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Flux cored solder wire - Specification and test methods - Part 2: Determination of flux content (ISO/DIS 12224-2:2023)

Flussmittelgefüllte Röhrenlote - Festlegung und Prüfverfahren - Teil 2: Bestimmung des Flussmittelgehaltes (ISO/DIS 12224-2:2023)

Fils d'apport de brasage tendre, pleins et à flux incorporé - Spécifications et méthodes d'essai - Partie 2: Détermination de la teneur en flux (ISO/DIS 12224-2:2023)

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Flux cored solder wire — Specification and test methods —

Part 2:
Determination of flux content

Fils d'apport de brasage, pleins et à flux incorporé — Spécifications et méthodes d'essai —

Partie 2: Détermination de la teneur en flux

ICS: 25.160.50

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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).

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For an explanation of 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 www.iso.org/iso/foreword.html.

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

This second edition cancels and replaces the first edition (ISO 12224-2:1997), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in 5.3 quartz glass crucible was added;

— in 5.6 Bunsen burner with tripod was added;

— in 6.4 method C with Bunsen burner was added.

A list of all parts in the ISO 12224 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Flux cored solder wire — Specification and test methods —

Part 2: Determination of flux content

1 Scope

This document specifies two methods for the determination of the flux content of a sample flux cored solder wire.

2 Normative references

There are no normative references in this document.

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 https://www.iso.org/obp

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

4 Principle

A known mass of the sample of flux cored solder wire is melted, separated from the flux medium and weighed. The flux content is calculated and expressed as a percentage by mass of the original wire.

5 Apparatus and materials

5.1 Degreasing solvent, such as propan-2-ol or the solvent recommended by the manufacturer.

5.2 Balance, having an accuracy of ±0,001 g.

5.3 Porcelain or quartz glass crucible, capacity 30 ml.

5.4 Scraper, stainless.

5.5 Crucible tongs

5.6 Solder bath, containing solder according to ISO 9453 maintained at a temperature of (50 ± 5) °C above the liquidus temperature of the wire under test.

5.7 Bunsen burner with tripod

5.8 Tissues

5.9 Glycerol

5.10 Glass beaker, pyrex, 100 ml to 150 ml.

6 Procedure

6.1 General

Clean the sample length of the flux cored solder wire under test with a tissue (5.7) soaked in the degreasing solvent (5.1). Follow either method A, method B or method C below.

6.2 Method A

Carry out the test in duplicate.

Using the balance (5.2) weigh (50 ± 5) g of the cleaned wire to 0,001 g. Record the mass of the sample (m_1). Form the sample into a ball and transfer it to the cleaned crucible (5.3) or the beaker (5.9).

Clean the surface of the molten solder in the solder bath (5.6) by means of the scraper (5.4).

Holding the crucible or beaker with the tongs (5.5), partially immerse it in the solder bath (5.6), maintained at a temperature (50 ± 5) °C above the liquidus temperature of the wire under test. Turn the crucible or beaker gently until the solder has melted into one pellet. Leave the crucible or beaker immersed in the solder bath for 10 s to 15 s after the solder has melted.

Remove the crucible or beaker from the solder bath and allow it to cool until the solder has just solidified. Pour off as much flux as possible while the flux remains warm.

Remove the pellet from the crucible or beaker. Clean it thoroughly with degreasing solvent (5.1) to remove all traces of flux. Dry the pellet with a clean tissue (5.7). Using the balance (5.2) weigh the dry pellet to a constant weight to 0,001 g. Record the mass of the pellet (m_2).

6.3 Method B

Carry out the test in duplicate.

Using the balance (5.2) weigh (30 ± 2) g of the cleaned wire to 0,001 g. Record the mass of the sample (m_1).

Transfer the solder wire to the beaker (5.9) with sufficient glycerol (5.8) to cover the sample (approximately 50 ml of glycerol).

Clean the surface of the molten solder in the solder bath (5.6) by means of the scraper (5.4).

Holding the beaker with the tongs (5.5), partially immerse it in the solder bath (5.6), maintained at a temperature (50 ± 5) °C above the liquidus temperature of the wire under test. Turn the beaker until the solder has melted into one pellet. Leave the beaker immersed in the solder bath for 10 s to 15 s after the solder has melted, while turning gently.

Allow the solder to solidify and then decant as much of the flux/glycerol mixture as possible from the molten solder. Allow the solder to cool and solidify.

Remove the solder pellet and wash it in water. Clean it thoroughly with degreasing solvent (5.1) to remove all traces of flux. Dry the pellet with a clean tissue (5.7).

Using the balance (5.2) measure the mass of the dry pellet to a constant weight, to 0,001 g (m_2).

In cases of dispute it is recommended that the method to be used should be agreed between supplier and purchaser.

6.4 Method C

A sample amount of 10 g is weighed in and the mass is recorded.

The wire sample is heated in a clean porcelain or quartz glass crucible on the tripod plate with the Bunsen burner. In the case of soldering wires with a low flux content, a little rosin is also added to the crucible to prevent metal residues from being left in the crucible when the molten solder is poured out.

When the sample has melted, it is poured quickly and completely into an aluminum mold with the aid of crucible tongs. It is important to ensure that the solder solidifies in one part.

The sample is removed from the aluminum dish with crucible tongs (the rosin should still be liquid at this point).

The solidified solder is now freed from all flux and rosin deposits with a cleaning cloth soaked in the solvent. Now the solder sample is weighed and the mass is recorded.

7 Expression of results for both methods

Calculate the flux content of the sample wire as the percentage by mass, using the following formula:

$$\text{Flux content} = \left[\frac{m_1 - m_2}{m_1}\right] \times 100\,\%\,(m/m)$$

where

m_1 is the mass, in grams, of the flux cored solder wire used in the test;

m_2 is the mass, in grams, of the solder pellet.

If the values of the two determinations differ by more than 0,2 %, the determination shall be repeated completely.

Calculate the arithmetic mean of the two determinations.

8 Test report

The test report shall include the following information:

a) the identification of the test sample;

b) reference to this part of ISO 12224;

c) the test method used;

d) the results obtained;

e) any unusual features noted during the test;

f) details of any operation not included in this part of ISO 12224, or regarded as optional.

Bibliography

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