

ISO 15590-1:2018 (E)

Petroleum and natural gas industries — Induction bends, fittings and flanges for pipeline transportation systems — Part 1: Induction bends

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Symbols and abbreviated terms
4.1	Symbols
4.2	Abbreviated terms
5	General requirements
5.1	Units of measurement
5.2	Rounding
5.3	Conformance to this document
6	Designation
7	Pressure rating and design
8	Information that shall be supplied by the purchaser
8.1	General information
8.2	Additional information
8.3	Information on the mother pipe
9	Manufacturing
9.1	Mother pipe
9.2	Qualification test bend
9.3	Production bending
9.4	Post-bending heat treatment
9.5	Forming and sizing after bending
9.6	Strip/plate end welds
9.7	Jointers and girth welds
9.8	End preparation
10	Testing and inspection
10.1	General requirements
10.2	Extent of testing and inspection
10.2.1	Qualification test bend
10.2.2	Production bends
10.2.3	Production test bends
10.3	Chemical composition
10.4	Physical testing
10.4.1	Test pieces — General
10.4.2	Tensile testing
10.4.2.1	Test pieces
10.4.2.2	Test method
10.4.3	Charpy V-notch impact testing
10.4.3.1	Test pieces
10.4.3.2	Test method

- 10.4.3.3 Requirements
- 10.4.4 Through-thickness hardness testing
 - 10.4.4.1 Test method
 - 10.4.4.2 Requirements
- 10.4.5 Surface hardness testing
 - 10.4.5.1 Test method
 - 10.4.5.2 Requirements
- 10.4.6 Metallographic examination
 - 10.4.6.1 Test method
 - 10.4.6.2 Requirements
- 10.4.7 Crack tip opening displacement testing
- 10.4.8 Guided bend testing
 - 10.4.8.1 Test pieces
 - 10.4.8.2 Test method
- 10.4.9 Flattening tests
- 10.5 Non-destructive testing
 - 10.5.1 General
 - 10.5.2 Visual inspection
 - 10.5.3 Weld seam testing
 - 10.5.4 Inspection of bend ends
 - 10.5.5 Magnetic particle testing or liquid-penetrant testing on the bend body
 - 10.5.6 Ultrasonic testing on the bend body
 - 10.5.7 Level of residual magnetism
 - 10.5.8 Repairs
 - 10.5.9 NDT personnel
- 10.6 Dimensions
- 10.7 Gauging
- 10.8 Hydrostatic testing

11 Inspection document

12 Marking

Annex A (normative) Manufacturing procedure specification (MPS)

- A.1 General
- A.2 Manufacturing procedure specification

Annex B (normative) PSL 2S bends ordered for sour service

- B.1 Introduction
- B.2 Additional information that shall be supplied by the purchaser
- B.3 Manufacturing
 - B.3.1 Manufacturing procedure
 - B.3.2 Pipe manufacturing
- B.4 Testing and inspection
 - B.4.1 Chemical composition
 - B.4.2 Tensile properties
 - B.4.3 HIC/SWC test
 - B.4.3.1 Test pieces
 - B.4.3.2 Test method
 - B.4.3.3 Requirements
 - B.4.4 SSC test
 - B.4.4.1 Test pieces
 - B.4.4.2 Test method
 - B.4.4.3 Requirements
 - B.4.5 Hardness test
 - B.4.5.1 Test pieces
 - B.4.5.2 Requirements
- B.5 Hard spots
- B.6 Inspection
- B.7 Non-destructive inspection
 - B.7.1 Laminar imperfections at the pipe ends
 - B.7.2 Ultrasonic testing on the bend body
 - B.7.3 Ultrasonic testing adjacent to weld seam
 - B.7.4 Non-destructive inspection of HFW weld seams
 - B.7.5 Ultrasonic inspection of SAW seam welds