
**Metallic materials — Tube ring
hydraulic pressure test**

*Matériaux métalliques — Essai d'expansion hydraulique sur anneau
tubulaire*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 2, *Ductility testing*.

This second edition cancels and replaces the first edition (ISO 15363:2000), of which it constitutes a minor revision.

The main changes to the previous edition are:

- Addition of the comparison of symbols and designations used for steel tubes as Annex B for harmonizing EN 10275:1999.

[Annex A](#) and [Annex B](#) of this document are for information only.

Metallic materials — Tube ring hydraulic pressure test

1 Scope

This document specifies the ring hydraulic pressure test for metallic tubes. It is generally applied to tubes with an outside diameter greater than 120 mm and outside diameter to thickness ratio of not less than 20.

The objective of this test is to ascertain the value of the hoop stress required to produce a specified total circumferential (hoop) strain.

2 Symbols

Symbols and corresponding designations are given in [Table 1](#).

Table 1 — Symbols and designations

Symbol	Designation	Unit
a	Measured tube test ring thickness	mm
A_t	Specified total circumferential strain	%
d	Measured outside diameter of the tube test ring	mm
l	Length of tube test ring	mm
p	Hydrostatic pressure to produce the specified total circumferential strain	MPa
R_{At}	Hoop strength at the specified total strain	MPa
NOTE For symbols used in standards for steel tubes, please see Annex B .		

3 Principle

Unrestrained expansion of the test ring between two platens, under internal hydraulic pressure; the outer circumference of the tube is the effective test piece gauge length.

The test is carried out on a test piece taken from a welded or seamless tube of thickness up to a limit dependent upon the capacity of the machine and the strength of the tube (see [Figure 1](#)). All sharp edges are removed from product machined surfaces before testing. Where the hydraulic pressure required to produce the specified circumferential strain exceeds the capacity of the test machine, modified tests may be carried out as described in [Annex A](#).

The test is specified when a measure of the hoop strength is required which is not influenced by cold forming and residual stress introduced when flattening a standard tensile test piece. The standard tensile test is necessary, however, when tensile strength and elongation measurements are required.