



National Standards Authority of Ireland

IRISH STANDARD

**I.S. EN 14096-1:2003**

ICS 01.040.19  
01.040.37  
19.100  
37.040.25

**NON-DESTRUCTIVE TESTING -  
QUALIFICATION OF RADIOGRAPHIC FILM  
DIGITISATION SYSTEMS - PART 1:  
DEFINITIONS, QUANTITATIVE  
MEASUREMENTS OF IMAGE QUALITY  
PARAMETERS, STANDARD REFERENCE  
FILM AND QUALITATIVE CONTROL**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 14096-1**

April 2003

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English version

**Non-destructive testing - Qualification of radiographic film  
digitisation systems - Part 1: Definitions, quantitative  
measurements of image quality parameters, standard reference  
film and qualitative control**

Essais non destructifs - Qualification des systèmes de  
numérisation des films radiographiques - Partie 1:  
Définitions, mesures quantitatives des paramètres de  
qualité d'image, film de référence normalisé et contrôle  
qualitatif

Zerstörungsfreie Prüfung - Qualifizierung von Röntgenfilm-  
Digitalisierungssystemen - Teil 1: Definitionen, quantitative  
Messung von Bildqualitätsparametern, Standard-  
Referenzfilm und Qualitätssicherung

This European Standard was approved by CEN on 11 March 2003.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## **Foreword**

This document (EN 14096-1:2003) has been prepared by 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of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

EN 14096 comprises a series of European Standards for radiographic film digitisation systems which is made up of the following:

- |            |   |
|------------|---|
| EN 14096-1 | Non-destructive testing – Qualification of radiographic film digitisation systems – Part 1: Definitions, quantitative measurements of image quality parameters, standard reference film and qualitative control |
| EN 14096-2 | Non-destructive testing – Qualification of radiographic film digitisation systems – Part 2: Minimum requirements  |

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

**EN 14096-1:2003 (E)****Introduction**

Radiographic film systems are used for industrial inspection by X- and gamma rays. To apply modern means of computer support for analysis, transmission and storage the information stored in the radiographic film should be converted into digital data (digitisation). This European Standard defines minimum requirements to ensure that the relevant information for evaluation of the digital data is preserved during the film digitisation process.

**1 Scope**

This European Standard specifies procedures for the evaluation of basic performance parameters of the radiographic film digitisation process such as spatial resolution and spatial linearity, density range, density contrast sensitivity and characteristic transfer curve. They can be integrated into the system software and together with a standard reference film (as described in clause 5) used for quality control of the digitisation process. This reference film provides a series of test targets for performance evaluation. The test targets are suitable for evaluating a digitisation system with a spatial resolution down to 25  $\mu\text{m}$ , a density contrast sensitivity down to 0,02 optical density, a density range of 0,5 to 4,5 and a film size capacity of (350 x 430)  $\text{mm}^2$ . This standard does not address signal processing and display of the digitised data.

**2 Normative references**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 584-1, *Non-destructive testing — Industrial radiographic film — Part 1: Classification of film systems for industrial radiography*.

EN 14096-2, *Non-destructive testing — Qualification of radiographic film digitisation systems — Part 2: Minimum requirements*.

**3 Terms and definitions**

For the purposes of this European Standard, the following terms and definitions apply.

**3.1 radiographic film digitisation system**

digitiser

sequential application of the two functions below:

- a) detection of the diffuse transmittance of a small unit area of the film (pixel, picture element) by means of an optical detector, giving an electric output signal (geometrical digitisation);
- b) conversion of the above electrical signal into a numerical value (densitometrical digitisation)

**3.2 scanning aperture**

$S_A$

spatial extension (area) on the radiographic film through which the digitiser performs the scanning of one pixel for geometrical digitisation

The size of the scanning aperture corresponds:

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