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GB/T 5777-2019

Replacing GB/T 5777-2008

Automated Full Peripheral Ultrasonic Testing of Seamless and Welded (except Submerged Arc-Welded) Steel Tubes for the Detection of Longitudinal and/or Transverse Imperfections

无缝和焊接（埋弧焊除外）钢管纵向和/或横向缺欠的全圆周自动超声检测

(ISO 10893-10:2011, Non-Destructive Testing of Steel Tubes – Part 10: Automated Full Peripheral Ultrasonic Testing of Seamless and Welded (except Submerged Arc-Welded) Steel Tubes for the Detection of Longitudinal and/or Transverse Imperfections, MOD)

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Standardization Administration of PRC.

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Foreword

This Standard was drafted as per the rules specified in GB/T 1.1-2009.

This Standard replaced GB/T 5777-2008 *Seamless Steel Pipe and Testing Methods for Ultrasonic Testing*. Compared with GB/T 5777-2008, this Standard has the major technical changes as follows:

--- Modify the standard name;

--- Modify the applicable scope; delete the electromagnetic sound detection method; and add Lamb wave and phased array technical detection methods (see Clause 1 of this Edition; Clause 1 of 2008 Edition);

--- Add terms and definitions, and general requirements (see Clauses 3 and 4 of this Edition);

--- Modify the contents of the detection method; and add Lamb wave detection method (see Clause 5 of this Edition; Clause 4 of 2008 Edition);

--- Delete the contents of flaw detector (see 6.1 of 2008 Edition);

--- Modify the contents of the probe size (see 5.4 and 5.5 of this Edition; and 6.2 of 2008 Edition);

--- Delete the contents of the detection device, transmission device and sorting devices (see 6.3, 6.4, 6.5 of 2008 Edition);

--- Modify the schematic diagram of the comparison sample tube (see Figures 1 and 2 of this Edition; Figures 1 and 2 and 2008 Edition);

--- Modify the requirements for the position of the groove (see 6.1.4 of this Edition; and 5.4.2 of 2008 Edition);

--- Modify the acceptance level and identification (see Table 1 of this Edition; Table 1 of 2008 Edition);

--- Modify the requirements for the minimum depth of the groove (see Table 2 of this Edition; Table 1 of 2008 Edition);

--- Modify the requirements for the width and length of the groove (see 6.3.1, 6.3.3 of this Edition; Table 1 of 2008 Edition);

--- Modify the requirements for the allowable deviation of the groove depth (see 6.3.2.4 of this Edition; Table 1 of 2008 Edition);

--- Modify the requirements for the calibration and re-inspection of the equipment (see Clause 7 of this Edition; Clause 8 of 2008 Edition);

--- Delete the informative Appendixes A, B, E, and normative Appendix D from 2008 Edition;

--- Change the normative Appendix C of 2008 Edition into normative Appendix A of this Standard (see Appendix A of this Edition; Appendix C of 2008 Edition).

--- Add normative Appendix B “Manual/ Semi-Automatic Detection of Untested Pipe Ends and Suspicious Areas” (see Appendix B of this Edition).

Tis Standard uses the redrafting method to modify and adopt ISO 10893-10:2011 *Non-Destructive Testing of Steel Tubes – Part 10: Automated Full Peripheral Ultrasonic Testing of Seamless and Welded (except Submerged Arc-Welded) Steel Tubes for the Detection of Longitudinal and/or Transverse Imperfections*.

This Standard conforms to the structure of ISO10893-10: 2011; and there are technical differences compared to ISO10893-10: 2011.The terms involved in these differences have been marked by vertical single lines (|) on the outer margins of the terms; Appendix C gives a list of corresponding technical differences and their causes.

This Standard was proposed by China Iron and Steel Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee for Standardization of Steel (SAC/TC 183).

Drafting organizations of this Standard: Hengyang Valin Steel Tube Co., Ltd.; Hubei Xinyegang Steel Co., Ltd.; and China Metallurgical Information and Standardization Institute.

Chief drafting staffs of this Standard: Deng Shirong, Tian Yan, Du Daojing, Dong Li, Zhao Bin, and Hu Caiwang.

The historical editions replaced by this Standard are as follows:

--- GB/T 5777-1996, GB/T 5777-2008.

Automated Full Peripheral Ultrasonic Testing of Seamless and Welded (except Submerged Arc-Welded) Steel Tubes for the Detection of Longitudinal and/or Transverse Imperfections

1 Scope

This Standard specifies the requirements for automated full peripheral ultrasonic transverse wave (generated by conventional or phased array technology) testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transverse imperfections.

Unless the purchaser specifically requires in the contract, the method used is generally the detection of longitudinal imperfections.

When performing longitudinal imperfection detection, manufacturers can also decide to use Lamb waves for detection.

For seamless pipes, the supplier and the purchaser can negotiate; the detection principle of this Standard can be used to detect imperfections in other directions.

This Standard applies to ultrasonic testing of steel pipes with an outer diameter of no less than 6mm, and a ratio of outer diameter to wall thickness of no less than 5. For the detection of longitudinal imperfections of steel pipes with a ratio of outer diameter to wall thickness less than 5, see Appendix A.

The testing of circular hollow parts can be performed with reference to this Standard, and the manual ultrasonic testing can be performed with reference to this Standard.

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this document.

GB/T 9445 Non-Destructive Testing - Qualification and Certification of NDT

Personnel (GB/T 9445-2015, ISO 9712:2012, IDT)

GB/T 12604.1 Non-Destructive Testing – Terminology – Terms Used in Ultrasonic Testing (GB/T 12604.1-2005, ISO 5577:2000, IDT)

ISO 11484 Steel Products – Employer's Qualification System for Non-Destructive Testing (NDT) Personnel

3 Terms and Definitions

For the purpose of this document, the terms and definitions given in GB/T 12604.1 and ISO 11484 and the following apply.

3.1 Reference standard imperfection

It is used to check the artificial imperfections of non-destructive testing equipment (such as drilling holes, grooves, and pits).

3.2 Reference tube

It indicates the steels tube or steel sections contained reference standard imperfections.

3.3 Reference sample

It indicates the samples (such as pipe sections, plates or strips) that contain reference standard imperfections.

NOTE: This Standard only uses the term "reference tube", and also includes the term reference sample.

3.4 Tube

It indicates the products with hollow long strip for the cross-section and any shapes on the opening of both ends.

3.5 Seamless tube

Steel tube that perforate the solid product into a hollow tube; then obtain the final size through the hot-processing and cold-processing.

3.6 Welded tube

Steel tube coiled by the flat materials into a hollow cylinder and welded the adjacent edges; then the final size can be obtained through further hot-processing and cold-processing after welding.

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