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Welding consumables — Covered electrodes — Determination of the efficiency, metal recovery and deposition coefficient

Électrodes enrobées — Détermination de l'efficacité, du rendement du métal et du coefficient de dépôt

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Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Test plates **2**
4.1 Number 2
4.2 Specification 2
5 Procedure **3**
6 Calculation of efficiency and metal recovery **4**
7 Rounding procedure **5**
8 Calculation of deposition coefficient **5**

Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 3, *Welding consumables*.

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This second edition cancels and replaces the first edition (ISO 2401:1972), which has been technically revised. The main changes compared to the previous edition are as follows:

— the Scope has been clarified;

— the document has been updated to the latest ISO style, including addition of Clause 2 and subsequent renumbering;

— the term 3.1, electrode efficiency has been added;

— Clause 5 has been revised and the option of eight electrodes introduced;

— in Subclauses 6.1 and 6.2, the option of eight electrodes has been introduced;

— Clause 7 has been introduced to align with other ISO/TC 44/SC 3 documents;

— in Clause 8, requirements on rounding procedure have been reworked (example deleted).

Welding consumables — Covered electrodes — Determination of the efficiency, metal recovery and deposition coefficient

1 Scope

This document specifies methods for the determination of the efficiency, weld metal recovery and deposition coefficient of covered electrodes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 80000-1:2009, *Quantities and units — Part 1: General.* Corrected by ISO 80000-1:2009/Cor 1:2011

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
electrode efficiency
ratio of the mass of weld metal deposited, under standard conditions, to the mass of core wire consumed

3.1.1
nominal electrode efficiency
R_N
electrode efficiency (3.1) calculated from the nominal diameter and specific weight of the core wire

Note 1 to entry: The value of R_N obtained using this document can be very close to the value of R_E.

Note 2 to entry: Specific weight for non-alloy, fine grained, high strength and creep resisting steels 7,85 gcm^{-3}.

3.1.2
effective electrode efficiency
R_E
electrode efficiency (3.1) determined using the actual mass of core wire consumed

Note 1 to entry: The value of R_E obtained using this document can be very close to the value of R_N.

3.2
overall weld metal recovery
R_G
ratio of the mass of weld metal deposited under standard conditions to the total mass of a given electrode tested

3.3
deposition efficiency
R_D
ratio of the mass of weld metal deposited under standard conditions to the total mass of a given electrode consumed, exclusive of stub ends

3.4
deposition coefficient
D
mass of weld metal deposited under standard conditions per ampere minute for a given electrode

Note 1 to entry: When reporting the results of tests, a further suffix shall be added to the above abbreviations R_N, R_E, R_G, R_D and D to indicate the type of current used to establish the values. These suffixes shall be used as follows:

— DC positive R_N +

— DC negative R_N –

— AC R_N ~

4 Test plates

4.1 Number

For each diameter of electrode to be tested, one test plate shall be welded.

4.2 Specification

The test plate shall be of carbon steel (up to 0,25 % C) and shall have approximately the following dimensions:

— width = 75 mm;

— length = 300 mm;

— thickness = 12 mm.

In most cases, a single test piece is long enough; if this is not the case, a second test piece having a length of 150 mm or, if necessary, 300 mm shall be placed end to end with the first test piece (see Figure 1).

Dimensions in millimetres

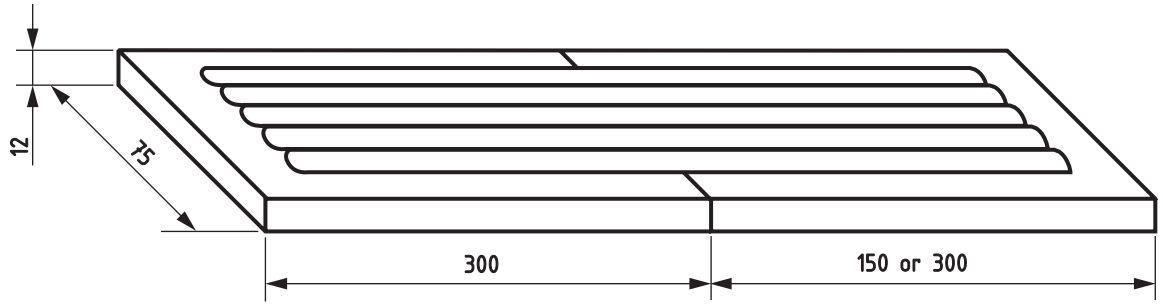

Figure 1 — Test plate

In order to facilitate weighing after welding, the test plate may, where two plates have been used, be broken into two parts.