### **INTERNATIONAL STANDARD**

## ISO 14934-3

Second edition 2012-05-15

### Fire tests — Calibration and use of heat flux meters -

# F, Part 3: Secondary calibration method

, -E, βe-Essais au feu — Étalonnage et utilisation des appareils de mesure du flux thermique —

Partie 3: Méthode d'étalonnage secondaire

Reference number ISO 14934-3:2012(E)



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### 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 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14934-3 was prepared by Technical Committee ISO/TC 92, *Fire safety*, Subcommittee SC 1, *Fire initiation and growth*.

This second edition cancels and replaces the first edition (ISO 14934-3:2006), which has been technically revised.

ISO 14934 consists of the following parts, under the general title *Fire tests* — *Calibration and use of heat flux meters*:

- Part 1: General principles
- Part 2: Primary calibration methods
- Part 3: Secondary calibration method
- Part 4: Guidance on the use of heat-flux meters in fire tests [Technical Specification]

### Introduction

In many fire test methods, the radiation level is specified and, therefore, it is of great importance that the radiant heat flux is well defined and measured with sufficient accuracy. Radiant heat transfer is also the dominant mode of heat transfer in most real fires.

A number of fire tests described in International Standards published by ISO require test specimens to be exposed to specified levels of irradiance. It is, therefore, necessary for fire test laboratories to be able to maintain working-standard heat flux meters to measure irradiance.

This part of ISO 14934 describes methods for the calibration of heat flux meters used as working standards in fire testing and for measuring heat flux in fire testing. Two different approaches can be used, either calibration in one of the primary calibration apparatuses or by means of a transfer calibration. The transfer calibration is performed by comparison of the heat flux meter with a heat flux meter with known sensitivity referred to as a secondary standard. The latter will have been calibrated according to ISO 14934-2.

The calibration of heat flux meters for use as primary and secondary standards requires considerable expertise and equipment that is not covered by this part of ISO 14934. For information on the calibration of primary standards and for a detailed account of the principles of the measurement of thermal radiation, reference is also made to ISO 14934-1 and ISO 14934-2.

Information on the accuracy of calibration, care of heat flux meters and guidance notes for carrying out the calibration are given in Annexes A to C. Annex D outlines a suitable procedure for the maintenance of a secondary standard of irradiance at a test laboratory.

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### Fire tests — Calibration and use of heat flux meters —

# Part 3: Secondary calibration method

### 1 Scope

This part of ISO 14934 specifies methods for the calibration of heat flux meters for use in fire testing.

The methods apply only to instruments having plane receivers. They do not apply to receivers in the form of wires, spheres, etc.

### 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.

ISO 13943, Fire safety - Vocabulary

ISO 14934-1, Fire tests — Calibration and use of heat flux meters — Part 1: General principles

ISO 14934-2, Fire tests — Calibration and use of heat flux meters — Part 2: Primary calibration methods

### 3 Terms and definitions

For the purposes of this part of ISO 14934, the terms and definitions given in ISO 14934-1 and ISO 13943 apply.

### 4 Principle

Two different approaches can be used, either calibration in one of the primary calibration apparatuses or by means of a transfer calibration.

### 5 Transfer calibration

### 5.1 General

Transfer calibration of heat flux meters (total hemispherical radiometers and total heat flux meters) for use as working standards is carried out by comparing the heat flux meter response at various levels of irradiance with the response of a secondary-standard heat flux meter of the same type at the same levels of irradiance. The measurements are made at different levels of irradiance, which are obtained by varying the distance between the radiant source and the heat flux meter or by varying the temperature of the radiant source. The transfer calibration is conducted at a minimum of 10 different levels of irradiance. The secondary-standard heat flux meter is calibrated according to one of the primary methods described in ISO 14934-2.

### 5.2 Apparatus

### 5.2.1 Radiant source

The radiant source can be spherical, flat or conical. It shall be an electrically powered heater. The irradiance from the radiant source shall be maintained at a preset level by controlling the temperature. This can be done