

STN	Skúšanie vplyvu prostredia Časť 2-69: Skúšky Skúška Te/Tc: Skúšanie spájkovateľnosti elektronických súčiastok a dosiek s plošnými spojmi metódou zmáčacích váh (meranie sily) Zmena A1	STN EN 60068-2-69/A1 34 5791
------------	---	--

Environmental testing - Part 2-69: Tests - Test Te/Tc: Solderability testing of electronic components and printed boards by the wetting balance (force measurement) method

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/19

STN EN 60068-2-69 z októbra 2017 sa bez tejto zmeny A1 môže používať do 24. 7. 2022.

Obsahuje: EN 60068-2-69:2017/A1:2019, IEC 60068-2-69:2017/AMD1:2019

129847

EUROPEAN STANDARD

EN 60068-2-69:2017/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2019

ICS 19.040; 31.190

English Version

**Environmental testing - Part 2-69: Tests - Test Te/Tc:
Solderability testing of electronic components and printed boards
by the wetting balance (force measurement) method
(IEC 60068-2-69:2017/A1:2019)**

Essais d'environnement - Partie 2-69: Essais - Essai Te/Tc:
Essai de brasabilité des composants électroniques et cartes
imprimées par la méthode de la balance de mouillage
(mesure de la force)
(IEC 60068-2-69:2017/A1:2019)

Umgebungseinflüsse - Teil 2-69: Prüfungen - Prüfung
Te/Tc: Prüfung der Lötbarkeit von Bauelementen der
Elektronik und Leiterplatten mit der Benetzungswaage
(Kraftmessung)
(IEC 60068-2-69:2017/A1:2019)

This amendment A1 modifies the European Standard EN 60068-2-69:2017; it was approved by CENELEC on 2019-07-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 amendment 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

EN 60068-2-69:2017/A1:2019 (E)**European foreword**

The text of document 91/1566/FDIS, future IEC 60068-2-69/A1, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60068-2-69:2017/A1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-04-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-07-24

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 60068-2-69:2017/A1:2019 was approved by CENELEC as a European Standard without any modification.



IEC 60068-2-69

Edition 3.0 2019-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Environmental testing –
Part 2-69: Tests – Test Te/Tc: Solderability testing of electronic components
and printed boards by the wetting balance (force measurement) method**

**Essais d'environnement –
Partie 2-69: Essais – Essai Te/Tc: Essai de brasabilité des composants
électroniques et cartes imprimées par la méthode de la balance de mouillage
(mesure de la force)**

**THIS PUBLICATION IS COPYRIGHT PROTECTED****Copyright © 2019 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC Glossary - std.iec.ch/glossary

67 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -**webstore.iec.ch/advsearchform**

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

Glossaire IEC - std.iec.ch/glossary

67 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.



IEC 60068-2-69

Edition 3.0 2019-06

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

**Environmental testing –
Part 2-69: Tests – Test Te/Tc: Solderability testing of electronic components
and printed boards by the wetting balance (force measurement) method**

**Essais d'environnement –
Partie 2-69: Essais – Essai Te/Tc: Essai de brasabilité des composants
électroniques et cartes imprimées par la méthode de la balance de mouillage
(mesure de la force)**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 19.040; 31.190

ISBN 978-2-8322-0000-0

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

FOREWORD

This amendment has been prepared by IEC technical committee 91: Electronics assembly technology.

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

FDIS	Report on voting
91/1566/FDIS	91/1580/RVD

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

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

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

koniec náhľadu – text ďalej pokračuje v platenej verzii STN

Table 3 – Pin diameter and solder pellet mass

Pin diameter mm	Solder pellet mass mg
1	5 ± 0,5
2	25 ± 2,5
3,2	100 ± 10
4	200 ± 10

Replace the last sentence of the 2nd paragraph with following sentence:

Refer to C.5.1.1 c) regarding the concave aluminium body head.

8.2.3 Solder globule wetting balance procedure

Replace the 2nd paragraph with the following:

Select the appropriate pin diameter for the component to be tested. Recommended pin diameters are given in Table 7.

Replace the 2nd sentence of the 6th paragraph with the following:

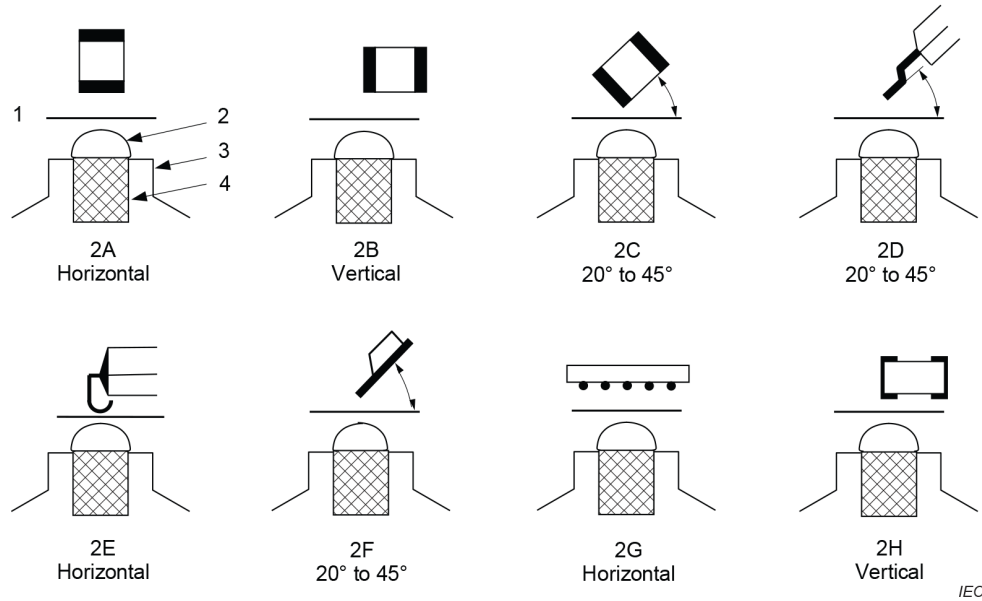
High-activated rosin base as specified in 7.2.1 shall be applied to the solder globule.

Table 7 – Recommended solder globule wetting balance test conditions

In the header row, replace "Pin size" with "Pin diameter" and replace "Globule mass" with "Solder pellet mass".

Figure 4 – Immersion conditions for solder globule method

Replace Figure 4 with the following new figure:

**Key**

1	Horizontal line	2	Solder globule
3	Globule support block	4	Iron pin

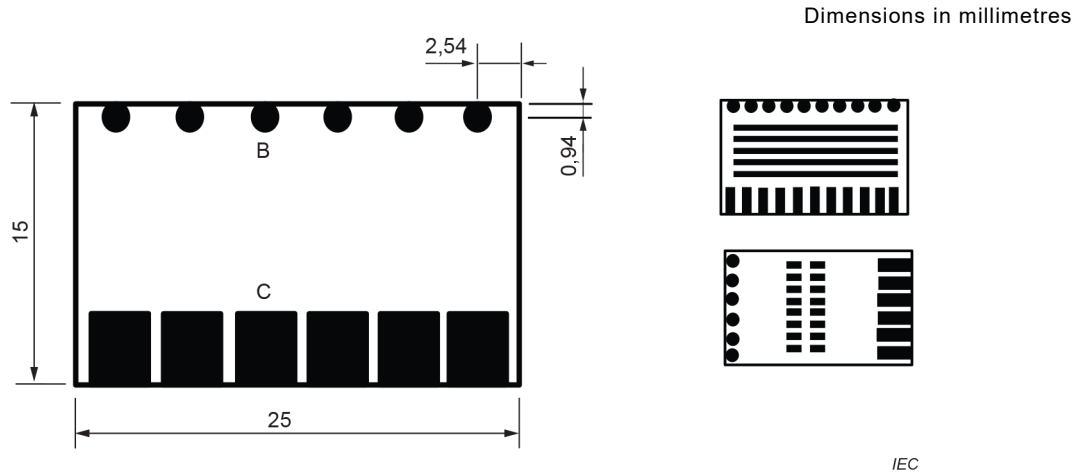
Figure 4 – Immersion conditions for solder globule method**8.2.4.1 Test specimen**

Replace the content with the following:

The test specimen shall be a full board, a section of a board or the test specimen as specified in the relevant specification. If the relevant specification does not specify the test specimen, the test specimens shown in Figure 5 may be used.

Figure 5 – Suggested wetting balance test specimens and soldering immersion

Replace Figure 5 with the following new figure:



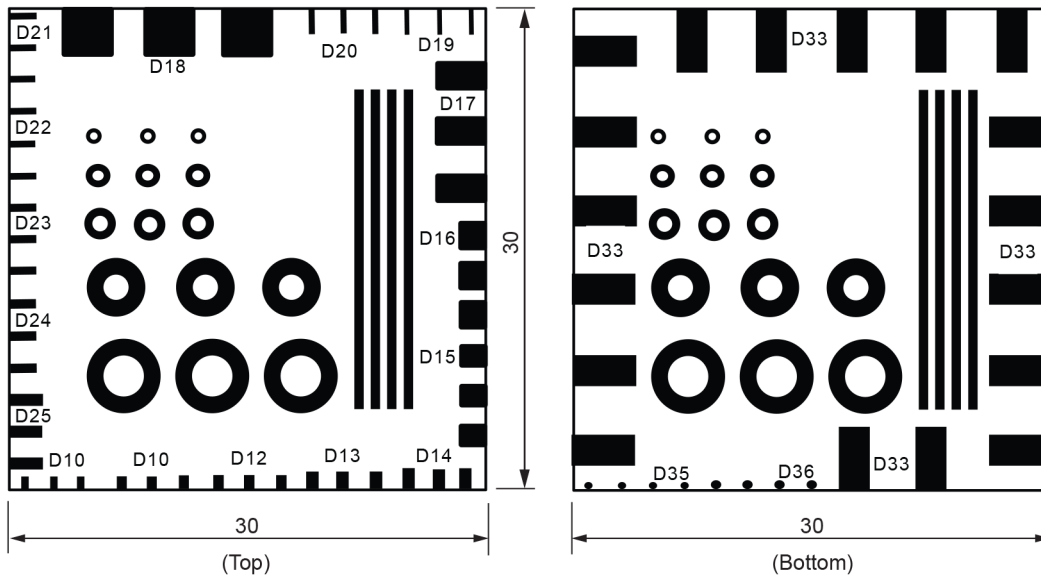
NOTE The figures on the right-hand side show the alternative configurations.

Symbol	Width	Length	Pad-to-pad pitch	Pad extension beyond the edge
B	1,9	round	4,0	—
C	3,18	4,52	4,0	0,51

[SOURCE: IPC 003c-4-2]

a) Test specimen for solder bath method

Dimensions in millimetres



Symbol	Width	Length
D10	0,698 5	0,899 2
D11	0,549 4	0,698 5
D12	0,800 1	1,000 8
D13	1,000 8	1,099 8
D14	0,899 2	1,399 5
D15	1,300 5	1,498 6
D16	1,600 2	1,798 3

Symbol	Width	Length
D17	1,798 3	3,200 4
D18	2,999 7	2,999 7
D19	0,170 2	1,600 2
D20	0,248 9	1,600 2
D21	0,299 7	1,600 2
D22	0,350 5	1,798 3
D23	0,399 8	1,798 3

Symbol	Width	Length
D24	0,500 4	1,798 3
D25	0,599 4	2,199 6
D33	1,899 9	3,799 8
D35	0,500 4	round
D36	0,599 4	round

[SOURCE: NPL Report MATCA(A)03, Figures 2 and 3 (TB26)]

b) Test specimen for solder globule method

Figure 5 – Suggested wetting balance test specimens for printed boards

8.2.4.2 Procedure

Replace the title with "Printed board test procedure".

Insert a new Subclause 8.2.4.2.1 entitled "Procedure for solder bath method" and move the existing contents of 8.2.4.2 into this new subclause with the following modifications.

Replace the 1st sentence of the 1st paragraph with the following:

The test specimens shall be dipped in the flux to the full depth to be soldered for 5 s to 10 s.

Replace the 1st sentence of the 2nd paragraph with the following:

Hang the specimen on the apparatus so that its lower edge is $10 \text{ mm} \pm 1 \text{ mm}$ above the solder bath to preheat it for $20 \text{ s} \pm 1 \text{ s}$.

Replace the 1st and 2nd sentences of the 3rd paragraph with the following:

The flux-covered surface shall be immersed only once in the molten solder to a depth of $0,2 \text{ mm} \pm 0,1 \text{ mm}$, and the angle of immersion shall be 20° to 40° , as shown in Figure 6.

Add the following new Subclause 8.2.4.2.2.

8.2.4.2.2 Procedure for solder globule method

As per 8.2.3 with the following details:

- a) pin diameter: 4 mm;
- b) solder pellet mass: 200 mg;
- c) flux type: high activated rosin-based flux as specified in 7.2.1;
- d) dipping angle: 45° ;
- e) immersion depth: 0,10 mm;
- f) immersion speed: 1 mm/s;
- g) dwell time: 10 s.

The time sequence of the test is shown in Table 8. The test sequence time should be the least possible whilst maintaining repeatability.

10 Information to be given in the relevant specification

In list item e), replace "Globule size" with "Pin diameter and solder pellet mass".

B.3 Solder globule mass and pin size

Replace the title with "Solder pellet mass and pin diameter".

Replace the first three paragraphs with the following:

IEC 60068-2-69:2017/AMD1:2019

– 7 –

© IEC 2019

The solder globule wetting balance method is standardized using 4 pin diameters (4 mm, 3,2 mm, 2 mm and 1 mm) for the iron insert in the aluminium block, and 4 corresponding solder pellet masses (200 mg, 100 mg, 25 mg and 5 mg).

In general, the smaller solder pellet masses give improved discrimination with the smaller SMDs and facilitate testing of individual leads on fine-pitch devices, such as QFPs (quad flat packs) and BGAs (ball grid arrays). The 200 mg pellet mass is required for all larger SMD and multi-leaded SMD, where the 25 mg solder pellet mass has insufficient volume to completely solder the terminations. The 100 mg solder pellet mass provides a larger wetting force than the 200 mg solder pellet mass and larger thermal inertia than the 25 mg solder pellet mass. With the advent of even smaller SMDs, such as 0603M (0201), a smaller pin diameter of 1 mm, and solder pellet mass 5 mg or 2,5 mg, may be required to match these finer SMD sizes.

A list of recommended pin diameters and solder pellet masses is given in Table 7 and Annex C.

B.7.2.2 Noise level (see Clause A.1 c))

Replace, in the title, "(see Clause A.1 c))" with "(see Clause A.1 d))".

Bibliography

Add the following document:

NPL Report MATC(A)03, *Solderability Measurements of PCB Pad Finishes and Geometries*, February 2001. By Deborah Lea, Fredrikus Jonck and Christopher Hunt

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
Fax: + 41 22 919 03 00
info@iec.ch
www.iec.ch