



उत्पाद मैनुअल
कार्बन या कार्बन - मैंगनीज स्टील की गैस परिरक्षित और स्व - परिरक्षित धातु आर्क
वेल्डिंग के लिए फ्लक्स कॉर्ड (ट्यूबलर) इलेक्ट्रोड
IS 15769: 2008 के अनुसार

Product Manual for
Flux cored (Tubular) electrodes for gas shielded and self - Shielded metal arc welding of
carbon or carbon - Manganese steel
According to IS 15769: 2008

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity 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.

1.	भारतीय मानक संख्या IS No.	:	IS 15769:2008
	शीर्षक Title	:	Flux cored (Tubular) electrodes for gas shielded and self - Shielded metal arc welding of carbon or carbon - Manganese steel
	संशोधनों की संख्या No. of amendments	:	02
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	No specific requirement Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex-A

c)	नमूने का परिमाण Sample Quantity	: 2 spools for each size/variety Note 1: Out of the Market and Factory samples tested in a year, one MS & FS will be tested for complete requirements of IS 15769:2008 and remaining samples will be tested for all requirements excluding Diffusible hydrogen estimation test (Cl. 5.7) and Radiographic soundness test (Cl. 5.2). Note 2: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर Parameters to be Declared in Test Request	: Class, Size Note: Apart from the above, any other requirements/parameters may also be declared as per the standard, as applicable.
3.	परीक्षण उपकरणों की सूची List of Test Equipment	: Please refer to Annex- B
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	: Please refer to Annex- C
5.	एक दिन में संभावित परीक्षण Possible tests in a day	
	Dimension (Cl 4.1), Temper, cast & Helix of Flux cored wire (Cl 4.2), Spools (Dimensions & weight) (Cl 4.4.3), Uniformity of Flux cored core (Cl 4.3) Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.	
6.	लाइसेंस का दायरा /Scope of the Licence:	
	IS 15769:2008 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है □Licence is granted to use Standard Mark as per IS 15769:2008 with the following scope:	
7.	उत्पाद का नाम Name of the product	Flux cored (Tubular) electrodes for gas shielded and self - Shielded metal arc welding of carbon or carbon - Manganese steel
	Class	Code for classification of electrode as per Cl. 3 of IS 15769:2008.
	Size	External Diameter

ANNEX-A
TO PRODUCT MANUAL FOR
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GROUPING GUIDELINES

In IS 15769:2008, Electrodes are classified according to a coding system of systems and numerals representing characteristics of electrodes like the ultimate tensile strength in combination with the yield strength and percentage elongation of the weld metal deposited, impact values of the weld metal deposited, welding positions etc. as well as optional coding for maximum diffusible hydrogen content in the weld metal as described in detail in Cl. 3 of IS 15769:2008

In addition, size of electrodes is designated by the nominal external diameter as given in Table 8 of IS 15769:2008

Further, as per the Details of Tests described in Cl. 5 of IS 15769:2008, electrodes of different specified sizes are required to be tested for the different tests e.g. for All Weld Metal Tests as per Cl. 5.1.1.1, 2 all weld metal test specimens shall be prepared, one using the smallest size of the electrode manufactured and the other using the largest size of the electrode manufactured.

In view of the above, the following grouping guidelines shall apply for Grant of Licence and Change in Scope of Licence.

- i) Samples of electrodes corresponding to each unique code of classification as per Cl. 3 of IS 15769:2008, intended to be covered in the licence shall be drawn and tested.
- ii) Samples of electrodes of sizes as prescribed under Details of Tests in Cl. 5 of IS 15769:2008 shall be drawn and tested. However, scope of licence may cover the entire range of sizes being manufactured, provided manufacturing and testing facilities exist.

Scope of licence shall be restricted based on the manufacturing and testing facilities available.

During surveillance, samples of electrodes of all varieties covered in the scope of the licence shall be drawn in rotation.

ANNEX – B

LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Major test equipment required to test as per requirements of Indian Standard.

Sl. No.	Tests Used in with Clause Reference	Test Equipment/Chemicals and Identification Numbers (Where applicable)
1	Cold Reduced Carbon Steel Strip for Flux Cored Electrode (Cl 6.0) Chemical analysis (Cl5.8) Flux fill ratio (As per company standard)	Device for instrumental analysis such as optical spectrometer or carbon Sulphur (Strohlein) apparatus, muffle furnace along with all necessary apparatus, analytical balance and reagents for chemical analysis
2	Dimensions (Cl 4.1)	Micrometer (0- 25 mm, LC 0.001 mm)
3	Dimensions (Cl4.2)	Steel scale/measuring tape (0- 1000mm LC 1 mm), weighing equipment
4	All weld mechanical tests for tensile and impact (Cl 5.1) Preparation of fillet Weld Assembly (Cl 5.1)	• Welding machine with all setup • Machine for beveling and machining test pieces • Heating oven • Heat treatment furnace/Muffle furnace • Dry Ice bath • Universal Testing Machine with attachments Charpy Impact Testing Machine Temperature indicating crayons/surface Thermometers/other temperature indicators Formers/Mandrels of required dimensions Gases like CO ₂ /Ar as per classification
5	Diffusible Hydrogen Evaluation Test by mercury method as per IS 11802 (Cl 5.7)	Diffusible Hydrogen Apparatus (Mercury/Glycerin/Gas Chromatography method)
6	Radiographic quality test (Cl 5.2)	Radiography setup, weld assembly and radioactivity protection arrangements
7	For weld assembly	DC rectifier, MIG / MAG Welding Machine with complete setup

Note: The above is an indicative list for the purpose of guidance only

ANNEX- C SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: entire quantity of electrodes of the same classification and size manufactured in a day shall be taken as one control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as “R” or other tests which can be subcontracted as “S”. Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as “R” in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the license and Licence Number (i.e. CM/L...) shall be suitably incorporated legibly and indelibly on each package of electrodes or on the drum or formers on which the electrodes are wound or on the label attached to each coil, spool etc. provided always that the electrodes so marked and packed conforms to all the requirement of the specification.

3.1 Packing, Storage and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements:** The material shall also be marked with the following additional requirement:

- a) “For BIS certification details please visit www.bis.gov.in”
- b) Any other requirement not specified in the Indian Standard

4. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. 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
(ONLY FOR GUIDANCE PURPOSE)

(1)				(2)	(3)		(4)
TEST DETAILS					LEVELS OF CONTROL		REMARKS
Clause	Requirements	Test Method		Test equipment requirement R: required (or) S:Sub-contracting permitted	No. of Samples	Frequency	
		Clause	Reference				
4	Manufacture (Freedom from defects)	4	IS 15769:2008	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.1	Sizes (External Diameter) of electrode	4.1	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.2	Temper, Cast & Helix of flux cored (tubular) electrode	4.2	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
4.3	Uniformity of flux cored (tubular) core	4.3	-do-	R	One	Each control unit	-

4.4.1	Material and design of coils, spools and payoff packs, cleanliness of formers and packing	4.4.1	-do-	R		Each coil/spool/payoff pack	-
4.4.2	Dimensions and maximum weight of coils with formers	4.4.2	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.4.3	Dimensions and maximum weight of spools	4.4.3	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.4.4	Overall diameter, height and maximum amount of electrode contained	4.4.4	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
4.4.5	Winding requirements	4.4.5	-do-	R	Firm to have adequate in-process controls to check compliance of this parameter as given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity.		
5	Tests for classification determination						

5.2	Radiographic soundness test	5.2	IS 15769:2008	S	One	Once a year	If applicable (Test required for classification determination are specified in Table 11 of IS 15769:2008)
5.3	All weld metal tensile test	5.3	-do-	R	One	Once a month for each class and size of electrode	-do-
5.4	Impact test	5.4	-do-	R	-do-	-do-	-do-
5.5	Transverse Tensile Test	5.5	-do-	R	-do-	-do-	-do-