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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 688

FILLER RODS FOR BRAZE WELDING

METHODS OF TEST FOR DETERMINING THE CHARACTERISTICS OF THE DEPOSITED METAL

1st EDITION

March 1968

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 688, *Filler rods for braze welding—Methods of test for determining the characteristics of the deposited metal*, was drawn up by Technical Committee ISO/TC 44, *Welding*, the Secretariat of which is held by the *Association Française de Normalisation* (AFNOR).

Work on this question by the Technical Committee began in 1957 and led, in 1961, to the adoption of a Draft ISO Recommendation.

In October 1965, this Draft ISO Recommendation (No. 846) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

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

Two Member Bodies opposed the approval of the Draft:

Germany
U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in March 1968, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 688 March 1968

FILLER RODS FOR BRAZE WELDING

METHODS OF TEST FOR DETERMINING THE CHARACTERISTICS OF THE DEPOSITED METAL

FOREWORD

This ISO Recommendation is a companion to ISO Recommendation R 698, *Filler rods for braze welding—Methods of test for determining the conventional bond strength on steel, cast iron and other metals.*

1. SCOPE

This ISO Recommendation describes tests 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. DETERMINATION OF THE MECHANICAL PROPERTIES

2.1 Execution of deposit

2.1.1 *Type of supporting plate*

2.1.1.1 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, should be made.

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

2.1.2 *Operating conditions*

2.1.2.1 The thickness of the supporting plate and the operating conditions should be chosen as follows:

Diameter of filler rod in millimetres	2	2.5	3.15	4	5	6.3
Thickness (*e*) of supporting plate in millimetres	10	10	12	15	18	18
Height (*h*) of deposit in millimetres	10	10	12	15	15	15
Acetylene consumption of blowpipe in litres per hour *	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 that indicated in the Table above.

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

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

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

2.2 Tensile tests

2.2.1 *Preparation of tensile test pieces*

2.2.1.1 Two test pieces should be taken, as indicated in Figure 2.

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

2.2.2 *Tensile test requirements.* The tests should be made at ambient temperature, unless otherwise specified. **

2.3 Expression of results

During the tensile tests, the following should be measured:

— tensile strength, in kilogrammes-force per square millimetre,

— percentage elongation.

3. DETERMINATION OF MELTING POINT OR MELTING TEMPERATURE RANGE

3.1 Operating procedure

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

3.1.2 The temperature should 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 should be taken to reduce such volatilization as far as possible.

3.2 Expression of results

From the cooling curve may be obtained

— the melting point for unalloyed metals,

— the melting temperature range for alloys.

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

** In accordance with ISO Recommendation R 82, *Tensile testing of steel.*