

Document No. :

BHEL/NPCIL/30599/FBM/
WD&T/NU3FABRICATION DIVISION
Welding Development & Technology
BHEL, BHOPAL

Technical Purchase Specification of E309L-16 SMAW coated electrodes

P.I.No.

Revision 01 Date:18-12-2019

S. No	Description	Requirement*	Vendor to Confirm
1	Scope:	This specification prescribes requirements for covered stainless steel electrodes for shielded metal arc welding. The welding consumable required in this specification shall be as per NPCIL approved brand list.	
2	Requirements	The consumable will be used for welding of dissimilar steels, such as joining Type 304 to mild or low-alloy steel, welding the clad side of Type 304-clad steels, welding the first layer of E308L weld cladding and applying stainless steel sheet linings to carbon steel.	
2.1	Classification	The electrode shall meet all the requirements of ASME Sec II - Part C, SFA 5.4 — E309L-16 classification and alongwith that modified requirements specified in this specification shall also be adhered to.	
2.2	Standard size and length	As per Table 7 of SFA 5.4 of ASME Sec II C.	
2.3	Electrode Identification	As per clause 18 of SFA 5.4 of ASME Sec II C.	
2.4	Packaging	As per clause 19 of SFA 5.4 of ASME Sec II C.	
2.5	Marking of Packages	As per clause 20 of SFA 5.4 of ASME Sec II C. The marking shall also include BHEL PO Number with date.	
2.6	Exposed Core	As per clause 17 of SFA 5.4 of ASME Sec II C.	
2.7	Core Wire and Covering	As per clause 16 of SFA 5.4 of ASME Sec II C.	
3	Batch Testing		
3.1	Acceptance	The batch shall be deemed to be accepted only if it meets the testing requirements as mentioned in S. No. 4 of this specification.	
3.2	Lot	The complete quantity of electrodes of a given size ordered shall be from a single heat/lot/batch(not more than 45 MT).	
3.3	Lot Class	Lot class shall be C3 as per ASME SEC II C, SFA 5.01	
3.4	Facilities for Batch testing	The manufacturer/supplier shall have all facilities to conduct batch testing as per Sr. No. 4 of this specification. If the manufacturer/supplier is not having facility for conducting any particular test(s) then manufacturer/supplier shall provide list of relevant testing facilities. The testing for such cases shall be done at NPCIL approved lab or NABL accredited lab, <i>acceptable to NPCIL.</i>	
4	Testing	All tests mentioned in S. No. 4.1 to 4.10 shall be duly witnessed by BHEL and NPCIL.	
4.1	Tests required	All relevant tests to be carried out as per Table 4 of SFA 5.4 of ASME Sec II C. In addition to this the tests specified in this specification must also be conducted.	

* All ASME standards referred in this specification shall be of Ed 2017

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4.2	All weld metal tension test	All weld metal tension test to be done in accordance with and shall meet the requirements of clause 12 of SFA 5.4 of ASME Sec II C (if it is required as per Table 4 of SFA 5.4 of ASME Sec II C).	
4.3	Radiographic Analysis	Radiographic Analysis to be done in accordance with and shall meet the requirements of clause 11 of SFA 5.4 of ASME Sec II C (if it is required as per Table 4 of SFA 5.4 of ASME Sec II C)	
4.4	Chemical Analysis	1) To be done in accordance with and shall meet the requirements of E309L-16 of SFA 5.4 of ASME Sec II C. 2) The following elements in addition to those mentioned in Table 1 of SFA 5.4 of ASME Sec II C must be reported : "Cb + Ta" 3) The result of chemical analysis shall be reported as per subsection C of NB-2432.2 of ASME Sec III NB	
4.5	Fillet Weld Test	As per Clause 13 of SFA 5.4 of ASME Sec II C (if required as per Table 4 of SFA 5.4 of ASME Sec II C)	
4.6	IGC Test	The resistance to Intergranular Corrosion (IGC) shall be determined as per ASTM A262 Practice 'E'.	
4.7	Delta Ferrite Determination	1) Delta Ferrite Determination to be done as per NB-2433 of ASME Sec III NB. 2) Method to be followed for determination of delta ferrite shall be in accordance with NB-2433.1 of ASME Sec III NB. 3) Acceptance Criteria shall be as per NB 2433.2 of ASME SEC III NB .	
5	Weld test Assemblies	Weld test Assemblies to be prepared as per clause 9 of SFA 5.4 of ASME Sec IIC. The test assembly required by SFA-5.4 shall be used for test coupon preparation, except that it shall be increased in size to conduct other additional tests as required in this specification.	
6	Level of Testing	As per schedule 6 or K of SFA 5.01	
7	Quality Considerations		
7.1	Information to be supplied in the bid	At the time of bidding the welding consumable supplier shall furnish all the relevant technical information regarding his product which shall include the recommended welding parameters and also instructions such as baking & shelf life etc.	
7.2	Deviations	The bidder shall clearly state, if there are any deviations to the requirements of this specification.	
7.3	Reports / Certificates	1. Signed and sealed test certificates of all the tests as specified in S. No. 4 of this specification shall be submitted in 6 original copies (with scanned PDF version on CD/USB drive) to BHEL. 2. An additional copy shall accompany the welding consumables in their package for shipment.	
7.4	Calibration Reort	All equipments used for conducting above mentioned tests must be calibrated and the calibration report shall be submitted to BHEL.	

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