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Non-destructive testing of steel tubes - Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections

钢管无损检测 焊接钢管焊缝纵向和/或横向缺欠的自动超声检测

(ISO 10893-11:2011, Non-destructive testing of steel tubes - Part 11: Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections, IDT)

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Standardization Administration of the People's Republic of China.

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Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document identically adopts ISO 10893-11:2011 "Non-destructive testing of steel tubes - Part 11: Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections".

This document has made the following minimal editorial changes:

- to coordinate with the existing standards, change the name of the standard to "Non-destructive testing of steel tubes - Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections";

- Incorporate amendments to ISO 10893-11:2011/Amd.1:2020. The outer margins of the clauses covered are marked with vertical double lines (||).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights.

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

This document shall be under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China (SAC/TC 183).

The drafting organizations of this document: Zhejiang Jinzhou Tube Industry Co., Ltd., Jiangsu Wujin Stainless Steel Co., Ltd., Zhejiang Special Equipment Research Institute, Anshan Changfeng Non-destructive Testing Equipment Co., Ltd., Shanxi Taigang Stainless Steel Tube Co., Ltd., Zhangjiagang Shagang Jinzhou Tubeline Co., Ltd., Wuhan Zhongke Innovation Technology Co., Ltd., Metallurgical Industry Information Standards Research Institute.

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Non-destructive testing of steel tubes - Automated ultrasonic testing of the weld seam of welded steel tubes for the detection of longitudinal and/or transverse imperfections

1 Scope

This document specifies the requirements for automated ultrasonic transverse wave (generated by conventional or phased array technology) inspection of submerged arc welded (SAW) steel tube or resistance and induction welded (EW) steel tube welds.

For SAW tube, this inspection includes detection of imperfections primarily parallel to the weld, or perpendicular to the weld according to agreement, or in both directions.

For EW steel tubes, this inspection includes the detection of imperfections oriented mainly parallel to the weld. For longitudinal imperfections, Lamb wave detection is chosen by the manufacturer.

For imperfections in the EW tube welds, full circumferential ultrasonic inspection can be performed.

This document also applies to the inspection of circular hollow profiles.

NOTE: For full circumferential ultrasonic testing of seamless steel tubes and welded steel tubes (except SAW steel tubes), see ISO 10893-10.

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 5577, *Non-destructive testing - Ultrasonic testing - Vocabulary*

NOTE: GB/T 12604.1-2020 *Non-destructive testing - Terminology - Ultrasonic testing* (ISO 5577:2017, MOD)

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

NOTE: GB/T 9445-2015 *Non-destructive testing - Qualification and certification of NDT personnel* (ISO 9712:2012, IDT)

sample tube and the chip shall be the same as the relative movement speed of the steel tube and the probe during the production inspection process. If the manufacturer can prove that other verification results are the same as the dynamic verification results. Other verification methods are allowed.

7.3.3 If any parameters used in the initial calibration change, the device shall be recalibrated.

7.3.4 During the production inspection and calibration process, if it is found that the equipment does not meet the calibration requirements, all steel tubes tested since the last calibration shall be re-tested after the equipment is recalibrated.

8 Acceptance

8.1 All steel tubes whose test signals are lower than the trigger/alarm threshold shall be deemed to have passed the test.

8.2 Steel tubes whose detection signal is greater than or equal to the trigger/alarm threshold signal shall be regarded as suspicious. Or the manufacturer may choose to re-test according to the provisions of this document. If after re-inspection, all detection signals are below the trigger/alarm threshold. The tube shall be deemed to have passed this test. Otherwise, the steel tube shall be marked as suspect.

8.3 According to the requirements of product standards, suspicious steel products shall be handled according to one or more of the following methods:

a) Upon agreement between the purchaser and the manufacturer, suspicious areas may be detected using appropriate methods. Or use other non-destructive testing techniques and methods to re-test. Acceptance registration shall be agreed upon by the purchaser and manufacturer. Retesting shall be in accordance with documented procedures.

b) Suspicious areas shall be sanded down by suitable methods. After it is verified that the remaining wall thickness is within the tolerance range, the steel tube shall be re-tested in accordance with the above regulations. If no signal greater than or equal to the trigger threshold is generated, the steel tube shall be deemed to have passed this test.

c) Suspicious areas shall be excised.

d) The steel tube shall be deemed to have failed this test.

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