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Soft soldering fluxes — Test methods —

Part 13: Determination of flux spattering

Flux de brasage tendre — Méthodes d'essai —

Partie 13: Détermination des projections de flux

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 12, *Soldering materials*.

This second edition cancels and replaces the first edition (ISO 9455-13:1996), which has been technically revised.

The main changes to the previous version are:

— solder designations have been updated according to ISO 9453;

— the test report has been updated;

— editorial revisions have been made.

A list of all parts in the ISO 9455 series can be found on the ISO website.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 12 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Soft soldering fluxes — Test methods —

Part 13: Determination of flux spattering

1 Scope

This document specifies a method for estimating the tendency of a flux to spatter in use. It is a qualitative (comparative) method and is only applicable to liquid fluxes, as defined in ISO 9454-1.

The method is not applicable to flux cored solder wire or to solder pastes.

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.

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities*

ISO 9453, *Soft solder alloys — Chemical compositions and forms*

ISO 9454-1, *Soft soldering fluxes — Classification and requirements — Part 1: Classification, labelling and packaging*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Principle

A measured amount of the liquid flux under test is placed on a specimen plate of sheet steel. The plate is heated on a solder bath and the plate examined visually for evidence of spattering of the flux.

5 Apparatus

Usual laboratory apparatus and, in particular, the following.

5.1 Solder bath, of rectangular cross-section, approximately 150 mm × 100 mm, containing at least 4 kg of tin-base solder according to ISO 9453. The depth of the solder shall be such that the liquid surface of the solder is not greater than 5 mm from the bath rim. The bath shall be capable of being maintained at a temperature of (400 ± 10) °C.

5.2 Specimen plates, cut from 1 mm thick unalloyed steel sheet, deep drawing quality, according to ISO 3574. The plates are to be cut to size, such that the length and width are 10 mm larger than the corresponding dimensions of the solder bath (5.1).

5.3 Silicon carbide cloth, 180 grade.

6 Procedure

Adjust the temperature of the solder in the solder bath (5.1) to (400 ± 10) °C. Ensure that the level of the solder in the bath is (4 ± 1) mm below the level of the rim of the bath.

Carry out the following procedure on three specimen plates (5.2).

Using the silicon carbide cloth (5.3), clean the surface of each specimen plate immediately before testing in order to remove all oxidation and contamination from the steel.

By means of a fine graduated pipette, transfer (0,1 ± 0,01) ml of the liquid test flux to the centre of one of the specimen plates.

Immediately after application of the flux, carefully place the specimen plate, flux upwards, on the rim of the solder bath, such that it covers the rim completely. During these operations, ensure that the solder bath is located in still air conditions.

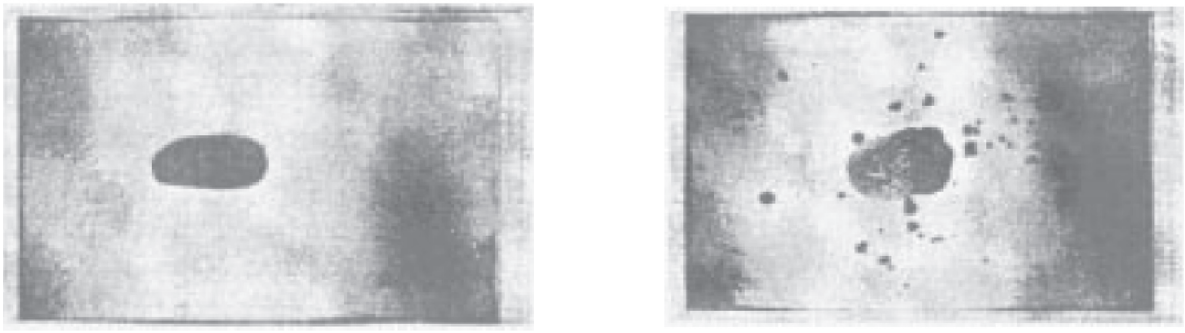
Remove the plate after 3 min and examine it visually for evidence of spattering.

Repeat this procedure for each of the two remaining specimen plates, while maintaining the solder bath temperature at (400 ± 10) °C.

7 Expression of the results

The average result obtained from the three tests is assessed, compared with Figure 1, and reported as either “no spattering” or “spattering occurs”. Alternatively, a reference flux of known satisfactory performance may be subjected to the same procedure as described in Clause 6, and the average spattering rating of the test flux reported as “equal to”, “better than” or “worse than” the average for the reference flux.

Figure 1 shows examples for flux spattering and no flux spattering.



a) No spattering of flux **b) Flux spattering occurs**

Figure 1 — Spattering of soldering flux

8 Test report

The test report shall include at least the following information:

a) an identification of the test sample;

b) the test method used (i.e. reference to this document, ISO 9455-13);

c) the results obtained from the test, either in absolute terms, or by comparison with a reference flux, the details of which should be given;

d) any unusual features noted in the test;

e) details of any operation not specified in the method or any optional operation which may have influenced the result;

f) the date.

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