



BSI Standards Publication

## Non-destructive testing – Radiographic inspection of corrosion and deposits in pipes by X- and gamma rays

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Part 2: Double wall radiographic inspection (ISO 20769-2:2018)

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## National foreword

This British Standard is the UK implementation of EN ISO 20769-2:2018. It supersedes BS EN 16407-2:2014, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee WEE/46, Non-destructive testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English Version

## Non-destructive testing - Radiographic inspection of corrosion and deposits in pipes by X- and gamma rays - Part 2: Double wall radiographic inspection (ISO 20769-2:2018)

Essais non destructifs - Examen radiographique de  
la corrosion et des dépôts dans les canalisations,  
par rayons X et rayons gamma - Partie 2: Examen  
radiographique double paroi (ISO 20769-2:2018)

Zerstörungsfreie Prüfung - Durchstrahlungsprüfung  
auf Korrosion und Ablagerungen in Röhren mit  
Röntgen - und Gammastrahlen - Teil 2: Doppelwand-  
Durchstrahlungsprüfung (ISO 20769-2:2018)

This European Standard was approved by CEN on 9 August 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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## European foreword

This document (EN ISO 20769-2:2018) has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing" in collaboration with Technical Committee CEN/TC 138 "Non-destructive testing" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

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

This document supersedes EN 16407-2:2014.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 20769-2:2018 has been approved by CEN as EN ISO 20769-2:2018 without any modification.

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## Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
<b>4 Classification of radiographic techniques</b> .....	<b>3</b>
<b>5 General</b> .....	<b>3</b>
5.1 Protection against ionizing radiation.....	3
5.2 Personnel qualification.....	4
5.3 Identification of radiographs.....	4
5.4 Marking.....	4
5.5 Overlap of films or digital images.....	4
5.6 Types and positions of image quality indicators (IQI).....	4
5.6.1 Single wire IQI.....	4
5.6.2 Duplex wire IQI (digital radiographs).....	5
<b>6 Recommended techniques for making radiographs</b> .....	<b>5</b>
6.1 Test arrangements.....	5
6.1.1 General.....	5
6.1.2 Double wall single image (DWSI).....	5
6.1.3 Double wall double image (DWDI).....	7
6.1.4 Alignment of beam and film/detector.....	8
6.2 Choice of radiation source.....	8
6.3 Film systems and screens.....	10
6.4 Screens and shielding for imaging plates (computed radiography only).....	11
6.5 Reduction of scattered radiation.....	12
6.5.1 Filters and collimators.....	12
6.5.2 Interception of back scattered radiation.....	12
6.6 Source-to-detector distance.....	13
6.6.1 Double wall single image.....	13
6.6.2 Double wall double image.....	13
6.7 Axial coverage and overlap.....	14
6.8 Circumference coverage.....	15
6.8.1 General.....	15
6.8.2 DWSI.....	15
6.8.3 DWDI.....	15
6.9 Selection of digital radiographic equipment.....	16
6.9.1 General.....	16
6.9.2 CR systems.....	16
6.9.3 DDA systems.....	16
<b>7 Radiograph/digital image sensitivity, quality and evaluation</b> .....	<b>16</b>
7.1 Minimum image quality values.....	16
7.1.1 Wire image quality indicators.....	16
7.1.2 Duplex wire IQIs (digital radiographs).....	16
7.1.3 Minimum normalized signal to noise ratio (digital radiographs).....	16
7.2 Density of film radiographs.....	17
7.3 Film processing.....	17
7.4 Film viewing conditions.....	17
<b>8 Measurement of differences in penetrated thickness</b> .....	<b>18</b>
8.1 Principle of technique.....	18
8.2 Measurement of attenuation coefficient.....	18
8.3 Source and detector positioning.....	18
8.4 Image grey level profiles.....	19
8.5 Validation.....	19

This is a preview of "BS EN ISO 20769-2:20...". Click here to purchase the full version from the ANSI store.

8.6	Key points.....	19
<b>9</b>	<b>Digital image recording, storage, processing and viewing.....</b>	<b>19</b>
9.1	Scan and read out of image.....	19
9.2	Calibration of DDAs.....	19
9.3	Bad pixel interpolation.....	20
9.4	Image processing.....	20
9.5	Digital image recording and storage.....	20
9.6	Monitor viewing conditions.....	20
<b>10</b>	<b>Test report.....</b>	<b>20</b>
<b>Annex A</b>	<b>(normative) Minimum image quality values.....</b>	<b>22</b>
<b>Annex B</b>	<b>(normative) Penetrated thickness measurements from image grey levels.....</b>	<b>24</b>
<b>Annex C</b>	<b>(normative) Determination of basic spatial resolution.....</b>	<b>26</b>
<b>Bibliography</b>	<b>.....</b>	<b>29</b>

This is a preview of "BS EN ISO 20769-2:20...". Click here to purchase the full version from the ANSI store.

## 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](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 135 *Non-destructive testing*, Subcommittee SC 5 *Radiographic testing*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

A list of all parts in the ISO 20769 series can be found on the ISO website.

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# Non-destructive testing – Radiographic inspection of corrosion and deposits in pipes by X- and gamma rays —

## Part 2: Double wall radiographic inspection

### 1 Scope

This document specifies fundamental techniques of film and digital 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.

This document applies to the radiographic examination of pipes in metallic materials for service induced flaws such as corrosion pitting, generalized corrosion and erosion. Besides its conventional meaning, “pipe” as used in this document is understood to cover other cylindrical bodies such as tubes, penstocks, boiler drums and pressure vessels.

Weld inspection for typical welding process induced flaws is not covered, but weld inspection is included for corrosion/erosion type flaws.

The pipes can be insulated or not, and can be assessed where loss of material due, for example, to corrosion or erosion is suspected either internally or externally.

This document covers double wall inspection techniques for detection of wall loss, including double wall single image (DWSI) and double wall double image (DWDI).

Note that the DWDI technique described in this document is often combined with the tangential technique covered in ISO 20769-1.

This document applies to in-service double wall radiographic inspection using industrial radiographic film techniques, computed digital radiography (CR) and digital detector arrays (DDA).

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 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 17636-2, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors*

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

ISO 19232-5, *Non-destructive testing — Image quality of radiographs — Part 5: Determination of the image unsharpness value using duplex wire-type image quality indicators*