SLOVENSKI STANDARD

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Nespajkani spoji – 2. del: Nespajkani stisnjeni spoji – Splošne zahteve, preskusne metode in praktični napotki (IEC 60352-2:2006)

Solderless connections -- Part 2: Crimped connections – General requirements, test methods and practical guidance (IEC 60352-2:2006)

ICS 29.120.20

Referenčna številka
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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60352-2

May 2006

ICS 31.220.10

Supersedes EN 60352-2:1994 + A1:1997 + A2:2002

English version

Solderless connections
Part 2: Crimped connections - General requirements, test methods and practical guidance
(IEC 60352-2:2006)

Connexions sans soudure
Partie 2: Connexions serties - Exigences générales, méthodes d'essai et guide pratique
(CEI 60352-2:2006)

Lötfreie Verbindungen
Teil 2: Crimpverbindungen - Allgemeine Anforderungen, Prüfverfahren und Anwendungshinweise
(IEC 60352-2:2006)

This European Standard was approved by CENELEC on 2006-03-01. 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.

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, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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

Ref. No. EN 60352-2:2006 E

Foreword

The text of document 48B/1584/FDIS, future edition 2 of IEC 60352-2, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60352-2 on 2006-03-01.

This European Standard supersedes EN 60352-2:1994 + A1:1997 + A2:2002.

It includes the following major technical changes with respect to EN 60352-2:1994 and its amendments:

a) the contents of clauses have been re-arranged, for example the old Clauses 5, 6, 7, 8 and 9 are now included in the new Clause 4, Requirements;

b) Subclause 4.3.1, the material requirements for crimp barrels have been changed from Vickers hardness into more appropriate tensile strength requirements and the requirements have been opened to other materials, if it is of suitable characteristics;

c) Subclause 4.3.3, Surface finishes: the tin-lead has been replaced by tin-alloy to comply with RoHS legislation. Other plating materials, such as nickel, may be used provided their suitability has been proven;

d) Subclause 5.1.4, Recovering, has been added;

e) Table 2, example of other materials, has been shortened;

f) Subclause 5.2.4.5 and Figure 7, Current loading, cyclic: the length of wire between two specimens has been changed to a "*minimum of 150 mm*" to comply with regional requirements;

g) Subclause 5.2.4.6, Crimping at low temperature, has been changed to "under consideration";

h) Subclause 15.4 of amendment A1 has been deleted for the sake of design freedom, because the dimensions are not widely used as stated; only a minority of products, in most cases older ones have these dimensions.

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)	2006-12-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60352-2:2006 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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 60050-581	1978	International Electrotechnical Vocabulary (IEV) Chapter 581: Electromechanical components for electronic equipment	-	-
IEC 60068-1 + corr. October + A1	1988 1988 1992	Environmental testing Part 1: General and guidance	EN 60068-1	1994
IEC 60189-3	1988	Low-frequency cables and wires with PVC insulation and PVC sheath Part 3: Equipment wires with solid or stranded conductor, PVC insulated, in singles, pairs and triples	-	-
IEC 60512	Series	Connectors for electronic equipment - Tests and measurements	EN 60512	Series
IEC 60512-1-100	2001	Connectors for electronic equipment - Tests and measurements Part 1-100: General - Applicable publications	EN 60512-1-100 [1)]	2001
IEC 60670 A1	1989 1994	Flat, quick-connect terminations	-	-
ISO 6892	1998	Metallic materials - Tensile testing at ambient temperature	-	-

[1)] EN 60512-1-100 is superseded by EN 60512-1-100:2006, which is based on IEC 60512-1-100:2006.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60352-2

Deuxième édition
Second edition
2006-02

Connexions sans soudure –

Partie 2: Connexions serties – Exigences générales, méthodes d'essai et guide pratique

Solderless connections –

Part 2: Crimped connections – General requirements, test methods and practical guidance

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE XA

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SOLDERLESS CONNECTIONS –

Part 2: Crimped connections – General requirements, test methods and practical guidance

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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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8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60352-2 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This second edition cancels and replaces the first edition published in 1990 and its amendments 1 (1996) and 2 (2002). This edition constitutes a technical revision.

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

a) The contents of clauses have been re-arranged, for example the old clauses 5, 6, 7, 8 and 9 are now included in the new clause 4, Requirements.

b) Subclause 4.3.1: the material requirements for crimp barrels have been changed from Vickers hardness into more appropriate tensile strength requirements and the requirements have been opened to other materials, if it is of suitable characteristics.

c) Subclause 4.3.3, Surface finishes: the tin-lead has been replaced by tin-alloy to comply with RoHS legislation. Other plating materials, such as nickel, may be used provided their suitability has been proven.

d) Subclause 5.1.4, Recovering, has been added.

e) Table 2, example of other materials, has been shortened.

f) Subclause 5.2.4.5 and Figure 7, Current loading, cyclic: the length of wire between two specimens has been changed to a "*minimum of 150 mm*" to comply with regional requirements.

g) Subclause 5.2.4.6, Crimping at low temperature, has been changed to "under consideration".

h) Subclause 15.4 of IEC 60352-2 amendment 1 (1996-11) has been deleted for the sake of design freedom, because the dimensions are not widely used as stated; only a minority of products, in most cases older ones have these dimensions.

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

FDIS	Report on voting
48B/1584/FDIS	48B/1617/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 2.

IEC 60352 consists of the following parts, under the general title *Solderless connections:*

Part 1: Wrapped connections – General requirements, test methods and practical guidance

Part 2: Crimped connections – General requirements, test methods and practical guidance

Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance

Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance

Part 5: Press-in connections – General requirements, test methods and practical guidance

Part 6: Insulation piercing connections – General requirements, test methods and practical guidance

Part 7: Spring clamp connections – General requirements, test methods and practical guidance

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

INTRODUCTION

IEC 60352-2 includes requirements, tests and practical guidance information. Two test schedules are provided: a basic test schedule which applies to solderless crimped connections which conform to all of the requirements given in Clause 4 and a full test schedule which applies to solderless crimped connections which do not fully conform to all of the requirements, for example which are made with solid wires, different materials, etc.

IEC Guide 109 advocates the need to minimise the impact of a product on the natural environment throughout the product life cycle. It is understood that some of the materials permitted in this standard may have a negative environmental impact. As technological advances lead to acceptable alternatives for these materials, they will be eliminated from the standard.

SOLDERLESS CONNECTIONS –

Part 2: Crimped connections – General requirements, test methods and practical guidance

1 Scope and object

This part of IEC 60352 is applicable to solderless crimped connections made with stranded wires of 0,05 mm^2 to 10 mm^2 cross-section or solid wires of 0,25 mm to 3,6 mm diameter and appropriately designed uninsulated or pre-insulated crimp barrels for use in telecommunication equipment and in electronic devices employing similar techniques.

Information on the materials and data from industrial experience is included in addition to the test procedures to provide electrically stable connections under prescribed environmental conditions.

NOTE This part of IEC 60352 is not intended to be applicable to crimping of coaxial cables.

The object of this part of IEC 60352 is to determine the suitability of solderless crimped connections under specified mechanical, electrical and atmospheric conditions and to provide a means of comparing test results when the tools used to make the connections are of different designs or manufacture.

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 60050(581):1978, *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electromechanical components for electronic equipment*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60189-3:1988, *Low-frequency cables and wires with PVC insulation and PVC sheath – Part 3: Equipment wires with solid or stranded conductor, PVC insulated, in singles, pairs and triples*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements*

IEC 60512-1-100:2001, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60760:1989, *Flat, quick-connect terminations*
Amendment 1 (1993)

ISO 6892:1998, *Metallic materials – Tensile testing at ambient temperature*

3 Terms and definitions

For the purpose of this document, the terms and definitions of IEC 60050(581), IEC 60512-1 and the following apply:

3.1
crimp barrel
conductor barrel designed to accommodate one or more conductors and to be crimped by means of a crimping tool

3.2
open crimp barrel
crimp barrel with an open shape before crimping, for example U- or V-shape (see Figure 1)

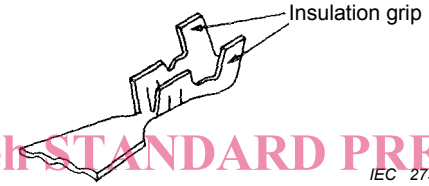

Figure 1 – Open crimp barrel

3.3
closed crimp barrel
crimp barrel with a closed shape before crimping (see Figure 2)

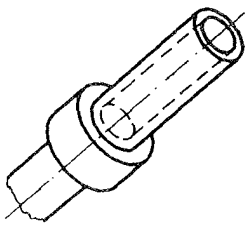

Figure 2a – Machined crimp barrel

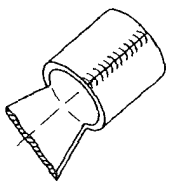

Figure 2b – Brazed/welded crimp barrel

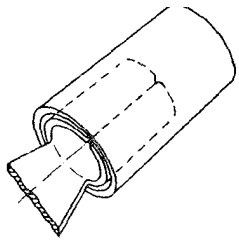

Figure 2c – Stamped/rolled crimp barrel

Figure 2 – Closed crimp barrels

3.4
pre-insulated crimp barrel
crimp barrel with a permanent layer of insulation through which the crimp is made (see Figure 3)