INTERNATIONAL STANDARD

ISO 3677

Second edition
1992-06-15

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

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

Reference number
ISO 3677:1992(E)

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.

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.

International Standard ISO 3677 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Sub-Committee SC 12, *Soldering and brazing materials*.

This second edition cancels and replaces the first edition (ISO 3677:1976), of which it constitutes a technical revision.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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

1 Scope

This International Standard specifies designations for filler materials for soft soldering, brazing and braze welding, on the basis of their chemical composition. For brazing and braze welding materials only, the designation includes their solidus/liquidus temperatures.

This International Standard deals only with those filler metals used in soft soldering, brazing and braze welding which do not incorporate flux, either as a covering or as an integral part of the filler material.

2 Symbols and requirements

2.1 General

The designation is divided into two parts for soft solder alloys and three parts for brazing and braze welding 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:

— "S" shall be used for all soft solder alloys;

— "B" shall be used for all brazing and braze welding alloys.

NOTE 1 For soft 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 $\pm$ 1.

NOTE 2 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 soft 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 soft solder alloys, their chemical symbols only;

b) for brazing and braze welding 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 soft solders for electronic applications, the letter "E" shall be added immediately after the second part.

2.4 Third part (for brazing and braze welding 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 Soft 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 metal

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

3.3 Braze welding filler materials

3.3.1 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

3.3.2 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.