



BSI Standards Publication

Founding - Radiographic testing

Part 1: Film techniques

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National foreword

This British Standard is the UK implementation of EN 12681-1:2017. Together with BS EN 12681-2:2017, it supersedes BS EN 12681:2003, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/111, Steel Castings and Forgings.

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

Founding - Radiographic testing - Part 1: Film techniques

Fonderie - Contrôle par radiographie - Partie 1 :
Techniques à l'aide de films

Gießereiwesen - Durchstrahlungsprüfung - Teil 1:
Filmtechniken

This European Standard was approved by CEN on 16 July 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Symbols and abbreviations	8
Table 1 — Symbols and abbreviations	8
5 Classification of radiographic techniques.....	9
6 General preparations and requirements	9
6.1 General preparations.....	9
6.1.1 Protection against ionizing radiation.....	9
6.1.2 Surface preparation and stage of manufacture.....	9
6.2 Agreements	9
6.3 Personnel qualification.....	10
7 Test arrangements.....	10
7.1 General.....	10
7.2 Single wall radiography of plane areas.....	10
7.3 Single wall radiography of curved areas	10
7.4 Double wall radiography of plane and curved areas	10
7.5 Choice of test arrangements for complex geometries	11
7.6 Acceptable test area dimensions.....	11
8 Choice of tube voltage and radiation source	16
8.1 X-ray devices up to 1 000 kV	16
8.2 Other radiation sources.....	17
9 Film systems and metal screens	18
10 Reduction of scattered radiation.....	20
10.1 Metal filters and collimators.....	20
10.2 Interception of backscattered radiation.....	20
11 Source-to-object distance.....	20
12 Optical density <i>D</i> of radiograph.....	23
13 Film processing and viewing.....	23
13.1 Processing.....	23
13.2 Film viewing conditions.....	23
14 Techniques for increasing the covered thickness range	23
14.1 General.....	23
14.2 Multiple film technique.....	24
14.3 Contrast decreasing by higher radiation energy	25
14.4 Contrast decreasing by beam hardening.....	25
14.5 Contrast decreasing by thickness equalization.....	26

This is a preview of "BS EN 12681-1:2017". [Click here to purchase the full version from the ANSI store.](#)

15	Requirements on radiographs	26
15.1	Identification of radiograph, test area, film position plan	26
15.2	Marking of the test areas	26
15.3	Overlap of films	26
16	Verification of image quality	26
17	Influence of crystalline structure	27
18	Acceptance criteria	27
18.1	General	27
18.2	Severity levels	27
18.3	Wall section zones	27
19	Test report	28
Annex A (normative) Minimum image quality values		30
Annex B (normative) Severity levels for steel castings		33
Annex C (normative) Severity levels for cast iron castings		36
Annex D (normative) Severity levels for aluminium alloy and magnesium alloy castings		39
Annex E (normative) Severity levels for copper alloy castings		43
Annex F (normative) Severity levels for titanium and titanium alloy castings		45
Annex G (informative) Significant technical changes between this European Standard and the previous edition		47
Bibliography		48

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European foreword

This document (EN 12681-1:2017) has been prepared by Technical Committee CEN/TC 190 "Foundry technology", the secretariat of which is held by DIN.

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 May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

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 12681:2003.

Within its programme of work, Technical Committee CEN/TC 190 requested CEN/TC 190/WG 10 "Testing for inner discontinuities":

- to revise EN 12681:2003 into EN 12681-1, *Founding — Radiographic testing — Part 1: Film techniques*;
- and to prepare a further standard EN 12681-2, *Founding — Radiographic testing — Part 2: Techniques with digital detectors*

Annex G covers the significant technical changes between this European Standard and EN 12681:2003.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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.

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Introduction

Radiography can be used to detect internal discontinuities in a casting. The discontinuities can be gas holes, non-metallic inclusions, shrinkage, cracks, inserts or chills or inclusions that have lower or higher densities than the parent metal. This European Standard gives acceptance criteria through severity levels.

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1 Scope

This European Standard gives specific procedures for industrial X-ray and gamma radiography for discontinuity detection purposes, using NDT (Non-destructive testing) film techniques. This part of EN 12681 specifies the requirements for film radiographic testing of castings.

Films after exposure and processing become radiographs with different area of optical density. Radiographs are viewed and evaluated using industrial radiographic illuminators.

This part of EN 12681 specifies the recommended procedure for the choice of operating conditions and radiographic practice.

These procedures are applicable to castings produced by any casting process, especially for steel, cast iron, aluminium, cobalt, copper, magnesium, nickel, titanium, zinc and any alloys of them.

NOTE This European Standard considers EN ISO 5579.

This part of this European Standard does not apply to:

- radiographic testing of castings for aerospace applications (see prEN 2002-21);
- radiographic testing of welded joints (see EN ISO 17636-1);
- radiography with digital detectors (see EN 12681-2);
- radiosopic testing (see EN 13068, all parts).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

EN 25580, *Non-destructive testing - Industrial radiographic illuminators - Minimum requirements (ISO 5580:1985)*

EN ISO 5579:2013, *Non-destructive testing - Radiographic testing of metallic materials using film and X-ray or gamma rays - Basic rules (ISO 5579:2013)*

EN ISO 9712, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712)*

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

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

EN 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 19232-1)*