

INTERNATIONAL STANDARD

ISO 9303

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

Tubes en acier sans soudure et soudés (sauf à l'arc immergé) pour service sous pression — Contrôle par ultrasons sur toute la circonférence pour la détection des imperfections longitudinales



Reference number
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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9303 was prepared by Technical Committee ISO/TC 17, *Steel*.

Annex A forms an integral part of this International Standard.

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Introduction

This International Standard concerns full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) tubes for pressure purposes for the detection of longitudinal imperfections.

Four different acceptance levels are considered (see table 1). The choice between these acceptance levels is within the province of the ISO Technical Committee responsible for the development of the relevant quality standards.

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

1 Scope

1.1 This International Standard specifies requirements for full peripheral ultrasonic shear wave testing of seamless and welded tubes for pressure purposes, with the exception of submerged arc-welded (SAW) tubes, for the detection of longitudinal imperfections according to four different acceptance levels (see table 1).

1.2 This International Standard is applicable to the inspection of tubes with an outside diameter greater than or equal to 9 mm, and with an outside diameter-to-thickness ratio greater than or equal to 5.

For tubes with an outside diameter-to-thickness ratio less than 5, one of the methods specified in annex A shall be used by agreement between manufacturer and purchaser.

Specific International Standards are in course of preparation for the ultrasonic test of the weld seam of welded tubes.

2 General requirements

2.1 The ultrasonic inspection covered by this International Standard is usually carried out on tubes after completion of all the production process operations.

This inspection shall be carried out by suitably trained operators and supervised by competent personnel nominated by the manufacturer. In the case of third-party inspection, this shall be agreed between the purchaser and manufacturer.

2.2 The tubes to be tested shall be sufficiently straight to ensure the validity of the test. The surfaces shall be sufficiently free from foreign matter which would interfere with the validity of the test.

3 Method of test

3.1 The tubes shall be tested using an ultrasonic shear wave technique for the detection of predominantly longitudinal imperfections.

3.2 During testing, the tubes and/or the transducer assembly shall be moved relative to each other so that the whole of the tube surface is scanned.

NOTE It is recognized that there is a short length at both tube ends which may not be able to be tested.

3.3 During testing, the tubes shall be scanned in two opposing circumferential directions of beam travel, unless otherwise agreed between purchaser and manufacturer.

3.4 The maximum width of each individual transducer, measured parallel to the major axis of the tube, shall be 25 mm.

For L1 and L2 category tubes with an outside diameter equal to or less than 50 mm, the width of any one transducer unit is normally restricted to a maximum of 12,5 mm (see also 5.3).

3.5 The equipment for automatic testing shall be capable of differentiating between acceptable and suspect tubes by means of an automatic trigger/alarm level combined with a marking and/or sorting system.

4 Reference standards

4.1 The reference standards defined in this International Standard are convenient standards for calibration of non-destructive testing equipment. The dimensions of these standards should not be construed as the minimum size of imperfection detectable by such equipment.