

Fire hazard testing —

Part 11-2: Test flames — 1 kW nominal pre-mixed flame — Apparatus, confirmatory test arrangement and guidance

The European Standard EN 60695-11-2:2003 has the status of a
British Standard

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National foreword

This British Standard is the official English language version of EN 60695-11-2:2003. It is identical with IEC 60695-11-2:2003. It supersedes BS EN 60695-2-4/1:1993 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/89, Fire hazard testing, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 21 and a back cover.

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Fire hazard testing
Part 11-2: Test flames –
1 kW nominal pre-mixed flame –
Apparatus, confirmatory test arrangement and guidance
(IEC 60695-11-2:2003)

Essais relatifs aux risques du feu
Partie 11-2: Flammes d'essai –
Flamme à prémélange de 1 kW nominal –
Appareillage, disposition d'essai
de vérification et indications
(CEI 60695-11-2:2003)

Prüfungen zur Beurteilung der
Brandgefahr
Teil 11-2: Prüfflammen –
1-kW-Flamme (Nennwert) mit
Gas/Luft-Gemisch –
Prüfaufbau, Vorkehrungen zur
Bestätigungsprüfung und Leitfaden
(IEC 60695-11-2:2003)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 89/595/FDIS, future edition 1 of IEC 60695-11-2, prepared by IEC TC 89, Fire hazard testing, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60695-11-2 on 2003-10-01.

This European Standard replaces EN 60695-2-4/1:1993 + A1:1996.

The structure of the standard remains essentially the same. Changes include:

- a new updated layout conforming to the latest IEC Directives;
- a new introduction;
- a new reference for the copper block material and the method of its attachment to the thermocouple;
- a recommended preference for the use of mass flowmeters;
- important modifications to Annex B;
- dimensional corrections to Figure A.8.

This standard is to be used in conjunction with EN 60695-2-4/0:1993.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2004-07-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2006-10-01

Annexes designated "normative" are part of the body of the standard.

Annexes designated "informative" are given for information only.

In this standard, annexes A and ZA are normative and annexes B and C are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60695-11-2:2003 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60695-1-1 NOTE Harmonized as EN 60695-1-1:2000 (not modified).

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INTRODUCTION

The best method for testing electrotechnical products with regard to fire hazard is to duplicate exactly the conditions occurring in practice. In most instances this is not possible. Accordingly, for practical reasons, the testing of electrotechnical products with regard to fire hazard is best conducted by simulating as closely as possible the actual effects occurring in practice.

IEC 60695-11-2 provides a general description of the apparatus required to produce the test flame and a general description of the principle of a calibration procedure to check that the flame produced meets the requirements. Detailed information for the confirmation of a test flame can be found in IEC 60695-11-40 [1] ^a.

^a Numbers in square brackets refer to the bibliography.

FIRE HAZARD TESTING –

Part 11-2: Test flames – 1 kW nominal pre-mixed flame – Apparatus, confirmatory test arrangement and guidance

1 Scope

This part of IEC 60695 gives the detailed requirements for the production of a 1 kW nominal, propane based pre-mixed type test flame.

It is applicable to electrotechnical equipment, its sub-assemblies and components and to solid electrical insulating materials or other combustible materials.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its 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 60584-1:1995, *Thermocouples – Part 1: Reference tables*

IEC 60584-2:1982, *Thermocouples – Part 2: Tolerances*

IEC 60695-2-4/0:1991, *Fire hazard testing – Part 2: Test methods – Section 4/sheet 0: Diffusion type and premixed type flame test methods*

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

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

3 Terms and definitions

For the purposes of this document, the definitions taken from ISO/IEC 13943, along with the following, apply.

3.1

standardized 1 kW test flame

test flame conforming to this international standard and meeting all of the requirements given in Clauses 4 to 6

4 Burner/supply arrangement

4.1 Requirements

A standardized 1 kW flame, according to this method, is one that is produced

- using hardware according to Figures A.1 to A.8,
- supplied with propane gas of purity not less than 98 % at a flow rate equivalent to 650 ml/min $\pm$ 30 ml/min at 23 °C, 0,1 MPa ^b,
- supplied with air at a flow rate equivalent to 10 l/min ^c $\pm$ 0,5 l/min at 23 °C, 0,1 MPa ^b. There shall be a means of measuring the ambient air temperature and pressure. The air shall be essentially free of oil and water.

The flame shall be symmetrical, stable and give a result of 45 s $\pm$ 5 s in the confirmatory test described in Clause 6.

The confirmatory test arrangement shown in Figure A.8 shall be used.

The approximate dimensions of the flame, when measured in the laboratory fumehood/ chamber and viewed in subdued light, are as follows:

- blue cone height: 50 mm to 60 mm;
- overall height: 170 mm to 190 mm.

4.2 Apparatus and fuel

4.2.1 Burner

The burner shall be in accordance with Figures A.1 to A.5 inclusive.

The fuel gas shall be propane with a purity of not less than 98 %.

NOTE The gas injector and flame stabilizer are removable for cleaning purposes.

4.2.2 Flowmeters

Flowmeters shall be appropriate

- for the measurement of the gas flow rate of 650 ml/min at 23 °C, 0,1 MPa with a tolerance of $\pm$ 2 %,
- for the measurement of the air flow rate of 10 l/min at 23 °C, 0,1 MPa with a tolerance of $\pm$ 2 %.

NOTE Mass flowmeters are the preferred means of controlling accurately the input flow rates of fuel and air to the burner. Other methods may be used if they can show equivalent accuracy.

4.2.3 Manometers

Two manometers are required, appropriate for the measurement of pressures in the range of 0 MPa to 0,1 MPa. Water manometers may be used for this purpose. They shall be adapted to read 0 MPa to 0,1 MPa.

NOTE Manometers are not required when mass flowmeters are used.

^b When corrected from the measurements taken under actual conditions of use.

^c Ten litres per minute.