National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 60846:2004

ICS 13.280

RADIATION PROTECTION INSTRUMENTATION - AMBIENT AND/OR DIRECTIONAL DOSE EQUIVALENT (RATE) METERS AND/OR MONITORS FOR BETA, X AND GAMMA RADIATION (IEC 60846:2002, MODIFIED)

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EUROPEAN STANDARD **EN 60846**

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ICS 13.280

English version

Radiation protection instrumentation – Ambient and/or directional dose equivalent (rate) meters and/or monitors for beta, X and gamma radiation
(IEC 60846:2002, modified)

Instrumentation pour la radioprotection - Instruments pour la mesure et/ou la surveillance de l'équivalent de dose (ou du débit d'équivalent de dose) ambiant et/ou directionnel pour les rayonnements bêta, X et gamma (CEI 60846:2002, modifiée)

Strahlenschutz-Messgeräte – Umgebungs- und Richtungs-Äquivalentdosis(leistungs)-Messgeräte und -Monitore für Beta, Röntgen- und Gammastrahlung (IEC 60846:2002, modifiziert)

This European Standard was approved by CENELEC on 2004-10-01. 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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

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Foreword

The text of the International Standard IEC 60846:2002, prepared by SC 45B, Radiation protection instrumentation, of IEC TC 45, Nuclear instrumentation, together with the common modifications prepared by the CENELEC BTTF 111-3, Instrumentation for ionizing radiation measurement and protection, was submitted to the formal vote and was approved by CENELEC on 2004-10-01.

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)	2005-10-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2007-10-01

Clauses, subclauses, tables and figures which are additional to those in IEC 60846 are prefixed “Z”.

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60846:2002 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

3 Terminology

Add:

3.2.Z1
maximum dose equivalent rate (for dosemeters)
the dose rate, specified by the manufacturer, above which the dose reading is no longer within the requirements of this standard

4 General characteristics of ambient and directional dose equivalent (rate) meters

4.3.10 **Delete:** ", (see also note 7 in 3.2)".

4.3.11 **Replace** reference to 3.2 by reference to 3.4.5 and 3.4.7.

5 Radiation characteristics – Directional dose equivalent (rate) meters

5.1.4.1 Last sentence: **replace** "alarm rate" by "alarm rates".

5.2.1 **Add** a second paragraph reading:

An additional test shall be performed with a beta emitter in the range $E_{\max}$ between 100 keV and 500 keV.

5.2.2 **Replace** first paragraph by:

For the beta radiations of ^{85}Kr or ^{204}Tl, ^{90}Sr/^{90}Y and ^{147}Pm, the response is measured for 0° angle and for angles of incidence of $\alpha = \pm 45°$ in two perpendicular planes containing the reference direction through the reference point of the directional dose equivalent (rate) meter.

Delete third paragraph.

5.4 **Replace** the text of subclause **5.4**, **Overload characteristics** by:

5.4 Overload characteristics

5.4.1 Doserate meters

5.4.1.1 Requirements

The dose equivalent ratemeter shall read off-scale on the high side or shall indicate overload when exposed to doses rates greater than the maximum of its measuring range. This requirement shall apply to all ranges.

5.4.1.2 Method of test

The dose equivalent ratemeter shall be submitted to the following dose equivalent rates for a period of 5 min:

– 100 times the range maximum for range maxima up to and including 0,1 $Sv.h^{-1}$;

– 10 times the range maximum, or 10 $Sv.h^{-1}$ whichever is the greater, for range maxima in excess of 0,1 $Sv.h^{-1}$.

The indication of dose equivalent rate shall read off-scale on the high side or indicate overload throughout this period and the dose equivalent ratemeter shall function within specification within 5 min [3] (footnote 3 as given in the IEC publication) after completion of this test. This test is applicable to each range.

5.4.2 Dosemeters

5.4.2.1 Requirements

1) The dose equivalent meter shall read off-scale on the high side or shall indicate overload when exposed to doses greater than the maximum of its measuring range. This requirement shall apply to all ranges.

2) When subjected to doserates in excess of the maximum doserate limit specified by the manufacturer there shall be indication that the equipment is not able to provide correct dose indication.

5.4.2.2 Method of test

1) Subject the dosemeter to doserates to give dose reading in excess of 100 times the maximum dose that can be indicated. The indication shall be off-scale on the high side or overload shall be indicated and shall remain so until the dose indication is reset or the equipment is switched off. The equipment shall not be reset or switched off for at least 30 min after the equipment has been subjected to the test dose. The doserate to achieve the required dose shall be less than the maximum doserate capability as specified by the manufacturer.

2) Subject the dosemeter to a doserate 10 % in excess of that specified as the doserate limit specified by the manufacturer for a period of 100 s. Ensure that either the dose indication is within the limits of this standard or indication is given that the reading of dose is in error. If the latter is not indicated subject the doserate to increased doserates of 10 % for 100 s until the error indication is displayed. Prior this the dose indication shall increase as appropriate.