

ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN ISO 28057:2021

Clinical dosimetry - Dosimetry with solid thermoluminescence detectors for photon and electron radiations in radiotherapy (ISO 28057:2019)

Klinische Dosimetrie - Dosimetrie mit
Festkörper-

Thermolumineszenzdetektoren für
Photonen- und Elektronenstrahlung in

Dosimétrie clinique - Dosimétrie avec
détecteurs thermoluminescents solides
pour les rayonnements de photons et
d'électrons en radiothérapie (ISO

02/2021



National Foreword

This European Standard EN ISO 28057:2021 was adopted as Luxembourgish Standard ILNAS-EN ISO 28057:2021.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

ILNAS-EN ISO 28057:2021

EUROPEAN STANDARD **EN ISO 28057**

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2021

ICS 13.280

Supersedes EN ISO 28057:2018

English Version

**Clinical dosimetry - Dosimetry with solid
thermoluminescence detectors for photon and electron
radiations in radiotherapy (ISO 28057:2019)**

Dosimétrie clinique - Dosimétrie avec détecteurs
thermoluminescents solides pour les rayonnements de
photons et d'électrons en radiothérapie (ISO
28057:2019)

Dosimetrie mit Festkörper -
Thermolumineszenzdetektoren für Photonen- und
Elektronenstrahlung in der Strahlentherapie (ISO
28057:2019)

This European Standard was approved by CEN on 18 January 2021.

CEN 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 CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	3

ILNAS-EN ISO 28057:2021 - Preview only Copy via ILNAS e-Shop

European foreword

The text of ISO 28057:2019 has been prepared by Technical Committee ISO/TC 85 "Nuclear energy, nuclear technologies, and radiological protection" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 28057:2021 by Technical Committee CEN/TC 430 "Nuclear energy, nuclear technologies, and radiological protection" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2021, and conflicting national standards shall be withdrawn at the latest by August 2021.

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

This document supersedes EN ISO 28057:2018.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 28057:2019 has been approved by CEN as EN ISO 28057:2021 without any modification.

Clinical dosimetry — Dosimetry with solid thermoluminescence detectors for photon and electron radiations in radiotherapy

*Dosimétrie clinique — Dosimétrie avec détecteurs
thermoluminescents solides pour les rayonnements de photons et
d'électrons en radiothérapie*



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Rules for the TLD measurement procedure	9
4.1 Principle of measurement.....	9
4.2 Measured quantity.....	9
4.3 Measurement cycle.....	10
4.3.1 General requirements.....	10
4.3.2 Sequence of measurement cycles.....	10
4.3.3 Common passing of the measurement cycles.....	10
4.3.4 Handling of TL detectors.....	10
4.3.5 Pre-irradiation annealing.....	11
4.3.6 Irradiation.....	11
4.3.7 Post-irradiation annealing.....	11
4.3.8 Reading.....	11
4.4 Measurement of the absorbed dose to water.....	12
4.4.1 Basic formula for the determination of the absorbed dose to water.....	12
4.4.2 Determination of the background value, M_0	12
4.4.3 Determination of the indicated value, M_i	13
4.4.4 Determination of the individual calibration coefficients, N_i	13
4.4.5 Determination of the correction factors, k_v	15
4.5 Uncertainty of measurement of the absorbed dose.....	22
4.6 Reusability.....	23
4.7 Stability check.....	23
4.8 Staff.....	23
5 Requirements for the TLD system	23
5.1 General information.....	23
5.1.1 Classification of the requirements.....	23
5.1.2 Requirements for operation characteristics.....	24
5.2 Completeness of the TLD system.....	24
5.2.1 Technical components.....	24
5.2.2 Hardware and software components.....	24
5.2.3 Operating instructions.....	24
5.2.4 Access to a calibration irradiation device.....	26
5.3 Requirements for TL detectors.....	26
5.3.1 Characteristics of TL materials.....	26
5.3.2 Tailoring of TL materials.....	26
5.3.3 Reusability of TL detectors.....	27
5.3.4 Individual variation.....	27
5.4 Requirements for TL-indicating instruments.....	28
5.4.1 General remarks.....	28
5.4.2 Mechanical setup.....	28
5.4.3 Warm-up time.....	28
5.4.4 Indication and indication range.....	28
5.4.5 Background value.....	28
5.4.6 Overflow indication and effects during evaluation of high doses.....	28
5.4.7 Test light source.....	29
5.4.8 Changes in the response.....	29
5.4.9 Mechanical construction.....	29
5.4.10 Light shielding.....	29