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Title: BS EN IEC 60352-7 Solderless connections

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

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



48B/3069/CD

COMMITTEE DRAFT (CD)

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SUPERSEDES DOCUMENTS:
48B/3061/RR

IEC SC 48B : ELECTRICAL CONNECTORS	
SECRETARIAT: United States of America	SECRETARY: Mr Jeffrey Toran
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	

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Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (SEE [AC/22/2007](#) OR [NEW GUIDANCE DOC](#)).

TITLE:

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SOLDERLESS CONNECTIONS –**Part 7: Spring clamp connections – General requirements,
test methods and practical guidance****FOREWORD**

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IEC 60352-7 has been prepared by SC 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 2020. This edition constitutes a technical revision.

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

- a) Addition of tests for resiliency in metallic parts to compensate for any shrinkage or yielding of insulating material with regards to contact pressure transmitted via insulating material (CoPI);
- b) ...

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

Draft	Report on voting
48B/XX/FDIS	48B/XX/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 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 covers spring clamp connections and includes requirements, tests and practical guidance information.

Two test schedules are provided.

a) The basic test schedule applies to spring clamp connections which conform to all requirements of Clause 5. These requirements are derived from experience with successful applications of such spring clamp connections.

b) The full test schedule applies to spring clamp connections which do not fully conform to all requirements of Clause 5, for example which are manufactured using materials or finishes not included in Clause 5.

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

The values given in this specification are minimum values, which are harmonized with other IEC documents. Other standards may specify other values.

The test procedure for resiliency in metallic parts to compensate for any shrinkage or yielding of insulating material with regards to contact pressure transmitted via insulating material (CoPI) has been derived from of IEC 60947-7-4:2019.

SOLDERLESS CONNECTIONS –

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

1 Scope

This part of IEC 60352 is applicable to spring clamp connections made with stripped wire without further preparation:

- solid conductors of 0,32 mm to 3,7 mm nominal diameter (0,08 mm² to 10 mm² cross-section), or
- stranded conductors of 0,08 mm² to 10 mm² cross-section, or
- flexible conductors of 0,08 mm² to 10 mm² cross-section,

according to IEC 60228 or IEC 60189-3 for use in electrical and electronic equipment and components.

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.

The object of this document is to determine the suitability of spring clamp connections under specified mechanical, electrical and atmospheric conditions.

NOTE IEC Guide 109 advocates the need to minimize 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 document may have a negative environmental impact. As technological advances lead to acceptable alternatives for these materials, they will be eliminated from this document.

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 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60189-3:2007, *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 60228:2004, *Conductors of insulated cables*

IEC 60512-1, *Connectors for 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*

- 249 IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1:*
250 *Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level*
251 *method*
- 252 IEC 60512-2-2, *Connectors for electronic equipment – Tests and measurements – Part 2-2:*
253 *Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test*
254 *current method*
- 255 IEC 60512-2-5, *Connectors for electronic equipment – Tests and measurements – Part 2-5:*
256 *Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*
- 257 IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4:*
258 *Dynamic stress tests – Test 6d: Vibration (sinusoidal)*
- 259 IEC 60512-9-2, *Connectors for electronic equipment – Tests and measurements – Part 9-2:*
260 *Endurance tests – Test 9b: Electrical load and temperature*
- 261 IEC 60512-9-5, *Connectors for electrical and electronic equipment - Tests and measurements - Part*
262 *9-5: Endurance tests - Test 9e: Current loading, cyclic*
- 263 IEC 60512-11-1, *Connectors for electrical and electronic equipment – Tests and measurements*
264 *– Part 11-1: Climatic tests – Test 11a – Climatic sequence*
- 265 IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4:*
266 *Climatic tests – Test 11d: Rapid change of temperature*
- 267 IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7:*
268 *Climatic tests – Test 11g: Flowing mixed gas corrosion test*
- 269 IEC 60512-16-20, *Electromechanical components for electronic equipment – Basic testing*
270 *procedures and measuring methods – Part 16: Mechanical tests on contacts and terminations*
271 *– Section 20: Test 16t: Mechanical strength (wired termination of solderless connections)*

272 **3 Terms and definitions**

273 For the purposes of this document, the following terms and definitions apply.

274 ISO and IEC maintain terminology databases for use in standardization at the following
275 addresses:

- 276 • IEC Electropedia: available at <https://www.electropedia.org/>
- 277 • ISO Online browsing platform: available at <https://www.iso.org/obp>

278 **3.1** 279 **spring clamp termination**

280 part of the contact or terminal to which one single conductor only is connected by means of a
281 spring

282 **3.1.1** 283 **universal spring clamp termination**

284 spring clamp termination intended to accept solid, stranded and flexible unprepared conductors

285 Note 1 to entry: For the meaning of solid, stranded and flexible, see IEC 60228 where conductors are classified as
286 class 1 (solid conductors), class 2 (stranded conductors), class 5 (flexible conductors) and class 6 (flexible
287 conductors which are more flexible than class 5).

3.1.2

non-universal spring clamp termination

spring clamp termination intended to accept conductors of one class only, for example solid conductors only, or conductors of two classes only, for example solid and stranded but not flexible

Note 1 to entry: For the meaning of solid, stranded and flexible, see IEC 60228 where conductors are classified as class 1 (solid conductors), class 2 (stranded conductors), class 5 (flexible conductors) and class 6 (flexible conductors which are more flexible than class 5).

3.1.3

push-in spring clamp termination

non-universal spring clamp termination in which the connection is made by pushing in a solid or stranded conductor without the aid of a tool or of an actuating element

Note 1 to entry: For the meaning of solid and stranded, see IEC 60228 where solid conductors are classified as class 1, stranded conductors are classified as class 2.

3.2

spring clamp connection

solderless connection achieved by clamping a conductor with a spring clamp termination, see Figure 1

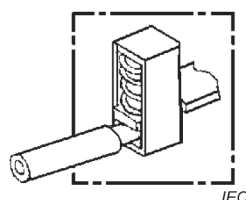


Figure 1a – Spring clamp connection, operated without a tool

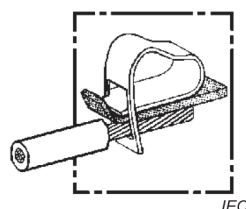


Figure 1b – Spring clamp connection, operated with a tool

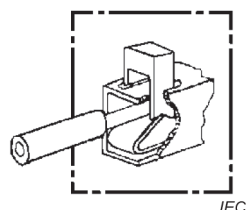


Figure 1c – Spring clamp connection, operated with an actuating element

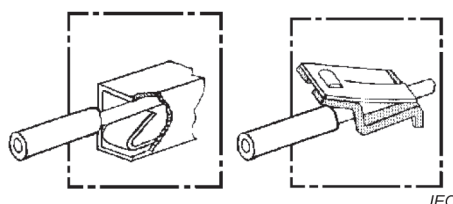


Figure 1d – Spring clamp connections, with a push-in spring clamp termination, with solid wires

Figure 1 – Examples of spring clamp connections