
INTERNATIONAL STANDARD 2504

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Radiography of welds and viewing conditions for films — Utilization of recommended patterns of image quality indicators (I.Q.I.)

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2504 was drawn up by Technical Committee ISO/TC 44, *Welding*.

It was approved in February 1972 by the Member Bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Ireland	Spain
Belgium	Israel	Sweden
Canada	Italy	Thailand
Czechoslovakia	Netherlands	Turkey
Egypt, Arab Rep. of	New Zealand	United Kingdom
Finland	Norway	U.S.A.
France	Portugal	U.S.S.R.
Germany	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Switzerland

Radiography of welds and viewing conditions for films — Utilization of recommended patterns of image quality indicators (I.Q.I.)

1 SCOPE AND FIELD OF APPLICATION

This International Standard relates to the conditions for use of recommended patterns of image quality indicators (I.Q.I.) for radiography of welds and viewing conditions for films.

2 REFERENCES

ISO/R 947, *Recommended practice for radiographic inspection of circumferential fusion welded butt joints in steel pipes up to 50 mm (2 in) wall thickness.*

ISO/R 1027, *Radiographic image quality indicators — Principles and identification.*

ISO/R 1106, *Recommended practice for radiographic inspection of fusion welded butt joints for steel plates up to 50 mm (2 in) thick.*

ISO 2405, *Recommended practice for radiographic inspection of fusion welded butt joints for steel plates 50 to 200 mm thick.*

3 POSITION OF INDICATORS

An image quality indicator of one or other of the two types specified in ISO/R 1027 shall be placed on the surface of the weld facing the source of radiation, so that the image of the I.Q.I. appears on the radiograph near the end of each film.

If the wire type I.Q.I. is used, the wires shall be placed across the weld or, alternatively, a shim shall be placed under the I.Q.I. so that the metal thickness penetrated by the radiation is equal to the maximum thickness penetrated through the weld. In this latter case the wire I.Q.I. may be placed beside the weld.

If the step and hole type of I.Q.I. is used, it shall be placed close to the weld with the thinnest steps towards the end of the radiograph and on a shim so that the thickness of metal under the I.Q.I. penetrated by the radiation is equal to the maximum thickness penetrated through the weld.

Whichever I.Q.I. is used, the diameters of the elements (wires or holes) shall be chosen so that one element along the I.Q.I. represents a just discernible image.

NOTES

1 In cases where a continuous length of film is used to cover a circumferential weld (or similar applications) at least three I.Q.I.s

shall be used. They shall be placed equidistantly at distances apart not greater than 1 m.

2 In the case of the "double-wall/double-image" technique, used for circumferential welds on pipes, the I.Q.I. shall be placed near the ends of the portion of weld under examination, on the surface of the piece nearest the source.

3 If the surface of the weld facing the source is not accessible for the placement of the I.Q.I., it is not possible to utilize an I.Q.I. directly. The sensitivity of the radiographic technique to be used shall be determined separately, by radiography of a piece which is similar to the work piece under examination, but in which the surfaces are accessible.

In this test, an I.Q.I. shall be placed on each face. By comparison of the readings of the I.Q.I. sensitivity from both I.Q.I., an indication of the actual sensitivity can be obtained. Great care shall be taken that the same radiographic technique and conditions are used.

4 If all the elements (holes or wires) in the I.Q.I. are visible on the radiograph, a correct measure of sensitivity will not be obtained.

4 DETERMINATION OF I.Q.I. SENSITIVITY (IMAGE QUALITY VALUES)

The radiograph shall be examined on a film-viewing screen, constructed for this purpose. The conditions for viewing radiographs, including some tests of the operator, are detailed in separate recommendations (see section 6).

Generally the image of the I.Q.I. shall be examined in its entirety without the use of a mask to conceal any part of the image. Masks to prevent glare from other areas of the radiograph may be necessary and can be employed.

For the wire type I.Q.I., when this is laid across the weld, the discernibility shall be determined for that part of the image of the I.Q.I. which is across the weld region.

From the examination of the image of the I.Q.I. on the radiograph, the diameter of the smallest wire or hole which can be discerned is determined. In the case of the step and hole type I.Q.I., if there are two holes of the same diameter, both shall be discernible, in order that the step be considered as visible.

The image quality obtained shall be indicated on the report of the radiographic examination. This can be done in various ways, but in each case the type of indicator used shall be clearly stated, as shown on the