

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

**Fire hazard testing –  
Part 8-1: Heat release – General guidance**

**Essais relatifs aux risques du feu –  
Partie 8-1: Dégagement de chaleur – Guide général**



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**FIRE HAZARD TESTING –****Part 8-1: Heat release –  
General guidance**

## FOREWORD

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International Standard IEC 60695-8-1 has been prepared by IEC technical committee 89: Fire hazard testing.

This second edition cancels and replaces the first edition, published in 2001 and constitutes a technical revision.

The main changes with respect to the first edition are listed below:

- editorial changes throughout;
- revised terms and definitions;
- new text concerning bomb calorimetry;
- revised Table 1a;
- new Clause 5 – Parameters used to report heat release data;
- introduction of intermediate scale fire test.

The text of this standard is based on the following documents:

FDIS	Report on voting
89/856/FDIS	89/863/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This standard is to be used in conjunction with IEC 60695-8-2.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

It has the status of a basic safety publication in accordance with IEC Guide 104 and ISO/IEC Guide 51.

A list of all the parts in the IEC 60695 series, under the general title *Fire hazard testing*, can be found on the IEC website.

Part 8 consists of the following parts:

Part 8-1: Heat release – General guidance

Part 8-2: Heat release – Summary of test methods

Part 8-3: Heat release – Heat release of insulating liquids used in electrotechnical products

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

In the design of any electrotechnical product, the risk of fire and the potential hazards associated with fire need to be considered. In this respect the objective of component, circuit and equipment design as well as the choice of materials is to reduce to acceptable levels the potential risks of fire even in the event of foreseeable abnormal use, malfunction or failure. The future IEC 60695-1-10 [1]<sup>1)</sup>, together with its companion the future IEC 60695-1-11 [2] provide guidance on how this is to be accomplished.

The primary aims are as follows:

- 1) to prevent ignition caused by an electrically energized component part, and
- 2) in the event of ignition, to confine any resulting fire within the bounds of the enclosure of the electrotechnical product.

Secondary aims include the minimization of any flame spread beyond the product's enclosure and the minimization of harmful effects of fire effluents including heat, smoke and toxic or corrosive combustion products.

Fires involving electrotechnical products can also be initiated from external non-electrical sources. Considerations of this nature are dealt with in the overall risk assessment.

Fires are responsible for creating hazards to life and property as a result of the generation of heat (thermal hazard), toxic and/or corrosive compounds and obscuration of vision due to smoke. Fire risk increases as the heat released increases, possibly leading to a flash-over fire.

One of the most important measurements in fire testing is the measurement of heat release, and it is used as an important factor in the determination of fire hazard; it is also used as one of the parameters in fire safety engineering calculations.

The measurement and use of heat release data, together with other fire test data, can be used to reduce the likelihood of (or the effects of) fire, even in the event of foreseeable abnormal use, malfunction or failure of electrotechnical products.

When a material is heated by some external source, fire effluent can be generated and can form a mixture with air, which can ignite and initiate a fire. The heat released in the process is carried away by the fire effluent-air mixture, radiatively lost or transferred back to the solid material, to generate further pyrolysis products, thus continuing the process.

Heat may also be transferred to other nearby products, which may burn, and then release additional heat and fire effluent.

The rate at which thermal energy is released in a fire is defined as the heat release rate. Heat release rate is important because of its influence on flame spread and on the initiation of secondary fires. Other characteristics are also important, such as ignitability, flame spread and the side-effects of the fire (see the IEC 60695 series of standards).

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1) Figures in square brackets refer to the bibliography.



## **FIRE HAZARD TESTING –**

### **Part 8-1: Heat release – General guidance**

#### **1 Scope**

This part of IEC 60695 provides guidance on the measurement and interpretation of heat release from electrotechnical products and materials from which they are constructed.

Heat release data can be used as part of fire hazard assessment and in fire safety engineering, as described in the future IEC 60695-1-10 [1] and the future IEC 60695-1-11[2].

This basic safety publication is intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications. The requirements, test methods or test conditions of this basic safety publication will not apply unless specifically referred to or included in the relevant publications.

#### **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.

IEC 60695 (all parts), *Fire hazard testing*

IEC/TS 60695-8-2, *Fire hazard testing – Part 8-2: Heat release – Summary and relevance of test methods.*

IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications.*

ISO 1716, *Reaction to fire tests for building products – Determination of the heat of combustion.*

ISO/IEC Guide 51:1999, *Safety aspects – Guidelines for their inclusion in standards.*

ISO/IEC 13943:2000, *Fire safety – Vocabulary*

EN 13823, *Reaction to fire tests for building products – Building products, excluding floorings, exposed to thermal attack by a single burning item.*

#### **3 Terms and definitions**

For the purposes of this document, the following definitions apply.