INTERNATIONAL STANDARD 688

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Filler rods for braze welding — Determination of characteristics of deposited metal

Métaux d'apport de soudobrasage — Détermination des caractéristiques du métal déposé

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 44 has reviewed ISO Recommendation R 688 and found it technically suitable for transformation. International Standard ISO 688 therefore replaces ISO Recommendation R 688-1968 to which it is technically identical.

ISO Recommendation R 688 was approved by the Member Bodies of the following countries :

Australia	India	South Africa, Rep. of
Austria	Ireland	Spain
Belgium	Israel	Sweden
Brazil	Italy	Switzerland
Canada	Japan	United Kingdom
Chile	Netherlands	U.S.S.R.
Denmark	New Zealand	Yugoslavia
Egypt, Arab Rep. of	Portugal	
France	Romania	

The Member Bodies of the following countries expressed disapproval of the Recommendation on technical grounds :

Germany
U.S.A.

The Member Body of the following country disapproved the transformation of ISO/R 688 into an International Standard :

Germany

Printed in Switzerland

Filler rods for braze welding — Determination of characteristics of deposited metal

0 INTRODUCTION

This International Standard is a companion to ISO 698, *Filler rods for braze welding — Determination of conventional bond strength on steel, cast iron and other metals.*

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods of test for filler rods for braze welding, to determine

a) the mechanical properties of the deposited metal :

- tensile strength,
- elongation;

b) the melting point or melting temperature range.

2 REFERENCE

ISO 82, *Steel — Tensile testing.*

3 DETERMINATION OF MECHANICAL PROPERTIES

3.1 Execution of deposit

3.1.1 *Type of supporting plate*

3.1.1.1 In order to determine the mechanical properties of metal deposited with braze welding filler rods, a deposit on the edge of a supporting plate, as shown in figure 1, shall be made.

3.1.1.2 The supporting plate shall be of mild steel and the edge on which the deposit is made shall be cleaned and degreased before the deposit is made.

3.1.2 *Operating conditions*

3.1.2.1 The thickness of the supporting plate and the operating conditions shall be as specified in the table, according to the diameter of the filler rod.

Diameter of filler rod, mm	2	2,5	3,15	4	5	6,3
Thickness, *e*, of supporting plate, mm	10	10	12	15	18	18
Height, *h*, of deposit, mm	10	10	12	15	15	15
Acetylene consumption of blowpipe, l/h *	150	150	200	250	315	315
Number of runs	10 to 8					

* The operator should ensure that the acetylene consumption of his blowpipe corresponds as closely as possible to the value shown.

3.1.2.2 The deposit shall be made by the leftward method, welding upward along the edge of the plate, which shall be set in a vertical plane at a slight inclination to the horizontal (approximately 30°).

The blowpipe shall be fed with correctly purified acetylene and with oxygen having a minimum purity of 98 %. The flame shall be neutral[1], unless otherwise recommended by the manufacturer of the filler rod. The nature of the flame, whether neutral or oxidizing, shall be stated in the test report.

3.1.2.3 If a cleaning flux is necessary, the flux appropriate to the filler rod being tested shall be applied.

3.2 Tensile tests

3.2.1 *Preparation of tensile test pieces*

3.2.1.1 Two test pieces shall be taken, as indicated in figure 2.

3.2.1.2 After the deposited filler metal has been taken from the supporting plate, using mechanical means only, two test pieces shall be prepared for the tensile tests as shown in figure 3.

1) A flame is said to be neutral when the ratio of oxygen to acetylene is nearly equal to 1.

3.2.2 *Tensile test requirements*

The tests shall be made at ambient temperature, unless otherwise specified, and in accordance with ISO 82.

3.3 Expression of results

During the tensile tests, the following shall be measured :

- tensile strength, in newtons per square millimetre,
- percentage elongation.

4 DETERMINATION OF MELTING POINT OR MELTING TEMPERATURE RANGE

4.1 Operating procedure

4.1.1 In order to determine the melting point or melting temperature range of a filler metal, a cooling curve for the molten metal shall be plotted; the cooling rate shall not exceed 20 °C/min.

4.1.2 The temperature shall be determined at regular intervals by means of a thermocouple, the operating method being chosen by the operator. However, for alloys containing elements liable to volatilize during melting, precautions shall be taken to reduce such volatilization as far as possible.

4.2 Expression of results

From the cooling curve may be obtained

- the melting point for unalloyed metals,
- the melting temperature range for alloys.