

INTERNATIONAL STANDARD

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Electric resistance and induction welded steel tubes for pressure purposes — Ultrasonic testing of the weld seam for the detection of longitudinal imperfections

*Tubes en acier soudés par résistance électrique ou induction pour service sous
pression — Contrôle par ultrasons du cordon de soudure pour la détection des
imperfections longitudinales*



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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 9764 was prepared by Technical Committee ISO/TC 17, *Steel*.

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Introduction

This International Standard concerns ultrasonic testing of the weld seam of electric resistance and induction weld steel tubes for pressure purposes, for the detection of longitudinal imperfections.

Two different acceptance levels are considered in table 1. The choice between these acceptance levels will depend on the intended application.

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Electric resistance and induction welded steel tubes for pressure purposes — Ultrasonic testing of the weld seam for the detection of longitudinal imperfections

1 Scope

This International Standard specifies requirements for the ultrasonic testing of the weld seam of electric resistance and induction welded steel tubes for the detection of predominantly radial longitudinal imperfections, according to two different acceptance levels (see table 1).

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 be 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 such foreign matter as would interfere with the validity of the test.

3 Method of test

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

3.2 During testing, the tubes and/or the transducer assembly shall be maintained in proper alignment with the weld so that the specified test sensitivity is maintained over the whole of the weld seam area over the tube length.

NOTE — It is recognized that there is a short length at both tube ends which it may not be possible to test.

3.3 During testing, the weld seam 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.

3.5 Equipment for automatic testing shall be capable of differentiating between acceptable and suspect tube by means of an automatic trigger/alarm level combined with marking and/or sorting systems.

4 Reference standards

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

4.2 The ultrasonic equipment shall be calibrated using a longitudinal reference notch on the outside and inside surfaces, or on the outside surface only, of a tubular test piece. The internal notch shall not be used when the tube internal diameter is less than 15 mm, unless otherwise agreed between purchaser and manufacturer.

Alternatively, a reference hole drilled radially through the full thickness of the test piece may be used for equipment calibration, by agreement between purchaser and manufacturer. In this case, the diameter of the drill required to produce the reference hole for a specific acceptance level shall also be agreed and the manufacturer shall demonstrate to the satisfaction of the purchaser that the test sensitivity achieved using the reference hole is essentially equivalent to that obtained when using the specified reference notch or notches.

4.3 The test piece shall have the same nominal diameter, thickness, surface finish and heat-treated condition as the tube to be tested, and shall have similar acoustic properties (velocity, attenuation coefficient, etc.).

4.4 The external and internal notches, or the reference hole, shall be sufficiently separated from the extremities of the test piece and from each other when both are used, so that clearly distinguishable signal indications are obtained.