

Solderless connections —

Part 5: Solderless press-in connections — General requirements, test methods and practical guidance

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- Federation of the Electronics Industry
- Ministry of Defence
- National Supervising Inspectorate

The following bodies were also represented in the drafting of the standard through subcommittees:

- Association of Manufacturers Allied to the Electrical and Electronics Industry (BEAMA Ltd.)
- British Telecommunications plc
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Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
Foreword	2
Text of EN 60352-5	3
List of references	Inside back cover

National foreword

This British Standard has been prepared by Technical Committee EPL/48, and is the English language version of EN 60352-5:1995 *Solderless connections — Part 5: Solderless press-in connections — General requirements, test methods and practical guidance*, published by the European Committee for Electrotechnical Standardization (CENELEC). It is identical with IEC 352-5:1995, published by the International Electrotechnical Commission (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>
IEC 68-1:1988	BS 2011 <i>Environmental testing</i> Part 1.1:1989 <i>General and guidance</i>
HD 142 S3:1991 (IEC 194:1988)	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 11:1991 <i>Printed circuits</i>
EN 60249-2-4:1994 (IEC 249-2-4:1987)	BS EN 60249 <i>Base materials for printed circuits</i> Part 2 <i>Specifications</i> Section 2.4:1994 <i>Specification for epoxide woven glass fabric copper-clad laminated sheet, general purpose grade</i>
EN 60249-2-5:1994 (IEC 249-2-5:1987)	Section 5:1994 <i>Specification No. 5 Epoxide woven glass fabric copper-clad laminated sheet of defined flammability (vertical burning test)</i>
EN 60249-2-11:1994 (IEC 249-2-11:1987)	Section 11:1995 <i>Specification for thin epoxide woven glass fabric copper-clad laminated sheet, general purpose grade, for use in the fabrication of multilayer printed boards</i>
EN 60249-2-12:1994 (IEC 249-2-12:1987)	Section 12:1994 <i>Thin epoxide woven glass fabric copper-clad laminated sheet of defined flammability, for use in the fabrication of multilayer printed boards</i>
IEC 326-3:1991	BS 6221 <i>Printed wiring boards</i> Part 3:1991 <i>Guide for the design and use of printed wiring boards</i>
IEC 326-5:1980	Part 5:1982 <i>Specification for single and double sided rigid printed boards with plated-through holes</i>
IEC 326-6:1980	Part 6:1982 <i>Specification for multilayer printed wiring boards</i>
IEC 352-1:1983	BS 6516 <i>Solderless connections</i> Part 1:1984 <i>Specification for solderless wrapped connections (including test methods and practical guidance)</i> BS 5772 <i>Specification for electromechanical components for electronic equipment: basic testing procedures and measuring methods</i>
IEC 512-4:1976	Part 4:1979 <i>Dynamic stress tests</i>

Publication referred to Corresponding British Standard

IEC 512-5:1992 Part 5:1993 *Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*

IEC 512-6:1984 Part 6:1984 *Climatic tests and soldering tests*

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, the EN title page, pages 2 to 28, 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.

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English version

Solderless connections
Part 5: Solderless press-in connections
General requirements, test methods and practical guidance
(IEC 352-5:1995)

Connexions sans soudure
Partie 5: Connexions insérées à force sans
soudure
Règles générales, méthodes d'essai et guide
pratique
(CEI 352-5:1995)

Lötfreie elektrische Verbindungen
Teil 5: Einpreßverbindungen
Allgemeine Anforderungen, Prüfverfahren und
Anwendungshinweise
(IEC 352-5:1995)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Foreword

The text of document 48B(CO)254 + 254A, future edition 1 of IEC 352-5, 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 60352-5 on 1995-03-06.

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) 1996-03-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-03-01

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.

Contents

	Page
Foreword	2
Introduction	3
Section 1. General	
1.1 Scope and object	3
1.2 Normative references	3
1.3 Definitions	4
1.4 IEC type designation	5
Section 2. Requirements	
2.1 Workmanship	5
2.2 Tools	5
2.3 Press-in terminations	6
2.4 Printed boards	7
2.5 Press-in connections	7
Section 3. Tests	
3.1 Testing	8
3.2 Type tests	8
3.3 Test schedules	12
Section 4. Practical guidance	
4.1 Current-carrying capacity	18
4.2 Tool information	18
4.3 Termination information	19
4.4 Printed-board information	21
4.5 Connection information	23
Annex ZA (normative) Other international publications quoted in this standard with the references of the relevant European publications	27
Figure 1 — Effective press-in length	5
Figure 2 — Parallelism of a solid press-in section	6
Figure 3 — Test arrangement, bending	9
Figure 4 — Test arrangement, push-out force	10
Figure 5 — Test arrangement, vibration	10
Figure 6 — Test arrangement, contact resistance	11
Figure 7 — Basic test schedule (see 3.3.2)	16
Figure 8 — Full test schedule (see 3.3.3)	17
Figure 9 — Examples of solid press-in sections	19
Figure 10 — Examples of compliant press-in sections	20
Figure 11 — Stacked printed board	23
Figure 12 — Application level a)	24
Figure 13 — Application level b)	24
Figure 14 — Application level c)	25
Figure 15 — Application level d)	25
Figure 16 — Termination extraction tool (example)	26
Table 1 — Finished plated-through holes	7
Table 2 — Vibration, preferred test severities	11
Table 3 — Number of sets of parts required	13
Table 4 — Finished plated-through holes	22

Introduction

This part of IEC 352 includes requirements, tests and practical guidance information.

Two test schedules are provided.

- The **basic test schedule** applies to press-in connections which **conform to all requirements** of section 2. These requirements are derived from experience with successful applications of such press-in connections.
- The **full test schedule** applies to press-in connections which **do not fully conform to all requirements** of section 2, for example, which are manufactured using hole diameters, materials or finishes not included in section 2.

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

Section 1. General

1.1 Scope and object

This part of IEC 352 is applicable to solderless press-in connections where a termination having a suitable solid or compliant press-in section is inserted into a plated-through hole of a double-sided or multilayer printed board for use in telecommunication 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.

NOTE Press-in technology, its applications and industrial experience with the technology are progressing rapidly. In order to keep pace with this progress, a revision of this document is in preparation.

The object of this part is to determine the suitability of press-in connections under specified mechanical, electrical and atmospheric conditions.

There are different designs for the press-in section of press-in terminations and different materials for terminations in use. For this reason solid and compliant terminations are only specified by fundamental parameters while the performance requirements of the printed board and the complete press-in connection are specified in full detail.

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

1.2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 352. 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 352 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 50(581):1978, *International Electrotechnical Vocabulary (IEV) — Chapter 581: Electromechanical components for electronic equipment*.

IEC 68-1:1988, *Environmental testing — Part 1: General and guidance*. Amendment No. 1 (1992)

IEC 68-2-60 TTD:1990, *Environmental testing — Part 2: Tests — Test Ke: Corrosion tests in artificial atmosphere at very low concentration of polluting gas(es)*.

IEC 194:1988, *Terms and definitions for printed circuits*.

IEC 249-2-4:1987, *Base materials for printed circuits — Part 2: Specifications — Specification No. 4: Epoxide woven glass fabric copper-clad laminated sheet, general purpose grade*.

IEC 249-2-5:1987, *Base materials for printed circuits — Part 2: Specifications — Specification No. 5: Epoxide woven glass fabric copper-clad laminated sheet of defined flammability (vertical burning test)*. Amendment 3 (1993)

IEC 249-2-11:1987, *Base materials for printed circuits — Part 2: Specifications — Specification No. 11: Thin epoxide woven glass fabric copper-laminated sheet, general purpose grade for use in the fabrication of multilayer printed boards*. Amendment 2 (1993)

IEC 249-2-12:1987, *Base materials for printed circuits — Part 2: Specifications — Specification No. 12: Thin epoxide woven glass fabric copper-clad laminated sheet of defined flammability, for use in the fabrication of multilayer printed boards*. Amendment 2 (1993)

IEC 326-3:1991, *Printed boards — Part 3: Design and use of printed boards*.

IEC 326-5:1980, *Printed boards — Part 5: Specification for single and double-sided printed boards with plated-through holes*. Amendment No. 1 (1989)

IEC 326-6:1980, *Printed boards — Part 6: Specification for multilayer printed boards*.

IEC 352-1:1983, *Solderless connections — Part 1: Solderless wrapped connections — General requirements, test methods and practical guidance*.

IEC 512-1:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 1: General*. Amendment No. 1 (1988)

IEC 512-2:1985, *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*.

IEC 512-4:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 4: Dynamic stress tests*.

IEC 512-5:1992, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*.

IEC 512-6:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods — Part 6: Climatic tests and soldering tests*.

1.3 Definitions

For the purposes of this part the terms and definitions of IEC 50 (581) and IEC 512-1 and the following additional terms and definitions shall apply. Terms and definitions related to printed boards are given in IEC 194.

1.3.1

press-in connection

a solderless electrical and mechanical connection made by inserting a press-in termination into a plated-through hole of a printed board

1.3.2 press-in termination (post)

A termination having a specially shaped section suitable to provide for a press-in connection.

1.3.2.1

solid press-in termination

a press-in termination having a solid press-in section. The forces necessary to provide for the press-in connection are generated by the deformation of the plated-through hole of a printed board into which the solid press-in termination is inserted

1.3.2.2

compliant press-in termination

a press-in termination having a compliant press-in section. The forces necessary to provide for the press-in connection are generated by the deformation of the compliant press-in section and of the plated-through hole of a printed board into which the compliant press-in termination is inserted

1.3.3

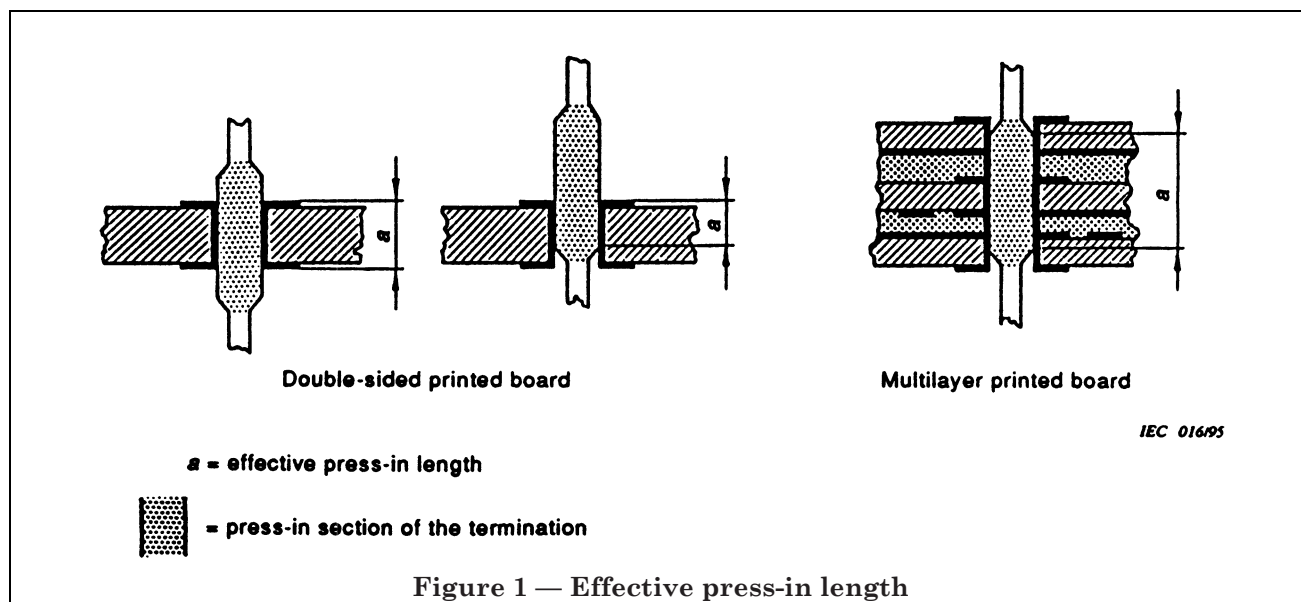
press-in section

the specially shaped section of a press-in termination which is suitable to provide the press-in connection

1.3.4

effective press-in length

the length of contact between the press-in section of a press-in termination and the metal plating of the plated-through hole in a printed board in which the press-in termination is inserted



1.3.5

termination insertion tool

a device used to insert press-in terminations or components equipped with press-in terminations into a printed board

1.3.6

termination extraction tool

a device for extracting a press-in termination from a printed board

1.4 IEC type designation

Not applicable.

Section 2. Requirements

2.1 Workmanship

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

2.2 Tools

Tools shall be used and inspected according to the instructions provided by the manufacturer(s) of the tools and/or connectors.

The tool shall be capable of making uniformly reliable connections during its useful life.

The tool shall be so designed that it does not damage the press-in termination or the printed board when correctly operated.

Tools are evaluated by testing press-in connections made with the tools to be evaluated.