
**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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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 6847 was prepared by the International Institute of Welding, which has been approved as an international standardizing body in the field of welding by the ISO Council.

This third edition cancels and replaces the second edition (ISO 6847:2000), of which it constitutes a minor revision.

Requests for official interpretations of any aspect of this International Standard should be directed to the ISO Central Secretariat, who will forward them to the IIW Secretariat for an official response.

Introduction

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, this revision simplifies weld pad preparation and broadens the range of welding processes and filler metals.

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

1 Scope

This International Standard specifies the procedure to be used for deposition of a weld metal pad for chemical analysis. This International Standard 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, tubular cored rods for gas tungsten arc welding, and wire-flux combinations for submerged arc welding. This International Standard 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, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6947, *Welds — Working positions — Definitions of angles of slope and rotation*

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

3 Base metal

3.1 Type

The base metal 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 %.

3.2 Dimensions

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

3.3 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 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

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

4 Method for preparing the weld metal pad

4.1 Drying of the welding consumables

Drying of the welding consumables (covered electrodes, fluxes for submerged arc welding) shall be performed using conditions indicated by the manufacturer. Tubular cored electrodes on metal supports may be dried.

4.2 Welding position

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

4.3 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.

4.4 Welding conditions

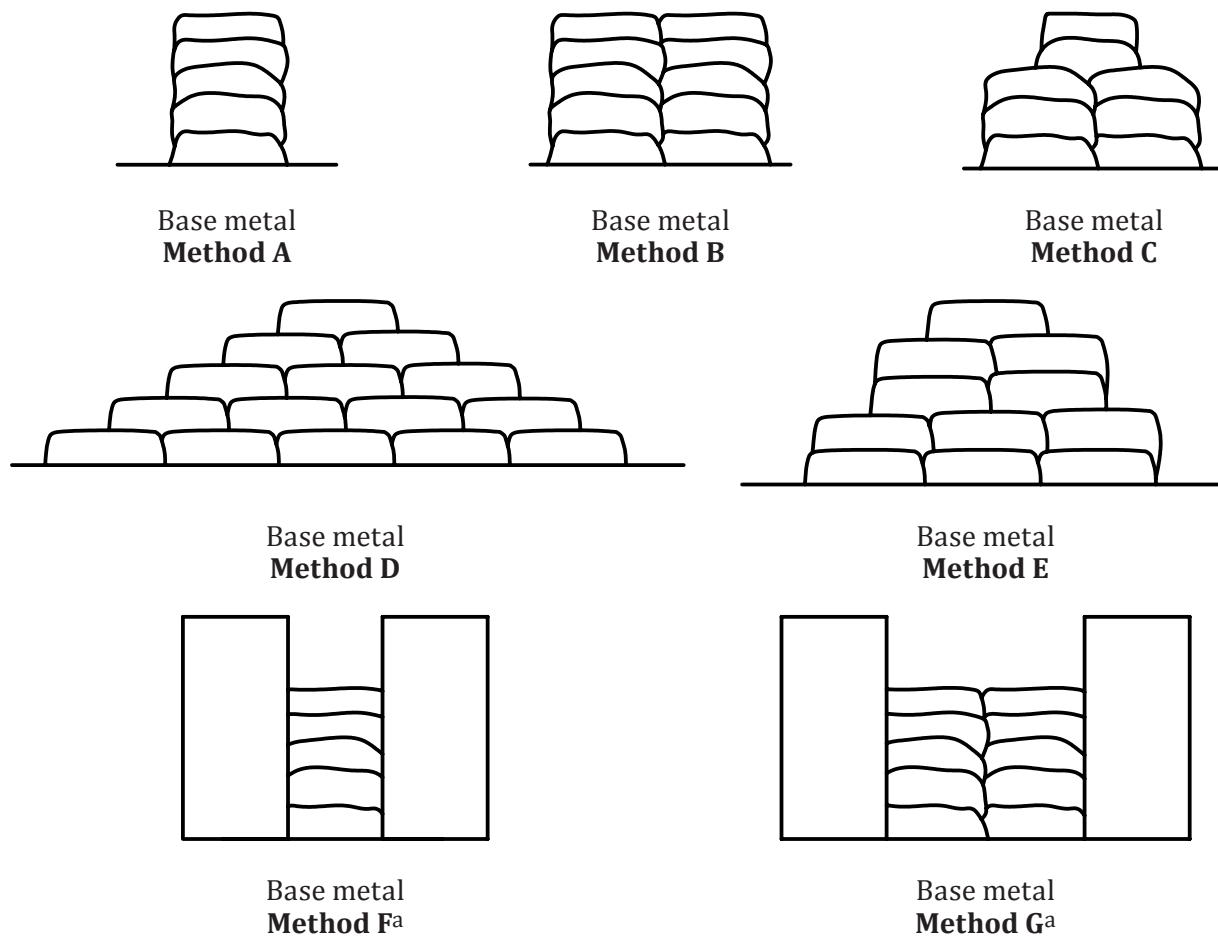
The welding conditions used, such as current, voltage, welding speed, etc., shall be in accordance with the limits specified in the relevant standard. If the welding conditions are not specified in the relevant standard, each pass shall be welded with a welding current of 70 % to 90 % of the maximum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

4.5 Welding method

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

Figure 1 — Examples of pass sequence

4.5.2 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.

4.5.3 Solid wires and tubular cored wires

The number and size of the beads will vary according to the size of the electrodes and the width of the weave as well as the amperage employed. The electrode extension (stickout) shall be as indicated by the manufacturer ± 3 mm. The weld metal pad shall be deposited using the type of shielding gas indicated by the manufacturer; otherwise, the type of shielding gas used shall be selected from those specified in ISO 14175. In the case of submerged arc welding, the appropriate flux shall be used.

5 Weld metal pad size

The minimum dimensions of the weld metal pad shall be as given in Table 2.

6 Sampling

The surface oxide on the sampling portion of the specimen for chemical analysis shall be removed by machining or grinding. When taking chips by a milling, a shaping, or a drilling machine, the use of cutting fluid shall be avoided. The specimen for chemical analysis shall be taken from the weld metal of the fifth layer or higher. The specimen shall not include the start or the crater.

Table 2 — Minimum dimensions of the weld metal pad

Welding consumables	Size of welding consumables mm	Sampling portion		Minimum number of weld layers
		Width mm	Length mm	
Covered electrodes and tubular cored rods for gas tungsten arc welding	≥1,6 but ≤2,6	12	30	5
	>2,6 but ≤5	12	40	5
	>5 but ≤8	12	55	5
Wire electrodes for gas shielded arc welding	≥0,6 but ≤2,5	12	80	5
Tubular cored electrodes for gas shielded or non-gas shielded arc welding	≥0,6 but ≤4	12	80	5
Wire-flux combinations for submerged arc welding	≥1,2 but ≤6,4	12	150	5

