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Welding consumables — Deposition of a weld metal pad for chemical analysis

Produits consommables pour le soudage — Exécution d'un dépôt de métal fondu pour l'analyse chimique

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Contents

Page

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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by IIW, *International Institute of Welding*, Commission II, *Arc Welding and Filler Metals*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding and allied processes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 6847:2013), which has been technically revised.

The main change compared to the previous edition is the addition of provisions for strip-flux combinations for use with cladding with the submerged arc welding and electroslag welding processes.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The first edition of this document, ISO 6847:1985, addressed only the deposition of a weld metal pad for chemical analysis using covered electrodes for manual arc welding. This pad preparation was expensive to execute. IIW Commission II conducted testing of several methods of weld pad preparation that were less costly to execute than that of ISO 6847:1985 and yet produced equivalent results. Further, these methods were applicable to solid wires for gas shielded welding, to tubular cored wires for arc welding with or without gas shielding, and to wires and fluxes for submerged arc welding, as well as being applicable to covered electrodes. Accordingly, subsequent revisions (ISO 6847:2000 and ISO 6847:2013) simplified weld pad preparation and broadened the range of welding processes and filler metals. This document adds the use of strip with the submerged arc welding and electroslag welding processes.

Welding consumables — Deposition of a weld metal pad for chemical analysis

1 Scope

This document specifies the procedure to be used for deposition of a weld metal pad for chemical analysis.

This document applies to deposition of a weld metal pad by use of covered electrodes, wire electrodes for gas shielded metal arc welding, tubular cored electrodes for gas shielded metal arc welding and for non-gas shielded metal arc welding, solid rods and tubular cored rods for gas tungsten arc welding, and wire-flux and strip-flux combinations for submerged arc welding or electroslag welding and cladding.

This document is applicable to welding consumables for non-alloy and fine grain steels, high strength steels, creep-resisting steels, stainless and heat-resisting steels, nickel and nickel alloys, and copper and copper alloys.

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 6947, *Welding and allied processes — Welding positions*

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

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
alloying flux
flux designed to modify the chemical composition of the weld using metals other than, or in addition to, manganese and silicon

4 Base metal

4.1 Type

The base metal (except for cladding) shall have a composition similar to that of the deposited metal or be a weldable carbon manganese structural steel with a carbon content of less than 0,2 %.

The base metal for cladding combinations shall be a weldable carbon manganese structural steel with a carbon content of less than 0,15 %, and with each of the following elements present at less than 0,10 % by weight: Cr, Mo, Nb, Ni.

4.2 Dimensions

The minimum dimensions of the base metal are given in Table 1.

4.3 Surface condition

The surface of the base metal on to which the weld metal is to be deposited shall be cleaned by grinding or other means in order to remove any rust, scale, grease, or paint.

Table 1 — Minimum dimensions of the base metal

Dimensions in millimetres

Welding consumables	Size of welding consumables	Plate size[a]	
		Length	Thickness
Covered electrodes; solid rods and tubular cored rods for gas tungsten arc welding	≥1,6 but ≤4 >4 but ≤8	55 65	10
Wire electrodes for gas shielded arc welding	≥0,6 but ≤2,5	100	10
Tubular cored electrodes for gas shielded or non-gas shielded arc welding	≥0,6 but ≤4	100	10
Wire-flux combinations for submerged arc welding	≥1,2 but ≤4 >4 but ≤6,4	200 300	15
Cladding (both strip-flux and wire-flux for submerged arc and electroslag processes)	wire ≥2,4 strip width ≥15	300	25

[a] Plate width should be appropriate for the pass sequence method chosen (see Figure 1).

5 Method for preparing the weld metal pad

5.1 Drying of the welding consumables

Drying of the welding consumables (covered electrodes, fluxes for submerged arc welding or electroslag welding) shall be performed using conditions indicated by the manufacturer. Tubular cored electrodes on metal supports may be dried in accordance with the manufacturer's recommendations.

5.2 Welding position

The weld metal pad shall be welded in the flat position (PA position) in accordance with ISO 6947.

5.3 Type of current

The weld metal shall be deposited using the type of current (and, if appropriate, the polarity) indicated by the manufacturer. However, if both DC operation and AC operation are claimed, then the test shall be performed using AC.

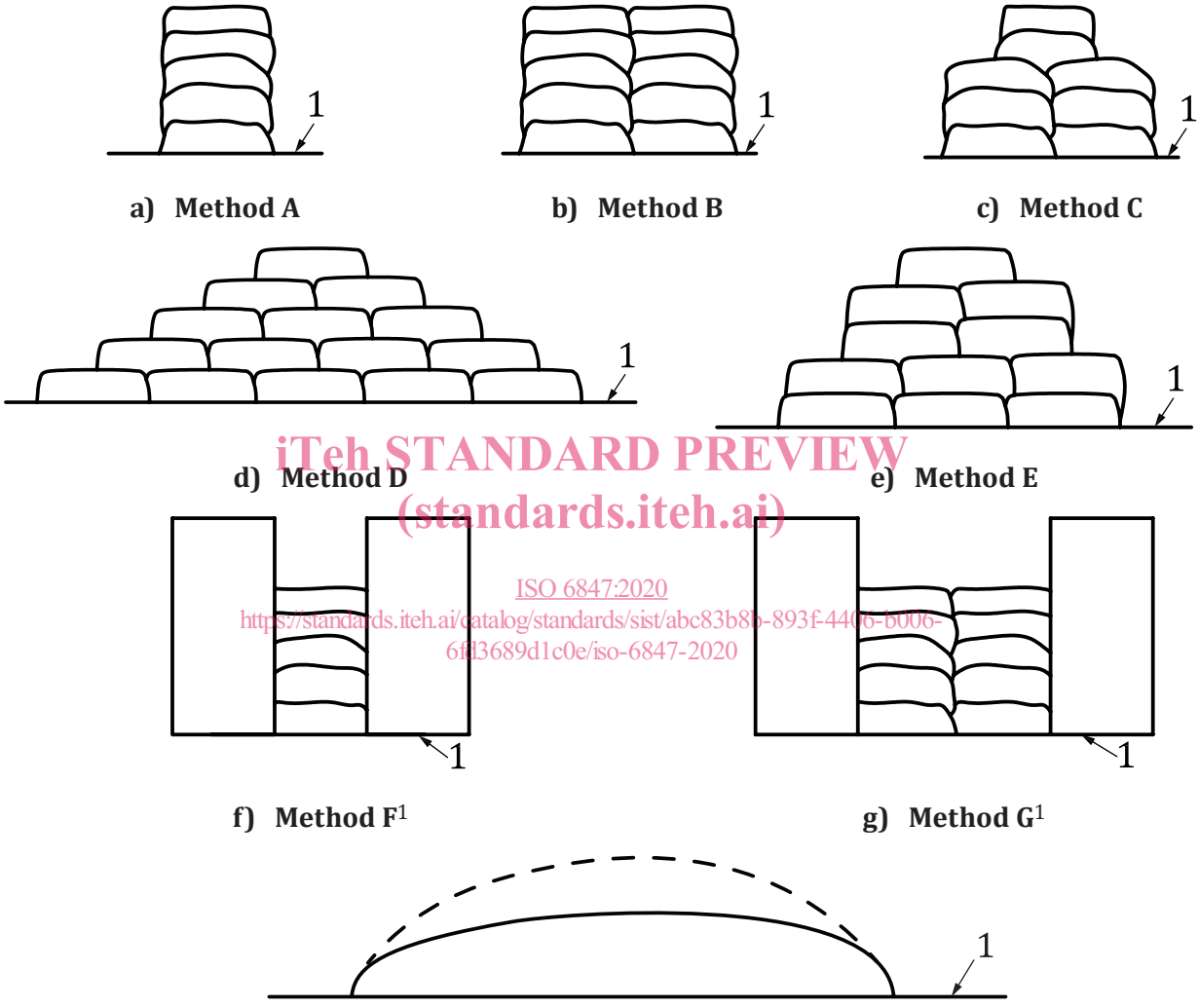
5.4 Welding conditions

The welding conditions used, such as current, voltage, welding speed, etc., shall be in accordance with the limits specified in the relevant standard. If the welding conditions are not specified in the relevant standard, each pass shall be welded with a welding current of 70 % to 90 % of the maximum current indicated by the manufacturer. The welding conditions used to produce the weld metal pad shall be reported.

5.5 Welding method

5.5.1 General

Various methods for building up a weld metal pad have been shown to be acceptable and the weld metal pad shall be prepared using one of the methods shown in Figure 1. After the welding of each pass, the test piece may be cooled in water for about 30 s, then dried sufficiently before proceeding with the next pass. The slag shall be removed from each pass. The welding shall be performed by alternating the direction of welding for each layer.



a) Method A

b) Method B

c) Method C

d) Method D

e) Method E

f) Method F[1]

g) Method G[1]

h) Method H[2]

Key

1 base metal

NOTE 1 The blocks on both sides of the weld deposits of methods F and G are copper.

NOTE 2 Method H is intended for use with consumables for cladding applications.

Figure 1 — Examples of pass sequence

5.5.2 Covered electrodes

The arc length shall be maintained as short as possible such that the arc remains stable. The maximum weave width shall be 2,5 times the diameter of the electrode core.