

INTERNATIONAL STANDARD

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Welding — All-weld metal test assembly for the classification of corrosion-resisting chromium and chromium-nickel steel covered arc welding electrodes

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*Soudage — Moule pour la classification des électrodes enrobées pour
soudage à l'arc, déposant un acier au chrome ou au chrome-nickel
résistant à la corrosion*

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INTERNATIONAL

ISO



Reference number
ISO 10446:1990(E)

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.

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.

International Standard ISO 10446 was prepared in collaboration with the International Institute of Welding, which has been approved as an international standardizing body in the field of welding by the ISO Council.

[ISO 10446:1990](https://standards.iteh.ai/catalog/standards/sist/661bf56f-f32-4c78-908d-0e96f06e09c2/iso-10446-1990)

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Welding — All-weld metal test assembly for the classification of corrosion-resisting chromium and chromium-nickel steel covered arc welding electrodes

1 Scope

This International Standard describes the preparation and welding of all-weld metal test assembly for the classification of the mechanical properties of corrosion-resisting chromium and chromium-nickel steel covered arc welding electrodes.

The procedure includes details for the preparation of deposited weld metal to allow comparison of test results obtained from the same weld metal grades of different origin.

Recommended electrode diameters for testing are 3,2 mm to 5,0 mm.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements

based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

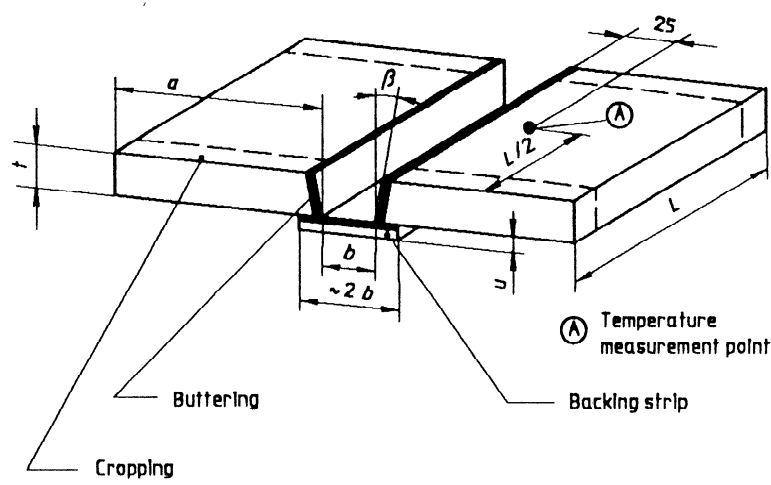
ISO 630:1980, *Structural steels*.

3 Preparation of the test assemblies

The deposited metal test assembly shall be prepared as shown in figure 1. The backing strip shall be tack welded to the test assembly.

The steel to be used for the assembly shall be a matching type, or the edges of the grooves and the backing strip may be built up with the corresponding electrode type being tested.

In instances where carbon steel is used, the plates and backing bar (Grade Fe 430 in accordance with ISO 630 or its equivalent) shall be built up with two layers of weld metal (see figure 1).



Electrode diameter mm	<i>t</i> mm	<i>a</i> minimum mm	<i>b</i> mm	<i>u</i> mm	<i>β</i> degrees	<i>L</i> minimum mm
3,2	16	100	12	6 to 10	10	100
4,0	20	100	16	10	10	150
5,0	20	120	20	10	10	150

Figure 1 — Details of the assembly for all-weld metal tests

4 Welding procedure

4.1 Welding and temperature

The assembly shall be welded in the flat position. The plates of the assembly shall be preset as recommended in figure 2. Welded test plates shall not be straightened.

The test assembly shall be within the following ranges of preheating temperatures and interpass temperatures before starting each pass (see table 1).

The temperature shall be measured on the assembly at a distance of 25 mm from the weld at the mid-length of the test plate (see figure 1).



Weld metal classification	Recommended preset <i>α</i> degrees
A + B Martensitic and ferritic chromium steel Soft martensitic stainless steel	~ 8
C + D Austenitic stainless steel Austenitic-ferritic (duplex) stainless steel	~ 10

Figure 2 — Recommended preset

Table 1 — Test assembly temperature ranges

Weld metal classification	Preheating temperatures °C	Interpass temperatures °C
A ¹⁾ Martensitic and ferritic chromium steel	200 to 300	200 to 300
B ²⁾ Soft martensitic stainless steel	100 to 180	100 to 180
C ³⁾ Austenitic stainless steel	not required	max. 150
D ⁴⁾ Austenitic-ferritic (duplex) stainless steel	not required	max. 150
1) 12 % to 17 % Cr/C below 0,15 % (m/m). 2) e.g. 13 % Cr 4 % Ni/ + Mo/C below 0,05 % (m/m). 3) All types of austenitic stainless steel weld metals with δ -ferrite and fully austenitic stainless steel weld metals. 4) e.g. 22 % Cr 9 % Ni/ + N/C below 0,04 % (m/m).		

If, after any pass, the stated maximum interpass temperature is exceeded, plates shall be cooled in air to a temperature for the applicable grade.

The preheating and interpass temperatures shall be measured. Temperature indicator crayons, surface thermometers or thermocouples may be used.

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4.2 Pass sequence

The pass sequence is shown in table 2.

The direction of welding to complete a layer consisting of 2 passes shall not vary, but the direction of welding of subsequent layers shall be alternated.

Each pass shall be welded with a welding current of 90 % of the maximum current as recommended by the manufacturer.

Regardless of the type of coating, welding shall be performed with a.c. when both a.c. and d.c. are recommended and with d.c. + when only d.c. is recommended.

Each electrode shall be consumed completely (up to a stub end of approximately 50 mm).

Table 2 — Pass sequence

Electrode diameter mm	Split weave		
	Layer no.	Passes per layer	Number of layers
3,2	1 to top	2	6 to 8
4,0	1 to top	2	7 to 9
5,0	1 to top	2	6 to 8

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Descriptors: welding, electric welding, arc welding, welding electrodes, covered electrodes, corrosion resistant steels, chromium steels, nickel chromium steels, test specimens.

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