127 Park Street, N.E., Vienna, Virginia 22180, USA

4) European Federation of Corrosion, c/o The Institute of Materials, 1 Carlton House Terrace, London SW1Y 5DB, United Kingdom