

Evaluation and routine testing in medical imaging departments —

Part 2: Constancy tests —

Section 2.2 Method for radiographic cassettes and film changers and film-screen contact and relative sensitivity of the screen-cassette assembly

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Health Care Standards Policy Committee (HCC/-) to Technical Committee HCC/73, upon which the following bodies were represented:

- British Institute of Radiology
- College of Radiographers
- Department of Health
- Institute of Physical Sciences in Medicine (IPSM)
- Royal College of Radiologists
- Society of X-ray Technology

This British Standard, having been prepared under the direction of the Health Care Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 15 February 1994

© BSI 10-1999

The following BSI references relate to the work on this standard:
Committee reference HCC/73
Draft for comment 88/56156 DC

ISBN 0 580 22798 7

Amendments issued since publication

Amd. No.	Date	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Introduction	1
1 Scope and object	1
2 References to other publications	1
3 Terminology	1
4 General condition of radiographic cassettes, intensifying screens and intensifying screens in film changers	2
5 Testing the constancy of adequate contact in film-screen combinations	2
6 Testing the relative sensitivity of intensifying screen(s) and associated radiographic cassettes	3
7 Test report	5
Annex A Terminology — Index of terms	6
Annex B Example of a form for the standardized test report	8
Annex C Guidance on action to be taken	10
Annex D Rationale	11
List of references	Inside back cover

National foreword

This Section of BS 7725 has been prepared under the direction of the Health Care Standards Policy Committee. It is identical with IEC Publication 1223-2-2:1993 *Evaluation and routine testing in medical imaging departments — Part 2-2: Constancy tests — Radiographic cassettes and film changers — Film-screen contact and relative sensitivity of the screen-cassette assembly*, prepared by the Technical Committee 62 Electrical equipment in medical practice and published by the International Electrotechnical Commission (IEC).

Cross-references

International Standard	Corresponding British Standard
IEC 788:1984	BS 6641:1985 <i>Glossary of medical radiology terms</i> (Identical) BS 7725 <i>Evaluation and routine testing in medical imaging departments</i>
IEC 1223-1:1993	Part 1:1994 <i>General</i> (Identical)
IEC 1223-2-1:1993	Section 2.1:1994 <i>Film processors</i> (Identical)
IEC 1223-2-3:1994	Section 2.3:1994 <i>Method for darkroom safelight conditions</i> (Identical)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Introduction

Some provisions or statements in the body of this technical report require additional information. Such information is presented in Annex D, Rationale. An asterisk in the left margin of a clause or subclause indicates the presence of such additional information.

1 Scope and object

1.1 Scope

This technical report applies to RADIOGRAPHIC CASSETTES and to FILM CHANGERS used to record an X-RAY PATTERN on RADIOGRAPHIC FILM by DIRECT RADIOGRAPHY.

This technical report applies to RADIOGRAPHIC CASSETTES and FILM CHANGERS that are equipped with INTENSIFYING SCREEN(S).

This technical report does not apply to specialized RADIOGRAPHIC CASSETTES such as mammographic cassettes, multi-section cassettes and cassettes used in DENTAL PANORAMIC TOMOGRAPHY. Its application to RADIOGRAPHIC CASSETTES with an integrated ANTI-SCATTER GRID may not give satisfactory results.

This technical report is a part of a series of Particular Publications (standards and technical reports) which will describe test methods for the constancy of properties of various subsystems of diagnostic X-RAY EQUIPMENT, as described in IEC 1223-1.

1.2 Object

This technical report describes simple methods to check:

- the constancy of adequate, homogeneous contact between the INTENSIFYING SCREEN(S) and the RADIOGRAPHIC FILM in the RADIOGRAPHIC CASSETTE or the FILM CHANGER;
- the relative sensitivity of the INTENSIFYING SCREEN(S) and associated RADIOGRAPHIC CASSETTE.

2 References to other publications

The following IEC publications are quoted in this technical report:

IEC 788:1984, *Medical radiology — Terminology*.

IEC 1223-1:1993, *Evaluation and routine testing in medical imaging departments — Part 1: General aspects*.

IEC 1223-2-1:1993, *Evaluation and routine testing in medical imaging departments — Part 2-1: Constancy tests — Film processors*.

IEC 1223-2-3:1993, *Evaluation and routine testing in medical imaging departments —*

Part 2-3: Constancy tests — Darkroom safelight conditions.

IEC 1223-2-12, *Evaluation and routine testing in medical imaging departments —*

Part 2-12: Constancy tests — Film illuminators. (under consideration)

3 Terminology

3.1 Use of terms

This technical report contains a number of terms that are defined in IEC 788, in IEC 1223-1 and in IEC 1223-2-1 (see Annex A, Terminology — Index of terms). Where these terms are used with the meanings given in their definitions, they are printed in capital letters to signify that the defined meaning applies. Words forming a part of the whole of any defined term may also appear in lower-case letters. In that event, the meaning is not intended necessarily to correspond to any formal definition, but to be derived from the customary meaning of the words in the language and from the actual context.

Terms derived from those formally defined (for example, the plural form of a term defined in the singular or the adjectival form of a term defined as a noun), are used where appropriate and, if printed in capital letters, have meanings linked to the definitions of the source terms concerned.

The term:

- | | |
|-------------|---|
| “specific” | when used with parameters or conditions: refers to a particular value or standardized arrangement, usually to those required in an IEC publication or a legal requirement. |
| “specified” | when used with parameters or conditions: refers to a value or arrangement to be chosen for the purpose under consideration and indicated usually in ACCOMPANYING DOCUMENTS. |

3.2 Definitions

3.2.1

FILM ILLUMINATOR

luminous surface in combination with additional provisions for the observation of transparent objects such as RADIOGRAMS on RADIOGRAPHIC FILM

4 General condition of RADIOGRAPHIC CASSETTES, INTENSIFYING SCREENS and INTENSIFYING SCREENS in FILM CHANGERS*

Any relevant instructions given in the ACCOMPANYING DOCUMENTS of the RADIOGRAPHIC CASSETTES, FILM CHANGER, and the INTENSIFYING SCREEN(S) should be observed when examining the devices.

The following measures should be taken:

- Each single INTENSIFYING SCREEN or each pair of INTENSIFYING SCREENS is given an individual identification such as a number;
 - this identification is written with permanent ink in an unobtrusive position on one INTENSIFYING SCREEN, so that it will be recorded on the film;
- *NOTE Attention has to be paid to the fact that permanent ink may affect or destroy the protective layer of INTENSIFYING SCREENS.
- this identification is indicated on the outside of the RADIOGRAPHIC CASSETTE.
- Each RADIOGRAPHIC CASSETTE and FILM CHANGER should be labelled with
 - name of manufacturer of INTENSIFYING SCREEN(S) contained;
 - type(s) of INTENSIFYING SCREEN(S) contained;
 - date of acquisition of the INTENSIFYING SCREEN(S).

The general condition of all RADIOGRAPHIC CASSETTES and the INTENSIFYING SCREENS should be checked as follows, at least every six months:

- 1) The exterior and interior of each cassette is examined for
 - correct labelling;
 - cleanliness;
 - signs of warping and fatigue of the material provided to ensure the contact between RADIOGRAPHIC FILM and INTENSIFYING SCREEN.
- 2) The hinge assembly and closure mechanism of the cassette are examined for wear and damage.
- 3) Each INTENSIFYING SCREEN is examined for
 - cleanliness;
 - worn and stained areas; and
 - *as appropriate, any screen or pair of screens is cleaned or replaced, and the date recorded.

NOTE It is generally undesirable to replace only one of a pair of INTENSIFYING SCREENS.

- 4) *Taking appropriate precautions to protect the eyes of the examiner, INTENSIFYING SCREENS are examined under ultra-violet light to reveal
 - artefacts;

- regions where the protective coat has been worn away.

5 Testing the constancy of adequate contact in film-screen combinations

5.1 Summary

The adequacy of the contact between the RADIOGRAPHIC FILM and INTENSIFYING SCREENS is determined by viewing the uniformity in blackening of the DIRECT RADIOGRAM, and the clarity of the image of a standard TEST DEVICE placed in front of the RADIOGRAPHIC CASSETTE or FILM CHANGER to be tested.

5.2 Test equipment

5.2.1 RADIOGRAPHIC FILM

The RADIOGRAPHIC FILM used for the test should be typical of that used with the INTENSIFYING SCREENS and associated RADIOGRAPHIC CASSETTES or FILM CHANGERS to be tested.

For successive tests, RADIOGRAPHIC FILM of the same type should be used.

5.2.2 Standard TEST DEVICE

The TEST DEVICE required for this test is a metal wire mesh of linear dimensions not smaller than the IMAGE RECEPTION AREA of the RADIOGRAPHIC CASSETTE or FILM CHANGER to be tested.

*The wire mesh should have a square pattern of such a quality that its structure appears uniform when viewed on a FILM ILLUMINATOR.

To facilitate the measurement of the optical density of the RADIOGRAM obtained during the test, the standard TEST DEVICE should have an opening in the centre of the wire mesh of 1 cm square or 1 cm in diameter.

*The wire should be made from metal composed predominantly of elements with an atomic number of at least 26, for example copper or zinc.

The diameter of the wire should be approximately 0,5 mm and the separation between the centres of adjacent wires should be approximately six diameters.

5.2.3 FILM PROCESSOR

The FILM PROCESSOR used for the test should have been tested and found satisfactory, according to IEC 1223-2-1.

5.2.4 Densitometer

Optical densities are measured with a densitometer which reads consistently within $\pm 0,02$.

5.2.5 FILM ILLUMINATOR

The FILM ILLUMINATOR used for the test should have been tested and found satisfactory, according to IEC 1223-2-12.