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

Part 4: Factory cold bends

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document 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*.

A list of all parts in the ISO 15590 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document makes reference to line pipe and bends with delivery conditions based on ISO 3183.

This document contains additional requirements for special applications as follows:

— Manufacturing procedure specification (Annex A);

— PSL 2S cold bends ordered for sour service (Annex B).

The requirements of the annexes apply only where they are specified on the purchase order. This document does not provide guidance on when it is necessary to specify the above supplementary requirements defined in the annexes. It is the responsibility of the purchaser to specify, based upon the intended use and design requirements, the supplementary requirements that will apply for a particular purchase order.

Further or differing requirements can be needed for individual applications. This document 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, it is the responsibility of the manufacturer to identify and provide details of any variations from this document.

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

Part 4: Factory cold bends

1 Scope

This document specifies the technical delivery conditions for bends made by the cold bending process for bend with radii 5xOD or higher for use in pipeline transportation systems for the petroleum and natural gas industries as defined in ISO 13623.

This document also specifies the requirements for the manufacture of two product specification levels (PSLs) of cold bends corresponding to product specification levels given for pipe in ISO 3183. This document is applicable to cold bends made from seamless and welded pipe of unalloyed or low-alloy steels.

NOTE 1 These are typically C-Mn steels or low-alloy steels that are appropriate for the corresponding level and grade of line pipe in accordance with ISO 3183.

This document is not applicable to the selection of the cold bend product specification level. It is the responsibility of the purchaser to specify the PSL, based upon the intended use and design requirements.

NOTE 2 See also ISO 3183:2012, Introduction.

This document is not applicable to field cold bends and pipeline bends made by other manufacturing processes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 80000-1:2009, *Quantities and units — Part 1: General*

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 3183:2012, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems*

ISO 6507 (all parts), *Metallic materials — Vickers hardness test*

ISO 6508 (all parts), *Metallic materials — Rockwell hardness test*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 6892-2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature*

ISO 7438, *Metallic materials — Bend test*

ISO 7539-2, *Corrosion of metals and alloys — Stress corrosion testing — Part 2: Preparation and use of bent-beam specimens*

ISO 8501-1, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

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