INTERNATIONAL STANDARD

ISO 17636-1

First edition
2013-01-15

Non-destructive testing of welds — Radiographic testing —

Part 1: X- and gamma-ray techniques with film

Contrôle non destructif des assemblages soudés — Contrôle par radiographie —

Partie 1: Techniques par rayons X ou gamma à l'aide de film

Reference number
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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

ISO 17636-1 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 44, *Welding and allied processes*, Subcommittee SC 5, *Testing and inspection of welds* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition, together with ISO 17636-2, cancels and replaces ISO 17636:2003, of which it constitutes a technical revision.

ISO 17636 consists of the following parts, under the general title *Non-destructive testing of welds — Radiographic testing*:

— *Part 1: X- and gamma-ray techniques with film*

— *Part 2: X- and gamma-ray techniques with digital detectors*

The main changes are that:

— the normative references have been updated;

— the document has been divided into two parts — this part of ISO 17636 applies to radiographic testing with films;

— X-ray devices up to 1 000 kV have been included;

— the text has been editorially revised.

Requests for official interpretations of any aspect of this part of ISO 17636 should be directed to the Secretariat of ISO/TC 44/SC 5 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Introduction

This International Standard specifies fundamental techniques of radiography with the object of enabling satisfactory and repeatable results to be obtained economically. The techniques are based on generally recognized practice and fundamental theory of the subject, inspection of fusion welded joints with industrial radiographic films.

Non-destructive testing of welds — Radiographic testing —

Part 1:
X- and gamma-ray techniques with film

1 Scope

This part of ISO 17636 specifies techniques of radiographic examination of fusion welded joints in metallic materials using industrial radiographic film techniques.

This part of ISO 17636 applies to the joints of plates and pipes. Besides its conventional meaning, “pipe” as used in this International Standard covers other cylindrical bodies such as tubes, penstocks, boiler drums, and pressure vessels.

NOTE This part of ISO 17636 complies with ISO 5579.[1]

This part of ISO 17636 does not specify acceptance levels for any of the indications found on the radiographs.

If contracting parties apply lower test criteria, it is possible that the quality achieved is significantly lower than when this part of ISO 17636 is strictly applied.

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 5576, *Non-destructive testing — Industrial X-ray and gamma-ray radiology — Vocabulary*

ISO 5580, *Non-destructive testing — Industrial radiographic illuminators — Minimum requirements*

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

ISO 11699-1, *Non-destructive testing — Industrial radiographic film — Part 1: Classification of film systems for industrial radiography*

ISO 11699-2, *Non-destructive testing — Industrial radiographic films — Part 2: Control of film processing by means of reference values*

ISO 19232-1, *Non-destructive testing — Image quality of radiographs — Part 1: Image quality indicators (wire type) — Determination of image quality value*

ISO 19232-2, *Non-destructive testing — Image quality of radiographs — Part 2: Image quality indicators (step/hole type) — Determination of image quality value*

ISO 19232-4, *Non-destructive testing — Image quality of radiographs — Part 4: Experimental evaluation of image quality values and image quality tables*

EN 12543 (all parts), *Non-destructive testing — Characteristics of focal spots in industrial X-ray systems for use in non-destructive testing*

EN 12679, *Non-destructive testing — Determination of the size of industrial radiographic sources — Radiographic method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5576 and the following apply.

3.1
nominal thickness
t
nominal thickness of the parent material only where manufacturing tolerances do not have to be taken into account

3.2
penetration thickness change
Δt
change of penetrated thickness relative to the nominal thickness due to beam angle

3.3
penetrated thickness
w
thickness of material in the direction of the radiation beam calculated on the basis of the nominal thicknesses of all penetrated walls

3.4
object-to-film distance
b
distance between the radiation side of the radiographed part of the test object and the film surface measured along the central axis of the radiation beam

3.5
source size
d
size of the radiation source or focal spot size

NOTE See EN 12679 or EN 12543.

3.6
source-to-film distance
SFD
SDD
distance between the source of radiation and the film measured in the direction of the beam

NOTE SFD = $f + b$

where

f source-to-object distance

b object-to-film distance

3.7
source-to-object distance
f
distance between the source of radiation and the source side of the test object measured along the central axis of the radiation beam

