BRITISH STANDARD

BS EN
60570:2003

Electrical supply track systems for luminaires

The European Standard EN 60570:2003 has the status of a British Standard

ICS 29.120.20; 29.140.40

BSI
British Standards

National foreword

This British Standard is the official English language version of EN 60570:2003. It was derived by CENELEC from IEC 60570:2003. It supersedes BS EN 60570:1997 and BS EN 60570-2-1:1995 which will be withdrawn on 2010-03-01.

The CENELEC common modifications have been implemented at the appropriate places in the text and are indicated by tags (e.g. 〈C〉 〈C〉)

The UK participation in its preparation was entrusted to Technical Committee CPL/34/4, Luminaires, 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

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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EUROPEAN STANDARD **EN 60570**

NORME EUROPÉENNE

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English version

Electrical supply track systems for luminaires
(IEC 60570:2003, modified)

Systèmes d'alimentation électrique par rail pour luminaires (CEI 60570:2003, modifiée)

Elektrische Stromschienensysteme für Leuchten (IEC 60570:2003, modifiziert)

This European Standard was approved by CENELEC on 2003-03-18. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

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CENELEC
European Committee for Electrotechnical Standardization
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Foreword

The text of document 34D/770/FDIS, future edition 4 of IEC 60570, prepared by SC 34D, Luminaires, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote. Together with existing common modifications in EN 60570:1996, it was approved by CENELEC as EN 60570 on 2003-03-18.

This European Standard supersedes EN 60570:1996 + A1:1998 + A2:2000 and EN 60570-2-1:1994 + A1:1996.

This standard is to be used in conjunction with EN 60598-1.

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) 2004-02-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2010-03-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 60570:2003 was approved by CENELEC as a European Standard with agreed common modifications.

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CONTENTS

ELECTRICAL SUPPLY TRACK SYSTEMS FOR LUMINAIRES

1 Scope

This International Standard applies to the following track systems with two or more poles for the connection of luminaires to the electrical supply consisting of, either

– a system with a rated voltage not exceeding 440 V between poles (live conductors) with provision for earthing (class I) and a rated current not exceeding 16 A per conductor, or

– a SELV system with a rated voltage not exceeding 25 V without provision for earthing (class III) and a rated current not exceeding 25 A per conductor, or

– a combination of the two systems mentioned above (mixed supply system) for the connection of both mains voltage luminaires (class I or II) and SELV supplied luminaires (class III) simultaneously, but in different sector openings (mains or SELV).

The track systems may also provide for the mechanical support of the luminaires.

It applies to track systems designed for ordinary interior use for mounting on, or flush with, or suspended from walls and ceilings. These track systems are not intended for locations where special conditions prevail as in ships, vehicles and the like and in hazardous locations, for example, where explosions are liable to occur.

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 60417-2, *Graphical symbols for use on equipment – Part 2: Symbol originals*

IEC 60598-1:1999, *Luminaires – Part 1: General requirements and tests*

IEC 61032:1997, *Protection of persons and equipment by enclosures – Probes for verification*

3 Terms and definitions

For the purposes of this standard, the definitions of section one of IEC 60598-1 apply, together with the following definitions.

NOTE The use of the term luminaire (see IEC 60598-1) hereinafter also includes components of the luminaire track system.

3.1
luminaire track system
system, including a track with conductors, for the connection of luminaires to an electrical supply in a range of different positions determined only by the length and location of the track and comprising some or all of the components defined in 3.2 to 3.14 (see also Figure 1)

3.2
track
generally linear assembly of conductors within a housing providing the electrical connection and in most instances mechanical support of luminaires

NOTE Luminaires can be positioned or repositioned along the length of track in a simple manner (that is, without the use of tools).

3.3
track* coupler
component enabling electrical or mechanical connection to be made between tracks, but electrically only on the same sector opening (mains voltage or SELV)

3.4
track* supply connector
component used for the electrical connection of a supply to the track system, but always operating on one sector opening only

NOTE 1 The function of a coupler and a track supply connector may be combined.

NOTE 2 For the SELV sector, the track supply connector may incorporate a SELV convertor or safety isolating transformer supplied directly from the mains voltage sector.

3.5
luminaire supply connector
component for the electrical connection of a luminaire to the track. A connector does not provide mechanical connection of a luminaire to the track

The electrical connection shall operate on one sector only (mains or SELV)

3.6
track* adaptor
component used for the electrical and mechanical connection of a luminaire to the track, but electrically and mechanically only on the same sector opening (mains voltage or SELV)

NOTE An adaptor may incorporate a switch or a fuse.

3.7
track* suspension device
component used for the mechanical connection of the track system to the supporting surface

3.8
luminaire suspension device
component used for the mechanical connection of a luminaire to the track

3.9
end cover
component intended to be fixed at the end of a track, providing electrical and mechanical protection of the ends of the conductors

3.10
class I track
generally linear assembly of conductors and housing designed to be operated from a mains voltage supply providing the electrical connection and in most instances mechanical support of class I and class II luminaires only.

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* The word ‘track’ is occasionally not repeated in the text of the standard where these definitions are used.

3.11
class III track
generally linear assembly of conductors and housing designed to be operated from a SELV supply providing the electrical connection and in most instances mechanical support of class III luminaires only

NOTE A class III SELV supplied system or a SELV sector opening need not have insulation to protect against contact with current-carrying parts, due to its inherently safe nature.

3.12
mixed supply track system – classes I and III
combination of tracks according to 3.10 and 3.11

3.13
rated current
current assigned to the track or the component by the manufacturer

3.14
track* sector opening
opening in the track enabling the electrical connection of the adaptor or the luminaire supply connector to the track conductors

4 Classification

Luminaire track systems shall be either class I, class III or a mixed supply track system with class I and class III sectors in accordance with the provisions of section two of IEC 60598-1.

Track systems shall only be classified as ordinary.

Luminaire/adaptor assemblies that are inseparable can be class II in accordance with the provisions of section two of IEC 60598-1 provided they contain no earthing facilities.

Separate adaptors shall not be classified as class II, but may be used with class II luminaires.

5 General test requirements

5.1 The requirements and tests of this standard shall not be applied to equipment already subject to its own separate IEC standard.

5.2 Tests according to this standard are type tests.

One test sample as described in 5.3 shall be subjected to all relevant tests.

In order to reduce the time of testing and to allow for any tests which may be destructive, the manufacturer may submit additional samples or parts of samples provided that these are of the same materials as the original sample and that the results of the test are the same as if carried out on a single sample.

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* The word ‘track’ is occasionally not repeated in the following text where these definitions are used.

5.3 Unless otherwise specified, the sample is tested as delivered and under the most unfavourable conditions of use taking into account the manufacturer's instructions, at an ambient temperature of between 10 °C and 30 °C.

The minimum test sample of a class I or a class III track shall include the following items. For a mixed supply system the minimum sample quantities stated are required for both class I and class III sectors:

a) where a track system provides for interconnection between track lengths, at least 3 sections of track comprising a total length when assembled together of not less than 2,4 m and including 1 section of maximum length as indicated in the manufacturer's literature. Where interconnection is not provided for, only 1 track section of maximum length is required;

b) 1 track supply connector;

c) 1 end cover (if required);

d) 1 coupler per length of track supplied (if applicable) (minimum of 3);

e) 1 adaptor per length of track supplied (minimum of 3);

f) 1 luminaire supply connector per length of track supplied (if applicable) (minimum of 3);

g) the necessary suspension devices and any other components as specified by the manufacturer in his installation instructions;

h) a typical luminaire representing the most unfavourable combination from a testing point of view for the purpose of the test of clause 11;

i) additionally with a class III test sample, one selection of track of each type of class I track made by the same manufacturer.

NOTE Item i) is required for the tests of 8.1.1 when testing a class III track.

5.4 Unless otherwise specified, the tests are carried out in the order of the clauses.

6 Marking

The provisions of section three of IEC 60598-1 apply together with the requirements in 6.1 to 6.7.

6.1 The track shall be marked with rated current (A), rated voltage (V) and the graphical symbol IEC 60417-5180 for class III equipment if appropriate.

A mixed supply system shall be marked with rated current (A), rated voltage (V) on the mains voltage sector and on the SELV sector respectively. The SELV sector shall also be marked with the symbol for class III.

6.2 Adaptors need only be marked with their rated current, rated voltage, manufacturer's name or trade mark and type reference and the graphical symbol IEC 60417-5180 for class III equipment if appropriate.

Adaptors and luminaire supply connectors incorporated in luminaires do not require marking additional to that of the luminaire.

If the adaptor has a fuse incorporated, the rated current and type of fuse shall be marked on the body of the adaptor.

6.3 Couplers and connectors need only be marked with the manufacturer's name or trade mark and type reference and the graphical symbol IEC 60417-5180 for class III equipment if appropriate.

Luminaire supply connectors not incorporated in the luminaire shall, in addition, be marked with rated current and rated voltage.

6.4 Marking of the rated current and the rated voltage of the track system shall be easily discernible during and after installation of the track system.

〖C〉 *Text deleted* 〈C〗

6.5 In addition to the above markings the following details, if they are necessary to ensure proper use and maintenance, shall be given either on the luminaire track system or in the manufacturer's instructions supplied with it:

a) details of the maximum mechanical loading for which each section of the track system and luminaire suspension devices are suitable, inclusive of the weight of luminaires and accessories. In addition, a warning that the mechanical loading shall be intended as the complete loading of the whole system.

b) a warning if the components are unsuitable for the connection of inductive loads, or de-rating for inductive loads if appropriate;

c) the maximum permissible track temperature under normal operating conditions if different from 70 °C;

d) a warning that it is the user's responsibility to ensure electrical, mechanical and thermal compatibility between the track system and luminaires attached to it.

Mounting instructions supplied with the adaptor shall state the track system on which it may be used and warnings shall be given that the use is limited to the track system specified.

〖C〉 Instructions related to safety shall be in a language which is acceptable in the country in which the equipment is to be installed. 〈C〗

6.6 In addition to the above markings and information, the following details shall be given in the manufacturer's instructions supplied with class III and mixed supply track systems;

a) a warning that the class III system or sector opening should only be connected to a SELV supply designed for operating class III equipment;

b) where there is an associated safety isolating transformer, adequate instruction regarding the correct method of connection of the transformer terminals to avoid misinterpretation of the primary and secondary terminals;

c) a warning that class III luminaire track systems/sectors openings and components are not compatible with class I track systems and that class III luminaire connectors/adaptors should not be used on other manufacturer's track systems;

d) instructions concerning suitable means for overload and short-circuit protection of the SELV circuit;

NOTE The means of protection should meet the requirements of IEC 60364-7-715: *Electrical installations of buildings – Extra-low voltage lighting installations*.

e) the minimum cross-sectional area and maximum length of the supply cable between transformer and track supply connector.

6.7 The instruction leaflet for class III track systems/sector openings shall contain the following warning:

CAUTION: TO REDUCE THE RISK OF OVERHEATING AND FIRE
DO NOT BRIDGE CONDUCTORS

7 General requirements and ratings

Track systems shall be so designed and constructed that in normal use they function safely and minimize the risk of danger to persons and surroundings.

In general, compliance is checked by carrying out all tests specified.

The rated voltage between poles for a class I track system shall not exceed 440 V and for a class III system the rated voltage shall not exceed 25 V. The current rating for a class I track system shall be maximum 16 A and for a class III system it shall be maximum 25 A. For a combined system the rated current of each sector opening shall not exceed the values given for a class I or a class III system respectively.

Compliance is checked by inspection.

8 Construction

The provisions of section four of IEC 60598-1 apply together with the requirements in 8.1 to 8.12.

8.1 Components for class I tracks shall be so designed that there is no risk of accidental contact between the earthing contact of the component and the current-carrying parts of the track during insertion and removal by the user.

This requirement does not apply during installation of the track system.

8.1.1 Adaptors, couplers and supply connectors shall be so constructed that electrical connection with systems/sectors openings of other classes of tracks made by the same manufacturer is effectively prevented.

8.2 Class I adaptors shall incorporate provision for mechanical connection to the track such that the weight of the adaptor and/or luminaire is not supported by the electrical connections of the adaptor and track.

The requirements of 16.3 shall also apply.

Class III adaptors shall incorporate provision for mechanical connection to the track such that the weight of the adaptor and/or luminaire cannot impair electrical connection and safety.

8.2.1 When fuses are incorporated in adaptors they shall be of the high-breaking capacity type.

8.3 Contacts of adaptors shall not be removable without dismantling the adaptor. Also, it shall not be possible to replace the earthing pins or contacts in an incorrect position and this provision shall also apply to neutral pins or contacts where this is a safety requirement of the method of construction of the system.

Where luminaires meet the requirements of class II and are provided with an integral adaptor for connection to track systems, the adaptor may incorporate an earthing contact provided that, when connected to the track, the requirements of class II for the luminaire are maintained.

Compliance is checked by inspection and by the electric strength test of 15.1.

8.4 Couplers, track supply connectors and end covers shall be capable of being mechanically locked to the track. Couplers, connectors and adaptors shall ensure reliable electrical connection.

Compliance with the requirements in 8.1 to 8.4 is checked by inspection, manual test and where appropriate by the test in 12.1.

Compliance of 8.1.1 is checked by attempting to insert the adaptors, couplers and connectors into the different samples of the track system/sector openings. There shall be no electrical connection made.

8.5 Adjacent lengths of track shall be mechanically locked together in one of the following ways:

a) with the aid of couplers;

b) by other separate means using the couplers only to align the tracks;

c) by rigidly fixing the length of track directly to the supporting surface in which case the electrical contact shall be reliable when the ends of the track sections are separated longitudinally by 1 mm and when they are separated by 1 mm at right angles to the supporting surface.

NOTE A spacing at right angles to the supporting surface is specified in order to take account of unevenness of the surface.

Compliance is checked by carrying out the tests with the track in this position.

8.6 Mechanical suspensions shall have adequate factors of safety. The tests in 4.14.1 of IEC 60598-1 shall be replaced by the following tests for luminaire track system suspensions.

Compliance is checked by the following tests:

To test the suspension of both track and luminaires, suspension devices for luminaires, including adaptors, are mounted on the track as in normal use and are subjected for 1 h to a load equal to 5 times the specified load as claimed by the manufacturer, with a minimum value of 50 N. This test shall be made at a temperature of t_a of the track +15 °C.

After the test, the components, the track and its fixing devices shall not be deformed to such an extent as would impair safety and the components shall not have become detached from the track.

For the purpose of the following bending test, which is an additional test of luminaire suspension devices, the track is mounted on a horizontal surface.

The test shall be made at a temperature of t_a of the track +15 °C.

A bending moment of 2,5 Nm is then applied to the luminaire suspension device, the force being applied for 1 min in a direction parallel to the track axis and for 1 min in a direction perpendicular to this axis.

After the test, the luminaire suspension device and other parts of the track system shall not be deformed to such an extent as would impair safety and the suspension device shall not have become loose.

NOTE Additional tests may be required for track systems designed for use in low-temperature areas.

8.7 Tracks shall have adequate mechanical robustness.

Compliance is checked by the following test:

A force of 30 N is applied to metal parts enclosing live parts by means of a test finger according to Figure 6 of IEC 61032. During the test, the clearance distance between metal parts and live parts shall be not less than the values given in clause 9.

8.8 Polarity

Where necessary for the correct operation of the system, means shall be provided throughout to ensure that the correct polarity is maintained.

Compliance is checked by inspection.

8.9 Mechanical/electrical endurance

Components shall withstand, without excessive wear and other harmful effects, the mechanical, electrical and thermal stresses occurring in normal use.

For adaptors and luminaire supply connectors, compliance is checked by the following tests in which "an operation" is either the insertion or withdrawal of an adaptor or the making or breaking of an electrical contact at a speed which corresponds to practical usage.

a) The mechanical support system is checked by 100 operations.

b) Electrical contacts which operate simultaneously with the mechanical fixing devices are checked by 100 operations in the same position on the track.

c) Electrical contacts which are operated independently from the mechanical fixing devices are checked by 1 000 operations. After each 100 operations the contacts shall be moved to a fresh position on the track. This test is applicable only to adaptors.

d) Where the luminaire supply connector or adaptor for a class III track system/sector is designed to be positioned along the axis of the track without being removed, it shall be subject to 150 cycles of operation as described in 4.14.3 of IEC 60598-1.

The tests of items b) and c) are made with a.c. at rated voltage and the test current shall be 1,25 times the rated current of the component. The power factor of the load shall be approximately 0,6 unless a different current rating is marked for resistor loads which are then tested with a.c. in a non-inductive circuit. For class III systems, the power factor is taken as 1,0.

NOTE In the case of a dual rating (see item b) of 6.5), the more onerous condition should be applied.

If an air core inductor is used for the 0,6 power factor load, a resistor taking approximately 1 % of the current through the inductor is connected in parallel with it. Iron core inductors may be used, provided the current is of substantially sinusoidal waveform. No current is passed through the earthing circuit.

After the test, the samples shall withstand an electric strength test made in accordance with 10.2 of IEC 60598-1, the test voltage however, being reduced to 1 500 V for components operating at mains supply voltage and to 500 V for components operating at SELV.

The samples shall show:

a) no wear impairing their further use;

b) no deterioration of enclosures or barriers;

c) no loosening of electrical or mechanical connections.

Before and after the tests of this clause, the adaptor shall be mounted on the track and the contacts loaded with 1,5 times the rated current of the adaptor. The voltage drop across each contact, including the earth contact, shall not exceed 50 mV.

8.10 Short-circuit protection

8.10.1 For class I system/sector openings it shall not be possible to bridge track conductors with the test probe D, according to IEC 60598-1.

Compliance is checked by the test of 9.2.0 of IEC 60598-1, using the test probe D application force shown in Table 9.1.

8.10.2 The SELV class III track system/sector opening shall incorporate means to prevent accidental short circuits between current-carrying parts of different polarity in the output circuit.

Adequate means shall be provided to prevent impairing of safety due to unintended short-circuiting of uninsulated accessible SELV conductors of opposite polarity by the test chain described in 4.26.3 of IEC 60598-1.

NOTE 1 Class III luminaires supplied from a separate unspecified SELV supply should have at least one conductor insulated. Where insulation is not provided, the luminaire manufacturer should declare the maximum VA output of the SELV source and the test should be conducted at this value.

NOTE 2 If the test chain cannot be hung on the track by itself, the test sample is deemed to comply with the test requirement.

Compliance is checked by the test of 4.26.2 of IEC 60598-1.

8.11 The opening in the insulating liner of a class I track/track sector giving access to the conductor shall have a maximum dimension of 3,0 mm and the conductor shall be recessed into the insulating liner by at least 1,7 mm. The contacts of class III adaptors shall have a minimum dimension of 3,5 mm in any orientation that can be presented to the conductor opening in the insulating liner of any class I track/track sector.

NOTE For clarity, the dimensions of the class I tracks and the class III adaptor contacts are measured in the positions shown in Figures 2 and 3.

Compliance is checked by measurements.

8.12 Care shall be taken in the design and manufacture of adaptors for use with a particular track system to ensure interchangeability and safety in use. In particular, no connections between live conductors and earth conductors shall be possible.

Tests shall be conducted with approved track samples retained by the test house or samples of the approved track provided by the manufacturer.

The track and adaptor shall comply with all appropriate parts of the standard.

Compliance is checked by inspection and measurements.

9 Creepage distances and clearances

The provision of section eleven of IEC 60598-1 apply but with the modifications in 9.1 and 9.2.

9.1 For rewirable connectors and adaptors the measurements are made with and without conductors of the largest cross-sectional area connected to the terminals.

For non-rewirable connectors and adaptors the measurements are made on the sample as delivered.

Components are checked when wired and installed as in normal use and electrical connection is made.

9.2 For a mixed supply system the creepage distances and clearances between conductors of mains voltage sector opening and SELV sector opening shall comply with Table 11.1 of IEC 60598-1 regarding class II constructions for the maximum working voltage used.

10 Terminals

The provisions of sections fourteen and fifteen of IEC 60598-1 apply except that the use of terminals mounted on floating contacts shall not be precluded provided their movement does not impair correct operation.

Compliance is checked by inspection.

11 External and internal wiring

The provisions of section five of IEC 60598-1 apply but with the following modification:

A non-detachable cable or cord shall only be connected to a track section which cannot be extended by other sections.

The cross-sectional area of the cable conductors must be compatible with the rated current of the track section.

Compliance is checked by inspection.

12 Thermal endurance and operating temperatures

Luminaire track systems shall have adequate thermal endurance and shall not attain excessive temperatures in conditions of normal use.

Compliance shall be checked by the tests in 12.1 to 12.3

12.1 Current-carrying parts of the track as installed shall be so designed as to prevent excessive temperatures due to the passage of current.

Compliance is checked by the following test:

A typical luminaire in accordance with 0.4.2 of IEC 60598-1 and chosen to represent the most onerous situation designed to be used with the track shall be mounted on it in the most unfavourable position of normal use and electrically connected to it. The track shall be further electrically loaded so as to pass a total current, including the current to the luminaire, equal to its rated current, until a condition of thermal stability is reached or for 1 h whichever is the longer.

Typical luminaires are mounted on the class I and class III sector openings.

The test shall be made at a temperature equal to the t_a of the track or at 25 °C if t_a is not marked.

The highest temperature of any part of the track shall be determined and the value obtained shall not exceed the manufacturer's stated maximum track temperature under normal operating conditions.

12.2 Components of a track system shall not attain excessive temperatures in normal use. Temperatures of components excluding the track shall comply with the requirements of section twelve of IEC 60598-1.

12.3 The thermal endurance of the track shall be checked by the following tests:

12.3.1 *A 1,2 m length of track is mounted as in normal use, according to the manufacturer's installation instructions, in a heating cabinet which is maintained for 168 h at a temperature which is 10 °C in excess of the manufacturer's stated maximum track temperature under normal operating condition, with a minimum of 80 °C or the t_a of the track +55 °C, whichever is the greater.*

After the test, the track shall show no visible signs of deterioration and any shrinkage of the insulating liner shall be such that the track still complies with the relevant requirements of clause 8 and 13.1 (steel probe, test finger, test chain, etc.) and the track shall comply with the requirements of 15.1 (insulation resistance test).

12.3.2 *For Class III track/sector openings a typical luminaire in accordance with 0.4.2 of IEC 60598-1 and chosen to represent the most onerous situation designed to be used with the track shall be mounted on it in the most unfavourable position of normal use and electrically connected to it. For the supply cable the most unfavourable position shall be taken with the cable bent sharply at the inlet opening as far as possible as the design permits. The track shall be further electrically loaded so as to pass a total current, including the current to the luminaire, equal to its rated current.*

The track system is operated at its rated t_a plus 20 °C and the test is made in accordance with 12.3 of IEC 60598-1.

Following the test, in addition to complying with 12.3 of IEC 60598-1, the track supply connector and couplers (if any) shall be loaded with 1,5 times the rated current of the track system. The voltage drop across each contact of the connectors and/or couplers shall not exceed 22,5 mV.

13 Protection against electric shock

The provisions of section eight of IEC 60598-1 apply together with the requirements of 13.1 to 13.3, except where the track system/sector openings is classified class III for operation from a SELV supply.

13.1 Additionally, for track, compliance with 8.2.5 of IEC 60598-1 shall be checked by the application of the test probe D, according to Table 9.1 of IEC 60598-1.

Compliance is checked by carrying out the test with the probe applied in every possible direction. During the test the probe shall not touch live parts.

13.2 Adaptors shall be so designed that live parts are not touchable when the adaptor is in partial or complete engagement and is wired as in normal use.

Compliance is checked by inspection and by a test with the standard test finger. This finger is applied in every possible position, if necessary with a force of 10 N, an electrical indicator being used to show contact with live parts. Movable parts are placed by hand in the most unfavourable position.

13.3 It shall not be possible to remove, by hand, track or component parts preventing access to live parts. The means for fixing these parts shall be insulated from live parts. For adaptors, the requirements of this subclause apply only when the adaptor is fitted to the track. If these parts are metallic, they shall not touch any of the live parts.

Compliance is checked by inspection and manual test.

14 Resistance to humidity

The provisions of 9.3 of section nine of IEC 60598-1 apply.

15 Insulation resistance and electric strength

The provisions of section ten of IEC 60598-1 apply but with the modifications of 15.1 to 15.3.

15.1 The insulation resistance measured according to 10.2.1 of IEC 60598-1 shall be not less than 100 MΩ divided by the length in metres of track under test, between live parts of different polarity and between live parts and the body and/or earthing conductors. (This replaces the values given in Table 10.1 of IEC 60598-1.)

15.2 The provisions in 10.3 of IEC 60598-1 do not apply.

15.3 For a mixed supply system the electric strength test between the mains voltage sector and the SELV sector shall be carried out using a 3 750 V test voltage.

16 Provision for earthing

The provisions of section seven of IEC 60598-1 apply but with the modification in 16.1 to 16.4.

This section applies to mains voltage class I track systems and the mains voltage sector opening of a mixed supply system only.

16.1 The test in 7.2.3 of IEC 60598-1 shall be made on the test sample, as specified in 5.3.

Compliance is checked by the following test:

The test shall be carried out at a current of at least 25 A, and the calculated resistance shall not exceed 0,1 Ω. Adaptors and luminaire supply connectors with current ratings of less than 6 A shall comply with the test in 7.2.3 of IEC 60598-1.

The voltage drop from which the resistance is calculated shall be measured between any 2 points of the installed system with 3 lengths of track, and in particular between the track supply connector and an adaptor placed farthest away from the supply, i.e. over at least 6 contact points of the earthing circuit.

16.2 All parts of the earthing system shall be such that there is no risk of corrosion, including oxidation, resulting from contact between the parts and the track earthing conductor, or any other metal that is in contact with it.

If the body of the track or enclosure is of aluminium or aluminium alloy, precautions shall be taken to avoid the risk of corrosion resulting from contact between copper and aluminium or its alloys.

16.3 For class I luminaires with detachable parts provided with connectors or similar connection devices, the earth connection shall be made before the current-carrying contacts are made and the current-carrying contacts shall separate before the earth connection is broken.

16.4 An earth continuity conductor shall extend the whole length of the track/sector. This conductor may be part of the mechanical construction of the track, provided that it is not possible to remove this part of the mechanical construction without at the same time interrupting the current supply.

〖C〉 *Text deleted* 〈C〗

Compliance with the requirements in 16.2 to 16.4 are checked by inspection and by test.

17 Resistance to heat, fire and tracking

The provisions of section thirteen of IEC 60598-1, excluding those in 13.4 apply except that the test in 13.2.1 of IEC 60598-1 for resistance to heat shall be as in 17.1 and 17.2.

17.1 Test for track

The test conditions and requirements shall be as in 13.2.1 of IEC 60598-1 except that 2 samples of the track insulation material about 100 mm long and of rectangular cross-section 10 mm wide and of a thickness equal to the minimum linear thickness used for insulation purposes within the particular track configuration shall be taken from different track lengths of the test sample. Where the track insulation is of insufficient size for the samples to be prepared and the test area to be unmachined, then test samples manufactured in the same material and by the same process shall be used. These samples shall be preconditioned as required in 12.3.

Both the track insulation samples shall comply with the test requirements, after the apparatus, with the sample in position, has been kept for 1 h in a heating cabinet at a temperature 10 °C in excess of the manufacturer's stated maximum track temperature under normal operating conditions, with a minimum of 80 °C or the t_a of the track +55 °C whichever is the greater.

17.2 Test for track components

The test conditions and requirements shall be as in 13.2.1 of IEC 60598-1 except that

a) parts of insulating material retaining live parts or current-carrying parts in position shall be tested at temperature equal to the t_a of the track +25 °C with a minimum temperature of 125 °C;

b) parts of insulating material providing protection against electric shock shall be tested at a temperature equal to the t_a of the track +25 °C with a minimum temperature of 80 °C.

NOTE Two samples of the actual product should be used for the test of 17.2. Where the product is of insufficient size, test samples manufactured in the same material and fashion should be provided by the manufacturer, on which to conduct the test. These samples should have been subjected to all previous tests as required by the standard.

Preparing a small complex-shaped product to give sufficient flat surface area by any normal method is likely to involve damaging the surface of that product. As such, its normal properties will be affected and this is not the intention of the test.

18 Terminals and connections for external wiring

For Class III track the provisions of 15.9.1 and 15.9.2 of IEC 60598-1 apply with the following modifications.

15.9.1.1

Replace the first paragraph by the following:

For all types of terminals (or connections), the test according to 15.9.1.3 is made with 10 solid copper non-insulated conductors or with conductors which are delivered by the manufacturer with the track system.

15.9.1.3

Add at the end of the first paragraph

The voltage drop is measured across each terminal and across each connection to the track conductor.

15.9.2.3

Replace the text by the following:

Terminals (or connections) with rated current up to and including 6 A are then subjected to the ageing test, without current of 25 cycles duration, each cycle comprising 30 min at the upper cycle temperature of T ± 5 °C or 80 °C ± 5 °C whichever is the higher, followed by a cooling-down period to a temperature between 15 °C and 30 °C.

Terminals (or connections) with rated current exceeding 6 A are subjected to an ageing test of 100 such cycles.

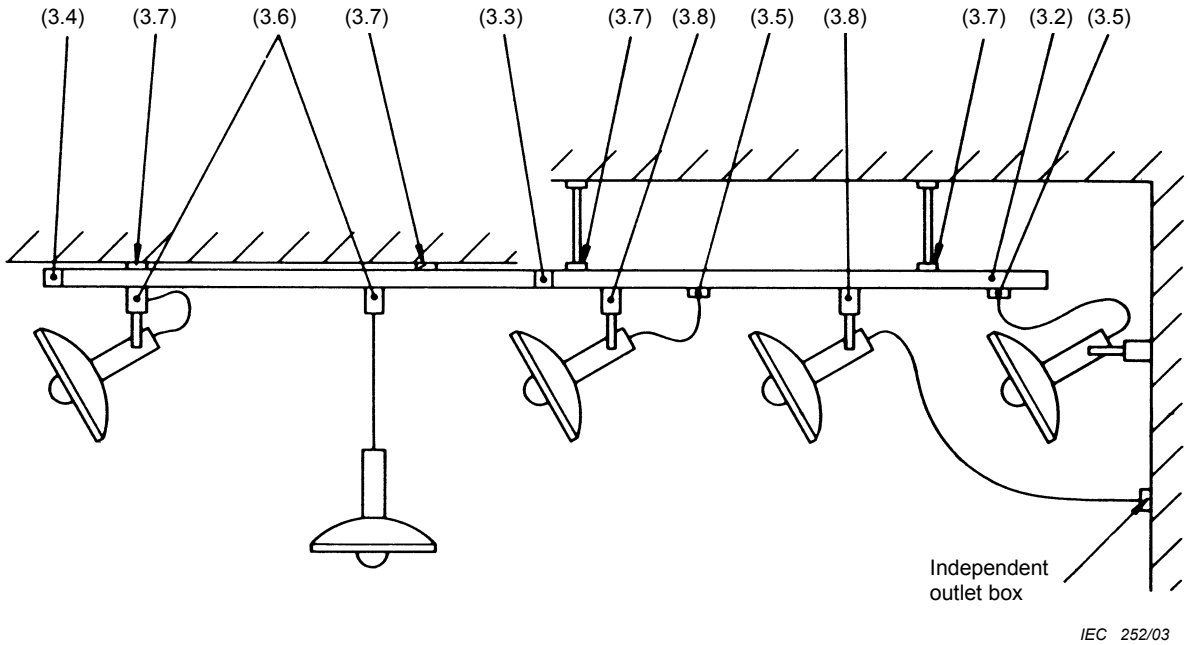
For the supply cable the most unfavourable position shall be taken with the cable bent sharply at the inlet opening as far as possible as the design permits.

NOTE The temperature T is the marked maximum rated temperature for *T*-marked components, such as lampholders.

15.9.2.4

Replace the text of the first line of the first paragraph by the following:

The voltage drop is measured across each terminal and across each connection to the track conductor:



3.2 Track.

3.3 Coupler.

3.4 Track supply connector – supply into track.

3.5 Luminaire supply connector – supply from track only.

3.6 Adaptor – Mechanical and electrical connection to track.

3.7 Track suspension device (to ceiling or to suspension tubes).

3.8 Luminaire suspension device – mechanical connection only to track.

NOTE This drawing is for guidance only; it does not prescribe design features.

Figure 1 – Luminaire track systems (definitions)

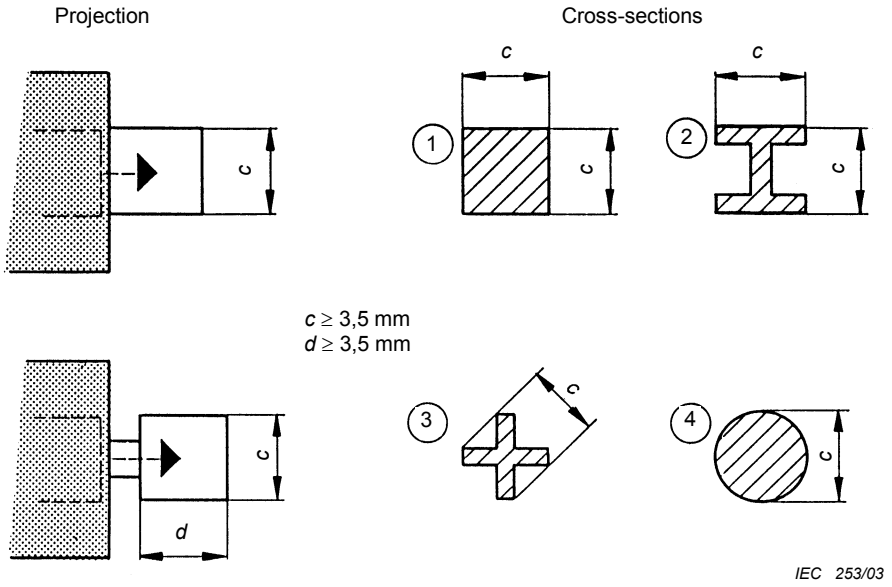


Figure 2 – Measurement positions for typical class III adaptor contacts

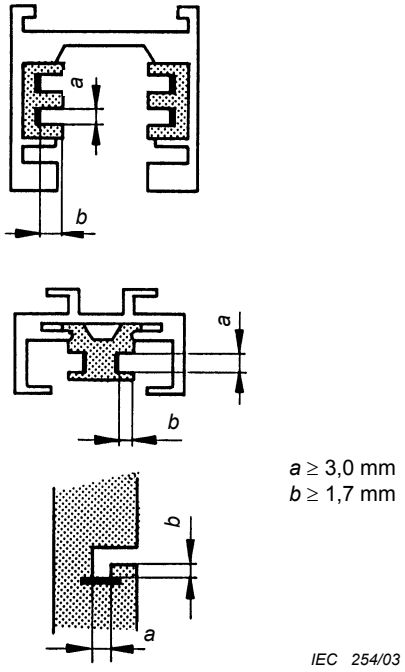


Figure 3 – Measurement positions for typical class I tracks

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60417-2	– [1)]	Graphical symbols for use on equipment Part 2: Symbol originals	EN 60417-2	– [1)]
IEC 60598-1 (mod)	1999	Luminaires Part 1: General requirements and tests	EN 60598-1 A11 A12	2000 2000 2002
IEC 61032	1997	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998

1) Undated reference.

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