SLOVENSKI STANDARD
SIST EN 61331-1:2002

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Protective devices against diagnostic medical X-radiation - Part 1: Determination of attenuation properties of materials

Protective devices against diagnostic medical X-radiation -- Part 1: Determination of attenuation properties of materials

Strahlenschutz in der medizinischen Röntgendiagnostik -- Teil 1: Bestimmung von Schwächungseigenschaften von Materialien

Dispositifs de protection radiologique contre les rayonnements X pour diagnostic médical -- Partie 1: Détermination des propriétés d'atténuation des matériaux

Ta slovenski standard je istoveten z: **EN 61331-1:2002**

ICS:

11.040.50	Radiografska oprema	Radiographic equipment
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SIST EN 61331-1:2002 **en**

EUROPEAN STANDARD **EN 61331-1**

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English version

Protective devices against diagnostic medical X-radiation Part 1: Determination of attenuation properties of materials

(IEC 61331-1:1994)

Dispositifs de protection radiologique contre les rayonnements X pour diagnostic médical Partie 1: Détermination des propriétés d'atténuation des matériaux (CEI 61331-1:1994)

Strahlenschutz in der medizinischen Röntgendiagnostik Teil 1: Bestimmung von Schwächungseigenschaften von Materialien (IEC 61331-1:1994)

This European Standard was approved by CENELEC on 2001-12-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of the International Standard IEC 61331-1:1994, prepared by IEC TC 62, Electrical equipment in medical practice, was submitted to the CENELEC Unique Acceptance Procedure and was approved by CENELEC as EN 61331-1 on 2001-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2002-12-01
- latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2004-12-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61331-1:1994 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60788	1984	Medical radiology - Terminology	HD 501 S1	1988

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Dispositifs de protection radiologique contre les rayonnements X pour diagnostic médical –

Partie 1:
Détermination des propriétés d'atténuation des matériaux

Protective devices against diagnostic medical X-radiation

Part 1:
Determination of attenuation properties of materials

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROTECTIVE DEVICES AGAINST DIAGNOSTIC MEDICAL X-RADIATION –

Part 1: Determination of attenuation properties of materials

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.

3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

International Standard IEC 1331-1 has been prepared by sub-committee 62B: Diagnostic imaging equipment, of IEC technical committee 62: Electrical equipment in medical practice.

The text of this part is based on the following documents:

DIS	Report on voting
62B(CO)70	62B(CO)75

Full information on the voting for the approval of this part can be found in the report on voting indicated in the above table.

Annex A forms an integral part of this standard.

PROTECTIVE DEVICES AGAINST DIAGNOSTIC MEDICAL X-RADIATION –

Part 1: Determination of attenuation properties of materials

1 Scope and object

1.1 *Scope*

This part of International Standard IEC 1331 applies to materials in sheet form used for the manufacturing of PROTECTIVE DEVICES against X-RADIATION of RADIATION QUALITIES generated with X-RAY TUBE VOLTAGES up to 400 kV and a TOTAL FILTRATION of up to 3,5 mm Cu.

This part 1 is not intended to be applied to PROTECTIVE DEVICES when these are to be checked for the presence of their ATTENUATION properties before and after periods of use.

1.2 *Object*

This part 1 specifies the methods of determining and indicating the ATTENUATION properties of the materials.

The ATTENUATION properties are given in terms of:

- ATTENUATION RATIO;
- BUILD UP FACTOR;
- ATTENUATION EQUIVALENT OR LEAD EQUIVALENT;

together with, as appropriate, an indication of inhomogeneity.

Ways of stating values of ATTENUATION properties in compliance with this part of the International Standard are included.

- Methods for periodical checks of PROTECTIVE DEVICES, particularly of PROTECTIVE CLOTHING,
- methods of determining the ATTENUATION by layers in the RADIATION BEAM, and
- methods of determining the ATTENUATION for purposes of protection against IONIZING RADIATION provided by walls and other parts of an installation

will be described in separate standards.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated is valid. All normative documents are subject to revision, and parties to

agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 788: 1984, *Medical radiology – Terminology*

3 Terminology

3.1 *Degree of requirements*

In this part of the International Standard, certain terms (which are not printed in SMALL CAPITALS) have particular meanings, as follows:

- "shall" indicates a requirement that is mandatory for compliance;
- "should" indicates a strong recommendation that is not mandatory for compliance;
- "may" indicates a permitted manner of complying with a requirement or of avoiding the need to comply;
- "specified" is used to indicate definitive information stated by the MANUFACTURER in ACCOMPANYING DOCUMENTS or in other documentation relating to the equipment under consideration, usually concerning its intended purposes or the parameters or conditions associated with its use or with testing to determine compliance.

3.2 *Use of terms*

In this part 1, terms printed in SMALL CAPITALS are used in accordance with their definitions in IEC 788 (see annex A).

4 Procedure

4.1 ATTENUATION properties of sheet materials shall be determined according to clauses 5 and 6.

4.2 The LEAD EQUIVALENT according to 6.4 shall be determined only for protective materials containing a significant amount of lead.

4.3 For sheet material which does not effect a homogeneous ATTENUATION the inhomogeneity shall be determined according to 6.5.

5 Measurement of quantities

5.1 *RADIATION QUANTITIES*

For the determination of ATTENUATION properties, the following AIR KERMA RATES shall be measured according to the subclauses given in table 1.