
**Photography — Industrial radiographic
films — Determination of ISO speed, ISO
average gradient and ISO gradients G2
and G4 when exposed to X- and
gamma-radiation**

*Photographie — Films pour radiographie industrielle — Détermination de la
sensibilité ISO, du contraste moyen ISO et des contrastes ISO G2 et G4
après exposition à des rayons X ou gamma*

Sample Document

get full document from standards.iteh.ai



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

Sample Document

get full document from standards.iteh.ai

© ISO 2002

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions	1
4 Sampling and storage.....	3
5 Method of test.....	3
5.1 Principle	3
5.2 Safelights	3
5.3 Exposure	3
5.4 Processing	5
5.5 Densitometry	5
5.6 Evaluation	6
6 Product classification.....	6
6.1 Speed calculation.....	6
6.2 Average gradient calculation	9
6.3 Point gradient determination	9
6.4 Uncertainty.....	10
7 Marking and labelling.....	10
7.1 ISO speed.....	10
7.2 ISO average gradient	10
7.3 ISO gradients G2 and G4.....	11
7.4 General	11
Annex A (informative) Units of measured energy	12
Annex B (informative) Scattered radiation measurement	13
Annex C (informative) Calibration of ionization chambers	14
Annex D (informative) Improvement of the reproducibility of measurement of X-radiation.....	15
Annex E (informative) Derivation of the relationship used in the determination of G2 and G4	16
Annex F (informative) Radiation quality code.....	17
Bibliography.....	18

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

International Standard ISO 7004 was prepared by Technical Committee ISO/TC 42, *Photography*.

This second edition cancels and replaces the first edition (ISO 7004:1987), of which it constitutes a technical revision.

Annexes A to F of this International Standard are for information only.

Sample Document

get full document from standards.iteh.ai

Introduction

This International Standard specifies methods for measuring the ISO speed, ISO average gradient and ISO gradients G_2 and G_4 of industrial radiographic film systems when exposed directly to X- and γ -radiation. Many countries have had national standards relating to this subject for many years and may provide values which are different from those obtained by following the procedure specified in this International Standard. Because the photographic characteristics of a film system are dependent on the energy distribution in the wavelength spectrum, four representative sources are specified for determining sensitometric characteristics. To minimize the differences between national standards and this International Standard, the minimum requirements for X-ray tubes and X-ray generators have been considered mandatory and have been clearly specified in the subclause on radiation quality (5.3.3). This International Standard imposes limiting specifications on the thickness of the metallic screens often used in conjunction with the film as specified in the basic rules for good radiographic practice in ISO 5579.

Photographic results are also dependent on the chemical process used to develop the film. This International Standard does not attempt to specify the processing method; therefore, when ISO speed or ISO gradient values are given for a film system, it is necessary to specify not only the radiation quality used but also the process. This will permit the comparison of systems consisting of film and film processing.

Sample Document

get full document from standards.iteh.ai

Photography — Industrial radiographic films — Determination of ISO speed, ISO average gradient and ISO gradients G2 and G4 when exposed to X- and gamma-radiation

1 Scope

This International Standard specifies methods for determining sensitometric curve shape, ISO speed, ISO average gradient and ISO gradients G2 and G4 for industrial radiographic systems consisting of film and film processing when exposed directly to X-rays and γ -rays. The measurement of characteristics of film systems used in industrial radiography with fluorescent intensifying screens is not specified in this International Standard.

NOTE Units of measured energy are given for information in annex A.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 5-2: 2001, *Photography — Density measurements — Part 2: Geometric conditions for transmission density*

ISO 5-3:1995, *Photography — Density measurements — Part 3: Spectral conditions*

ISO 4037-1:1996, *X and gamma reference radiation for calibrating dosimeters and doserate meters and for determining their response as a function of photon energy — Part 1: Radiation characteristics and production methods*

ISO 5579: 1998, *Non-destructive testing — Radiographic examination of metallic material by X- and gamma rays — Basic rules*

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1

radiographic film

transparent plastic sheet coated on one or both sides with a photographically sensitive layer

3.2

film system

system consisting of a radiographic film, the film processing and, when in use, the lead foil(s) and film holder