

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Protective devices against diagnostic medical X-radiation –
Part 3: Protective clothing, eyewear and protective patient shields**

**Dispositifs de protection radiologique contre les rayonnements X pour
diagnostic médical –
Partie 3: Vêtements et lunettes de protection radiologique, écrans de protection
pour le patient**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROTECTIVE DEVICES AGAINST
DIAGNOSTIC MEDICAL X-RADIATION –****Part 3: Protective clothing, eyewear and protective patient shields****FOREWORD**

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International Standard IEC 61331-3 has been prepared by subcommittee 62B: Diagnostic imaging equipment, of IEC technical committee 62: Electrical equipment in medical practice.

This second edition cancels and replaces the first edition of IEC 61331-3, published in 1998. It constitutes a technical revision. This second edition has been adapted to apply to the present technology. It includes a requirement to use a better method for the determination of attenuation properties over a broader and more clinically relevant range of RADIATION QUALITIES appropriate to the use of the devices. It also covers three additional protective devices, THYROID COLLARS, PROTECTIVE EYEWEAR and PROTECTIVE APRONS FOR DENTAL USE.

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

FDIS	Report on voting
62B/938/FDIS	62B/944/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

In this standard, the following print types are used:

- requirements and definitions: roman type;
- informative material appearing outside of tables, such as notes, examples and references: in smaller type. Normative text of tables is also in a smaller type;
- TERMS DEFINED IN CLAUSE 3 OF THIS STANDARD OR AS NOTED: SMALL CAPS.

The verbal forms used in this standard conform to usage described in Annex H of the ISO/IEC Directives, Part 2. For the purposes of this standard, the auxiliary verb:

- “shall” means that compliance with a requirement or a test is mandatory for compliance with this standard;
- “should” means that compliance with a requirement or a test is recommended but is not mandatory for compliance with this standard;
- “may” is used to describe a permissible way to achieve compliance with a requirement or test.

A list of all parts of the IEC 61331 series, published under the general title *Protective devices against diagnostic medical X-radiation*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

PROTECTIVE DEVICES AGAINST DIAGNOSTIC MEDICAL X-RADIATION –

Part 3: Protective clothing, eyewear and protective patient shields

1 Scope

This part of IEC 61331 applies to PROTECTIVE DEVICES such as PROTECTIVE CLOTHING and EYEWEAR for the protection of persons against X-RADIATION up to 150 kV, during RADIOLOGICAL examinations and interventional procedures.

NOTE PROTECTIVE DEVICES are not intended by themselves to provide complete protection of persons, but are used to reduce the dose to persons where other methods of protection against X-RADIATION are insufficient or not applicable.

This standard deals with:

- general requirements on the ACCOMPANYING DOCUMENTS, on design and on materials used;
- sizing, particular design features, minimum ATTENUATION properties of materials, marking and standardized forms of statements of compliance with this standard.

It covers PROTECTIVE CLOTHING mainly for the protection of the OPERATOR, such as:

- PROTECTIVE APRONS;
- THYROID COLLARS;
- PROTECTIVE GLOVES;
- PROTECTIVE MITTENS;
- PROTECTIVE EYEWEAR;

and PROTECTIVE DEVICES for the protection of the PATIENT, such as:

- PROTECTIVE GONAD APRONS;
- SCROTUM SHIELDS;
- OVARY SHIELDS;
- SHADOW SHIELDS;
- PROTECTIVE APRONS FOR DENTAL USE.

The latter group of PROTECTIVE DEVICES is intended to be used during RADIOLOGICAL examinations to minimize the effects of IRRADIATION on the reproductive organs particularly with regard to genetic damage.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60601-1:2005, *Medical electrical equipment – Part 1: General requirements for basic safety and essential performance*
IEC 60601-1:2005/AMD 1:2012

IEC 60601-1-3:2008, *Medical electrical equipment – Part 1-3: General requirements for basic safety and essential performance – Collateral Standard: Radiation protection in diagnostic X-ray equipment*

IEC 60601-1-3:2008/AMD1:2013

IEC/TR 60788:2004, *Medical electrical equipment – Glossary of defined terms*

IEC 61331-1:2014, *Protective devices against diagnostic medical X-radiation – Part 1: Determination of attenuation properties of materials*

EN 340:2003, *Protective clothing – General requirements*

EN 13402-3, *Size designation of clothes – Part 3: Measurements and intervals*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC/TR 60788:2004, IEC 60601-1:2005 and IEC 60601-1:2005/AMD1:2012, IEC 60601-1-3:2008 and IEC 60601-1-3:2008/AMD1:2013 and the following apply.

3.1

AREA DENSITY

W_s

minimum mass per unit area of the protective material used to provide the required LEAD EQUIVALENT of the device, at all of the stated test values of X-RAY TUBE VOLTAGES

Note 1 to entry: AREA DENSITY is expressed in SI units as $\text{kg}\cdot\text{m}^{-2}$.

3.2

PROTECTIVE APRON FOR DENTAL USE

protective apron worn by the PATIENT to protect the region of the upper torso during RADIOLOGICAL dental procedures

Note 1 to entry: Such an apron may have an accompanying THYROID COLLAR, separate or attached.

3.3

PROTECTIVE EYEWEAR

protective device made of transparent material to protect the eyes

3.4

PROTECTIVE GONAD APRON

protective apron worn by the PATIENT to protect the region of the gonads as an alternative to the use of a SCROTUM SHIELD or an OVARY SHIELD

Note 1 to entry: See also rm-64-05 of IEC TR 60788:2004.

3.5

PROTECTIVE MITTEN

protective glove with open palm and separated thumb used where full perception of touch is essential

3.6

SHADOW SHIELD

protective device to intercept the radiation beam in the areas of the gonads

Note 1 to entry: A SHADOW SHIELD is to be used when a SCROTUM SHIELD and an OVARY SHIELD cannot be used.