



NSAI
Standards

Irish Standard
I.S. EN 62598:2013

Nuclear instrumentation - Constructional requirements and classification of radiometric gauges (IEC 62598:2011 (EQV))

I.S. EN 62598:2013

Incorporating amendments/corrigenda issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 60405:2007	<i>This document is based on:</i> EN 62598:2013 EN 60405:2007	<i>Published:</i> 9 August, 2013 20 July, 2007
This document was published under the authority of the NSAI and comes into effect on: 15 August, 2013		ICS number: 27.120
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 62598

August 2013

ICS 27.120

Supersedes EN 60405:2007

English version

**Nuclear instrumentation -
Constructional requirements and classification of radiometric gauges
(IEC 62598:2011)**

Instrumentation nucléaire -
Exigences de construction et classification
pour les jauges radiométriques
(CEI 62598:2011)

Strahlungsmessgeräte -
Konstruktionsanforderungen und
Klassifikation radiometrischer
Messanordnungen
(IEC 62598:2011)

This European Standard was approved by CENELEC on 2013-07-22. 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

Foreword

This document (EN 62598:2013) consists of the text of IEC 62598:2011 prepared by IEC/TC 45 "Nuclear instrumentation".

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) 2014-07-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-07-22

This document supersedes EN 60405:2007.

EN 62598:2013 includes the following significant technical changes with respect to EN 60405:2007:

- Introduction of Category C for stand-alone source housings intended for fixed radiometric gauges and associated test procedures.
- The system classification code has been amended by one digit indicating the applied revision of EN 62598 and by a second digit indicating the fire test conditions.
- The term dose rate class shall be used instead of radiation protection class. Class 7, or alternatively E, represents the current ICRP regulations.
- Introduction of fire resistance classes.
- Revision of the procedure for dose equivalent measurements.
- Addition of Annex A (informative) "Guidelines for the installation of radiometric gauges".

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.

Endorsement notice

The text of the International Standard IEC 62598:2011 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 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 60050-394	2007	International Electrotechnical Vocabulary - Part 394: Nuclear instrumentation - Instruments, systems, equipment and detectors	-	-
IEC 60476	1993	Nuclear instrumentation - Electrical measuring - systems and instruments utilizing ionizing radiation sources - General aspects	-	-
IEC 60692	1999	Nuclear instrumentation - Density gauges - utilizing ionizing radiation - Definitions and test methods	-	-
IEC 60846-1	2009	Radiation protection instrumentation - Ambient- and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 1: Portable workplace and environmental meters and monitors	-	-
IEC 60846-2	2007	Radiation protection instrumentation - Ambient- and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation - Part 2: High range beta and photon dose and dose rate portable instruments for emergency radiation protection purposes	-	-
IEC 60982	1989	Level measuring systems utilizing ionizing radiation with continuous or switching output	-	-
IEC 61005 (mod)	2003	Radiation protection instrumentation - Neutron ambient dose equivalent (rate) meters	EN 61005	2004
IEC 61010-1 + corr. May	2010 2011	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1	2010
IEC 61326	Series	Electrical equipment for measurement, control and laboratory use - EMC requirements	EN 61326	Series
IEC 61336	1996	Nuclear instrumentation - Thickness measurement systems utilizing ionizing radiation - Definitions and tests methods	-	-
ISO 361	1975	Basic ionizing radiation symbol	-	-
ISO 921	1997	Nuclear energy - Vocabulary	-	-

I.S. EN 62598:2013

- 4 -

EN 62598:2013

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 2919	1999	Radiation protection - Sealed radioactive sources - General requirements and classification	-	-

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope and object.....	7
2 Normative references	7
3 Terms and definitions	8
4 Classification of radiometric gauge types.....	9
4.1 Category A: Radiometric gauges with restricted beam	9
4.2 Category B: Radiometric gauges with omnidirectional beam	11
4.3 Category C: Stand alone source housings for fixed radiometric gauges	11
4.4 Dose rate classes.....	12
4.5 Temperature class.....	12
5 General requirements.....	13
5.1 Measuring gap	13
5.2 Source holder.....	13
5.3 Source housing	13
5.4 Alignment of the useful beam	13
5.5 Other requirements	13
6 Protection against ionizing radiation	14
6.1 General requirements.....	14
6.2 Requirements for Category A gauges	14
6.3 Requirements for Category B gauges	14
6.4 Requirements for Category C stand alone source housings	14
6.5 Resistance of the source housing in case of fire	15
6.6 Detector housing	15
6.7 Measuring head.....	15
7 Other safety devices.....	15
7.1 General.....	15
7.2 Protection against non-authorized use.....	15
7.3 Indication of the shutter position.....	16
7.4 Additional warning device.....	16
8 Determination of the dose equivalent rate.....	16
8.1 General.....	16
8.2 Dose equivalent rate measurements in the case of closed shutters	18
8.3 Dose equivalent rate measurements in the case of open shutters.....	18
8.4 Procedure for dose equivalent rate measurements	18
8.5 Determining the relevant values of the dose equivalent rate	19
9 Test methods	19
9.1 General.....	19
9.2 Temperature cycle test on the shutters and the source holder	19
9.2.1 Requirements	19
9.2.2 Procedure.....	19
9.3 Test for checking the resistance of the shutter, the source holder and the source container in case of fire.....	20
9.3.1 Requirements	20
9.3.2 Procedure.....	20

I.S. EN 62598:2013

62598 © IEC:2011(E)

– 3 –

9.4	Test for checking the mechanical resistance of the shutter and the source holder.....	20
9.4.1	Requirements	20
9.4.2	Procedure.....	21
10	System classification coding and labelling	21
10.1	Classification code	21
10.2	Labelling	22
11	Accompanying documents	22
	Annex A (informative) Guidelines for the installation of radiometric gauges.....	23
	Figure 1 – Schematic arrangement of Category A gauges	10
	Figure 2 – Schematic arrangement of Category B gauges	11
	Figure 3 – Category C stand alone source housing for fixed level or density gauges.....	11
	Figure 4 – Schematic representation of isodistance gauging faces in the case of thickness gauges	17
	Figure 5 – Schematic representation of isodistance gauging faces in the case of level and density gauges and back-scatter gauges.....	17
	Figure 6 – Schematic representation of isodistance gauging faces in the case of stand alone source housings	18
	Figure A.1 – Examples of protection methods and principles.....	24
	Table 1 – Dose rate classes.....	12
	Table 2 – Temperature classes	12
	Table 3 – Fire resistance classes	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**NUCLEAR INSTRUMENTATION –
CONSTRUCTIONAL REQUIREMENTS
AND CLASSIFICATION OF RADIOMETRIC GAUGES**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62598 has been prepared by IEC technical committee 45: Nuclear instrumentation.

This standard cancels and replaces the second edition of IEC 60405, issued in 2003. It constitutes a technical revision (see Introduction).

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

FDIS	Report on voting
45/718/FDIS	45/721/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.

I.S. EN 62598:2013

62598 © IEC:2011(E)

– 5 –

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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This International Standard is based on the second edition of IEC 60405 which was published in 2003. It modifies or supplements it with additional provisions, where required by current needs.

Compared to the second edition of IEC 60405, the following major changes have been made:

- Introduction of Category C for stand alone source housings intended for fixed radiometric gauges and associated test procedures.
- The system classification code has been amended by one digit indicating the applied revision of IEC 62598 and by a second digit indicating the fire test conditions.
- The term dose rate class shall be used instead of radiation protection class. Class 7, or alternatively E, represents the current ICRP regulations.
- Introduction of fire resistance classes.
- Revision of the procedure for dose equivalent measurements.
- Addition of Annex A (informative) "Guidelines for the installation of radiometric gauges".

NUCLEAR INSTRUMENTATION – CONSTRUCTIONAL REQUIREMENTS AND CLASSIFICATION OF RADIOMETRIC GAUGES

1 Scope and object

This International Standard applies to the manufacture and installation of electrical measuring systems and instruments utilizing radioactive sources (radiometric gauges, hereinafter called gauges). It also applies to source housings intended for use in the aforementioned measuring systems. This standard applies to equipment, which is not related to power production or to the fuel cycle.

It does not apply to portable gauges which, because of their construction and purposes for use, are intended to be operated as mobile equipment and it does not apply to gauges operated with X-ray tubes, but it can be analogously applicable to these gauges.

The object of this standard is to specify constructional requirements for the design of instruments utilizing radioactive sources in regard of radiation protection. This standard does not take into account mechanical or electrical hazards.

2 Normative references

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

IEC 60050-394:2007, *International Electrotechnical Vocabulary (IEV) – Part 394: Nuclear instrumentation – Instruments, systems, equipment and detectors*

IEC 60476:1993, *Nuclear instrumentation – Electrical measuring systems and instruments utilizing ionizing radiation sources – General aspects*

IEC 60692:1999, *Nuclear instrumentation – Density gauges utilizing ionizing radiation – Definitions and test methods*

IEC 60846-1:2009, *Radiation protection instrumentation – Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation – Part 1: Portable workplace and environmental meters and monitors*

IEC 60846-2:2007, *Radiation protection instrumentation – Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation – Part 2: High range beta and photon dose and dose rate portable instruments for emergency radiation protection purposes*

IEC 60982:1989, *Level measuring systems utilizing ionizing radiation with continuous or switching output*

IEC 61005:2003, *Radiation protection instrumentation – Neutron ambient dose equivalent (rate) meters*

IEC 61010-1:2010, *Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-