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**Neporušitveno preskušanje - Kakovost radiografske slike - 3. del: Razredi kakovosti slike za železne kovine**

Non-destructive testing - Image quality of radiographs - Part 3: Image quality classes for ferrous metals

Zerstörungsfreie Prüfung - Bildgüte von Durchstrahlungsaufnahmen - Teil 3: Bildgüteklassen für Eisenwerkstoffe

Essais non destructifs - Qualité d'image des radiogrammes - Partie 3: Classes de qualité d'image pour métaux ferreux

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19.100	Neporušitveno preskušanje	Non-destructive testing
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EUROPEAN STANDARD

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English version

**Non-destructive testing - Image quality of  
radiographs - Part 3: Image quality classes for  
ferrous metals**

Essais non destructifs - Qualité d'image des  
radiogrammes - Partie 3: Classes de qualité  
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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist 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 Central Secretariat has the same status as the official versions.

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

## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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## Foreword

This European Standard 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of an identical text or by endorsement, at the latest by April 1997, and conflicting national standards shall be withdrawn at the latest by April 1997.

EN 462-3 is a part of series of European Standards; the other parts are the following:

- EN 462-1 Non-destructive testing - Image quality of radiographs - Part 1: Image quality indicators (wire type), determination of image quality value
- EN 462-2 Non-destructive testing - Image quality of radiographs - Part 2: Image quality indicators (step/hole type), determination of image quality value
- EN 462-4 Non-destructive testing - Image quality of radiographs - Part 4: Experimental evaluation of image quality values and image quality tables
- EN 462-5 Non-destructive testing - Image quality of radiographs - Part 5: Image quality indicators (Duplex wire type), determination of total image unsharpness value.

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

## 1 Scope

This standard specifies the minimum image quality values to ensure a uniform radiographic quality. It applies to the two types of image quality indicator as detailed in EN 462-1 for wire type IQI and EN 462-2 for step/hole type IQI and for the two techniques described in EN 444. Values are specified for the two classes of radiographic technique specified in EN 444 and for ferrous metals.

## 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.

- EN 444. Non-destructive testing - General principles for radiographic examination of metallic materials by X and Gamma rays
- EN 462-1 Non-destructive testing - Image quality of radiographs - Part 1: Image quality indicators (wire type), determination of image quality value (standards.iteh.ai)
- EN 462-2 Non-destructive testing - Image quality of radiographs - Part 2: Image quality indicators (step/hole type), determination of image quality value (standards.iteh.ai/catalog/standards/sist/3a45a1c3-6ccc-4814-b165-cb0210b589b/sist-en-462-3-1997)
- EN 462-4 Non-destructive testing - Image quality of radiographs - Part 4: Experimental evaluation of image quality values and image quality tables
- EN 584-1 Non-destructive testing - Industrial radiographic film - Part 1: Classification of film systems for industrial radiography
- prEN 1435 Non-destructive examination of welds - Radiographic examination of welded joints.
- EN 25 580 Non-destructive testing - Industrial radiographic illuminators - Minimum requirements (ISO 5580:1985)

## 3 Definitions

For the purposes of this standard, the following definitions apply:

- 3.1 Classification of radiographic techniques  
see EN 444
- 3.2 Image quality indicator (IQI)  
see EN 462-1 and EN 462-2
- 3.3 Image quality value  
see EN 462-1 and EN 462-2

### 3.4 Image quality table see EN 462-4

Additional definitions are given in EN 444.

## 4 Image quality classes

### 4.1 Single-wall radiography

The image quality classes given in tables 1 to 4 can be obtained if the requirements of EN 444 are met:

- Image quality class A for the class A radiographic technique (see EN 444)
- Image quality class B for the class B radiographic technique (see EN 444).

Image quality values given in tables 1 to 4 apply in cases where the IQI is placed on the source side. If it is not possible to place the IQI on the source side it may be placed on the film side. Tables 1 to 4 cannot be applied in this case.

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NOTE: The use of exceptional arrangements (for example: use of an iridium 192 source for thin plate sections) can result in obtaining different image quality values from those specified (see footnotes of tables 1 to 4).

### 4.2 Double-wall radiography

The image quality classes given in tables 5 to 12 can be obtained if the requirements of EN 444 are met:

- Image quality class A for the class A radiographic technique (see EN 444)
- Image quality class B for the class B radiographic technique (see EN 444).

NOTE: The use of exceptional arrangements can result in obtaining different image quality values from those specified (see footnotes of tables 6, 8, 10 and 12).

When using double wall radiographic technique, the penetrated thickness "w" can be the sum of both wall thicknesses "t".

Tables 5 to 8 indicate the image quality values corresponding to the image quality classes A and B for a double-wall test with interpretation of the two walls, the IQI being placed on the source side of the object (IQI on the source side).

Tables 9 to 12 indicate the image quality values corresponding to the image quality classes A and B for a double-wall test with interpretation of the single image, the IQI being placed on the film side of the object (IQI on the film side).

Tables 9 to 12 may also be used to indicate the image quality corresponding to the double-wall/double image technique when the IQI is placed on the film side. This may be the case of elliptical radiographs according to prEN 1435.

## 5 Arrangement

To determine the image quality, when the radiograph is being taken, the IQI shall be placed on the source side of the section under test. If this is not possible, the IQI may be placed adjacent to the side of the section under test nearest the film. To indicate that this latter arrangement has been used, the image of the letter F shall be visible immediately next to the IQI marking on the radiograph.

The IQI shall always be placed on the object under test in an area where the thickness is as uniform as possible.

Special arrangements are determined by application standards.

## 6 Determination of image quality value

In determining the image quality value, the conditions for viewing radiographs specified in EN 25 580 shall be observed.

For wire type IQIs the number of the thinnest wire which is still visible on the radiograph shall be taken as the image quality value achieved. The image of a wire is accepted to be visible if a continuous length of at least 10 mm is clearly visible in a region of uniform optical density.

For step/hole type IQIs the number of the smallest hole which is visible on the radiograph shall be taken as the image quality value. When the step contains two holes, both shall be visible.

In general, the image quality value shall be determined for every radiograph. If steps have been taken to guarantee that radiographs of similar test objects and regions are produced with identical exposure and processing techniques and no differences in the image quality value are likely, the image quality need not be verified for every radiograph, the extent of image quality verification being subject to agreement between the contracting parties.



## Single-wall technique; IQI on source side

Table 1: Wire IQI

Image quality class A			
Nominal thickness t mm			IQI value <sup>1)</sup>
		to 1,2	W 18
above	1,2	to 2	W 17
above	2	to 3,5	W 16
above	3,5	to 5	W 15
above	5	to 7	W 14
above	7	to 10	W 13
above	10	to 15	W 12
above	15	to 25	W 11
above	25	to 32	W 10
above	32	to 40	W 9
above	40	to 55	W 8
above	55	to 85	W 7
above	85	to 150	W 6
above	150	to 250	W 5
above	250		W 4

<sup>1)</sup> When using Ir 192 sources, IQI values worse than listed values may be accepted as follows:

10 mm to 24 mm: up to 2 values  
above 24 mm to 30 mm: up to 1 value.

Table 2: Step and hole IQI

Image quality class A			
Nominal thickness t mm			IQI value <sup>1)</sup>
		to 2	H 3
above	2	to 3,5	H 4
above	3,5	to 6	H 5
above	6	to 10	H 6
above	10	to 15	H 7
above	15	to 24	H 8
above	24	to 30	H 9
above	30	to 40	H 10
above	40	to 60	H 11
above	60	to 100	H 12
above	100	to 150	H 13
above	150	to 200	H 14
above	200	to 250	H 15
above	250	to 320	H 16
above	320	to 400	H 17
above	400		H 18

<sup>1)</sup> When using Ir 192 sources, IQI values worse than listed values may be accepted as follows:

10 mm to 24 mm: up to 2 values  
above 24 mm to 30 mm: up to 1 value.