3 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 31-0:1992, Quantities and units — Part 0: General principles

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

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

ISO 404, Steel and steel products — General technical delivery requirements

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

ISO 4885, Ferrous products — Heat treatments — Vocabulary

ISO 6506 (all parts), Metallic materials — Brinell hardness test

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

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

ISO 6892, Metallic materials — Tensile testing at ambient temperature

ISO 6929, Steel products — Definitions and classification

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 8491, Metallic materials — Tube (in full section) — Bend test

ISO 8492, Metallic materials — Tube — Flattening test


ISO 9303:1989, Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes — Full peripheral ultrasonic testing for the detection of longitudinal imperfections

ISO 9304:1989, Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes — Eddy current testing for the detection of imperfections

ISO 9305:1989, Seamless steel tubes for pressure purposes — Full peripheral ultrasonic testing for the detection of transverse imperfections

ISO 9402:1989, Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes — Full peripheral magnetic transducer/flux leakage testing of ferromagnetic steel tubes for the detection of longitudinal imperfections

ISO 9598:1989, Seamless steel tubes for pressure purposes — Full peripheral magnetic transducer/flux leakage testing of ferromagnetic steel tubes for the detection of transverse imperfections
ISO 9764:1989, Electric resistance and induction welded steel tubes for pressure purposes — Ultrasonic testing of the weld seam for the detection of longitudinal imperfections

ISO 9765:1990, Submerged arc-welded steel tubes for pressure purposes — Ultrasonic testing of the weld seam for the detection of longitudinal and/or transverse imperfections

ISO/TR 9769, Steel and iron — Review of available methods of analysis

ISO 10124:1994, Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes — Ultrasonic testing for the detection of laminar imperfections

ISO 10474:1991, Steel and steel products — Inspection documents

ISO 10543, Seamless and hot-stretch-reduced welded steel tubes for pressure purposes — Full peripheral ultrasonic thickness testing

ISO 11484, Steel tubes for pressure purposes — Qualification and certification of non-destructive testing (NDT) personnel

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


ISO 12094:1994, Welded steel tubes for pressure purposes — Ultrasonic testing for the detection of laminar imperfections in strips/plates used in the manufacture of welded tubes

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 12135, Metallic materials — Unified method of test for the determination of quasistatic fracture toughness

ISO 13663:1995, Welded steel tubes for pressure purposes — Ultrasonic testing of the area adjacent to the weld seam for the detection of laminar imperfections

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

ISO 13665, Seamless and welded steel tubes for pressure purposes — Magnetic particle inspection of the tube body for the detection of surface imperfections

ISO 13678, Petroleum and natural gas industries — Evaluation and testing of thread compounds for use with casing, tubing and line pipe

ISO 14284, Steel and iron — Sampling and preparation of samples for the determination of chemical composition


EN 10204:2004, **Metallic products — Types of inspection documents**

API Spec 5B, **Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads (US Customary Units)**

API RP 5A3, **Recommended Practice on Thread Compounds for Casing, Tubing, and Line Pipe**

API RP 5L3, **Recommended Practice for Conducting Drop-Weight Tear Tests on Line Pipe**

ASNT SNT-TC-1A, **Recommended Practice No. SNT-TC-1A — Non-Destructive Testing**

ASTM A 370, **Standard Test Methods and Definitions for Mechanical Testing of Steel Products**

ASTM A 435, **Standard Specification for Straight-Beam Ultrasonic Examination of Steel Plates**

ASTM A 578, **Standard Specification for Straight-Beam Ultrasonic Examination of Plain and Clad Steel Plates for Special Applications**

ASTM A 751, **Standard Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products**

ASTM A 941, **Terminology Relating to Steel, Stainless Steel, Related Alloys, and Ferroalloys**

ASTM A 956, **Standard Test Method for Leeb Hardness Testing of Steel Products**

ASTM A 1038, **Standard Practice for Portable Hardness Testing by the Ultrasonic Contact Impedance Method**

ASTM E 8, **Standard Test Methods for Tension Testing of Metallic Materials**

ASTM E 10, **Standard Test Method for Indentation Hardness of Metallic Materials by Portable Hardness Testers**

ASTM E 114, **Standard Practice for Ultrasonic Pulse-Echo Straight-Beam Examination by the Contact Method**

ASTM E 165, **Standard Test Method for Liquid Penetrant Examination**

ASTM E 213, **Standard Practice for Ultrasonic Examination of Metal Pipe and Tubing**

ASTM E 273, **Standard Practice for Ultrasonic Examination of the Weld Zone of Welded Pipe and Tubing**

ASTM E 309, **Standard Practice for Eddy-Current Examination of Steel Tubular Products Using Magnetic Saturation**

ASTM E 570, **Standard Practice for Flux Leakage Examination of Ferromagnetic Steel Tubular Products**

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1) CEN, European Committee for Standardization, Central Secretariat, Rue de Stassart 36, B-1050, Brussels, Belgium.

2) American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005, USA.

3) American Society for Nondestructive Testing, 1711 Arlingate Lane, Columbus, OH 43228-0518, USA.

4) ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA.
ASTM E 709, Standard Guide for Magnetic Particle Examination


ASTM E 1806, Standard Practice for Sampling Steel and Iron for Determination of Chemical Composition

ASTM E 1815-06, Standard Test Method for Classification of Film Systems for Industrial Radiography

ASTM G 39, Standard Practice for Preparation and Use of Bent-Beam Stress-Corrosion Test Specimens

NACE TM0177:2005, Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H₂S Environments


4 Terms and definitions

For the purpose of this document, the terms and definitions

— in ISO 6929 or ASTM A 941 for steel products,
— in ISO 4885 or ASTM A 941 for heat treatment,
— in ISO 377, ISO 404, ISO 10474 or ASTM A 370, whichever is applicable, for the types of sampling procedures, inspection and inspection documents,

except as given in 4.1 to 4.53, shall apply.

4.1 as agreed
requirement to be as agreed upon by the manufacturer and the purchaser, and specified in the purchase order

NOTE Associated, for example, with items covered by 7.2 a).

4.2 as-rolled
delivery condition without any special rolling and/or heat-treatment

4.3 cold-expanded pipe
pipe that, while at ambient mill temperature, has received a permanent increase in outside diameter or circumference throughout its length, by internal hydrostatic pressure in closed dies or by an internal expanding mechanical device

4.4 cold-sized pipe
pipe that, after forming (including sizing on EW), while at ambient mill temperature, has received a permanent increase in outside diameter or circumference for all or part of its length, or permanent decrease in outside diameter or circumference for all or part of its length

5) NACE International, P.O. Box 201009, Houston, Texas 77216-1009, USA.