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Soldering and brazing materials — Methods for the sampling of soft solders for analysis

*Produits d'apport pour brasage tendre et brasage fort — Méthode
d'échantillonnage des produits d'apport de brasage tendre pour analyse*



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Foreword

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International Organization for Standardization

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Soldering and brazing materials — Methods for the sampling of soft solders for analysis

1 Scope

This International Standard specifies methods for sampling a consignment of soft solder which is subdivided into batches and the procedures for the preparation of an analysis sample representative of each batch.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 soft solder: Metallic filler material which is used to join metallic parts and which has a melting temperature (liquidus) lower than that of the parts to be joined, and usually lower than 450 °C.

2.2 unit of product: Item inspected in order to determine its classification as defective or non-defective.

2.3 batch: Collection of units of product, made from a single uniform melt.

2.4 consignment: Quantity of product, consisting of one or more batches, of the same grade delivered at the same time, by the supplier to the purchaser.

2.5 batch sample: One or more units of product selected at random from the batch and considered, in total, to be representative of the batch.

2.6 test sample stick: Stick of solder prepared by melting the whole of, or a representative fraction of, the batch sample and pouring it into a suitably shaped cast iron or aluminium mould.

2.7 analysis sample: Representative sample prepared from the test sample stick and used for the determination of the chemical composition.

3 Principle

The procedures given in clause 4 are designed to produce an analysis sample representative of each batch of soft solder in the consignment.

4 Sampling

4.1 Unit of product

The unit of product used for the sampling shall be as given in table 1.

Table 1 — Units of product for various forms of solder

Form of solder	Unit of product
Ingot, bar, slab, stick or rod	A single ingot, bar, slab, stick or rod
Wire	A single coil or reel
Wrought pre-forms and rings, pellets or powder	The individual packaged quantity

4.2 Selection of the batch sample

Select the batch sample as follows:

- where the batch consists of up to 4 units of product, select all the units;
- where the batch consists of over 4, up to and including 44 units of product, randomly select 4 units of product;
- where the batch consists of n units of product (where n is greater than 44), randomly select $0,1 n$ units of product (to the nearest integer above $0,1 n$).

4.3 Preparation of the test sample sticks from the batch sample

4.3.1 General

Using the batch sample selected in accordance with 4.2, prepare test sample sticks by the method described in either 4.3.2 or 4.3.3, depending on the form in which the soft solder is supplied.

4.3.2 Solder (cast or wrought) in ingot, slab, bar, stick or rod form

Melt the whole batch sample (4.2) in a clean iron or fire clay crucible and heat it to between 50 °C and 100 °C above the liquidus temperature of the alloy. Stir well and chill-cast test sample sticks, approximately 50 g to 100 g in mass and not more than 8 mm thick, in a cast iron or aluminium mould of the shape given in figure 1. If the batch sample mass is 50 g or less, then pour the whole of the melted sample into one of the cavities in the mould.

NOTES

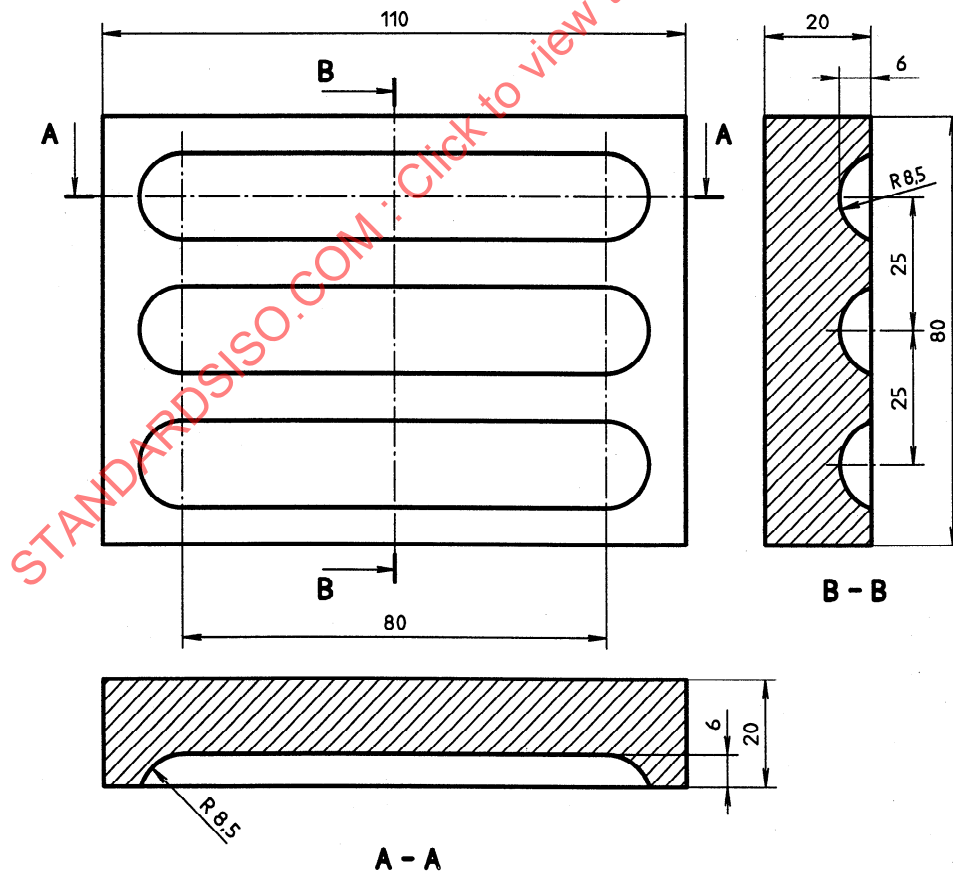
1 The material from which the mould is made should be such that it does not cause contamination of the solder samples.

2 No flux is necessary when melting the batch sample, if the units of product are in the cast form. However, the dross should be scraped aside before casting the test sample sticks.

4.3.3 Solder (wrought) in the form of wire, pellets, powder or pre-forms

From each unit of product in the batch sample (4.2) take, at random, a portion having a nominal mass of 10 g. Place all the portions taken to represent the batch into a fire clay crucible. Melt the aggregated portions under a thin layer of flux, such as palm oil, glycerol, rosin or paraffin wax, and heat the melt to between 50 °C and 100 °C above the liquidus temperature of the alloy. Stir well and chill-cast one test sample stick, approximately 50 g to 100 g in mass and not more than 8 mm thick, in a cast iron or aluminium mould of the shape given in figure 1, for every

Dimensions in millimetres



NOTE — Material: Cast iron or aluminium.

Figure 1 — Mould for casting the test sample sticks

100 g of melt. If the melted portions have a total mass of less than 50 g, then pour the whole melt into one of the cavities in the mould.

NOTES

3 The material from which the mould is made should be such that it does not cause contamination of the solder samples.

4 For solder forms containing an integral flux, the flux cover may be omitted when melting the portions.

5 For powders, the recommended flux is activated rosin (e.g. type 1.1.3, as defined in ISO 9454-1:1990, *Soft soldering fluxes — Classification and requirements — Part 1: Classification, labelling and packaging*).

6 If the mass of the consignment is too small for this procedure to be practicable, then the procedure for sampling should be agreed between the supplier and the purchaser.

4.4 Preparation of the analysis sample

Cut each test sample stick, obtained as described in 4.3, in half transversely and take sufficient transverse slices from the middle portion of each stick to give a total mass of between 10 g and 20 g. Place all the slices into a clean fire clay crucible and add flux (as listed in 4.3.3). Melt the slices and heat the melt to between 50 °C and 100 °C above the liquidus temperature of the alloy.

Stir well and invert the crucible at a height of approximately 50 cm above a dry, clean, smooth steel plate, having dimensions greater than 50 cm × 50 cm. The "splash" sample obtained, which should be in the form of a foil suitable for cutting with scissors, constitutes the analysis sample representative of the batch.

4.5 Testing of individual units of product (for wrought forms only)

As an alternative to combining the units of product in the batch sample, as in 4.3.2 and 4.3.3, each unit of product selected from the batch by the procedure given in 4.2 may be analysed individually. In this case, prepare the analysis sample for each individual unit of product in accordance with the procedures given for the batch sample in 4.3.2 or 4.3.3 (as appropriate) and in 4.4.

NOTE 7 If individual units of product are found not to comply with the chemical composition requirements, then they should be individually rejected. If more than 10 % of the units of product in the batch are found to fail on analysis, then the whole batch should be rejected.

5 Preservation of the analysis sample

Cut the "splash" sample (4.4) into small pieces with scissors, degrease them with acetone and dry in a stream of warm air. Keep the sample pieces until required in a sealed airtight container, having a label giving full details of the origin of the sample.

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