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## **Lödfria förbindningar – Del 5: Inpressningsförband – Allmänna fordringar, provningsmetoder och praktiska anvisningar**

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

Som svensk standard gäller europastandarden EN IEC 60352-5:2020. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 60352-5:2020.

### **Nationellt förord**

Europastandarden EN IEC 60352-5:2020

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 60352-5, Fifth edition, 2020 - Solderless connections - Part 5: Press-in connections - General requirements, test methods and practical guidance**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 60352-5, utgåva 4, 2012 och SS-EN 60352-5/AC1, utgåva 1, 2016, gäller ej fr o m 2023-08-26.

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English Version

**Solderless connections - Part 5: Press-in connections - General  
requirements, test methods and practical guidance  
(IEC 60352-5:2020)**

Connexions sans soudure - Partie 5: Connexions insérées  
à force - Exigences générales, méthodes d'essai et guide  
pratique  
(IEC 60352-5:2020)

Lötfreie Verbindungen - Teil 5: Einpressverbindungen -  
Allgemeine Anforderungen, Prüfverfahren und  
Anwendungshinweise  
(IEC 60352-5:2020)

This European Standard was approved by CENELEC on 2020-08-26. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## **European foreword**

The text of document 48B/2810/FDIS, future edition 5 of IEC 60352-5, prepared by SC 48B "Electrical connectors" of IEC/TC 48 "Electrical connectors and mechanical structures for electrical and electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60352-5:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2021-05-26 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2023-08-26 document have to be withdrawn

This document supersedes EN 60352-5:2012 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

## **Endorsement notice**

The text of the International Standard IEC 60352-5:2020 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 60352-1	NOTE	Harmonized as EN 60352-1
IEC 61249 (series)	NOTE	Harmonized as EN 61249 (series)
IEC 61249-2-4	NOTE	Harmonized as EN 61249-2-4

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60512-1	-	Connectors for electrical and electronic equipment - Tests and measurements - Part 1: Generic specification	EN IEC 60512-1	-
IEC 60512-1-1	-	Connectors for electronic equipment - Tests and measurements - Part 1-1: General examination - Test 1a: Visual examination	EN 60512-1-1	-
IEC 60512-1-2	-	Connectors for electronic equipment - Tests and measurements - Part 1-2: General examination - Test 1b: Examination of dimension and mass	EN 60512-1-2	-
IEC 60512-2-1	-	Connectors for electronic equipment - Tests and measurements - Part 2-1: Electrical continuity and contact resistance tests - Test 2a: Contact resistance - Millivolt level method	EN 60512-2-1	-
IEC 60512-2-5	-	Connectors for electronic equipment - Tests and measurements - Part 2-5: Electrical continuity and contact resistance tests - Test 2e: Contact disturbance	EN 60512-2-5	-
IEC 60512-6-4	-	Connectors for electronic equipment - Tests and measurements - Part 6-4: Dynamic stress tests - Test 6d: Vibration (sinusoidal)	EN 60512-6-4	-
IEC 60512-11-1	-	Connectors for electrical and electronic equipment - Tests and measurements - Part 11-1: Climatic tests - Test 11a - Climatic sequence	EN IEC 60512-11-1	-
IEC 60512-11-4	-	Connectors for electronic equipment - Tests and measurements - Part 11-4: Climatic tests - Test 11d: Rapid change of temperature	EN 60512-11-4	-

## EN IEC 60352-5:2020 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60512-11-9	-	Connectors for electronic equipment - Tests and measurements - Part 11-9: Climatic tests - Test 11i: Dry heat	EN 60512-11-9	-
IEC 61188-5-1	-	Printed boards and printed board assemblies - Design and use - Part 5-1: Attachment (land/joint) considerations - Generic requirements	EN 61188-5-1	-
IEC 62326-4	-	Printed boards - Part 4: Rigid multilayer printed boards with interlayer connections - Sectional specification	EN 62326-4	-

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	8
4 Requirements .....	10
4.1 General.....	10
4.2 Tools .....	10
4.2.1 General .....	10
4.2.2 Tools evaluation .....	10
4.3 Press-in terminations .....	10
4.3.1 Materials .....	10
4.3.2 Dimensions of the press-in zone .....	10
4.3.3 Surface finishes.....	10
4.4 Test boards.....	11
4.4.1 General .....	11
4.4.2 Materials .....	11
4.4.3 Thickness of test boards.....	11
4.4.4 Hole.....	11
4.4.5 Plated-through hole .....	12
4.5 Press-in connections.....	13
4.6 Manufacturer's specification .....	14
5 Tests .....	15
5.1 General remarks .....	15
5.1.1 General .....	15
5.1.2 Standard conditions for testing .....	15
5.1.3 Mounting of specimens .....	15
5.2 Test and measuring methods .....	16
5.2.1 General examination.....	16
5.2.2 Mechanical tests.....	16
5.2.3 Contact resistance measurements .....	19
5.2.4 Climatic tests.....	20
5.3 Test schedules.....	21
5.3.1 General .....	21
5.3.2 Qualification test schedule.....	21
5.3.3 Flow chart.....	23
5.3.4 Application test schedule .....	24
5.4 Test report .....	25
5.4.1 Qualification test report .....	25
5.4.2 Application test report.....	26
Annex A (informative) Practical guidance.....	27
A.1 General.....	27
A.2 Current-carrying capacity .....	27
A.3 Tool information .....	27
A.3.1 Termination insertion tool .....	27
A.3.2 Support block .....	27

A.3.3	Termination removal tool .....	28
A.4	Information to press-in termination and press-in connections .....	28
A.4.1	General .....	28
A.4.2	Design features .....	28
A.4.3	Materials and surface finishes .....	29
A.4.4	Press-in terminations with connector contact elements .....	29
A.5	Printed board information .....	29
A.5.1	General .....	29
A.5.2	Plated-through hole .....	30
A.5.3	Dimensioning of the hole .....	30
A.5.4	Manufacturing of the hole, example with drilling for FR4 .....	31
A.5.5	Manufacturing of the hole with materials other than FR4 .....	31
A.6	Press-in connection information .....	31
A.6.1	General .....	31
A.6.2	Press-in connection .....	31
A.6.3	Repair of press-in connections .....	32
A.6.4	Combination of press-in connections and soldered connections .....	33
A.6.5	Bimetallic electrolytic corrosion effects .....	33
	Bibliography .....	34
	Figure 1 – Guide for hole ranges in a test board .....	12
	Figure 2 – Plated-through hole .....	13
	Figure 3 – Location and example of the transversal microsection for measuring the copper thickness .....	13
	Figure 4 – Test arrangement – push-out force .....	17
	Figure 5 – Transverse section of a press-in connection .....	18
	Figure 6 – Longitudinal section of a press-in connection .....	19
	Figure 7 – Test arrangement for contact resistance .....	20
	Figure 8 – Qualification test schedule .....	24
	Figure A.1 – Conceptual composition of a four-layer printed circuit board .....	30
	Figure A.2 – Example of a termination removal tool .....	33
	Table 1 – Plated-through hole requirements for test printed boards .....	12
	Table 2 – Vibration, preferred test severities .....	18
	Table 3 – Qualification test schedule – Test group AP .....	22
	Table 4 – Qualification test schedule – Test group BP .....	22
	Table 5 – Qualification test schedule – Test group CP .....	23
	Table 6 – Application test schedule – Test group DP .....	25
	Table A.1 – Example for dimensioning the printed circuit board hole .....	31



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**SOLDERLESS CONNECTIONS –****Part 5: Press-in 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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International Standard IEC 60352-5 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This fifth edition cancels and replaces the fourth edition published in 2012. This edition constitutes a technical revision.

This edition includes the following significant changes with respect to the previous edition:

- a) revising the scope by removing the wording "... telecommunication equipment and in electronic devices employing similar techniques" and replacing it by "... electrical and electronic equipment and components" in the first paragraph;
- b) adding terms and definitions for 'board', 'hole' and 'metal board' to recognize that press-in terminations are being used in many non-printed board materials;

- c) editorial changes to clarify the difference between the two test schedules for qualification and application;
- d) modification of upper limit of copper thickness of the plated-through-hole to reflect actual market trends and manufacturing practices;
- e) removal of bending test, as this test is very specific for applications of press-in technology no longer common;
- f) adding graphs to document the press-in and push-out force, since this is common testing practice and provides further insight into mechanical performance of the contact zone;
- g) reducing the number of test specimens required, since in previous testing scheme a lot of test samples were discarded;
- h) new wording in 4.5 for cracked and bent terminations;
- i) added Figure 7b to show V and A connection locations when the press-in termination does not protrude through the bottom side of the board.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
48B/2810/FDIS	48B/2822/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 60352 series, published under the general title *Solderless connections*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

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

## INTRODUCTION

This part of IEC 60352 includes requirements and relevant tests (normative) as well as a practical guidance in Annex A (informative) for press-in connections.

Two test schedules are provided.

- a) The qualification test schedule applies to individual press-in connections to demonstrate the suitability of the press-in zone.

These press-in connections are tested to the specification provided by the manufacturer of the press-in termination (see 4.6) taking into account the requirements of Clause 4.

The qualification is independent of the application of the press-in zone in a component.

- b) The application test schedule applies to press-in connections which are part of a component and are already qualified to the qualification test schedule.

Test sequences focus on the performance of the press-in connection which is affected by the implementation in a component.

The requirements and tests apply to all elements involved in the manufacturing of a press-in connection:

- the press-in termination, which may be part of a component (e.g. a multi-pole connector);
- the board, printed board or MID (moulded interconnect device) - (plated-through holes dimensions) for which the termination is suitable;
- the tool(s) required to produce the press-in connection.

As the manufacturer of the press-in termination has to provide the main part of the information needed for qualification, the word "manufacturer" is used throughout this document for simplicity to indicate the manufacturer of the press-in termination. The manufacturers of the other items playing a role in the qualification of press-in connections are specified, if needed, as the board manufacturer or the tool(s) manufacturer.

The practical guidance in Annex A (informative) serves as a guide for the workmanship required in 4.1. Attention is drawn to the fact that some industries (e.g. automotive, aircraft and aerospace, nuclear, military) may have specific workmanship standards and/or quality requirements, which are outside the scope of this document.

IEC Guide 109 advocates the need to minimize the impact of a product on the natural environment throughout the product life cycle.

## **SOLDERLESS CONNECTIONS –**

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

#### **1 Scope**

This part of IEC 60352 is applicable to solderless press-in connections for use in electrical and electronic equipment and components.

The press-in connection consists of a termination having a suitable press-in zone which is inserted into a hole of a board.

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

The object of this document is to determine the suitability of press-in connections under mechanical, electrical and atmospheric conditions as specified by the manufacturer of the press-in termination 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 documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60512-1, *Connectors for electrical and electronic equipment – Tests and measurements – Part 1: Generic specification*

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-5, *Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*

IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-11-1, *Connectors for electrical and electronic equipment – Tests and measurements – Part 11-1: Climatic tests – Test 11a – Climatic sequence*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 61188-5-1, *Printed boards and printed board assemblies – Design and use – Part 5-1: Attachment (land/joint) considerations – Generic requirements*

IEC 62326-4, *Printed boards – Part 4: Rigid multilayer printed boards with interlayer connections – Sectional specification*