

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

**BS EN 61674:2013**



BSI Standards Publication

# Medical electrical equipment — Dosimeters with ionization chambers and/or semiconductor detectors as used in X-ray diagnostic imaging

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

*raising standards worldwide™*



This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

This British Standard is the UK implementation of EN 61674:2013. It is identical to IEC 61674:2013. It supersedes BS EN 61674:1998, which will be withdrawn on 3 January 2016.

The UK participation in its preparation was entrusted by Technical Committee CH/62, Electrical Equipment in Medical Practice, to Subcommittee CH/62/3, Equipment for radiotherapy, nuclear medicine and radiation dosimetry.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013.

Published by BSI Standards Limited 2013

ISBN 978 0 580 70786 5

ICS 11.040.50; 17.240

**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2013.

#### **Amendments issued since publication**

<b>Date</b>	<b>Text affected</b>
-------------	----------------------

---

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

NORME EUROPÉENNE  
EUROPÄISCHE NORM

February 2013

ICS 11.040.50

Supersedes EN 61674:1997 + A1:2002

English version

**Medical electrical equipment -  
Dosimeters with ionization chambers and/or semiconductor detectors as  
used in X-ray diagnostic imaging  
(IEC 61674:2012)**

Appareils électromédicaux -  
Dosimètres à chambres d'ionisation et/ou  
à détecteurs à semi-conducteurs utilisés  
en imagerie de diagnostic  
à rayonnement X  
(CEI 61674:2012)

Medizinische elektrische Geräte -  
Dosimeter mit Ionisationskammern  
und/oder Halbleiterdetektoren für den  
Einsatz an diagnostischen  
Röntgeneinrichtungen  
(IEC 61674:2012)

This European Standard was approved by CENELEC on 2013-01-03. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

**CENELEC**

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

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

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

## Foreword

The text of document 62C/551/FDIS, future edition 2 of IEC 61674, prepared by IEC TC 62 "Electrical equipment in medical practice" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61674:2013.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-10-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-01-03

This document supersedes EN 61674:1997 + A1:2002.

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.

In this standard, the following print types are used:

– Requirements and definitions: roman type.

– *Test specifications: italic 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 EN 60601-1, IN THIS PARTICULAR STANDARD OR AS NOTED: SMALL CAPITALS.

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.

## Endorsement notice

The text of the International Standard IEC 61674:2012 was approved by CENELEC as a European Standard without any modification.

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050	Series	International Electrotechnical Vocabulary	-	-
IEC 60417	Data-base	Graphical symbols for use on equipment	-	-
IEC 60601-1 + corr. December + corr. December	2005 2006 2007	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance	EN 60601-1 + corr. March + A11	2006 2010 2011
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	EN 60601-1-3 + corr. March	2008 2010
IEC 60731	2011	Medical electrical equipment - Dosimeters with ionization chambers as used in radiotherapy	EN 60731	2012
IEC/TR 60788	2004	Medical electrical equipment - Glossary of defined terms	-	-
IEC 61000-4	Series	Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques	EN 61000-4	Series
IEC 61000-4-2	-	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	-
IEC 61000-4-3	-	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	-
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	-
IEC 61000-4-6	-	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	-

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

IEC 61674-11	-	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	EN 61674-11	-
IEC 61187	-	Electrical and electronic measuring equipment - Documentation	EN 61187	-
IEC 61267	2005	Medical diagnostic X-ray equipment - Radiation conditions for use in the determination of characteristics	EN 61267	2006
ISO/IEC Guide 98-3	2008	Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)	-	-
ISO/IEC Guide 99	2007	International vocabulary of metrology - Basic and general concepts and associated terms (VIM)	-	-
ISO 3534-1	2006	Statistics - Vocabulary and symbols - Part 1: General statistical terms and terms used in probability	-	-

This is a preview of "BS EN 61674:2013". [Click here to purchase the full version from the ANSI store.](#)

## CONTENTS

INTRODUCTION.....	6
1 Scope and object.....	7
1.1 Scope.....	7
1.2 Object.....	7
2 Normative references.....	7
3 Terms and definitions.....	8
4 General requirements.....	15
4.1 Performance requirements.....	15
4.2 REFERENCE VALUES and STANDARD TEST VALUES.....	15
4.3 General test conditions.....	16
4.3.1 STANDARD TEST CONDITIONS.....	16
4.3.2 Statistical fluctuations.....	17
4.3.3 STABILIZATION TIME.....	17
4.3.4 Adjustments during test.....	17
4.3.5 Batteries.....	17
4.4 Constructional requirements as related to performance.....	18
4.4.1 Components.....	18
4.4.2 Display.....	18
4.4.3 Indication of battery condition.....	18
4.4.4 Indication of polarizing voltage failure.....	18
4.4.5 Over-ranging.....	18
4.4.6 MEASURING ASSEMBLIES with multiple DETECTOR ASSEMBLIES.....	19
4.4.7 Radioactive STABILITY CHECK DEVICE.....	19
4.5 UNCERTAINTY of measurement.....	20
5 Limits of PERFORMANCE CHARACTERISTICS.....	20
5.1 Linearity.....	20
5.2 Repeatability.....	20
5.2.1 General.....	20
5.2.2 Repeatability in the ATTENUATED BEAM.....	20
5.2.3 Repeatability in the UNATTENUATED BEAM.....	21
5.3 RESOLUTION of reading.....	21
5.4 STABILIZATION TIME.....	21
5.5 Effect of pulsed radiation on AIR KERMA and AIR KERMA LENGTH PRODUCT measurements.....	22
5.6 Reset on AIR KERMA and AIR KERMA LENGTH PRODUCT ranges.....	22
5.7 Effects of LEAKAGE CURRENT.....	22
5.7.1 AIR KERMA RATE measurements.....	22
5.7.2 AIR KERMA and AIR KERMA LENGTH PRODUCT measurements.....	22
5.8 Stability.....	23
5.8.1 Long term stability.....	23
5.8.2 Accumulated dose stability.....	23
5.9 Measurements with a radioactive STABILITY CHECK DEVICE.....	23
6 LIMITS OF VARIATION for effects of INFLUENCE QUANTITIES.....	24
6.1 General.....	24
6.2 Energy dependence of RESPONSE.....	24