

Document No. :	FABRICATION DIVISION
BHEL/NPCL/305991/FBM/	Welding Development & Technology
WD&T/NU6	BHEL BHOPAL
	

Technical Purchase Specification of ER70S-2 bare rods for GTAW

Revision 00 Date:14-09-2019

P.I.No.	Requirement*
S. No	Description
1	Scope: This specification prescribes requirements for the carbon steel rods (solid) for Gas Tungsten Arc welding (GTAW). The welding consumable required in this specification shall be as per NPCL approved brand list.
2	Requirements These rods shall be used for welding of low and medium carbon steel pressure vessel components like SA 516 Gr-70, attachments to pressure parts and pipe material.
2.1	Classification The bare rod shall meet the requirements of SFA 5.18 of ASME Sec II C — ER70S-2 classification and alongwith that additional requirements specified in this specification shall also be adhered to.
2.2	Chemical Composition of bare rod As per clause 4.2 of this specification.
2.3	Mechanical and Impact Properties The mechanical and impact properties of as-weld metal deposited using the bare rod shall meet the requirements of ER70S-2 of Table 3 of SFA 5.18 and clause 14 of SFA 5.18 of ASME Sec II C respectively.
2.4	Standard sizes Bare rods shall be supplied in diameters and lengths as specified in the Purchase order. The standard sizes and length shall meet the requirement of Clause 17 of SFA 5.18 of ASME Sec II C.
2.5	Finish and Uniformity As per Clause 18 of SFA 5.18 of ASME Sec II C.
2.6	Standard Package Forms As per Clause 19 of SFA 5.18 of ASME Sec II C.
2.7	Filler Metal As per Clause 21 of SFA 5.18 of ASME Sec II C.
2.8	Packaging As per Clause 22 of SFA 5.18 of ASME Sec II C.
2.9	Marking of Packages As per Clause 23 of SFA 5.18 of ASME Sec II C. Also, BHEL PO with date shall be mentioned on the packages.
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 bare rods 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 S2 as per SFA 5.01 of ASME SEC II C.

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

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P.I.No.		Revision 00		Date:14-09-2019	
S. No	Description	Requirement			
3.4	Facilities for Batch testing	The manufacturer /supplier shall have all facilities to conduct batch testing as per S. 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.			
4	Testing	All tests mentioned in S. No. 4.1 to 4.5 shall be duly witnessed by BHEL and NPCIL.			
4.1	Tests required	All relevant tests to be carried out as per Table 5 of SFA 5.18 of ASME Sec II C. In addition to this the tests specified in this specification must also be conducted.			
4.2	Chemical Composition of bare rod	1) To be done in accordance with and shall meet the requirements of clause 10 of SFA 5.18 of ASME Sec II C. 2) The weight percent of copper in addition to those mentioned in Table of ASME Sec II C must be reported. 3) The result of chemical analysis shall be reported as per NB 2432 of ASME Sec III NB. 4) The Cobalt content in weld metal shall be limited to 0.02%.			
4.3	Radiographic Test	Radiographic Analysis to be done in accordance with and shall meet the requirements of clause 11 of SFA 5.18 of ASME Sec II C.			
4.4	Tension Test	All Weld Metal Tension Test to be done in accordance with and shall meet the requirements of clause 12 of SFA 5.18 of ASME Sec II C.			
4.5	Impact Test	Impact Test to be done in accordance with and shall meet the requirements of clause 14 of SFA 5.18 of ASME Sec II C.			
5	Weld test Assemblies	Weld test Assemblies to be prepared as per clause 9 of SFA 5.18 of ASME Sec II C.			
6	Level of Testing	As per schedule 6 or K of SFA 5.01 of ASME Sec II C.			
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 shielding gas 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 Report	All equipments used for conducting above mentioned tests must be calibrated and the calibration report shall be submitted to BHEL.			

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