UDC 621.791 : 778.33

Ref. No. : ISO/R 1027-1969 (E)

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 1027

RADIOGRAPHIC IMAGE QUALITY INDICATORS

PRINCIPLES AND IDENTIFICATION

1st EDITION

March 1969

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 1027, *Radiographic image quality indicators – Principles and identification*, was drawn up by Technical Committee ISO/TC 44, *Welding*, the Secretariat of which is held by the Association Française de Normalisation (AFNOR).

Work on this question led to the adoption of a Draft ISO Recommendation.

In April 1967, this Draft ISO Recommendation (No. 1165) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	India	Romania
Austria	Ireland	South Africa, Rep. of
Belgium	Israel	Spain
Canada	Japan	Sweden
Czechoslovakia	Korea, Rep. of	Switzerland
Denmark	Netherlands	Turkey
Finland	New Zealand	United Kingdom
France	Norway	U.S.A.
Germany	Poland	U.S.S.R.
Greece	Portugal	Yugoslavia

No Member Body opposed the approval of the Draft .

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1969, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 1027 March 1969

RADIOGRAPHIC IMAGE QUALITY INDICATORS

PRINCIPLES AND IDENTIFICATION

INTRODUCTION

For an item submitted to radiographic examination by means of X or gamma rays, the revealing of any imperfection depends on the quality of negative obtained.

This quality, which itself depends on the radiographic technique used, should be checked with an image quality indicator (I.Q.I.).

It is recommended that one or other of the two image quality indicators specified below should be used.

1. SCOPE

This ISO Recommendation defines the characteristics of image quality indicators used in radiography and specifies the symbols which allow the identification of these indicators.

2. DEFINITIONS

Definitions of the principal terms concerning radiographic techniques used in this ISO Recommendation are given in an Appendix, separately published under the title *Explanations of the significance of the principal radiographic terms used in ISO Recommendations concerning welding.*

3. MANUFACTURE

The material used for manufacturing the indicators should have a specified coefficient of absorption as close as possible to that of the part being examined. If the indicator has a protective covering, this should not be so absorbent as to affect the visibility of wires or holes.

• At present Draft ISO Recommendation No. 1168.

4. REQUIRED CHARACTERISTICS

4.1 Wire type image quality indicator

4.1.1 *Specifications.* The indicator consists of a series of wires of minimum length 25 mm (1 in). These are mounted side by side, parallel, with a distance between the axes of the wires of not less than three times the wire diameter and not less than 5 mm (0.2 in), and arranged in order of increasing diameter. The diameter sizes should be determined as a consecutive series of numbers taken in general from the R 10* series of preferred numbers, taking either the millimetre or the inch as the unit. Exceptionally, and in particular for use with thick material, the R 20* series of preferred numbers may be used. An example of a wire type image quality indicator is given in Figure 1 (page 8).

4.1.2 *Dimensional tolerances.*** The permitted tolerances on the wire diameters for the R 10 series of preferred numbers are given in Table 1, below.

TABLE 1 – **Permitted tolerances on wire diameters**

Wire diameter, ϕ	Tolerance
mm	mm
$0 < \phi \leqslant 0.125$	± 0.005
$0.125 < \phi \leqslant 0.5$	± 0.01
$0.5 < \phi \leqslant 1.6$	± 0.02
$1.6 < \phi \leqslant 4$	± 0.03

4.2 Step and hole type image quality indicator

4.2.1 *Specifications.* The indicator consists of a part or an assembly having a series of steps. Each step has one or more circular holes of a diameter equal to the thickness e of the step.

The thickness of the steps, and the diameters of the holes, should be determined as a consecutive series of numbers taken in general from the R 10* series of preferred numbers, taking either the millimetre or the inch as the unit. Exceptionally, and in particular for use with thick material, the R 20* series of preferred numbers may be used.

Steps with a thickness greater than or equal to 0.8 mm (0.032 in) have only a single hole. Steps with a thickness of less than 0.8 mm (0.032 in) may have two or more holes arranged differently from step to step.

The distance from the centre of the hole to the edge of the step, or between the edges of two holes, should in no case be less than the hole diameter plus 1 mm (0.04 in). Examples of step and hole type image quality indicators are given in Figure 2 (page 8).

* See ISO Recommendation R 3, *Preferred numbers – Series of preferred numbers*, and ISO Recommendation R 17, *Guide to the use of preferred numbers and of series of preferred numbers.* Allowing for rounding, the R 10 series of preferred numbers is a geometrical progression, unlimited in either direction, with a ratio of $\sqrt[10]{10}$ and including unity; a superior series is, for instance the R 20 series of preferred numbers, with a ratio of $\sqrt[20]{10}$.

** These tolerances are correct for steel. For other metals or alloys, it is recommended that production conditions be such that the tolerances are as near as possible to those fixed for steel.