

Solderless connections —

Part 1: Solderless wrapped connections — General requirements, test methods and practical guidance

The European Standard EN 60352-1:1994 has the status of a
British Standard

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee EPL/48, Electromechanical components for electronic equipment, to Subcommittee EPL/48/2, Connectors for electronic equipment, upon which the following bodies were represented:

- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA Ltd.)
- British Telecommunications plc
- BSI Quality Assurance
- Federation of the Electronics Industry
- Ministry of Defence
- Premises Cabling Association

This British Standard, having been prepared under the direction of the Electrotechnical Sector Board, was published under the authority of the Standards Board and comes into effect on 31 December 1984

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National foreword

This Part of BS EN 60352 has been prepared by Subcommittee EPL/48/2, and is the English language version of EN 60352-1:1994 *Solderless connections — Part 1: Specification for solderless wrapped connections (including test methods and practical guidance)* published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 352-1:1983, published by the International Electrotechnical Committee (IEC).

Cross-references

Publication referred to	Corresponding British Standard
IEC 50 (581):1978	BS 4727 <i>Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms</i> Part 1: <i>Terms common to power, telecommunications and electronics</i> Group 13:1991 <i>Electromechanical components for electronic equipment</i>
HD 323 (series)	BS EN 2011 <i>Environmental testing</i> (series)
EN 60068 (series) [IEC 68 (series)]	BS EN 60068 <i>Environmental testing</i> (series)

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 26, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

English version

Solderless connections

Part 1: Solderless wrapped connections — General requirements, test methods and practical guidance

(IEC 352-1:1983)

Connexions sans soudure
Première partie: Connexions enroulées sans
soudure — Règles générales, méthodes d'essai
et conseils pratiques
(CEI 352-1:1983)

Lötfreie elektrische Verbindungen
Teil 1: Wickelverbindungen — Allgemeine
Anforderungen, Prüfverfahren und
Anwendungshinweise
(IEC 352-1:1983)

This European Standard was approved by CENELEC on 1994-05-15. 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, 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

At the request of the 77th Technical Board of CENELEC, HD 476.1 S1:1988 (IEC 352-1:1983) was submitted to the CENELEC voting procedure for conversion into a European Standard.

The text of the International Standard was approved by CENELEC as EN 60352-1 on 15 May 1994.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1995-07-15
- latest date of withdrawal of conflicting national standards (dow) —

Annexes designated “normative” are part of the body of the standard. In this standard, Annex ZA is normative.

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Introduction

This standard includes requirements, tests and practical guidance information. Two test schedules are provided: a basic test schedule which applies to solderless wrapped connections which conform to all the requirements, and a full test schedule which applies to solderless wrapped connections which conform to all the requirements except for the size or material of the wrapping wire or the post.

Section 1. General

1 Scope

This standard is applicable to solderless wrapped connections made with single solid round wires with nominal diameters of 0.25 mm (0.01 in) 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 is included in addition to the test procedures to provide electrically stable connections under prescribed environmental conditions.

2 Object

To determine the suitability of solderless wrapped connections under specified mechanical, electrical and atmospheric conditions.

To provide a means of comparing test results when the tools used to make the connections are of different designs or manufacture.

3 Terminology

The terms and definitions used in this standard are given in IEC Publication 50(581): International Electrotechnical Vocabulary (IEV), Chapter 581: Electromechanical Components for Electronic Equipment.

IEC Publication 512: Electromechanical Components for Electronic Equipment; Basic Testing Procedures and Measuring Methods, also contains some applicable terms and definitions.

For the purpose of this standard, the following additional terms and definitions shall apply:

3.1

wrapped connection (IEV 581-03-10, modified)

an electrical connection between a wire and a sharp-cornered post in which the wire is wrapped directly around the post with controlled tension, several turns of the wire indenting and being indented by and locking on the corners of the post to form gas-tight areas (see Figure 1)

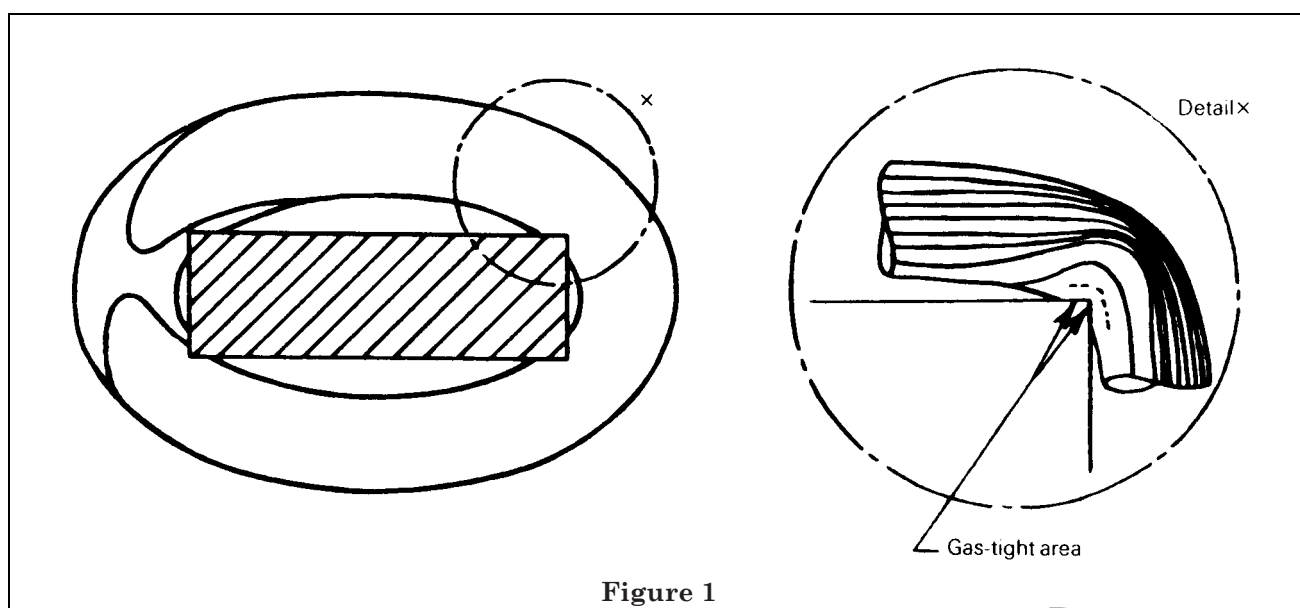


Figure 1

3.2**conventional wrapped connection**

a helix of solid uninsulated wire tightly wrapped around a wrap post to produce a mechanically and electrically stable connection (see Figure 2a)

3.3**modified wrapped connection**

a connection as defined in Sub-clause 3.2 with the wire insulation wrapped around at least three corners of the wrap post (see Figure 2b)

3.4**turn of wire**

a single helical ring of wire wrapped 360° around a wrap post

3.5**reference corner**

that corner of the wrap post at which the uninsulated wire makes its first indentation and from which the number of wrapped turns is counted (see Figure 2)

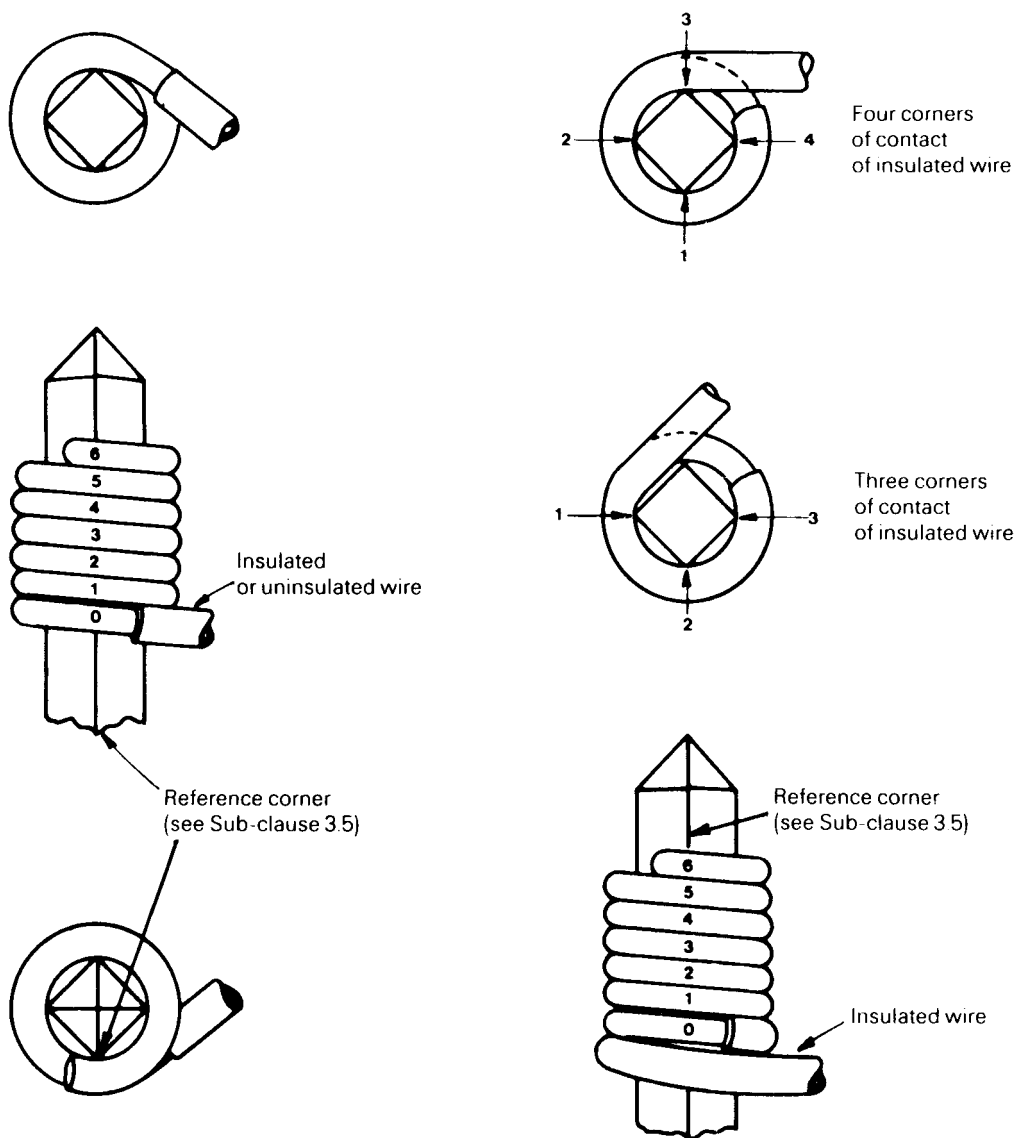


Figure 2a

Figure 2b

Figure 2 — Reference corners

3.6**end tail**

the final portion of the last turn of wire in a wrapped connection which extends beyond the last corner contact (see Figure 3)

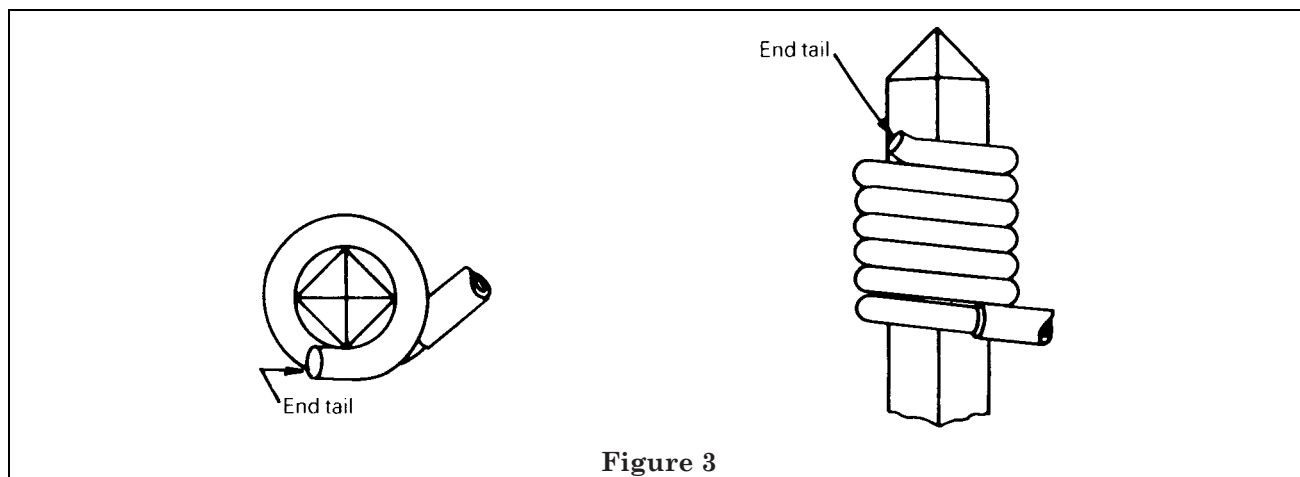


Figure 3

3.7**wrap post** (IEV 581-03-34)

a termination to accept a wrapped connection

NOTE In this standard, the term “wrap post” is shortened to “post”.

3.8**gas-tight area**

the part of the contact area formed at a corner of the post that is not affected by gases under specified conditions (see Figure 1, page 3)

3.9**stripping force**

the force applied to the wrapped connection along the major axis of the post which breaks the gas-tight areas

NOTE The gas-tight areas are broken by the initial movement of the connection along the post.

3.10**effective wrapping length**

that portion of a post suitable and available for the application of the wrapped connection for which all requirements regarding parallelism and radii, burrs, etc., apply

3.11**total post length**

the length of the post from the mounting plane to the tip

3.12**hoop stress**

the tension in the wire induced by the wrapping operation and maintained by the wire being locked on the corners of the post

3.13**type, style, variant**

Not applicable.

4 IEC type designation

Not applicable.

Section 2. Requirements

5 Workmanship

The connections shall be processed in a careful and workmanlike manner, in accordance with good current practice.

6 Tools

Tools shall be used and inspected according to the instructions given by the manufacturer.

6.1 Wrapping tools

The wrapping tool shall be capable of making uniformly reliable connections during its useful life. It shall also make a neat closure of the last turn, without causing undue mutilation of the wrapping wire or post. The hole in the bit shall have a depth sufficient to accommodate the total length of the post (see Sub-clauses 14.1 and 15.5.3).

Tools are evaluated by testing wrapped connections made with the tools to be evaluated.

6.2 Unwrapping tools

Unwrapping tools shall not damage the post and shall completely remove the unwrapped wire from the post (see Sub-clause 14.2).

7 Posts

7.1 Materials

Suitable grades of copper alloys, such as brass, phosphor bronze, nickel-silver, or beryllium copper, shall be used. Vickers hardness shall be 95 HV 5 to 220 HV 5 when tested in accordance with ISO Standard 6507-1. When the hardness of the post is to be measured and Vickers hardness cannot be used due to the size of the indent, another suitable method such as diamond pyramid hardness or Knoop hardness may be used.

NOTE The hardness range 95 HV 5 to 120 HV 5 is mainly used for busbars incorporating wrap posts.

7.2 Cross-section

Table I lists seven groups of post sizes and the relevant wire sizes for each.