

INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION
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**Tests for electric cables under fire conditions – Circuit integrity –
Part 1: Test method for fire with shock at a temperature of at least 830 °C for
cables of rated voltage up to and including 0,6/1,0 kV and with an overall
diameter exceeding 20 mm**

**Essais pour câbles électriques soumis au feu – Intégrité des circuits –
Partie 1: Méthode d'essai au feu avec chocs pour les câbles de tension assignée
au plus égale à 0,6/1,0 kV et de diamètre externe supérieur à 20 mm, à une
température d'au moins 830 °C**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**TESTS FOR ELECTRIC CABLES UNDER FIRE CONDITIONS –
CIRCUIT INTEGRITY –**
**Part 1: Test method for fire with shock at a temperature of at least 830 °C
for cables of rated voltage up to and including 0,6/1,0 kV and
with an overall diameter exceeding 20 mm**

FOREWORD

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International Standard IEC 60331-1 has been prepared by IEC technical committee 20: Electric cables.

This first edition of IEC 60331-1 cancels and replaces IEC 60331-12 (2002) and IEC 60331-31 (2002) to form one single standard.

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

FDIS	Report on voting
20/1049/FDIS	20/1053/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 publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

It has the status of a group safety publication in accordance with IEC Guide 104.

A list of all the parts in the IEC 60331 series, under the general title *Tests for electric cables under fire conditions – circuit integrity*, can be found on the IEC website.

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- withdrawn,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.

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INTRODUCTION

IEC 60331 consists of the following parts under the general title: *Tests for electric cables under fire conditions – Circuit integrity*:

- Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding 20 mm
- Part 2: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter not exceeding 20 mm
- Part 3: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV tested in a metal enclosure
- Part 11: Apparatus – Fire alone at a flame temperature of at least 750 °C
- Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV
- Part 23: Procedures and requirements – Electric data cables
- Part 25: Procedures and requirements – Optical fibre cables

NOTE Parts 21, 23 and 25 relate to fire-only conditions at a flame temperature of at least 750 °C.

Since its first edition (1970), IEC 60331 has been extended and has introduced a range of test apparatus in order that a test may be carried out on large and small power, control, data and optical fibre cables.

Successful tests carried out in accordance with this standard will enable an identification to be marked on the product.

TESTS FOR ELECTRIC CABLES UNDER FIRE CONDITIONS – CIRCUIT INTEGRITY –

Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV and with an overall diameter exceeding 20 mm

1 Scope

This part of IEC 60331 specifies the test apparatus and procedure and gives the performance requirements, including recommended flame application times, for low voltage power cables of rated voltage up to and including 0,6/1,0 kV and control cables with a rated voltage which are required to maintain circuit integrity when subject to fire and mechanical shock under specified conditions. It is intended for use when testing cables of greater than 20 mm overall diameter.

NOTE 1 Cables of smaller diameter should be tested using the apparatus, procedure and requirements of IEC 60331-2.

This standard describes the means of test specimen preparation, the continuity checking arrangements, the electrical testing procedure, the method of burning the cables and the method of shock production, and gives requirements for evaluating test results.

NOTE 2 Although the scope is restricted to cables with rated voltage up to and including 0,6/1,0 kV, the procedure may be used, with the agreement of the manufacturer and the purchaser, for cables with rated voltage up to and including 3,3 kV, provided that suitable fuses are used.

Annex A provides the method of verification of the burner and control system used for the test.

Requirements are stated for an identification that may optionally be marked on the cable to signify compliance with this standard.

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 60584-1, *Thermocouples – Part 1: Reference tables*

IEC 60269-3, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Examples of standardized systems of fuses A to F*

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