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IS 15732-3 (2006): Optics and photonics Medical Endoscopes and endotherapy devices, Part 3: Determination of field of view and direction of view of endoscopes with optics [MHD 1: Surgical Instruments]
Indian Standard

OPTICS AND PHOTONICS — MEDICAL ENDOSCOPES AND ENDOTHERAPY DEVICES

PART 3  DETERMINATION OF FIELD OF VIEW AND DIRECTION OF VIEW OF ENDOSCOPES WITH OPTICS

ICS 11.060.10

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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NATIONAL FOREWORD

This Indian Standard (Part 3) which is identical with ISO 8600-3 : 1997 'Optics and optical instruments — Medical endoscopes and endoscopic accessories — Part 3 : Determination of field of view and direction of view of endoscopes with optics' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Surgical Instrument Sectional Committee and approval of the Medical Equipment and Hospital Planning Division Council.

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker in the International Standard while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

Other parts of this standard are:

Part 1 General requirements

Part 4 Determination of maximum width of insertion portion

Amendment No. 1 to the above International Standard has been given at the end of this publication.

For the purpose of deciding whether a particular requirement of this standard is compiled with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.
1 Scope

This part of ISO 8600 specifies requirements and recommends test methods for measuring the field of view and direction of view of endoscopes.

2 Requirements

2.1 Measuring accuracy (field of view)

The minimum accuracy of the test method used to measure the field of view shall be:

± 5 % of the reading for rigid endoscopes;

± 10 % of the reading for flexible endoscopes.

2.2 Measuring accuracy (direction of view)

The minimum accuracy of the test method used to measure the direction of view shall be:

± 3° for rigid endoscopes;

± 10° for flexible endoscopes.

3 Apparatus

3.1 Optical bench, or equivalent device, to support the optical endoscope being tested and allowing adjustment of the central axis of the field of view to the centre of the target to measure the field of view at a distance of 50 mm between the distal window surface of the endoscope and the centre of the graduated scale situated at right angles to the centreline.

3.2 Target holder and protractor, graduated in degrees (see figure 1).
3.3 **Target for field of view and direction of view tests**, round, having circles showing the field of view $\beta$, in degrees, from a distance of 50 mm computed as

$$D_{\text{mm}} = 100 \tan \frac{\beta}{2}$$

and mounted on the device (see figure 2).

Major divisions shall be marked every 10° with the corresponding number in degrees.

Between each major division, four finer marks shall indicate every 2°.

3.4 **Illumination source**

A white-light target illumination with a minimum intensity of 500 lux shall be provided, using either the endoscope illumination or an external source.

4 **Test method for field of view and direction of view**

The following test method is recommended; however, other test methods may be used if the same results are obtained.

4.1 Mount the target (3.3) into the device according to 3.1.

4.2 Mount the endoscope to be tested in the endoscope holder (3.1) in such a manner that the centre of the distal window is 50 mm ± 0.2 mm from the target centre.

4.3 Adjust the endoscope holder by looking through the endoscope, so that the circles marked on the target and the circumference of the field of view are centred.

4.4 Determine the largest visible circle and record it as the field of view, in degrees. For a non-circular image, only segments of the largest circle may be visible.

4.5 Read and record as the direction of view the angular position, in degrees, of the protractor relative to the perpendicular axis of the endoscope.

4.6 Repeat steps 4.3 to 4.5 until a sufficient number of results have been obtained to verify the required statistical accuracy of the endoscope.
Figure 1 — Example of a test device (not to scale)
Figure 2 — Target for field of view and direction of view tests (not to scale)
AMENDMENT 1

Page 1, subclause 3.1
Add the following sentence:

If the working distance of the endoscope, as specified by the manufacturer, is less than 50 mm, then a target designed to measure field of view at that working distance should be placed at the specified working distance.

Page 2, subclause 3.3
Add the following sentence:

If the working distance of the endoscope, as specified by the manufacturer, is less than 50 mm, then a similar target, designed to measure field of view at that working distance, should be used.

Page 2, subclause 4.2
Add the following sentence:

If the working distance of the endoscope, as specified by the manufacturer, is less than 50 mm, then the endoscope should be mounted at that working distance ± 0.2 mm from the target designed to measure field of view at that working distance.
Bureau of Indian Standards

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This Indian Standard has been developed from Doc : No. MHR 01 (0028).

Amendments Issued Since Publication

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