



Technical Specification : 2

**TITLE : TECHNICAL SPECIFICATION FOR LOW HYDROGEN WELDING
ELECTRODES (AWS E7018, ASME SFA 5.1, IS 814)**

1.0 SCOPE :

- 1.1 The scope of supply shall include secure packing, transport and delivery the complete consignments in Hindustan Shipyard Ltd., Visakhapatnam.
- 1.2 The supply shall accompanied with relevant test certificates as mentioned in this specification for each consignment.
- 1.3 The cost shall be quoted per 1000 Nos. and for each size of electrode.
- 1.4 Delivery of the electrodes shall as per the HSL requirement.

2.0 TECHNICAL SPECIFICATION :

- 2.1 A medium heavy coated, Low Hydrogen Potassium iron powder type all position electrode for welding of medium, high tensile structural steels, heavy sections, restrained joints in high tensile steels, subjected to dynamic loading. The electrodes shall have deposition efficiency not less than 110%. The weld metal shall have resistant to hot & cold cracking and tri-axial stressing. The electrodes shall be suitable for AC/DC operation.
- 2.2 The electrodes shall confirm to AWS A5.1 E 7018 and shall be able to produce sound welds with good arc flow characteristics like minimum spatter, good surface finish of weld, free of porosity & slag inclusions, easy striking and maintenance of arc, less fumes, easy slag removable and shall give the chemical and mechanical properties of weld metal shall conforms to ASME SFA 5.1, consistent radiographic quality welds at least IIW-Blue. The physical properties like surface finish, eccentricity, flux coating etc. shall be as per the IS 814.
- 2.3. For every raise of indent for purchase of electrodes, the required Technical Specification is to be collected from Welding Engineering(QC) for identifying the dual Class.
- 2.4 The electrodes shall be approved by the following Ship Classification Societies under a minimum Grade-2. Dual Class approval certificates(IRS and other Class basing on the Classification of the vessel) are required for the electrodes to be used on each vessel under construction.
 - 2.4.1 Indian Register of Shipping(IRS).
 - 2.4.2 Lloyds Register of Shipping(LRS).
 - 2.4.3 American Bureau of Shipping(ABS).
 - 2.4.4 Bureau Veritas(BV)

- 2.4.5 Mercantile Marine Department (MMD)
2.4.6 Det Norske Veritas (DNV).



Hindustan Shipyard Limited
Visakhapatnam – 530 005
Quality Assurance Department

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Copies of the latest Valid Certificates from Ship Classification Societies as mentioned above along with the copies of test results of the relevant manufacturing units as per ASME, SFA 5.1 are to be enclosed for the Technical Scrutiny.

If the latest approval indicates "Approval as previously Graded", copies of the original, thus referred shall also be included.

Offers, which are not accompanied by the Valid Class Approvals as indicated at Clause 2.0 and relevant test certificates for the product offered shall not be considered for technical scrutiny and stands rejected.

- 2.5 In case the electrode brand is new to HSL Yard, the vendor should tender samples, which will be subjected for performance test in the HSL Yard prior to technical evaluation.
- 2.6 The qualified parties are to submit the following along with the consignment of relevant manufacturing units, without which consignment will not be accepted.
- a) Valid Class Approvals duly signed by Class Surveyors.
 - b) Batch Test Certificates.
- 2.7 If the electrodes are supplied from different batches the number of such batches should be kept as minimum as possible and a minimum quantity of 50,000 pieces per batch shall be supplied.

3.0 PACKING :

All the electrodes shall be supplied in the covers as described below in addition to the requirements given in IS 814.

- 3.1 The electrodes shall be contained in a thick polythene heat seal air tight cover and the 2nd cover shall be of good quality card board/plastic contained.
- 3.2 Each bundle or packet shall be clearly marked with the following information :
- 3.2.1 Code marking like AWS and IS.
 - 3.2.2 Trade and Brand Name of the Electrodes.
 - 3.2.3 Size and Number of pieces.
 - 3.2.4 Recommended current, Polarity & Voltage.



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- 3.2.5 Approvals of Agencies/Classification Societies.
- 3.2.6 Date of Manufacturing & Batch No.
- 3.2.7 Expiry date/Shelf life of electrodes.
- 3.2.8 Recommendation for special storage/usage on work, if any.
- 3.3 Date of manufacturing of electrodes and consignee's address shall be indicated on each case.
- 4.0 AWS number, brand name shall be imprinted on each electrode, which shall be legible before and after normal welding applications.
- 5.0 Shipyard reserves the right of testing random samples from each batch for the mechanical / chemical properties of weld metal / flow characteristics of the electrode.
- 5.1 If the electrode fails to re-produce the results required as per the rules of Classification Societies/Technical Specifications, the samples are deemed to have failed and two more samples at random shall be tested at the discretion of the Shipyard.
- 5.2 Even if one sample out of two, fails to confirm to the specification, the entire batch stands rejected. Testing charges for such re-test shall be to the account of the suppliers, such rejected batches shall be replaced immediately by the supplier at free of charge.
- 5.3 Shipyard reserves the right to cancel the balance quantity of complete order, if such failures are repetitive.
- 6.0 The supplier should offer minimum one year guarantee from the date of supply from any defects like :
 - a) Quantity & Sizes
 - b) Weld ability.
 - c) Rusting, Erosion, Peeling off Flux.
 - d) Moisturizing / Humidification and
 - e) Other damages, if any.

Approved by

Prepared by

Head (Quality Division)

Welding Engineering

