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ISO/DIS 3677

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Filler metal for soft soldering, brazing and braze welding — Designation

Métaux d'apport de brasage tendre, de brasage fort et de soudobrasage — Désignation

ICS: 25.160.50

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 3677 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes* .

This third edition cancels and replaces the second edition (ISO 3677:1992), which has been technically revised.

Introduction

Requests for official interpretations of any aspect of this standard should be directed to the Secretariat of ISO/TC 44/WG 3 via your national standards body, a complete listing which can be found at www.iso.org.

Filler metal for soft soldering, brazing and braze welding — Designation

1 Scope

This International Standard specifies designations for filler materials for soldering and brazing, on the basis of their chemical composition. For brazing materials only, the designation includes their solidus/liquidus temperatures. This International Standard deals with the metallic part of filler materials used in soldering and brazing products, e.g. foils, wires, rods, pastes, flux coated rods/wires, flux cored rods/wires, etc.

2 Symbols and requirements

2.1 General

The designation is divided into two parts for solder alloys and three parts for brazing alloys. In each case the parts are separated by a dash.

2.2 First part (applicable to all materials)

The first part consists of a letter denoting the type of use of the material, as follows:

a) "S" shall be used for all solder alloys;

b) "B" shall be used for all brazing alloys.

NOTE For solders for electronic applications see also 2.3.6.

2.3 Second part (applicable to all materials)

2.3.1 The second part consists of a group of symbols, in accordance with the classification given in 2.3.2 to 2.3.6, indicating the various metals or metalloids making up the filler metal.

2.3.2 The chemical symbol of the major element in the filler metal is placed first. This is followed by the nominal mass percentage of the element concerned. This value shall be expressed as a whole number with an accuracy of ± 1.

NOTE When a range is specified for an element in the alloy, the nominal value to be used in the designation should be the mean of the range, rounded to the nearest whole number, or rounded to the nearest even number if the mean is halfway between two whole numbers. When only a minimum value is specified, however, the rounded-off minimum percentage should be used as the nominal value in the designation.

2.3.3 The chemical symbols of the other metals or metalloids specified in the alloy are given in decreasing order of their nominal percentage. In addition, for solder alloys only, each chemical symbol shall be followed by the nominal mass percentage of the element concerned (see note 2). If two or more elements have the same nominal mass percentage they shall be classified in order of decreasing atomic number.

2.3.4 Metals or metalloids having a nominal specified value (see note 2) which is less than 1 % by mass shall not be indicated in the designation, unless these elements are functional components of the alloy, in which case they shall be indicated by:

a) for solder alloys, their chemical symbols only;

b) for brazing alloys, their chemical symbols enclosed in parentheses.

2.3.5 Only the chemical symbols of the first six constituents shall be indicated.

2.3.6 For solders for electronic applications, the letter "E" shall be added immediately after the second part.

2.4 Third part (for brazing alloys only)

The third part indicates the temperatures, expressed in degrees Celsius, at the beginning and end of solidification. The solidus temperature shall be placed first, followed by the liquidus temperature. The temperatures shall be separated by an oblique stroke (slash).

3 Examples

3.1 Solders

3.1.1 A tin-base alloy (60 %) with 39 % lead and 0,4 % antimony, with a solidus/liquidus temperature of S 183 °C — L 191 °C, shall be designated as follows:

S-Sn60Pb40Sb

3.1.2 A tin-base alloy (63 %) with 37 % lead of high purity, for use in special applications (e.g. in the electronics industry), with a melting temperature of 183 °C shall be designated as follows:

S-Sn63Pb37E

3.2 Brazing filler materials

3.2.1 A binary eutectic filler metal with 72 % silver and 28 % copper, with a melting temperature of 780 °C, shall be designated as follows:

B-Ag72Cu-780

A similar alloy, but containing lithium (less than 1 %) as a functional element, shall be designated as follows: B-Ag72Cu(Li)-780.

3.2.2 A nickel-base filler metal (63 %) with 16 % tungsten, 10 % chromium, 3,8 % iron, 3,2 % silicon, 2,5 % boron, 0,5 % carbon, 0,6 % phosphorus, 0,1 % manganese and 0,2 % cobalt, with a solidus/liquidus temperature of S 970 °C — L 1105 °C shall be designated as follows:

B-Ni63WCrFeSiB-970/1105

3.2.3 A copper-base alloy (59 %) with 40 % zinc, 0,5 % tin, 0,2 % silicon, 0,2 % manganese and 0,1 %

nickel, with a solidus/liquidus temperature of S 850 °C — L 885 °C, shall be designated as follows:

B-Cu59Zn-850/885

3.2.4 An aluminium-base alloy (88 %) with 12 % silicon, with a solidus/liquidus temperature of S 575 °C — L 590 °C, shall be designated as follows:

B-Al88Si-575/590

4 Use of designations

These designations are intended for use on the packages and in the instructions for use of filler materials. They are not intended for the marking of filler materials themselves.