



उत्पाद मैनुअल

मैनुअल मेटल आर्क वेल्डिंग के लिए निम्न
और मध्यम मिश्र धातु इस्पात कवर इलेक्ट्रोड के लिए विशिष्टता

IS 1395:1982 के अनुसार

Product Manual for Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc Welding according to IS 1395:1982

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम 2018 की स्कीम-I के तहत यह उत्पाद मैनुअल प्रमाणीकरण की संचालन रीति में सुसंगतता और पारदर्शिता सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	उत्पाद Product	:	IS 1395:1982
	शीर्षक Title	:	Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc Welding
	संशोधनसंख्या No. of Amendments	:	01
2.	नमूनाकरणदिशानिर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	NA

b)	समूहिकरण दिशानिर्देश Grouping guidelines	:	कृपया Annex-A देखें Please refer ANNEX – B
c)	नमूने का परिमाण Sample Size	:	4 packets of electrodes
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-B देखें Please refer ANNEX –C
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-C देखें Please refer ANNEX –D
5.	एक दिन में संभावित परीक्षण Possible tests in a day:		Chemical Composition of weld metal deposit, Dimension (Cl 5), general requirements (Cl 6)
6.	लाइसेंस का कार्य क्षेत्र/ Scope of the Licence:		
	IS 1395:1982 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्य क्षेत्र के लिए प्रदान किया जाता है “Licence is granted to use Standard Mark as per IS 1395:1982 with the following scope:		
	उत्पाद का नाम Name of the product		Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc Welding
	Classification as per Table 1		E49C-A1, E55R-B1, E63R-B3.....
	Size/Designation of Electrode Size		2.00 mm/2, 2.50 mm/2.5, 3.15 mm/3.15, 4.00 mm/4, 5 mm/5, 6.30 mm/6.3, 8.00 mm/8

ANNEX B to the Product Manual for
Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc
Welding as per IS 1395:1982

GROUPING GUIDELINES

1) IS 1395:1982 covers the requirements for low and medium alloy steel electrodes for manual arc welding. The range of electrodes covered in this standard and the chemical composition of all weld metals have been specified at Table 1.

2) Further with regards to size, electrodes have been designated based upon the diameter of the Electrode Core Wire as specified at cl.5.1.

3) In view of above, the following grouping guidelines shall be considered for the purpose of GoL/CSoL:-

Group	Designations	Sampling
Carbon Molybdenum Steel Electrodes	E49C-A1 E49R-A1 E49O-A1 E49B-A1	One sample of the smallest electrode size of any designation shall be drawn to cover all designations and sizes within the group
Chromium Molybdenum Steel Electrodes	E55R-X E55B-X Where X indicates suffixes such as B2, B2L etc. as per Table 1	One sample of the smallest electrode size of any designation shall be drawn to cover all designations and sizes within the group
	E41R-X E41B-X Where X indicates suffixes such as B6,B7,B8. as per Table 1	One sample of the smallest electrode size of any designation shall be drawn to cover all designations and sizes within the group
	E63 R-X E63 B-X Where X indicates suffixes such as B3,B3L as per Table 1	One sample of the smallest electrode size of any designation shall be drawn to cover all designations and sizes within the group
Nickel Steel Electrodes	E55B-C1 E55B-C2 E55B-C3	One sample of the smallest electrode size of any designation shall be drawn to cover all

		designations and sizes within the group
Manganese Molybdenum Steel Electrodes	E63B-D1 E63B-D2	One sample of the smallest electrode size of any designation shall be drawn to cover all designations and sizes within the group
Other Alloy Steel Electrodes	EXC-G1 EXR-G1 EXO-G1 EXB-G1 Where X indicates the Minimum Tensile Strength of the weld metal such as 41,49,55,63,68,76,83 (Refer cl.4.1.2)	One sample of each designation having the highest Tensile Strength of weld metal and the smallest electrode size shall be drawn to cover designations having lower tensile strength of weld metal and all sizes.
	E63B-M1 E68B-M2 E76B-M3 E83B-M4	One sample of each designation of the smallest electrode size shall be drawn to cover all sizes for each designation.

4) However, it shall be ensured that the manufacturer has complete manufacturing and testing facilities for all designations and sizes of electrodes intended to be covered in the scope of the licence.

5) During the operation of the licence, it shall be ensured that the varieties of electrodes covered in the scope of the licence are drawn for testing in rotation.

Annex- C to the Product Manual for
Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc
Welding as per IS 1395:1982

List of Test Equipment

Major test equipment required to test as per the Indian Standard

Sl. No.	Tests used in with Clause Reference	Test Equipment
1	Chemical Composition of All Weld Metal Deposit, Table 1	Device for instrumental chemical analysis such as Optical Emission Spectrometer with all requisite channels Or, Chemicals and equipments as per IS 228
2	Size and Tolerance, Cl 5	Steel Scale, Micrometer, Vernier callipers
3	General requirements, Cl 6	Scrapping tools, Vernier Callipers Micrometer Steel Scale
4	Fillet Weld Test, Cl 10.1.4 and Cl 17	Welding arrangement and a qualified welder Vernier calliper Fillet weld assembly cutting arrangement Arrangement for fracturing fillet weld assembly Shaping machine Lathe machine
5	Tensile strength and Elongation, cl.15.Table 4	Universal Tensile testing machine with extensometer Heat treatment furnace Sample preparation facility
6	Moisture Content Tests, Cl 10.1.5, Cl 18, Table 7	U Tube furnace set up as per Fig 9 of IS 1395 comprising of Furnace Weighing balance Anhydrous Magnesium Perchlorate Conc Sulphuric Acid gas sealing bottle Oxygen Cylinder with flow meter Nickel or Clay Boat Fuse Silica or high temperature ceramic type combustion tube
7	Impact test, Table 2	Charpy Impact Testing Machine Dry Ice bath
8	Radiographic test, Table 2	Radiography setup, weld assembly and radioactivity protection arrangements

The above list is indicative only and may not be treated as exhaustive.

ANNEX C

Scheme of Inspection and Testing

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare and implement a calibration plan for the test equipment.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. LABELLING & MARKING – The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L.....) shall be incorporated on the product and the test certificate accompanying each consignment, and the labelling and marking shall be done as per the provisions of the Indian Standard, provided always that the product thus marked conforms to all the requirement of the specification. In addition, details of BIS website shall be marked as follows: “For details of BIS certification please visit www.bis.gov.in”.

CONTROL UNIT – For the purpose of this scheme, entire quantity of electrodes of the same classification and size manufactured in a day shall be taken as one control unit

1. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

1.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

2. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016

TABLE 1

(1)				(2)	(3)		
Test Details				Test equipment requirement R: required (or) S: Sub-contracting permitted	Levels of Control		
Cl.	Requirement	Test Method			No. of Sample	Frequency	Remarks
		Clause	Reference				
Table 1	Chemical Composition of all weld metal	13	IS 1395 IS 228 (various parts) or any other established instrumental method	R	One	Each Control Unit	---
5	Size and tolerance	5	IS 1395	R	Adequate inspection to ensure that each electrode conforms to the requirements of the specification		
6	General requirements	6.1, 6.2, 6.3	IS 1395	R	Adequate inspection to ensure that each electrode conforms to the requirements of the specification		
10.1.4 , Table 6	Fillet Weld Test	17, Table 10	IS 1395	R	One	Once in a month	---
10.1.2 , Table 4	Tensile strength and Elongation	15	IS 1395 IS 1608 (Part 1)	R	One	Once in a month	---
10.1.5	Moisture Content Tests	18	IS 1395	S	One	Once in an year	---
10.1.3, Table 5	Impact test,	16	IS 1395 IS 1757(Part 1)	R	One	Once a month	---
10.1.1 , Table 3	Radiographic test, Table 2	14	IS 1395 IS 1182	S	One	Once in an year	---

Note-1: Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification for approval by BO Head.

ANNEXURE I

BIS STANDARDS MARK

(Para 6 of the Scheme of Inspection and Testing)

XYZ STEEL COMPANY

(Registered office Address and works address)

TEST CERTIFICATE FOR Specification for Low and Medium Alloy Steel Covered Electrodes for Manual Metal Arc Welding **According to IS 1395:1982**

TEST CERTIFICATE No. _____

DATE _____

To M/s _____

We certified that the material described below fully conforms to IS 1395:1982, for Physical properties of the product and with Chemical composition as declared below, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L _____ which indicated below against each order No.

(PLEASE REFER TO IS 1395 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Diameter for Electrode Core Wire	Control Unit/ Batch No.	Designation	Quantity in tonnes	CHEMICAL COMPOSITION								Mechanical properties		Fillet Weld Test
													All Weld Metal Tension Test	Impact Test	
					C %	S %	P %	Si %	Mn %	Ni %	Cr%	Mo%	V%		

REMARKS WAGON NO. TRUCK NO.
be used for this test certificate)

FOR XYZ STEEL COMPANY (It is suggested that size A4 paper