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Standards

Irish Standard  
I.S. EN 60627:2015

# Diagnostic X-ray imaging equipment - Characteristics of general purpose and mammographic anti-scatter grids

## I.S. EN 60627:2015

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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EUROPEAN STANDARD

**EN 60627**

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2015

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Supersedes EN 60627:2001

English Version

**Diagnostic X-ray imaging equipment - Characteristics of general  
purpose and mammographic anti-scatter grids  
(IEC 60627:2013)**

Équipements de diagnostic par imagerie à rayonnement X -  
Caractéristiques des grilles antidiffusantes d'usage général  
et de Mammographie  
(IEC 60627:2013)

Bildgebende Geräte für die Röntgendiagnostik -  
Kenngrößen von Streustrahlenrastern für die allgemeine  
Anwendung und für die Mammographie  
(IEC 60627:2013)

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**EN 60627:2015**

**Foreword**

The text of document 62B/914/FDIS, future edition 3 of IEC 60627, prepared by SC 62B "Diagnostic imaging equipment" of IEC/TC 62 "Electrical equipment in medical practice" was submitted to the IEC CENELEC parallel vote and approved by CENELEC as EN 60627:2015.

The following dates are fixed:

- latest date by which the document has to be (dop) 2016-01-14  
implemented at national level by  
publication of an identical national  
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- latest date by which the national (dow) 2018-04-14  
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This document supersedes EN 60627:2001.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For the relationship with EU Directive 93/42/EEC, see informative Annex ZZ, which is an integral part of this document.

**Endorsement notice**

The text of the International Standard IEC 60627:2013 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60601-1	2005	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance	EN 60601-1 + corr. March	2006 2010
+A1	2012		+A1 +A1/AC +A12	2013 2014 2014
IEC 60601-1-3	2008	Medical electrical equipment - Part 1-3: General requirements for basic safety and essential performance -	EN 60601-1-3 + corr. March	2008 2010
+A1	2013	Collateral Standard: Radiation protection in diagnostic X-ray equipment	+A1 +A1/AC	2013 2014
IEC/TR 60788	2004	Medical electrical equipment - Glossary of defined terms	-	-
IEC 61267	2005	Medical diagnostic X-ray equipment - Radiation conditions for use in the determination of characteristics	EN 61267	2006

**EN 60627:2015**

**Annex ZZ**  
(informative)

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This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and within its scope the Standard covers all relevant essential requirements given in Annex I of EU Directive 93/42/EEC of 14 June 1993 concerning medical devices.

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

**WARNING:** Other requirements and other EU Directives can be applied to the products falling within the scope of this standard.



**IEC 60627**

Edition 3.0 2013-07

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**



**Diagnostic X-ray imaging equipment –  
Characteristics of general purpose and mammographic anti-scatter grids**

**Équipements de diagnostic par imagerie à rayonnement X –  
Caractéristiques des grilles antidiffusantes d'usage général et de  
mammographie**



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**IEC 60627**

Edition 3.0 2013-07

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Diagnostic X-ray imaging equipment –  
Characteristics of general purpose and mammographic anti-scatter grids**

**Équipements de diagnostic par imagerie à rayonnement X –  
Caractéristiques des grilles antidiffusantes d'usage général et de  
mammographie**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### DIAGNOSTIC X-RAY IMAGING EQUIPMENT –

#### Characteristics of general purpose and mammographic anti-scatter grids

#### FOREWORD

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International Standard IEC 60627 has been prepared by subcommittee 62B: Diagnostic imaging equipment, of IEC technical committee 62: Electrical equipment in medical practice.

This third edition cancels and replaces the second edition published in 2001, and constitutes a technical revision.

In this revision calcium tungstate phosphor FLUORESCENT SCREENS, which are no longer available, have been replaced by gadolinium oxysulphide (GOS) FLUORESCENT SCREENS. Further, a new quality parameter is introduced: the IMAGE IMPROVEMENT FACTOR or Q-factor, which better describes the properties of the ANTI-SCATTER GRID, especially for digital detector applications.

Further differences between this third edition and the previous second edition are:

- some definitions have been modified and others added to improve clarity, harmonization or generality;

- new instrumentation is prescribed for measurements of the TRANSMISSION OF PRIMARY RADIATION, the TRANSMISSION OF SCATTERED RADIATION and the TRANSMISSION OF TOTAL RADIATION, because FLUORESCENT SCREENS made of calcium tungstate phosphors are outdated and are no longer available;
- the definition of the PHANTOM used for measurements of the TRANSMISSION OF PRIMARY RADIATION, the TRANSMISSION OF SCATTERED RADIATION and the TRANSMISSION OF TOTAL RADIATION is modified and references to IEC 61267 are omitted;
- the RADIATION CONDITIONS used for the measurements have been adapted and are now the RQR and RQR-M conditions specified in IEC 61267:2005;
- tolerances are specified for the dimensions in the arrangements for the measurements of the TRANSMISSION OF PRIMARY RADIATION, the TRANSMISSION OF SCATTERED RADIATION and the TRANSMISSION OF TOTAL RADIATION.

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

FDIS	Report on voting
62B/914/FDIS	62B/922/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.
- *Test specifications: italic type.*
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- TERMS DEFINED IN CLAUSE 3 OF THIS STANDARD OR IN OTHER IEC PUBLICATIONS REFERENCED IN THIS STANDARD: SMALL CAPITALS.

In referring to the structure of this standard, the term

- “clause” means one of the numbered divisions within the table of contents, inclusive of all subdivisions (e.g., Clause 5 includes subclauses 5.1, 5.2, etc.);
- “subclause” means a numbered subdivision of a clause (e.g., 5.1, 5.2 and 5.2.1 are all subclauses of Clause 5).

References to clauses within this standard are preceded by the term “Clause” followed by the clause number. References to subclauses within this particular standard are by number only.

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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

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It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 36 months from the date of publication.

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## INTRODUCTION

The first edition of IEC 60627 was intended for ANTI-SCATTER GRIDS used in general radiography and is not appropriate for ANTI-SCATTER GRIDS used in mammography. As a consequence, a complementary standard IEC 61953 was published. Later, it was decided to revise and merge together the two standards covering ANTI-SCATTER GRIDS. Wherever possible, a harmonized approach has been used. This constituted the second edition of IEC 60627 published in 2001.

This third edition is a revision of the second edition. This revision was initiated by the fact that calcium tungstate phosphors have become obsolete, and are no longer available. Instrumentation with FLUORESCENT SCREENS made of gadolinium oxysulphide (GOS) is the present state of the art.

Further, a new quality parameter is introduced: the IMAGE IMPROVEMENT FACTOR  $Q$ . This factor better describes the properties of ANTI-SCATTER GRIDS than the GRID EXPOSURE FACTOR  $B$  and the CONTRAST IMPROVEMENT FACTOR  $K$ , especially for digital detector applications. Namely, the signal-to-noise ratio (SNR) for digital X-ray detectors is increased proportionally with the square root of the factor  $Q$  when an ANTI-SCATTER GRID is applied. This effect is due to the efficient reduction of SCATTERED RADIATION and overcompensates the loss of PRIMARY RADIATION when using an ANTI-SCATTER GRID in situations where a considerable amount of SCATTERED RADIATION is present. The name IMAGE IMPROVEMENT FACTOR is chosen to reflect the improved image quality (characterized by SNR and other parameters) under equal RADIATION dose conditions.

Special laboratory provisions and carefully controlled test conditions are needed for the measurements described here.

## DIAGNOSTIC X-RAY IMAGING EQUIPMENT –

### Characteristics of general purpose and mammographic anti-scatter grids

#### 1 Scope

This International Standard is applicable to ANTI-SCATTER GRIDS used in medical diagnostic X-ray imaging equipment. ANTI-SCATTER GRIDS are used to reduce the incidence of SCATTERED RADIATION, produced particularly in the body of the PATIENT, upon the IMAGE RECEPTION AREA and thus to improve the contrast of the X-RAY PATTERN. This International Standard specifies the definitions, determination and indication of characteristics of ANTI-SCATTER GRIDS.

In this standard only LINEAR GRIDS are considered.

Since at present only FOCUSED GRIDS are used in mammography, this standard is restricted to FOCUSED GRIDS where MAMMOGRAPHIC ANTI-SCATTER GRIDS are concerned.

This standard is not intended to be applied for ACCEPTANCE TESTS.

This standard does not cover the homogeneity of performance over the area of a grid.

This standard is intended to be applied for the determination of the characteristics of ANTI-SCATTER GRIDS under test conditions. These conditions are not usually available at the site of the RESPONSIBLE ORGANIZATION.

#### 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*  
Amendment 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*  
Amendment 1:2013

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

IEC 61267:2005, *Medical diagnostic X-ray equipment – Radiation conditions for use in the determination of characteristics*

#### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60601-1:2005+A1:2012, IEC 60601-1-3:2008+A1:2013, IEC/TR 60788:2004 and the following apply.



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