

INTERNATIONAL  
STANDARD

**ISO**  
**11496**

First edition  
1993-11-15

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

*Tubes en acier soudés et sans soudure pour service sous pression —  
Contrôle par ultrasons des extrémités de tube pour la détection des  
dédoublures de laminage*



Reference number  
ISO 11496:1993(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 11496 was prepared by Technical Committee ISO/TC 17, *Steel*, Sub-Committee SC 19, *Technical delivery conditions for steel tubes for pressure purposes*.

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International Organization for Standardization

Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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

## 1 Scope

**1.1** This International Standard specifies requirements for full peripheral ultrasonic testing of the ends of seamless and welded tubes for the detection of laminar imperfections.

It is intended to detect, over a zone at the ends of plain end and bevelled end tubes, laminar imperfections which may interfere with subsequent fabrication operations (e.g. welding, ultrasonic inspection of welds, etc.).

**1.2** This International Standard is applicable to the inspection of tubes with an outside diameter greater than 30 mm. No lower limit of thickness is specified, but see note 1.

NOTE 1 For thicknesses less than 5 mm, difficulties can be experienced in detecting laminar imperfections by this method. When such difficulties arise, an agreement between the purchaser and manufacturer is required to determine the testing technique to be adopted.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 11484:—<sup>1)</sup>, *Steel tubes for pressure purposes — Qualification and certification of non-destructive testing (NDT) personnel*.

1) To be published.

## 3 General requirements

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

These activities shall be carried out by personnel certificated in accordance with ISO 11484, as nominated by the manufacturer. In the case of third-party inspection, this shall be agreed between the purchaser and manufacturer.

**3.2** The surfaces of the tube end zones to be tested shall be sufficiently free from foreign matter which would interfere with the validity of the test.

## 4 Method of test

**4.1** The tube end zone at both tube ends shall be tested using an ultrasonic pulse echo technique for the detection of laminar imperfections, with ultrasound transmitted in the direction normal to the tube surface.

**4.2** 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 from the outside surface, or the inside surface where appropriate, over a 25 mm or  $2a$  wide band ( $a$  = wall thickness) with a maximum of 50 mm, whichever is the greater, from the point where the outside surface meets the end face or bevel.

In the case of submerged arc-welded tubes, when the weld reinforcement precludes a test for laminar imperfections close to and over the reinforcement, a 25 mm wide zone on either side of the weld reinforcement shall not be inspected unless the purchaser and manufacturer agree to do so. The