

INTERNATIONAL STANDARD

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Second edition
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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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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 3.

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 International Standard 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 in collaboration with the International Institute of Welding which has been approved by the ISO Council as an international standardizing body in the field of welding.

This second edition cancels and replaces the first edition (ISO 6847:1985), which has been technically revised.

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Introduction

ISO 6847:1985 addresses only the deposition of a weld metal pad for chemical analysis using covered electrodes for manual arc welding. This pad preparation is expensive to execute. IIW Commission II has conducted testing of several methods of weld pad preparation that are less costly to execute than that of ISO 6847:1985 and yet produce equal results. Further, these methods are 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 of ISO 6847:1985, drafted by IIW Commission II at the request of ISO/TC44/SC3, simplifies weld pad preparation and broadens the range of welding processes and filler metals.

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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 arc metal welding and for self-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-resistant steels, stainless and heat-resistant steels, nickel and nickel alloys, and copper and copper alloys.

2 Normative references

The following normative documents contain certain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

ISO 14175, *Welding consumables — Shielding gases for arc welding and cutting.*

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	
		Length	Thickness
Covered electrodes, and tubular cored rods for gas tungsten arc welding	$\geq 1,6$ but ≤ 4	55	10
	> 4 but ≤ 8	65	
Wire electrodes for gas shielded arc welding	$\geq 0,6$ but $\leq 2,5$	100	10
Tubular cored electrodes for gas shielded or self-shielded arc welding	$\geq 0,6$ but ≤ 4	100	10
Wire-flux combinations for submerged arc welding	$\geq 1,2$ but ≤ 4	200	15
	> 4 but $\leq 6,4$	300	

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, in the case where both the DC 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, travel 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.

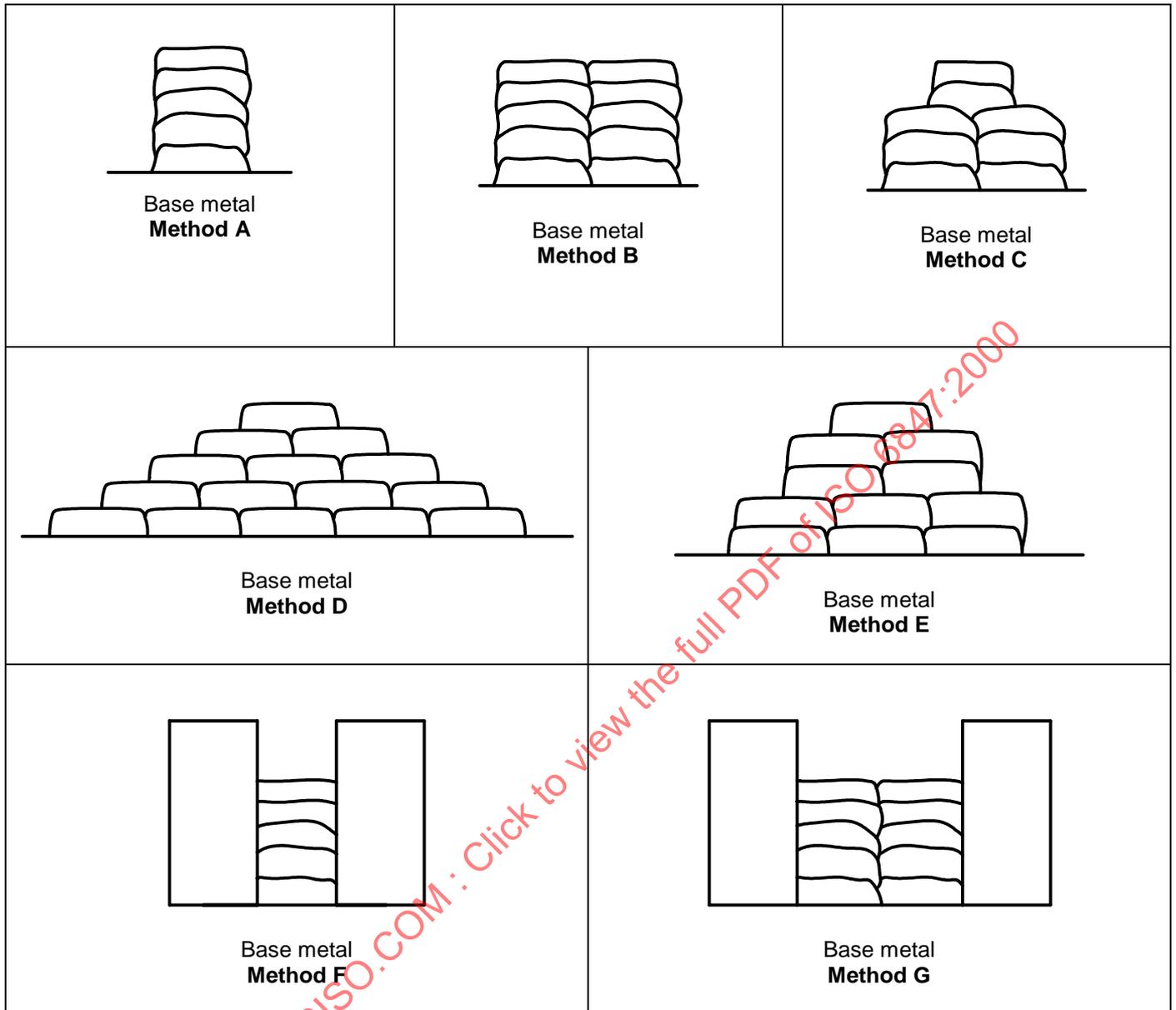


Figure 1 — Examples of pass sequence

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

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	$\geq 1,6$ but $\leq 2,6$	12	30	5
	$> 2,6$ but ≤ 5	12	40	5
	>5 but ≤ 8	12	55	5
Wire electrodes for gas shielded arc welding	$\geq 0,6$ but $\leq 2,5$	12	80	5
Tubular cored electrodes for gas shielded or self- shielded arc welding	$\geq 0,6$ but ≤ 4	12	80	5
Wire-flux combinations for submerged arc welding	$\geq 1,2$ but $\leq 6,4$	12	150	5