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**Električne inštalacije zgradb - 4-42. del: Zaščitni ukrepi - Zaščita pred  
toplotnimi učinki**

Electrical installations of buildings - Part 4-42: Protection for safety - Protection  
against thermal effects

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**Installations électriques des bâtiments –**

**Partie 4-42:  
Protection pour assurer la sécurité –  
Protection contre les effets thermiques**

**Electrical installations of buildings –**

**Part 4-42:  
Protection for safety –  
Protection against thermal effects**

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CONTENTS

FOREWORD ..... 5

420.1 Scope ..... 7

420.2 Normative references ..... 7

421 Protection against fire ..... 9

422 Measures for protection against fire ..... 11

422.1 General ..... 11

422.2 Conditions of evacuation in an emergency ..... 11

422.3 Nature of processed or stored materials ..... 13

422.4 Combustible constructional materials ..... 15

422.5 Fire propagating structures ..... 15

423 Protection against burns..... 17

424 Protection against overheating ..... 17

424.1 Forced air heating systems ..... 17

424.2 Appliances producing hot water or steam ..... 17

Annex A (informative) IEC 60364 – Parts 1 to 6: Restructuring ..... 19

Table 42A – Temperature limits in normal service for accessible parts of equipment  
within arm’s reach ..... 17

Table A.1 – Relationship between restructured and original parts ..... 19

Table A.2 – Relationship between new and old clause numbering..... 23

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRICAL INSTALLATIONS OF BUILDINGS –****Part 4-42: Protection for safety –  
Protection against thermal effects**

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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International Standard IEC 60364-4-42 has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

The IEC 60364 series (parts 1 to 6), is currently being restructured, without any technical changes, into a more simple form (see annex A).

According to a unanimous decision by the Committee of Action (CA/1720/RV (2000-03-21)), the restructured parts of IEC 60364 have not been submitted to National Committees for approval.

The text of this second edition of IEC 60364-4-42 is compiled from and replaces

- part 4-42, first edition (1980),
- part 4-482, first edition (1982).

This publication has been drafted, as close as possible, in accordance with the ISO/IEC Directives, Part 3.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

## ELECTRICAL INSTALLATIONS OF BUILDINGS –

### Part 4-42: Protection for safety – Protection against thermal effects

#### 420.1 (421)<sup>1</sup> Scope

Persons, fixed equipment, and fixed materials adjacent to electrical equipment shall be protected against harmful effects of heat developed by electrical equipment, or thermal radiation, particularly the following effects:

- combustion or degradation of materials;
- risk of burns;
- impairment of the safe function of installed equipment.

NOTE Protection against overcurrent is dealt with in IEC 60364-4-43.

#### 420.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60364. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 60364 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60079-14:1996, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60332-1:1993, *Tests on electric cables under fire conditions – Part 1: Tests on a single vertical insulated wire or cable*

IEC 60332-3-10:2000, *Tests on electric cables under fire conditions – Part 3-10: Test for vertical flame spread of vertically-mounted bunched wires or cables – Apparatus*

IEC 60332-3-21:2000, *Tests on electric cables under fire conditions – Part 3-21: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A F/R*

IEC 60332-3-22:2000, *Tests on electric cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A*

IEC 60332-3-23:2000, *Tests on electric cables under fire conditions – Part 3-23: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category B*

IEC 60332-3-24:2000, *Tests on electric cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C*

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<sup>1</sup> In this standard, references in brackets refer to the previous numbering system.

IEC 60332-3-25:2000, *Tests on electric cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D*

IEC 60364-4-41: *Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-4-43: *Electrical installations of buildings – Part 4-43: Protection for safety – Protection against overcurrent*

IEC 60364-5-51: *Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules*

IEC 60614 (all parts), *Conduits for electrical installations*

## **421 (422) Protection against fire**

NOTE Fire terms and related tests are under consideration by co-operation between ISO and IEC. The terms used in this clause are provisional.

**421.1 (422.1)** Electrical equipment shall not present a fire hazard to adjacent materials

Any relevant manufacturer's erection instructions shall be observed in addition to the requirements of IEC 60364.

**421.2 (422.2)** Where fixed equipment may attain surface temperatures which could cause a fire hazard to adjacent materials, the equipment shall either:

- be mounted on or within materials which will withstand such temperatures and are of low thermal conductance, or
- be screened from elements of building construction by materials which will withstand such temperatures and are of low thermal conductance, or
- be mounted to allow safe dissipation of heat at a sufficient distance from any material on which such temperatures could have deleterious thermal effects, any means of support being of low thermal conductance.

**421.3 (422.3)** Where arcs or sparks may be emitted by permanently connected equipment in normal service, the equipment shall either:

- be totally enclosed in arc-resistant material, or
- be screened by arc-resistant material from building elements on which the arcs could have deleterious thermal effects, or
- be mounted to allow safe extinction of the arc at a sufficient distance from building elements on which the arc could have deleterious thermal effects.

Arc-resistant material used for this protective measure shall be non-combustible, of low thermal conductivity, and of adequate thickness to provide mechanical stability.

**421.4 (422.4)** Fixed equipment causing a focusing or concentration of heat shall be at a sufficient distance from any fixed object or building element so that the object or element, in normal conditions, cannot be subjected to a dangerous temperature.

**421.5 (422.5)** Wherever electrical equipment in a single location contains flammable liquid in significant quantity, precautions shall be taken to prevent burning liquid and the products of combustion of the liquid (flame, smoke, toxic gases) spreading to other parts of the building.

NOTE 1 Examples of such precautions are

- a drainage pit to collect leakages of liquid and ensure their extinction in the event of fire, or
- installation of the equipment in a chamber of adequate fire resistance and the provision of sills or other means of preventing burning liquid spreading to other parts of the building, such a chamber being ventilated solely to the external atmosphere.

NOTE 2 The generally accepted lower limit for a significant quantity is 25 l.

NOTE 3 For less than 25 l, an arrangement to prevent the escape of liquid will suffice.

NOTE 4 It is desirable to switch off supply at the onset of a fire.

**421.6 (422.6)** The materials of enclosures arranged around electrical equipment during erection shall withstand the highest temperature likely to be produced by the electrical equipment.

Combustible materials are not suitable for the construction of these enclosures unless preventive measures against ignition are taken, such as covering with non-combustible or not readily combustible material of low thermal conductivity.

## **422 (482) Measures for protection against fire**

### **422.1 (482.0) General**

The requirements of this clause shall be observed in addition to those of clause 421 for installations in locations where the conditions of external influences described in 422.2 exist.

### **422.2 (482.1) Conditions of evacuation in an emergency**

Condition BD2: Low density occupation, difficult conditions of evacuation  
BD3: High density occupation, easy conditions of evacuation  
BD4: High density occupation, difficult conditions of evacuation  
(according to table 51A of IEC 60364-5-51).

NOTE Authorities responsible for building construction, public gatherings, fire prevention, etc. may specify which BD condition is applicable.

**422.2.1 (482.1.1)** In conditions BD2, BD3 and BD4, wiring systems shall not encroach on escape routes unless the wiring is provided with sheaths or enclosures which, either during the time authorized by regulations for building elements of the escape route or for 2 h in the absence of such a regulation,

- will not contribute to, or propagate a fire, and
- will not attain a temperature high enough to ignite adjacent material.

NOTE Tests on cables under fire conditions are given in IEC 60332-1, IEC 60332-3-10, IEC 60332-3-21, IEC 60332-3-22, IEC 60332-3-23, IEC 60332-3-24 and IEC 60332-3-25. Tests on conduit under fire conditions are given in IEC 60614.

Wiring systems encroaching on escape routes shall not be within arm's reach unless they are provided with protection against mechanical damage likely to occur during an evacuation. Any wiring systems in escape routes shall be as short as practicable.