INTERNATIONAL STANDARD

ISO 19232-5

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Non-destructive testing — Image quality of radiographs —

Part 5: Determination of the image unsharpness value using duplex wire-type image quality indicators

Essais non destructifs — Qualité d'image des radiogrammes —

Partie 5: Détermination de l'indice de flou de l'image à l'aide d'indicateurs de qualité d'image duplex à fils

Reference number
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Contents

Page

Foreword ..... **iv**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Specification of duplex wire-type IQI **1**

4.1 Dimensions, manufacture, and marking 1

4.2 Declaration of conformity 2

5 Use of duplex wire **3**

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 19232-5 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 135, *Non-destructive testing*, Subcommittee SC 5, *Radiation methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 19232-5:2004), of which it constitutes a minor revision with the following changes:

— updated references and definitions;

— change of writing order of the duplex wire number;

— statement that EN duplex wire IQIs of EN 462-5:2004 and its designation are identical to ISO duplex wire-type IQIs and its designation, as defined in this part of ISO 19232;

— replacement of film by detector, which includes film and digital detectors;

— extended description for use of duplex wire-type IQI.

ISO 19232 consists of the following parts, under the general title *Non-destructive testing — Image quality of radiographs*:

— *Part 1: Determination of the image quality value using wire-type image quality indicators*

— *Part 2: Determination of the image quality value using step/hole-type image quality indicators*

— *Part 3: Image quality classes*

— *Part 4: Experimental evaluation of image quality values and image quality tables*

— *Part 5: Determination of the image unsharpness value using duplex wire-type image quality indicators*

Non-destructive testing — Image quality of radiographs —

Part 5: Determination of the image unsharpness value using duplex wire-type image quality indicators

1 Scope

This part of ISO 19232 specifies a method of determining the total image unsharpness of radiographs and real-time radioscopic systems.

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.

ISO/IEC 17050-1, *Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements*

3 Terms and definitions

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

3.1
duplex wire-type image quality indicator
duplex wire-type IQI
image quality indicator specifically designed to assess the total image unsharpness of a radiograph and composed of a series of pairs of wire elements made of high-density metal

3.2
total image unsharpness value
smallest number of the duplex wire pair, which is not separable

Note 1 to entry: The corresponding unsharpness values are given in Table 1. See also Clause 4.

4 Specification of duplex wire-type IQI

4.1 Dimensions, manufacture, and marking

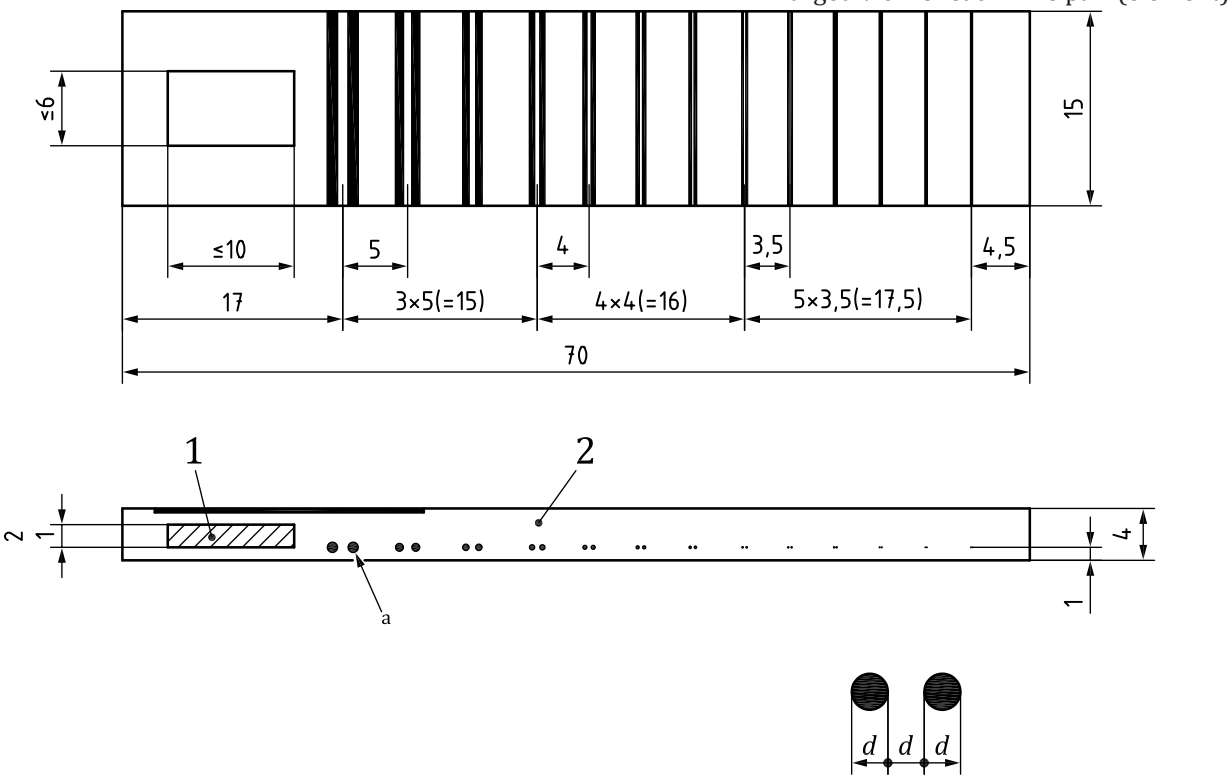
4.1.1 Dimensions and material

The duplex wire-type IQI shall consist of a series of 13 elements placed in a transparent rigid plastic holder. Each element shall consist of a pair of wires of circular section. The elements D1 to D3 are of tungsten, the others of platinum.

The dimensions shall be in accordance with Figure 1.

Dimensions in millimetres

Enlarged view of each wire pair (element)



Key

1 space for identification marking

2 rigid plastic mounting

a Wire diameter, *d*, equals spacing between the wires.

Figure 1 — Duplex wire-type IQI

4.1.2 Manufacture

The wire diameters and spacing of the wires are shown in Table 1.

4.1.3 Marking

The marking of the duplex wire-type IQI (see Figure 1) shall give the following information: ISO and serial number.

IQIs with the letters EN are considered to be identical to IQIs with the letters ISO.

4.2 Declaration of conformity

Each IQI shall be delivered with a declaration of conformity according to ISO/IEC 17050-1, which confirms that the IQI complies with this International Standard. For identification, the IQI shall be numbered and marked by the producer.

Table 1 — Duplex wire number, corresponding image unsharpness, and wire diameter

Dimensions in millimetres

Duplex wire number	Corresponding unsharpness	Wire diameter and spacing *d*	Tolerances of wire diameter and wire spacing
D13	0,10	0,050	± 0,005
D12	0,13	0,063	
D11	0,16	0,080	
D10	0,20	0,100	
D9	0,26	0,130	
D8	0,32	0,160	± 0,01
D7	0,40	0,200	
D6	0,50	0,250	
D5	0,64	0,320	
D4	0,80	0,400	
D3	1,00	0,500	± 0,02
D2	1,26	0,630	
D1	1,60	0,800	

5 Use of duplex wire

The duplex wire-type IQI should be used in conjunction with a wire- or step/hole-type IQI. It shall be placed on the source side of the object being examined and be aligned as closely as possible normal to the axis of the radiation beam.

NOTE If the IQI is placed directly on the detector, the inherent detector unsharpness is measured.

The image of the duplex wire-type IQI shall be examined with the aid of a magnifying glass up to 4× on film or by a profile function in digital radiography. The largest element (i.e. pair of wires), the image of which has just merged from that of two separate wires into the single form without an identifiable space between the image of the two wires, is taken as the limit of discernibility. The total image unsharpness, u, is given by $2d$, where d is the corresponding diameter of the wires and the wire spacing distance (see Figure 1 and Table 1). The value of d is considered to be the basic spatial resolution of the image.

NOTE The duplex wire-type IQI is no alternative for the wire- or step/hole-type IQI because it relates only to unsharpness.

Special conditions may be determined by application standards.

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Price based on 3 pages