



# SLOVENSKI STANDARD

## SIST EN 60352-1:2002

01-september-2002

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### **Solderless connections - Part 1: Wrapped connections - General requirements, test methods and practical guidance (IEC 60352-1:1997)**

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

Lötfreie Verbindungen -- Teil 1: Wickelverbindungen - Allgemeine Anforderungen, Prüfverfahren und Anwendungshinweise

Connexions sans soudure -- Partie 1: Connexions enroulées - Règles générales, méthodes d'essai et guide pratique

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**Ta slovenski standard je istoveten z: EN 60352-1:1997**

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#### **ICS:**

29.120.20      Spojni elementi      Connecting devices

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EUROPEAN STANDARD

**EN 60352-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 1997

ICS 29.120.20

Supersedes EN 60352-1:1997

Descriptors: Connections, solderless connections, wrapped connections, general requirements, test methods

English version

**Solderless connections**  
**Part 1: Wrapped connections - General requirements,**  
**test methods and practical guidance**  
**(IEC 60352-1:1997)**

Connexions sans soudure  
 Partie 1: Connexions enroulées  
 Règles générales, méthodes d'essai  
 et guide pratique  
 (CEI 60352-1:1997)

Lötfreie Verbindungen  
 Teil 1: Wickelverbindungen - Allgemeine  
 Anforderungen, Prüfverfahren und  
 Anwendungshinweise  
 (IEC 60352-1:1997)

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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 members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, 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 48B/590/FDIS, future edition 3 of IEC 60352-1, 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 60352-1 on 1997-10-01.

This European Standard supersedes EN 60352-1:1994.

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) 1998-07-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1998-07-01

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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The text of the International Standard IEC 60352-1:1997 was approved by CENELEC as a European Standard without any modification.

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**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 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		
+ A1	1992		EN 60068-1 <sup>1)</sup>	1994
IEC 60352-5	1995	Solderless connections Part 5: Solderless press-in connections General requirements, test methods and practical guidance	EN 60352-5	1995
IEC 60512-1	1994	Electromechanical components for electronic equipment - Basic testing procedures and measuring methods Part 1: General	EN 60512-1	1994
IEC 60512-2	1985	Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests	-	-
A1	1994		-	-
IEC 60512-6	1984	Part 6: Climatic tests and soldering tests	-	-
IEC 60512-8	1993	Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations	-	-
IEC 60979	1989	Wires for wire wrapping applications	-	-
ISO 468	1982	Surface roughness - Parameters, their values and general rules for specifying requirements	-	-

1) EN 60068-1 also includes the corrigendum October 1988 to IEC 60068-1.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 1337	1980	Wrought coppers (having minimum copper contents of 99,85 %) - Chemical composition and forms of wrought products	-	-
ISO 6507-1	1982	Metallic materials - Hardness test Vickers test -- Part 1: HV 5 to HV 100	-	-

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**NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD**

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IEC**

**60352-1**

Troisième édition  
Third edition  
1997-08

**Connexions sans soudure –**

**Partie 1:**

**Connexions enroulées –**

**Règles générales, méthodes d'essai  
et guide pratique**

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**Solderless connections –**

SIST EN 60352-1:2002

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**Part 1:**

**Wrapped connections –**

**General requirements, test methods  
and practical guidance**

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

CODE PRIX  
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For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

## 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 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 60352-1 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This third edition cancels and replaces the second edition published in 1983, of which it constitutes a technical revision.

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

FDIS	Report on voting
48B/590/FDIS	48B/635/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.

The contents of the corrigendum of October 1998 have been included in this copy.

## INTRODUCTION

This part of IEC 60352 includes requirements, tests and practical guidance information.

Two test schedules are provided.

The basic test schedule applies to wrapped connections which conform to all the requirements of clause 4.

These requirements are derived from experience with successful applications of such wrapped connections.

The full test schedule applies to wrapped connections which do not fully conform to all the requirements of clause 4, for example those which are manufactured using materials or finishes not included in clause 4.

This approach permits cost- and time-effective performance verification using a limited basic test schedule for established wrapped connections and an expanded full test schedule for wrapped connections requiring more extensive performance validation.

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## **SOLDERLESS CONNECTIONS – Part 1: Wrapped connections – General requirements, test methods and practical guidance**

### **1 Scope and object**

This part of IEC 60352 is applicable to wrapped connections made with single solid round wires with nominal diameters of 0,16 mm minimum and appropriately designed posts for use in telecommunications equipment and in electronic devices employing similar techniques.

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

The object of this standard is to determine the suitability of wrapped 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 design or manufacture.

### **2 Normative references**

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60352. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 60352 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(581): 1978, *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electro-mechanical components for electronic equipment*

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

IEC 60352-5: 1995, *Solderless connections – Part 5: Solderless press-in connections – General requirements, test methods and practical guidance*

IEC 60512-1: 1994, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 1: General*

IEC 60512-2: 1985, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*  
Amendment 1 (1994)

IEC 60512-6: 1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 6: Climatic tests and soldering tests*

IEC 60512-8: 1993, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*

IEC 60979: 1989, *Wires for wire wrapping applications*

ISO 468: 1982, *Surface roughness – Parameters, their values and general rules for specifying requirements*

ISO 1337: 1980, *Wrought coppers (having minimum copper contents of 99,85 %) – Chemical composition and forms of wrought products*

ISO 6507-1: 1982, *Metallic materials – Hardness test – Vickers test – Part 1: HV 5 to HV 100*

### 3 Definitions

For the purpose of this part of IEC 60352, the terms and definitions included in IEC 60050(581) and IEC 60512-1 and the following additional terms and definitions apply.

3.1 **wrap post:** A termination generally rectangular with sharp corners made to accept a wrapped connection. [IEV 581-03-34, modified]

NOTE – In this standard, the term "wrap post" is shortened to "post".

3.2 **wrapped connection:** A solderless connection achieved by wrapping a solid conductor around a wrap post (see figure 1). [IEV 581-03-10, modified]

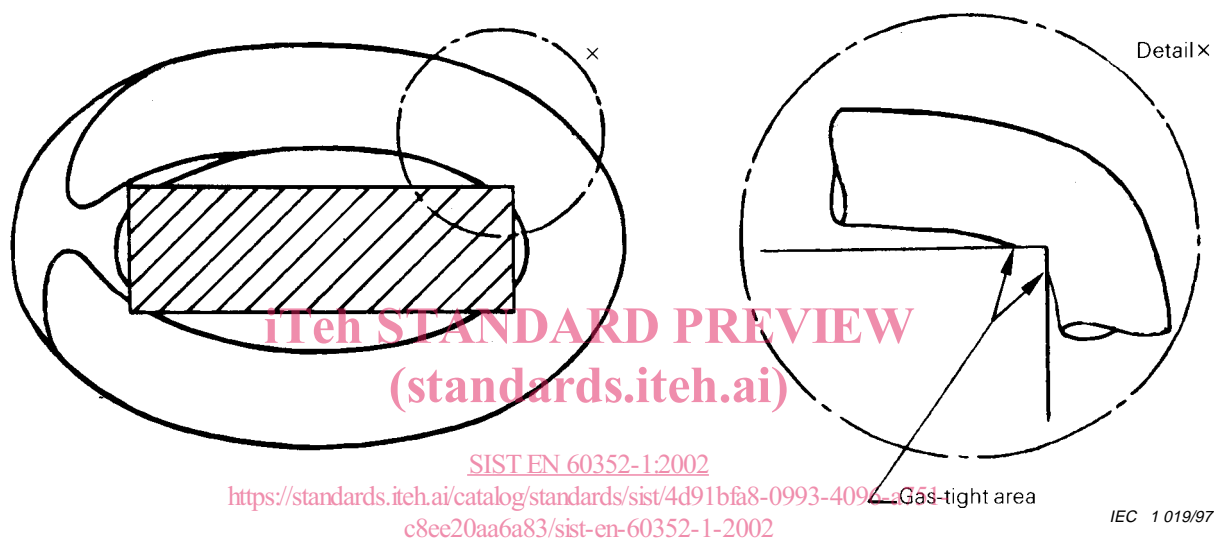


Figure 1 – Wrapped connection

3.3 **conventional wrapped connection:** A solderless connection achieved by wrapping a solid conductor around a wrap post without any contact of the wire insulation to the post (see figure 2a). [IEV 581-03-45]

3.4 **modified wrapped connection:** A solderless connection achieved by wrapping a solid conductor around a wrap post with the wire insulation wrapped around at least three corners of the post (see figure 2b). [IEV 581-03-44]

3.5 **turn of wire:** A single helical ring of wire wrapped 360° around a wrap post. [IEV 581-03-65]

3.6 **reference corner:** That corner of the wrap post at which the stripped wire makes its first indentation and from which the number of wrapped turns is counted (see figure 2). [IEV 581-03-38]