

**SLOVENSKI
STANDARD**

SIST EN 61537:2003

marec 2003

Cable tray systems and cable ladder systems for cable management (IEC 61537:2001)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 61537:2003](https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2f34/sist-en-61537-2003)

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2f34/sist-en-61537-2003>

ICS 29.120.10

Referenčna številka
SIST EN 61537:2003(en)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61537:2003

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2f34/sist-en-61537-2003>

EUROPEAN STANDARD

EN 61537

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2001

ICS 29.120.10

English version

**Cable tray systems and cable ladder systems
for cable management
(IEC 61537:2001)**

Systèmes de chemin de câbles et
systèmes d'échelle à câbles pour
systèmes de câblage
(CEI 61537:2001)

Kabelträgersysteme zum Führen von
Leitungen für elektrische Energie und
Informationen
(IEC 61537:2001)

This European Standard was approved by CENELEC on 2001-10-01. 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.

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-4d26b38c-0139-2019>

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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 23A/365/FDIS, future edition 1 of IEC 61537, prepared by SC 23A, Cable management systems, of IEC TC 23, Electrical accessories, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61537 on 2001-10-01.

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) 2002-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-10-01

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

Annexes designated "informative" are given for information only.

In this standard, annexes D and ZA are normative and annexes A, B, C, E, F, G, H and I are informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61537:2001 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

- | | | |
|----------------|------|---|
| IEC 60093 | NOTE | Harmonized as HD 429 S1:1983 (not modified). |
| IEC 60364-5-54 | NOTE | Harmonized as HD 384.5.54 S1:1988 (not modified). |

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-75	1997	Environmental testing Part 2-75: Tests - Test Eh: Hammer tests	EN 60068-2-75	1997
IEC 60364-5-523 (mod)	1999	Electrical installations of buildings Part 5: Selection and erection of electrical equipment – Section 523: Current-carrying capacities in wiring systems	HD 384.5.523 S2	2001
IEC 60695-2-1/1	1994	Fire hazard testing Part 2: Test methods Section 1/sheet 1: Glow-wire end- product test and guidance	EN 60695-2-1/1)	1996
IEC 60695-2-4/1	1991	Part 2: Test methods Section 4/sheet 1: 1 kW nominal pre- mixed test flame and guidance	EN 60695-2-4/1	1993
ISO 4046	1978	Paper, board, pulp and related terms - Vocabulary	-	-

1) EN 60695-2-1/1 is superseded by EN 60695-2-11:2001 (IEC 60695-2-11:2000).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 61537:2003

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2f34/sist-en-61537-2003>

NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

61537

Première édition
First edition
2001-09

**Systèmes de chemin de câbles et systèmes
d'échelle à câbles pour systèmes de câblage**

**Cable tray systems and cable ladder systems
for cable management**
(standards.iteh.ai)

SIST EN 61537:2003

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2f34/sist-en-61537-2003>

© IEC 2001 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission
Telefax: +41 22 919 0300

3, rue de Varembé Geneva, Switzerland
e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE. **XB**

*Pour prix, voir catalogue en vigueur
For price, see current catalogue*

CONTENTS

FOREWORD	7
1 Scope	9
2 Normative references	9
3 Definitions	9
4 General requirements	15
5 General conditions for tests	17
6 Classification	17
7 Marking and documentation	21
8 Dimensions	25
9 Construction	25
10 Mechanical properties	27
11 Electrical properties	45
12 Thermal properties	47
13 Fire hazards	47
14 External influences	51
15 Electromagnetic compatibility (EMC)	53
Annex A (informative) Sketches of typical cable tray lengths and cable ladder lengths	87
Annex B (informative) Sketches of typical support devices	89
Annex C (informative) Protective earth (PE) function	93
Annex D (normative) Methods of applying a UDL for SWL tests	95
Annex E (informative) Typical methods of applying a UDL for SWL tests	107
Annex F (informative) Example for the determination of TDF	109
Annex G (informative) Example for clarification of allowed creep	113
Annex H (informative) Information for a safe installation of pendants with cantilever brackets	115
Annex I (informative) Summary of compliance checks	119
Bibliography	121
Figure 1 – Safe working load test – General arrangement	55
Figure 2 – Safe working load test types I, II and III (see 10.3.1 to 10.3.3)	59
Figure 3 – Safe working load test IV (see 10.3.4)	61
Figure 4 – Safe working load test type V (see 10.3.5)	61
Figure 5 – Safe working load test for fittings	67
Figure 6 – Test set-up for cantilever brackets	73
Figure 7 – Test set-up for pendants	77
Figure 8 – Impact test stroke arrangement	79
Figure 9 – Test set-up for electrical continuity	81
Figure 10 – Arrangement for the flame test	83
Figure 11 – Enclosure for the flame test	85

Figure A.1 – Solid bottom cable tray lengths	87
Figure A.2 – Perforated cable tray lengths	87
Figure A.3 – Mesh cable tray lengths	87
Figure A.4 – Cable ladder lengths	87
Figure B.1 – Cantilever brackets	89
Figure B.2 – Pendants	91
Figure B.3 – Fixing brackets	91
Figure D.1 – Examples of distribution load points across the width	95
Figure D.2 – Distributed loads.....	97
Figure D.3 – Equispaced point loads.....	99
Figure D.4 – Examples of test load distribution on cable ladder lengths	101
Figure D.5 – n rungs.....	101
Figure D.6 – Three rungs.....	103
Figure D.7 – Two rungs	103
Figure D.8 – One rung.....	105
Figure D.9 – Cantilever with extension	105
Figure G.1 – Example for clarification of allowed creep	113
Figure H.1 – Forces on pendant and cantilever bracket.....	115
Figure H.2 – Illustration of the safe area	117
iteh STANDARD PREVIEW (standards.iteh.ai)	
Table 1 – Minimum temperature classification.....	19
Table 2 – Maximum temperature classification.....	19
Table 3 – Perforation base area classification.....	21
Table 4 – Free base area classification.....	21
Table 5 – Impact test values	45
Table D.1 – Number of point loads across the width	95
Table D.2 – Number of point loads along the length	97
Table F.1 – Manufacturer's declared sizes	109
Table F.2 – Cable tray length, 100 mm wide.....	109
Table F.3 – Cable tray, 400 mm wide	111

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CABLE TRAY SYSTEMS AND CABLE LADDER SYSTEMS FOR CABLE MANAGEMENT

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.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 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.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61537 has been prepared by subcommittee 23A: Cable management systems, of IEC technical committee 23: Electrical accessories.

The text of this standard is based on the following documents:

FDIS	Report on voting
23A/365/FDIS	23A/366/RVD

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

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

Annexes A, B, C, E, F, G, H and I are for information only.

Annex D forms an integral part of this standard.

The committee has decided that the contents of this publication will remain unchanged until 2004-02. At this date, the publication will be

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

CABLE TRAY SYSTEMS AND CABLE LADDER SYSTEMS FOR CABLE MANAGEMENT

1 Scope

This International Standard specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and accommodation of cables and possibly other electrical equipment in electrical and/or communication systems installations. Where necessary, cable tray systems and cable ladder systems may be used for the segregation of cables.

This standard does not apply to conduit systems, cable trunking systems and cable ducting systems or any current-carrying parts.

NOTE Cable tray systems and cable ladder systems are designed for use as supports for cables and not as enclosures.

2 Normative references

The following normative documents contain provisions, which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard 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.

<https://standards.iteh.ai/catalog/standards/sist/9c86517d-a814-40e5-b148->

IEC 60068-2-75:1997, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60364-5-523:1999, *Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Section 523: Current-carrying capacities in wiring systems*

IEC 60695-2-1/1:1994, *Fire hazard testing – Part 2: Test methods – Section 1/sheet 1: Glow-wire end-product test and guidance*

IEC 60695-2-4/1:1991, *Fire hazard testing – Part 2: Test methods – Section 4/sheet 1: 1 kW nominal pre-mixed test flame and guidance*

ISO 4046:1978, *Paper, board, pulp and related terms – Vocabulary*

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1

cable tray system or cable ladder system

assembly of cable supports consisting of cable tray lengths or cable ladder lengths and other system components

3.2

system component

part used within the system. System components are as follows:

- a) cable tray length or cable ladder length
- b) cable tray fitting or cable ladder fitting
- c) support device
- d) mounting device
- e) system accessory

NOTE System components may not necessarily be included together in a system. Different combinations of system components may be used.

3.3

cable tray length

system component used for cable support consisting of a base with integrated side members or a base connected to side members

NOTE Typical examples of cable tray types are shown in figures A.1 to A.3.

3.4

cable ladder length

system component used for cable support consisting of supporting side members, fixed to each other by means of rungs

NOTE Typical examples of cable ladder types are shown in figure A.4.

3.5

fitting

system component used to join, change direction, change dimension or terminate cable tray lengths or cable ladder lengths

NOTE Typical examples are couplers, bends, tees, crosses.

3.6

cable runway

assembly comprised of cable tray lengths or cable ladder lengths and fittings only

3.7

support device

device designed to provide mechanical support and which may limit movement of a cable runway

NOTE Typical examples of support devices are shown in annex B.

3.8

mounting device

system component used to attach or fix other devices to the cable runway

NOTE A typical example is an apparatus mounting device.

3.9

apparatus mounting device

component used to accommodate electrical apparatus like switches, socket outlets, circuit-breakers, telephone outlets, etc. which can be an integral part of the electrical apparatus and which is not part of the cable tray system and cable ladder system

3.10**system accessory**

system component used for a supplementary function such as cable segregation, cable retention, and covers, etc.

3.11**cable segregation**

under consideration

3.12**metallic system component**

system component which consists of metal only. Screws for connections and other fasteners are not considered

3.13**non-metallic system component**

system component which consists of non-metallic material only. Screws for connections and other fasteners are not considered

3.14**composite system component**

system component which consists of both metallic and non-metallic materials. Screws for connections and other fasteners are not considered

3.15**non-flame propagating system component**

system component which is liable to catch fire as a result of an applied flame, along which the flame does not propagate and which extinguishes itself within a limited time after the flame is removed

<https://standards.iteh.ai/catalog/standards/sist/9c865f7d-a8f4-40e5-b148-a772ce4f2b34/sist-en-61537-2003>

3.16**external influence**

presence of water, oil, building materials, corrosive and polluting substances, and external mechanical forces such as snow, wind, and other environmental hazards

3.17**safe working load (SWL)**

maximum load that can be applied safely in normal use

3.18**uniformly distributed load (UDL)**

load applied evenly over a given area

NOTE Methods of applying uniformly distributed loads are shown in annexes D and E.

3.19**span**

distance between the centres of two adjacent support devices

3.20**internal fixing device**

device for joining and/or fixing system components to other system components. This device is part of the system but not a system component

NOTE Typical examples are nuts and bolts.

3.21**external fixing device**

device used for fixing a support device to walls, ceilings or other structural parts. This device is not part of the system

NOTE Typical examples are anchor bolts.

3.22**base area of cable tray length or cable ladder length**

plan area available for cables

3.23**free base area**

part of the base area which is open to the flow of the air. Holes in cable ladder rungs are included in the free base area

3.24**load plate**

rigid means through which a load is applied to the sample for testing purposes

3.25**product type**

group of system components which vary in the case of

- cable runways in the width only
- cantilever brackets in the length only
- pendants in the length only

NOTE Different jointing methods and position constitute different product types.

3.26**topological shape**

group of product types which varies in thickness and height only

4 General requirements

Cable tray systems and cable ladder systems shall be so designed and so constructed that in normal use, when installed according to the manufacturer's or responsible vendor's instructions, they ensure reliable support to the cables contained therein. They shall not impose any unreasonable hazard to the user or cables.

The system components shall be designed to withstand the stresses likely to occur during recommended transport and storage.

Cable tray systems and cable ladder systems according to this standard are not intended to be used as walkways.

Compliance is checked by carrying out all the relevant tests specified in this standard.

5 General conditions for tests

5.1 Tests according to this standard are type tests.

5.2 Unless otherwise specified, tests shall be carried out with cable tray system components or cable ladder system components assembled and installed as in normal use according to the manufacturer's or responsible vendor's instructions.

5.3 Tests on non-metallic system components or composite system components shall not commence earlier than 168 h after manufacture.

5.4 Unless otherwise specified, tests shall be carried out at an ambient temperature of $20\text{ °C} \pm 5\text{ °C}$.

Unless otherwise specified, all tests are carried out on new samples.

5.5 When toxic or hazardous processes are used, precautions should be taken to safeguard the person performing the test.

5.6 Unless otherwise specified, three samples are subjected to the tests and the requirements are satisfied if all the tests are met.

If only one of the samples does not satisfy a test due to an assembly or a manufacturing fault, that test and any preceding one which may have influenced the results of the test shall be repeated and also the tests which follow shall be made in the required sequence on another full set of samples, all of which shall comply with the requirements.

NOTE The applicant, when submitting a set of samples, may also submit an additional set of samples which may be necessary, should one sample fail. The testing station will then, without further request, test the additional set of samples and will reject only if a further failure occurs. If the additional set of samples is not submitted at the same time, the failure of one sample will entail rejection.

5.7 If the relative humidity of the atmosphere has a significant effect on the classified properties of the samples under test, the manufacturer or responsible vendor shall declare this information.

5.8 If a system component or system is coated in paint or any other substance which is likely to affect its classified properties, then the relevant tests in this standard shall be performed on the coated sample.

6 Classification

6.1 According to material

6.1.1 Metallic system component

6.1.2 Non-metallic system component

6.1.3 Composite system component

6.2 According to resistance to flame propagation

6.2.1 Flame propagating system component

6.2.2 Non-flame propagating system component

6.3 According to electrical continuity characteristics

6.3.1 Cable tray system or cable ladder system without electrical continuity characteristics