

# INTERNATIONAL STANDARD

# ISO 4168

Second edition  
2002-05-01

---

---

## Timekeeping instruments — Conditions for carrying out checks on radioluminescent deposits

*Instruments horaires — Conditions d'exécution des contrôles des dépôts  
radioluminescents*



Reference number  
ISO 4168:2002(E)

© ISO 2002

**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.

© 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](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

Printed in Switzerland

## 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 4168 was prepared by Technical Committee ISO/TC 114, *Horology*, Subcommittee SC 5, *Luminescence*.

This second edition cancels and replaces the first edition (ISO 4168:1979), which has been technically revised.

# Timekeeping instruments — Conditions for carrying out checks on radioluminescent deposits

## 1 Scope

This International Standard specifies the conditions in which checks on radioluminescent deposits for timekeeping instruments are to be carried out.

It supplements ISO 3157, in particular clause 4 of that document, "Specifications and test methods for radioluminescent deposits".

## 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 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3157:1991, *Radioluminescence for time measurement instruments — Specifications*

## 3 Terms and definitions

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

### 3.1

#### **user**

anyone who handles and applies the radioluminescent substance

NOTE The term "poseur" is widely used in Switzerland.

### 3.2

#### **new support**

any part (hand, dial, bezel) which, owing to the nature of the materials and the treatments of the surface, is outside the previous experience of the user of the radioluminescent substance

### 3.3

#### **new deposit**

any deposit of radioluminescent substance which, owing to its shape or dimensions, is outside the previous experience of the user of the radioluminescent substance

## 4 Carrying out checks

### 4.1 General

All radioluminescent deposits shall be capable of successfully withstanding the tests specified in clause 4 of ISO 3157:1991 carried out in the following conditions.

### 4.2 Checking of the colours, the specific luminous intensity and resistance to ageing

The colours, the specific luminous intensity and the resistance to ageing shall be checked on five standard deposits as defined in 4.1 c) of ISO 3157:1991, for each production batch of radioluminescent substance and each time the nature of the binder is altered.

These checks are the responsibility of the manufacturer of the radioluminescent substance.

If a user applies the radioluminescent substance in conditions which differ from those defined by the manufacturer of this substance (proportion and nature of the binder), the checks are the responsibility of such a user.

### 4.3 Checking of adhesion

4.3.1 The adhesion shall be checked as follows.

4.3.2 Check each production batch of radioluminescent substance and each production batch of binder, on five standard supports.

These checks are the responsibility of the manufacturer of the radioluminescent substance.

4.3.3 Check each new support or new deposit which has not undergone testing by the user concerned, on at least five pieces.

These checks are the responsibility of the user of the radioluminescent substance.

4.3.4 Check each production batch of dials or hands or any part bearing a radioluminescent deposit, on a representative sample ensuring an acceptable quality level (AQL) of 1 %, in accordance with the standard inspection conditions specified in ISO 2859-1.

These checks are the responsibility of the user of the radioluminescent substance.

### 4.4 Checking of the insolubility

4.4.1 The insolubility shall be checked as follows.

4.4.2 Check each production batch of radioluminescent substance and each production batch of binder, on the standard supports used for the checking of adhesion as defined in 4.3.2.

These checks are the responsibility of the manufacturer of the radioluminescent substance.

4.4.3 Check on the new supports which were used for the checking of adhesion as defined in 4.3.3 when the new element concerns the support material or the surface treatment of the support.

These supports are the responsibility of the user of the radioluminescent substance.

## 5 Certificate of conformity

**5.1** The manufacturer of the radioluminescent substance shall be required, at the request of the customer, to furnish a certificate with each delivery, indicating the production batch numbers, and stating the characteristics defined in 4.2 and 4.3 of ISO 3157:1991 for one or more types of binder and for one or more proportions of mixture, and conformity of the product with the specifications in 4.4, 4.5 and 4.6 of ISO 3157:1991.

**5.2** The user of the radioluminescent substance shall be required, at the request of the customer, to furnish a certificate with each delivery of hands or dials, guaranteeing, firstly, use of a radioluminescent substance complying with the specifications of ISO 3157 and, secondly, conformity with the specifications in 4.5 and 4.6 of ISO 3157:1991.

**5.3** Both the manufacturer and the user of the radioluminescent substance shall be required, with due regard to national regulations applying to prescribed time limits, to file the reports on checks carried out on their production, as well as the duplicate copies of certificates accompanying deliveries, and to produce them on demand.

.....

---

---

**ICS 39.040.01**

Price based on 3 pages

© ISO 2002 – All rights reserved