

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Boxes and enclosures for electrical accessories for household and similar fixed electrical installations –
Part 21: Particular requirements for boxes and enclosures with provision for suspension means**

**Boîtes et enveloppes pour appareillage électrique pour installations électriques fixes pour usage domestique et analogue –
Partie 21: Règles particulières concernant les boîtes et enveloppes avec dispositifs de suspension**





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INTERNATIONAL STANDARD

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REDLINE VERSION

VERSION REDLINE



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**BOXES AND ENCLOSURES FOR ELECTRICAL ACCESSORIES FOR
HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –**

**Part 21: Particular requirements for boxes and enclosures
with provision for suspension means**

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60670-21 edition 1.1 contains the first edition (2004-04) [documents 23B/742/FDIS and 23B/746/RVD] and its amendment 1 (2016-02) [documents 23B/1198/FDIS and 23B/1203/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60670-21 has been prepared by subcommittee 23B: Plugs, socket-outlets and switches, of IEC technical committee 23: Electrical accessories.

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

This part of IEC 60670 shall be used in conjunction with IEC 60670-1. It lists the changes necessary to convert that standard into a specific standard for boxes and enclosures with provision for suspension means.

When a particular subclause of Part 1 is not mentioned in this part, that subclause applies as far as reasonable.

In this publication,

- the following print types are used:
 - requirements proper: in roman type;
 - *test specifications: in italic type;*
 - notes: in smaller roman type;
- subclauses, figures, tables or notes which are additional to those in Part 1 are numbered starting from 101, table footnotes additional to those in Part 1 are lettered aa, bb etc.

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or [IEC 60670-21:2004](#)
- amended.

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BOXES AND ENCLOSURES FOR ELECTRICAL ACCESSORIES FOR HOUSEHOLD AND SIMILAR FIXED ELECTRICAL INSTALLATIONS –

Part 21: Particular requirements for boxes and enclosures with provision for suspension means

1 Scope

This clause of Part 1 is applicable with the following modification:

Addition after the fourth paragraph:

This standard applies to boxes and enclosures with provision for suspension means.

2 Normative references

This clause of Part 1 is applicable.

3 Definitions

This clause of Part 1 is applicable with the following modification:

Addition:

3.101

box for suspension means

box intended to be used for suspending loads and which accepts the suspension means

3.102

suspension means

means comprising any necessary components (hooks, brackets, etc.) which may be delivered with the box and enclosure or supplied separately (see Figure 101)

4 General requirements

This clause of Part 1 is applicable.

5 General notes on tests

This clause of Part 1 is applicable.

6 Ratings

Void.

7 Classification

This clause of Part 1 is applicable with the following modification:

Addition to Table 1:

7.101 The provision for suspension means: ^{aa}	7.101.1 For suspension of a luminaire	
	7.101.2 For suspension of a ceiling fan.	
^{aa} The suspension means may be provided with the box or not.		

8 Marking

This clause of Part 1 is applicable with the following modification:

8.1

Addition after item j):

- k) the mass in kg, if the test force declared by the manufacturer is greater than 250 N for boxes and enclosures classified according to 7.101.1.

NOTE 1 In the following countries boxes for luminaire support are marked "For luminaire support". Where boxes are intended to support a mass greater than 15,8 kg, the mass is to be marked: US.

NOTE 2 In Denmark shall the marking in kg reflect a safety factor of 5 times.

9 Dimensions

This clause of Part 1 is applicable.

[IEC 60670-21:2004](https://standards.iteh.ai/catalog/standards/iec/708fb0ad-e25f-4dc8-b8a3-e13c02ac5f20/iec-60670-21-2004)

<https://standards.iteh.ai/catalog/standards/iec/708fb0ad-e25f-4dc8-b8a3-e13c02ac5f20/iec-60670-21-2004>

10 Protection against electric shock

This clause of Part 1 is applicable with the following modification:

Addition:

Conductive parts of suspension means inside the box or enclosure shall be:

- protected by a layer of insulating material which complies with the tests for insulating linings, or
- located such that it will not come in contact with electrical conductors or live parts, or
- reliably connected to the earthing means complying with requirements of 11.1 when fitted as for normal use.

11 Provision for earthing

This clause of Part 1 is applicable.

12 Construction

This clause of Part 1 is applicable with the following modification:

Addition:

12.101 Unless otherwise declared by the manufacturer, screws for fixing accessories and/or covers are not considered as provision for suspension means.

13 Resistance to ageing, protection against ingress of solid objects and against harmful ingress of water

This clause of Part 1 is applicable.

14 Insulation resistance and electric strength

This clause of Part 1 is applicable.

15 Mechanical strength

This clause of Part 1 is applicable with the following modification:

Addition:

15.101 Boxes and enclosures with provision for suspension means

Boxes and enclosures with provision for suspension means shall withstand the thermal and mechanical stresses occurring in normal use.

Boxes and enclosures with provision for suspension means according to

- 7.101.1 shall comply with the requirements in 15.101.1 and 15.101.2;
- 7.101.2 shall comply with the requirements in 15.101.3.

15.101.1 Boxes and enclosures which are intended for suspension of loads from a ceiling shall withstand a test force of 250 N or the higher test force Y declared by the manufacturer.

NOTE 1 In the following countries there is no requirement for all boxes and enclosures for suspension means to withstand 250 N and no requirement for non-metallic boxes and enclosures to withstand 90° C: UK.

NOTE 2 In Denmark shall the test force Y correspond to 5 times the marking in kg as required in item k) of 8.1.

NOTE 3 In Spain, there are no requirements for all boxes and enclosures for suspension means to withstand 90 °C.

Compliance is checked by the following test.

The specimen is fitted with a suspension means and installed as for normal use according to the manufacturer's instructions, any screw being tightened to two-thirds of the torque given in the relevant column of Table 4.

Greater values of torque may be used if so declared by the manufacturer, when the relevant information is provided.

The suspension means is then loaded with a weight of (250 ± 5) N or with a weight $(Y \pm 2 \%)$ N declared by the manufacturer, whichever is the higher, for 24 h.

For boxes and enclosures according to 7.1.1 and 7.1.3 the test is performed in a heating cabinet at (90 ± 2) °C.

For boxes and enclosures according to 7.1.2 and 7.1.4 the test is performed at ambient temperature.

NOTE 4 In the following country the test of this clause shall be carried out at (80 ± 2) °C instead of (90 ± 2) °C: NL.

During the test, the box and the enclosure or the suspension means shall not become detached and the specimen shall show no damage which leads to non-compliance with this standard.

15.101.2 Boxes and enclosures which are intended to be used in or on a wall shall withstand a test force of 100 N or the higher test force Y declared by the manufacturer.

NOTE 1 This means may be screws otherwise intended for fixing a part of the box, for example the cover or cover plate.

NOTE 2 In the following countries there is no requirement for all suspension means to withstand 100 N: UK.

Compliance is checked by inspection and by the following test.

The box or the enclosure including covers and cover plates (if any) shall be installed as for normal use according to the manufacturer's instructions and shall be placed in a heating cabinet, any screw being tightened to two-thirds of the torque given in the relevant column of Table 4.

A force, equally distributed between each means if more than one, of (100 ± 5) N or of $(Y \pm 2 \%)$ N declared by the manufacturer, is then applied for 24 h at (40 ± 2) °C perpendicularly to the wall.

~~*For boxes and enclosures according to 7.1.1 and 7.1.3 the test is performed at (40 ± 2) °C.*~~

During the test, the box or enclosure or the suspension means shall not become detached and the specimen shall show no damage which leads to non-compliance with this standard.

15.101.3 Boxes and enclosures which are intended to support a ceiling fan shall withstand the thermal and mechanical stress occurring in normal use.

During the test the box or enclosure or its supporting means shall not be pulled loose from the test structure when subjected to the following tests.

One specimen shall be tested in each of the horizontal and inclined positions.

A specimen shall be mounted in accordance with the manufacturer's instructions to a supporting test structure so as to be tested while both in a horizontal position and inclined 30° from the horizontal with the mounting screws perpendicular to the ceiling and the fan blades parallel to the floor (see Figure 102).

A test fan having four blades with a diameter of $(1\,320 \pm 25)$ mm, weighing or ballasted to a weight of (155 ± 5) N (corresponding to a mass of $(15,8 \pm 0,5)$ kg) or the rated load Y declared by the manufacturer, whichever is higher, shall be used for the tests. A 0,392 N (corresponding to a mass of 40 g) imbalance shall be placed at the centre of gravity of one blade, measured independently from the test fan.

The test fan shall be provided with a downrod of rigid metal pipe of a length sufficient to position the lower end of the fan blades (305 ± 25) mm below the surface of the ceiling after mounting. The downrod shall be welded at the upper end to a 7,9 mm thick fan mounting bracket.

The test fan mounting bracket shall be secured to the box or enclosure in accordance with the manufacturer's instructions. Screws or nuts shall be tightened with a torque given in the relevant column in Table 4. A universal type joint mounting construction shall not be used for the test. The fan motor shall be such that the speed can be controlled.

The speed of the test fan shall be adjusted to maintain a blade tip speed of 1 220 m/min (294 r/min).

The blade pitch shall be reduced to a minimum. The fan shall operate continuously at the prescribed speed for (24^{+1}_0) h.

At the end of the 24 h, one of the cover retaining screws or nuts shall be loosened two full turns and the fan shall operate as specified for an additional 24 h for each mounting condition, horizontal and inclined. This additional test is not required for constructions that employ cover retaining or fan mounting screws with captive, locking type washers or locknuts.

Additionally, there shall be no stripping of threads, cracking, crazing, breaking, or visible damages to the box or enclosure or its supporting means (other than bending).

16 Resistance to heat

This clause of Part 1 is applicable.

17 Creepage distances, clearances and distances through sealing compound

Void.

18 Resistance of insulating material to abnormal heat and to fire

This clause of Part 1 is applicable.

19 Resistance to tracking

[IEC 60670-21:2004](https://standards.iteh.ai/iec/708fb0ad-e25f-4dc8-b8a3-e13c02ac5f20/iec-60670-21-2004)

<https://standards.iteh.ai/iec/708fb0ad-e25f-4dc8-b8a3-e13c02ac5f20/iec-60670-21-2004>

This clause of Part 1 is applicable.

20 Resistance to corrosion

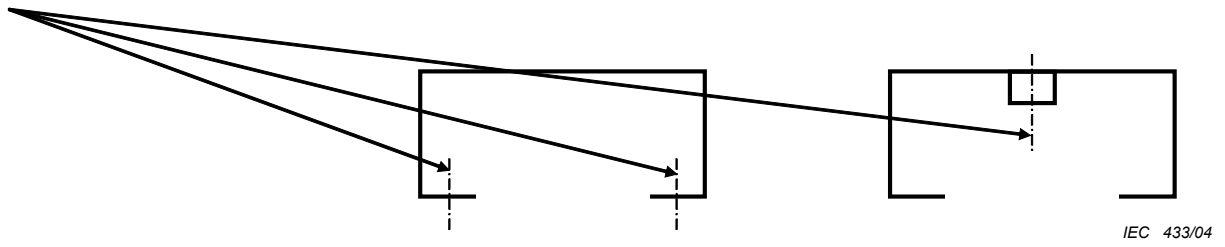
This clause of Part 1 is applicable.

21 Electromagnetic compatibility

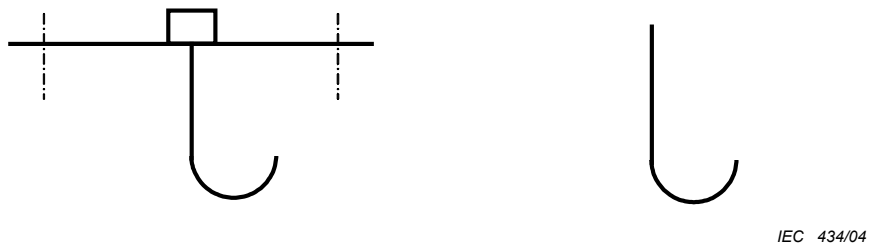
This clause of Part 1 is applicable.

a) Box provided with provision for suspension means

Example of provision for suspension means



b) Suspension means



c) Box and enclosure delivered with suspension means

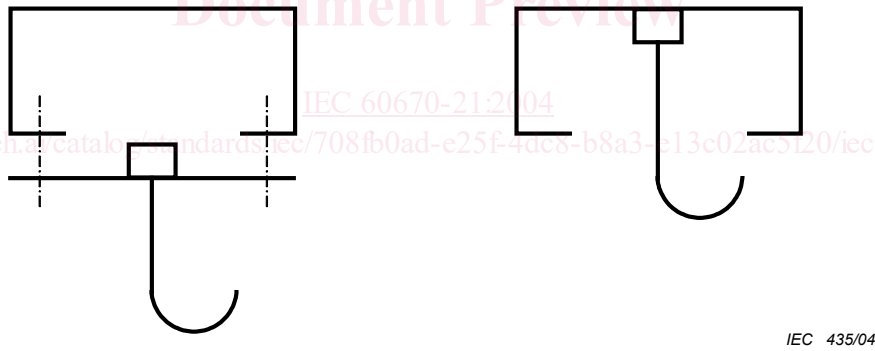


Figure 101 – Examples of suspension means