

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Optical fibre cables –  
Part 1-309: Generic specification – Basic optical cable test procedures – Cable  
element test methods – Bleeding and evaporation of filling or flooding  
compounds, Method G9**

**Câbles à fibres optiques –  
Partie 1-309: Spécification générique – Procédures fondamentales d'essai des  
câbles optiques – Méthodes d'essai des éléments de câble – Exsudation et  
évaporation des composés de remplissage ou d'étanchéité, Méthode G9**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

**Part 1-309: Generic specification – Basic optical cable test procedures –  
Cable element test methods – Bleeding and evaporation of filling  
or flooding compounds, Method G9**

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IEC 60794-1-309 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics. It is an International Standard.

This first edition of IEC 60794-1-309 cancels and replaces method G9 of the second edition of IEC 60794-1-23 published in 2019.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the optical cable element test methods contained in IEC 60794-1-23:2019 will now be individually numbered in the IEC 60794-1-3xx series. Each test method is now considered to be an individual document rather than part of a multi-test method compendium. Full cross-reference details are given in IEC 60794-1-2;
- b) the scope is broadened so that the test method is also applicable for flooding compounds;
- c) the cover of the test set-up is cancelled.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86A/2305/FDIS	86A/2321/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

A list of all parts in the IEC 60794 series, published under the general title *Optical fibre cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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## OPTICAL FIBRE CABLES –

### Part 1-309: Generic specification – Basic optical cable test procedures – Cable element test methods – Bleeding and evaporation of filling or flooding compounds, Method G9

## 1 Scope

This part of IEC 60794 describes the test procedures to be used in establishing uniform requirements for optical fibre cable elements, filling compounds or flooding compounds, for the environmental property-bleeding and evaporation.

This document applies to optical fibre cables for use with telecommunication equipment and devices employing similar techniques, and to cables having a combination of both optical fibres and electrical conductors.

NOTE Throughout the document, the wording "optical cable" can also include optical fibre units, microduct fibre units, etc.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures – General guidance*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 General requirements

IEC 60794-1-2 is the reference guide to test methods of all types. It shall be considered for general requirements and definitions.

## 5 Method G9: Bleeding and evaporation

### 5.1 Object

The purpose of this test is to measure at high temperature the bleeding or evaporation, or both, of filling compounds or flooding compounds used in optical fibre cables.

## 5.2 Sample

The filling or flooding compound material intended to be used in contact with optical fibres shall be prepared with a sufficient amount to perform the test.

## 5.3 Apparatus

The apparatus consists of:

- a) an electric heating cabinet with natural ventilation,
- b) an analytical balance with an error limit  $G = 0,1$  mg, and
- c) the test set-up (see Figure 1), consisting of the following:
  - 1) a cone, nickel, gauze, 60 mesh (holes: 5,6 per mm<sup>2</sup>; wire diameter: 0,19 mm; opening: 0,28 mm), with a wire handle;

NOTE Alternatively the cone can consist of stainless steel (60 mesh, opening 0,25 mm) and the solder width can be more than 1 mm, provided it is proved that the results are not significantly different from the first one.

- 2) a beaker, tall-form, without a spout, 200 ml;
- 3) a metal rod, with a length slightly larger than the diameter of the beaker top;
- 4) a desiccator.

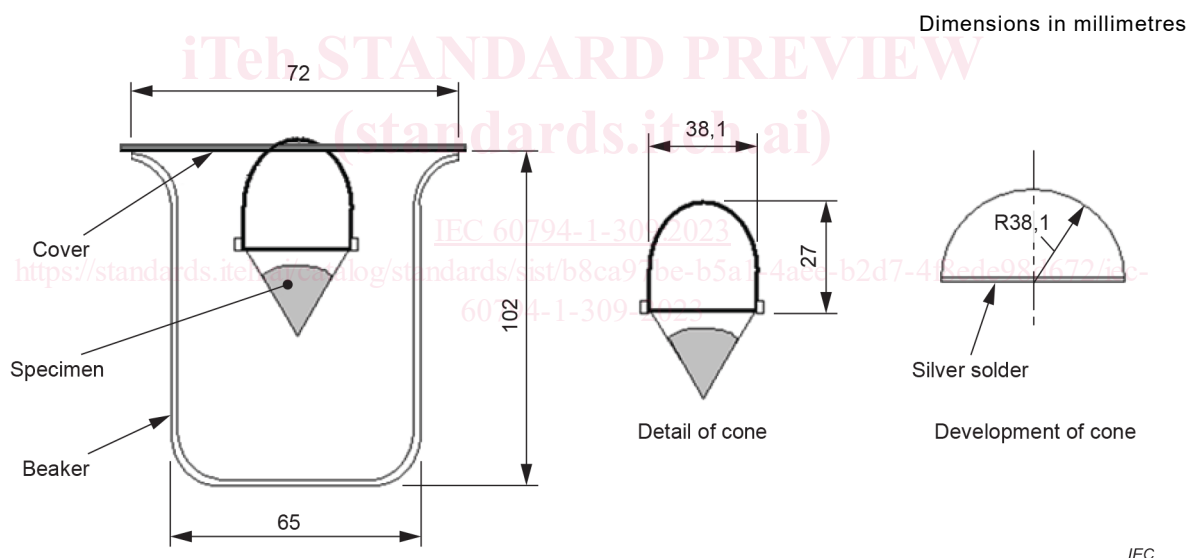


Figure 1 – Bleeding and evaporation test set-up

## 5.4 Procedure

Perform the test using the following procedure:

- a) clean the cone with proper organic solvent (ethanol, etc.) and wait till the cone is dry;
- b) weigh the clean dry beaker and record as  $M_1$  (weighed to within 1 mg). Weigh the assembled beaker, cone, and cone support (the metal rod) and record as  $M_2$ ;
- c) add about 10 g of sample to the cone (the upper surface shall be smooth and convex so that the fluid is not trapped and there shall be no aggregate materials in the gauze mesh). Weigh the assembled apparatus and sample and record as  $M_3$ ;
- d) heat the test set-up in the cabinet at the temperature and for the duration stated in the detail specification. Cool to room temperature in the desiccator;



- e) reweigh the assembled apparatus and record as  $M_4$ ;

NOTE 1 This step can be skipped when measuring only the bleeding.

- f) carefully remove the cone support and cone. Reweigh the beaker and record as  $M_5$ ;

NOTE 2 This step can be skipped when measuring only the evaporation

- g) calculate the percentage bleeding or evaporation according to Formula (1) and Formula (2), and report the average of the duplicate results.

$B$  characterizes the bleeding and is calculated as

$$B = \frac{M_5 - M_1}{M_3 - M_2} \times 100 \quad (1)$$

$E$  characterizes the evaporation and is calculated as

$$E = \frac{M_3 - M_4}{M_3 - M_2} \times 100 \quad (2)$$

where

$B$  is the amount of compound which has bled into the beaker, in %;

$E$  is the amount of compound missing from the system, in %.

## 5.5 Requirements

The reported average results shall not exceed the maximum values given in the detail specification.

## 5.6 Details to be specified

The detail specification shall include the following:

- test temperature;
- duration of test;
- type of cone to be used if differing from that of 5.3 c)1);
- number of samples to be tested;
- maximum allowed bleeding and evaporation.

## 5.7 Details to be reported

The test report shall include the following:

- test temperature;
  - duration of test;
  - type of cone if differing from that of 5.3 c)1);
  - number of samples tested;
  - result value(s) of bleeding or evaporation, or both.
-

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