LOW HYDROGEN TYPE COVERED ARC WELDING ELECTRODES FOR ALLOY STEEL G20Mo5

1.0 Scope

This specification covers the quality of chromium molybdenum steel low hydrogen covered arc welding electrodes. The electrodes are to be used for rectification welding of Mo steel.

2.0 Compliance with National and International Standards

Assistance has been taken from TLV 917301 and ASME Section II (c) in preparing the specification.

3.0 Condition of Delivery

Electrodes shall be supplied in seaworthy and tight packing to avoid any damage / exposure to atmosphere during handling, transit and storage.

4.0 Manufacture

The core wire and the coating used for the manufacture of the electrode shall be at the discretion of the supplier

5.0 Chemical Composition

Chemical composition of deposited weld metal, when tested in accordance with ASME Sec. II (c) shall conform to the following requirements

Element	Min. (%)	Max. (%)
Carbon	0.050	0.100
Sulphur	---	0.020
Phosphorus	---	0.025
Manganese	---	1.500
Silicon	---	0.500
Molybdenum	0.400	0.700

6.0 Mechanical Properties

The following mechanical properties shall be obtained after stress relieving at 660 ± 10° C / Water/Air quenching at 940 ± 10° C and tempering at 690 ± 10° C

Yield Strength (0.2 % offset)	-	350 Mpa min.
Tensile Strength	-	470 Mpa min.
% Elongation	-	25.0 min.
% RA	-	40.0 min.
Charpy V notch (ISO-V)	-	27.0 J avg. of 3 specimens at + 20° C

7.0 Selection of Test Samples

The selection of test samples for acceptance for chemical composition and mechanical properties shall be done as follows

7.1 Electrodes shall be drawn from one or more than one packet from each batch no. for carrying out chemical and mechanical properties.

7.2 Test Sample for chemical analysis shall be made according to ASME Sec. II (c)

7.3 Electrode shall be deposited on carbon steel plates for radiography and mechanical properties in accordance with ASME Sec. II (c).

8.0 Preparation of Test Samples

Tensile and Impact specimen shall be prepared in accordance with ASME Sec. II (c).

9.0 Freedom from Defects

Weldment on the test plate made as per ASME Sec. II (c) shall be free from inclusions, cracks and lack of fusion etc , on radiography, as per recommendation of ASME Sec. II (c).

10.0 Acceptance

10.1 Each batch of electrodes supplied by approved vendor shall be accepted on the basis of properties given in Cl. 5.0 and properties as per Cl. 6.0 shall be checked on surveillance basis.

10.2 For a new vendor the initial approval will be done on the basis of properties (given in Cl. 5.0, 6.0 and 9.0) obtained on the test samples prepared from the test plate made as per ASME Sec. II (c) at BHEL

11.0 Test Certificates

The supplier shall submit five copies of test certificates giving the following information along with delivery

11.1 BHEL REFERENCE

11.1.1 PO Number

11.1.2 Specification No.

11.2 SUPPLIER REFERENCE

11.2.1 Supplier Name and Emblem.

11.2.2 Chemical Analysis

11.2.3 Result of Mechanical Properties

11.2.4 Diameter of core wire and length of electrodes

11.2.5 Batch No.

11.2.6 Date of manufacture

11.3 Party shall certify that the electrodes have been manufactured in accordance with FF77196 Rev 02.

12.0 Marking

Each electrode shall be marked by imprint of Plant Standard No./ AWS No. and brand name of supplier near to the gripping end. Ink used for imprinting shall provide sufficient contrast with the electrode covering, so that it is legible before and after normal welding operation. Party shall imprint following information on each carton.

- Brand Name
- Size of electrode
- Batch no. and Date of Manufacture
- Quantity and net weight.

RECORD OF CHANGES

REV CODE	NO. OF CHANGES	DOCU. NO.	SHEET NO.	SIGN	DATE
02	Clause No. 2.0 DIN 17245 (87) replaced with TLV 917301		1 of 4		20.10.06
	Clause No. 6.0 SR and Q & T temperatures specified		2 of 4		20.10.06
	Clause No. 7.4 deleted		2 of 4		20.10.06
	Clause No. 9.0 Radiography added		2 of 4		20.10.06
	Clause no. 10.0 added		2 of 4		20.10.06
	Clause No. 12.0 AWS No. added		3 of 4		20.10.06

DISTRIBUTION OF PRINTS

RMI	√
STANDARD SECTION	√
MPIC	√