Sl. No.	Pre –Qualification Criteria E9015-B91 SMAW ELECTRODE AS PER WCPI-245/08. Diameter - 2.5 mm /2.4 mm length – 250mm /300 mm/350 mm	Bidder remark
1	Bidder shall be a manufacturer of the Quoted item/ an authorized dealer of the same. If the offer is quoted by agent, letter of authorization and agreement duly signed by the manufacturer is required to consider the offer.	
2	Bidder (Principle Supplier) shall have successful experience for supplying of E9015-B91/E9015-B9 to any govt. Organizations/ PSUs/ Public ltd./ Company/Reputed Industries etc. Purchase orders copies or related documents to be submitted along with offer to consider the offer.	
3	Quoted Welding Consumables brand name shall be provided along with offer.	
4	Product Catalogue shall be provided along with offer.	
5	Mill address (manufacturing address) shall be provided along with offer.	
6	Mill capacity for Quoted item shall be provided along with offer.	
7	Manufacturer shall submit manufacturing process flow chart (Raw material to finished product) along with offer for Quoted Item.	
8	Manufacturer (Principle Supplier) shall submit a valid ISO 9001 certificate or Quality Management System Certificate or Written down procedure for Inspection or Written down procedure for Quality or Written down procedure for Quality for ISO 9001 or ISO 140001 Certificate or ISO 45001 Certificate.	

Seal and sign of Authorized person

ADITYA KUMAR
Senior Engineer
Welding Technology Centre
BHEL, TRICHY-620 014.

Sl. No.	Pre –Qualification Criteria	Bidder Remark.
	E9015-B91 SMAW ELECTRODE AS PER WCPI-245/08. Diameter - 2.5 mm /2.4 mm length – 250mm /300 mm/350 mm	
9	Shall confirm to Technical Specifications as per as per WCPI-245/08.	
10	Vendor should give confirmation to BHEL's Technical Specification. Any deviation from the Specification are to be mentioned in the "Bidder remark Space". If There is no deviation vendor should indicate "**No Deviation**".	
11	Offered Details Diameter (mm) – Length (mm) -	

ADITYA KUMAR
Senior Engineer
Welding Technology Centre
BHEL TRICHY - 620 014

Seal and sign of Authorized person

WELDING CONSUMABLE PURCHASE INSTRUCTION FOR NON SYNTHETIC SMAW ELECTRODE AS PER ASME SEC.II.C, SFA 5.5, CLASS E9015-B91

1.0 SCOPE:

1.1 This purchase instruction prescribes the requirements for non-synthetic Shielded Metal Arc Welding (SMAW) Electrode that conforms to ASME SEC II, Part C, SFA- 5.5, E9015-B91.

2.0 GENERAL:

2.1 Electrodes shall be supplied in sizes and quantity as specified in the Purchase Order.

2.2 The Electrode shall comply with requirements as specified in the latest edition and Addenda (Applicable on the date of issue of Purchase order) of ASME Sec II C, SFA 5.5, Class E9015-B91 and all tests, acceptance criteria referred in this document shall be in accordance with this. Additional requirements specified in this document are also to be complied.

2.3 The Electrode shall be suitable for Radiography Quality Butt Joint welding of boiler pressure parts of SA387Gr91-Plate, SA335P91-Pipe, SA213T91-Tube, SA182F91-Forging and SA217C12A-Casting material for high temperature creep resistant service.

2.4 Every batch of electrode shall be inspected & Certified Material Test Report (CMTR) countersigned by Inspecting Authority approved by IBR for country of origin (to be concurred by BHEL)

2.5 The weld metal deposited by this electrode shall meet minimum 10,000 hours creep rupture test at 600°C and 100MPa without failure. The results of the tests are to be furnished. The test shall be continued for 30,000 hours and the results shall be reported later. Extrapolated creep properties for 100,000 hours at 600°C to be made available. Test shall be conducted at any government lab or NABL approved lab or corporate R&D, BHEL, Hyderabad or creep test report shall be countersigned by Inspecting Authority approved by IBR for country of origin.

2.6 The electrode shall be of Non-Synthetic type with alloyed core wire that matches with weld metal chemistry.

3.0 CHEMICAL COMPOSITION:

The chemical composition of the undiluted weld metal deposited using the electrode shall be as follows.

Prepared:	Reviewed & Approved:
Aditya Kumar SE/WTC	R Arivazhagan SM/WTC

Carbon	0.08-0.13	Molybdenum	0.85-1.20
Manganese	1.20 Max	Vanadium	0.15-0.30
Silicon	0.30 max	Copper	0.25 Max
Sulphur	0.01 Max	Aluminium	0.04 Max
Phosphorus	0.01 Max	Niobium	0.02-0.10
Nickel	0.80 Max	Nitrogen*	0.02-0.07
Chromium	8.0-10.5	Mn+ Ni	1.20 Max
*Minimum=(0.5 x Aluminium content+0.03%) Elements Sb, Sn and As shall be reported.			

4.0 RADIOGRAPHIC SOUNDNESS:

4.1 The electrodes with DCEP shall deposit weld metal, which meets Radiographic Soundness requirements specified in ASME Sec.II C, SFA-5.5, E9015-B91.

4.2 The Electrodes shall produce acceptable radiography quality pipe and tube welds in all positions.

5.0 MECHANICAL PROPERTIES:

The Mechanical Properties of weld metal deposited using the electrode after stress relieving the test plate assembly at 760 ± 15 °C for 120 minutes shall be as follows. (Tests as per ASME Sec II C, SFA-5.5, E 9015-B91)

a) Yield strength at 0.2% offset : 530 Mpa (Minimum)
b) Tensile strength : 620 Mpa (Minimum)
c) Elongation : 17% (Minimum)
d) Absorbed Energy at +20°C : 27 Joules Average(Minimum)
(Charphy 'V' Notch Impact test) (Single value should be ≥20Joules)
e) Hardness : 195 HV -320 HV

6.0 FILLET WELD TEST:

Fillet weld test done using the electrode shall meet requirements specified in ASME Sec II C, SFA 5.5, E9015-B91.

7.0 MOISTURE CONTENT OF COVERING:

Moisture content of the electrode covering shall not exceed the limit specified in ASME Sec II C, SFA 5.5, E9015-B91.

8.0 DIFFUSIBLE HYDROGEN CONTENT OF WELD METAL:

Diffusible Hydrogen content of weld metal deposited using the electrode shall be maximum of 4ml/100 grams. Test shall be done as per ASME Sec II C, SFA 5.5, E 9015-B91.

9.0 SIZE, COVERING, ARC END & GRIP END AND IDENTIFICATION:

9.1 **SIZE:**

Electrodes shall be supplied in diameters and lengths as specified in the purchase order.

9.2 **COVERING:**

The core wire and covering shall be free of defects and should ensure uniform deposition of weld metal. The flux coating shall be uniform and concentric around the core wire such that the performance of welding is not affected in any position and no tapered burning of electrode is permitted. Covering shall not exhibit any cracking during welding at maximum current recommended by manufacturer. The electrode shall not become red hot upon continuous welding through the length of electrode

9.3 **ARC END & GRIP END:**

The arc end of each Electrode shall be sufficiently bare and covering sufficiently tapered to permit easy striking of the Arc. The Grip end shall be bare for a length that is sufficient to provide electrical contact with the Electrode Holder.

9.4 **IDENTIFICATION:**

All electrodes shall be identified by providing at least one imprint of the Electrode Classification near the grip end. The numbers and letters of the imprint shall be of bold block type and of a size large enough to be legible.

The ink used for imprint shall provide sufficient contrast with the electrode coating such that the imprint shall remain legible even after drying and welding.

10.0 PACKING AND MARKING OF PACKAGES:

10.1 **PACKAGING:**

A standard quantity of electrodes such that the net weight of each package does not exceed 5Kg shall be packed in hermetically sealed containers or moisture proof Cardboard-Polythene encapsulated pockets.

Electrode pockets shall be shipped in wooden crates lined with waterproof material. Net weight of each crate shall not exceed 1000Kg.

10.2 **MARKING OF PACKAGES:**

The package shall be marked clearly with AWS Specification, brand name, classification, lot number, manufacturer name, size and quantity of electrode with net weight, health and safety warnings.

11.0 **CERTIFICATION AND TESTING:**

11.1 Batch/Lot classification shall be Class C1 of SFA-5.01 Filler metal procurement guidelines of ASME Sec.II. Part C.

11.2 The level of testing shall be Schedule K of SFA 5.01 Filler metal procurement guidelines of ASME Sec.II. Part -C.

11.3 Three copies of Original Certified Material Test Report (CMTR) in English countersigned by Inspecting Authority approved by IBR for country of origin (to be concurred by BHEL) giving details of following tests done for compliance to this Purchase Instruction and ASME Sec.II.C, SFA-5.5, E9015-B91 shall be sent. In addition, test certificate shall contain purchase order number with date, quantity and customer name.

11.4 The testing authority shall certify that supplies made against the Batch conforms to the requirements of the Latest Edition and Addenda (applicable on the date of issue of purchase order) of ASME Sec II C, SFA 5.5, E9015-B91 and this purchase instruction.