INTERNATIONAL STANDARD 689

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Microcopying — ISO micromire — Description and use for checking a reading apparatus

Microcopie — Micromire ISO — Description et utilisation pour l'examen d'un appareil de lecture

First edition — 1975-11-01

UDC 778.148 : 002

Ref. No. ISO 689-1975 (E)

Descriptors : reproduction (copying), documentation, microcopies, film readers, data storage devices, legibility.

Price based on 4 pages

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.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 46 has reviewed ISO Recommendation R 689 and found it technically suitable for transformation. International Standard ISO 689 therefore replaces ISO Recommendation R 689-1968 to which it is technically identical.

ISO Recommendation R 689 was approved by the Member Bodies of the following countries :

Australia	Germany	Poland
Belgium	Hungary	Portugal
Canada	India	Romania
Chile	Ireland	Spain
Colombia	Italy	Sweden
Czechoslovakia	Japan	United Kingdom
Denmark	Korea, Rep. of	U.S.A.
Finland	New Zealand	U.S.S.R.
France	Norway	

No Member Body expressed disapproval of the Recommendation.

No Member Body disapproved the tranformation of ISO/R 689 into an International Standard.

Printed in Switzerland

Microcopying — ISO micromire — Description and use for checking a reading apparatus

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the characteristics of the ISO micromire (ISO micro-test object), referred to in sub-clause 6.3.3 of ISO 435, and its use in determining the reading capability of a microcopy reading apparatus, as judged by the sharpness of the image which it provides.

2 REFERENCES

ISO 435, *Documentary reproduction — ISO conventional typographical character for legibility tests (ISO character).*

ISO 446, *Microcopying — ISO No. 1 mire — Description and use in photographic documentary reproduction.*

3 DESCRIPTION OF THE ISO MICROMIRE (ISO MICRO-TEST OBJECT)

3.1 Micromire element

An ISO micromire element is essentially a 1/10 scale reduction of ISO mires as defined in ISO 446.

3.1.1 The ISO mires, before 1/10 scale reduction, are arranged as shown in figure 1.

3.1.2 The adopted radial and diagonal arrangement has the advantage of permitting the study of legibility as a function of the distance from the centre.

3.1.3 The numbers identifying the face sizes are the dimensions in thousandths of a millimetre.

3.1.4 The background of the micromire (micro-test object) is squared and referenced to permit positioning, if required.

3.2 Micromire (micro-test object)

A micromire (micro-test object) consists of two micromire elements arranged side by side on a 35 mm microfilm strip of 230 mm length, as shown in figure 2.

3.2.1 A micromire (micro-test object) is either positive or negative with, in both cases, the following silver image densities (measured under white directional light, 2 900 to 3 000 K) :

negative	blacks	:	1,6 ± 0,3
	whites	:	0,05 ± 0,02
positive	blacks	:	1,6 ± 0,3
	whites	:	0,05 ± 0,02

3.2.2 A micromire (micro-test object) may be designated an *ISO micromire* (ISO micro-test object) only if it complies in every respect with this International Standard and if a qualified laboratory has verified that it provides in every respect a correct reproduction of the ISO mire test *characters.*

3.2.3 The strip with the micromire (micro-test object) shall show reference marks of the laboratory that made it.

4 USE OF THE ISO MICROMIRE (ISO MICRO-TEST OBJECT)

4.1 Principle

4.1.1 The capacity of a reading apparatus to provide, on a screen, an identifiable image of another image existing on a microcopy can be judged by reading an ISO micromire (ISO micro-test object) in this reading apparatus.

NOTE — This International Standard considers the image obtained only from the point of view of legibility, regardless of any other characteristics (brilliance, contrast, distortion, etc.).

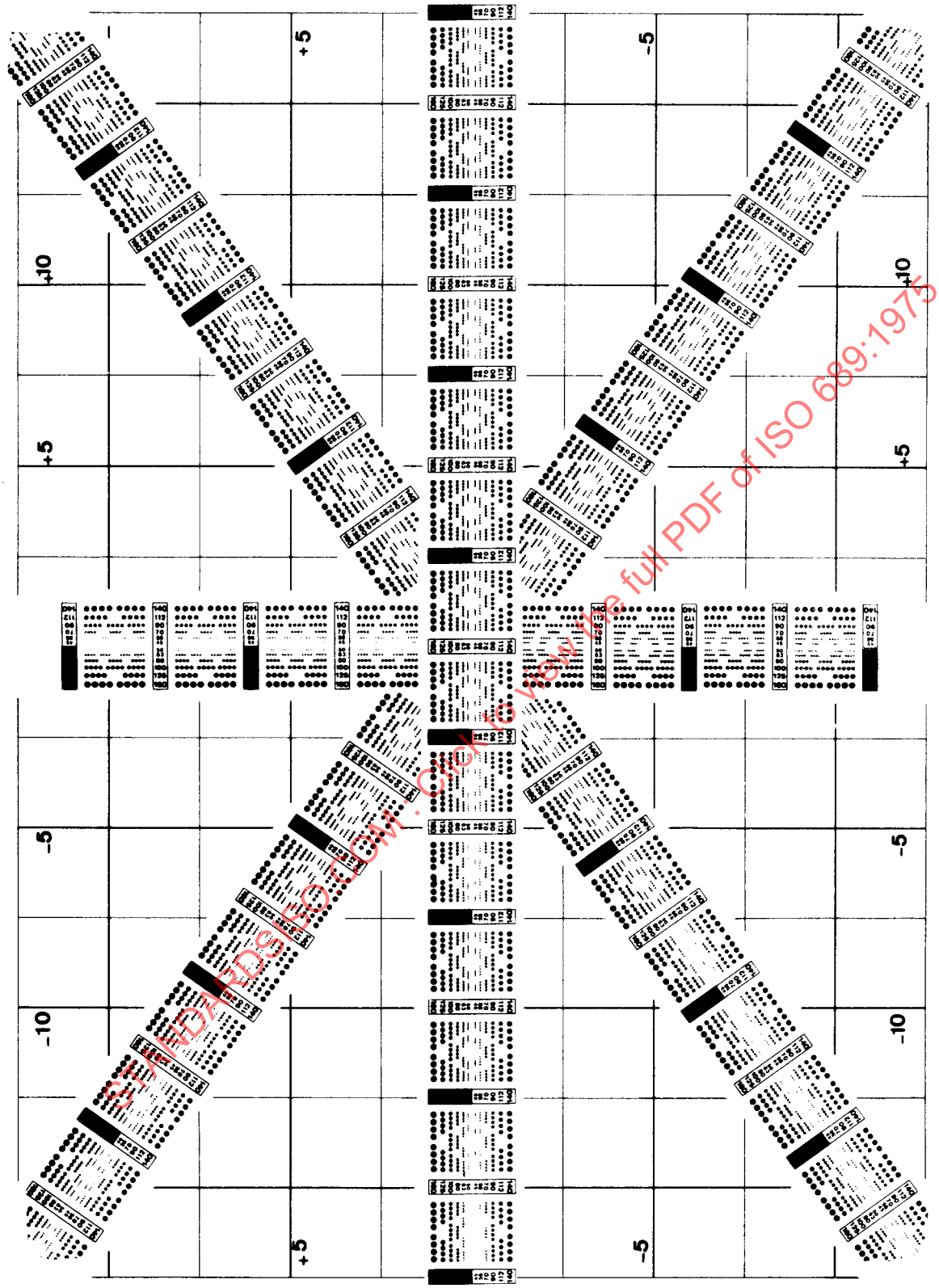

FIGURE 1 — **Enlarged view of an ISO micromire** (ISO micro-test object)

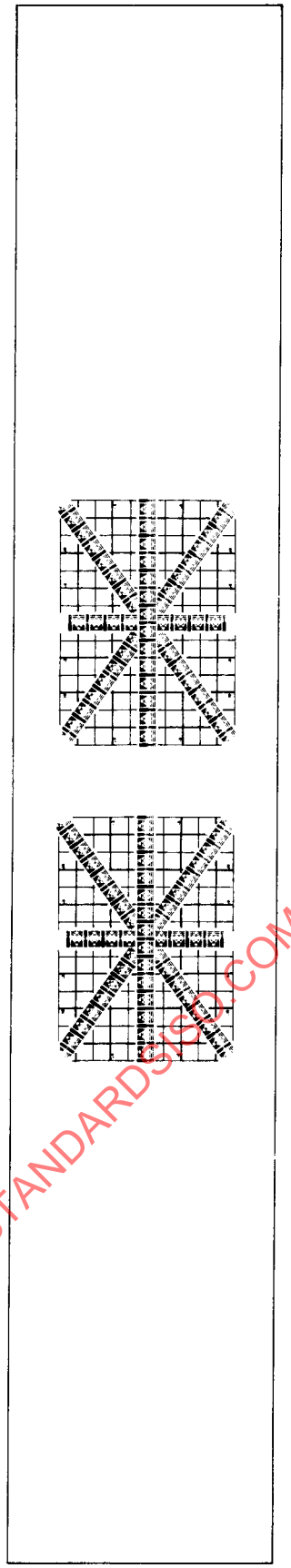

FIGURE 2 — **Micromire** (micro-test object)

4.2 Procedure

4.2.1 A positive or negative ISO micromire (ISO micro-test object) shall be arranged in the reading apparatus, previously adjusted, and the numbers of the face sizes considered as "read" shall be determined in various areas of the field.

4.2.1.1 An ISO character of a given number will be considered as "read" in a given area of the field, if at least seven out of the eight characters of a group of two *ISO words* are identified in this area.

NOTE — It is sufficient to identify the *orientation* (|, —, /, \), even if the image is imperfect.

4.2.2 The *actual presence* on the screen of an identifiable image of a given character shall be ascertained in darkness, if necessary using a magnifying glass or any similar instrument that eliminates reading difficulties due to the observer's position or visual acuity.

The advantage of this procedure is that it eliminates differences in individual appreciation resulting from characteristics of vision peculiar to the observer and thus facilitates counter-checking. It may have the disadvantage of not allowing for the visual adaptability or unadaptability of the reading apparatus itself.

4.2.3 The examination made in accordance with 4.2.2 can be supplemented by noting the observer's personal appreciation of his own practical ability to identify a character of a given number, without using a magnifying glass, in the reading position called for by the design of the apparatus or by the special service he may require of it. This type of examination is a less accurate way than the former for checking results.

4.3 Interpretation of results

4.3.1 *Theoretical reading capability*

When the procedure specified under 4.2.2 has been followed, one of the principal optical properties of the reading apparatus, i.e. its ability to provide sharp images, can be designated by a micromire (micro-test object) number.

4.3.1.1 It can be stated that No. 45 on a micromire (micro-test object), corresponding to an ISO character of 45 μm, represents substantially the smallest image obtainable, in the present state of technical progress, on a commercial emulsion for microcopies. Any reading apparatus providing a satisfactory image of this character on the whole area of its screen will, in practice, show up every detail of all ordinary microcopies placed in it, without prejudice, however, to any advantages of a physiological nature which may result from a still higher optical quality.

4.3.1.2 Any reading apparatus which does not permit character 160 of the micromire (micro-test object) to be read over the whole area of its screen can be considered to be of a level incompatible with present technical possibilities.

4.3.1.3 Having regard to the foregoing particulars, it is for the interested parties to come to an agreement, depending on the purpose and price of the reading apparatus under consideration.

4.3.2 *Practical reading capabilities*

4.3.2.1 As the design of the reading apparatus may to some extent restrict the position of the observer's eye, the practical reading capability as defined in 4.2.3 by a character of given number will often be below, and never exceed, the theoretical capability mentioned in 4.3.1.

4.3.2.2 Practical capabilities being equal, the reading apparatus with the greatest theoretical capability should, in principle, provide the greatest reading comfort.

4.4 Additional uses of micromires (micro-test object)

Parallel lines spaced at distances of 5 mm appear on the micromire (micro-test object) and can be useful for determining enlargement scale, field dimensions, etc.