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WELDING & PAINTING PROCEDURE

BHARAT HEAVY ELECTRICALS LIMITED
FSIP, JAGDISHPUR
AMETHI -227817

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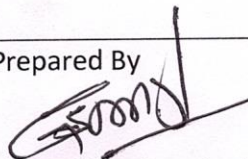
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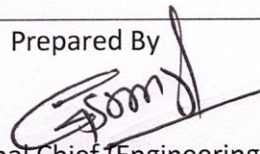
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2.0 RECORD OF REVISIONS

Revision Date	Section No.	Revision No.	Clause No.	Nature of Changes
04.07.19	All	00	--	Updation in line with merger of CS-FP & IP

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WELDING & PAINTING PROCEDURE

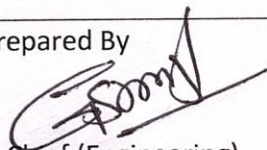
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3.0 DISTRIBUTION LIST

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4.1 WELDING PROCEDURE:

4.1.1 The welding procedure outlined will be followed to ensure uniform and good quality welding.

4.1.2 The welding must be Arc / Flux cored after maintaining proper fit up.

4.1.3 The material specification of welding electrodes/Flux core wire to be as below:

A **Electrode: MS** - E 6013

Arc welding (2.5 mm , 3.15 mm or 4.0 mm):- make

Advani- Oerlikon: Overcords	D&H : Medio	Rockweld: V-117	I.O.L/ESAB: Vordian/Ferrospeed plus
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Electrode: SS - E 7018

Arc welding (2.5 mm , 3.15 mm or 4.0 mm) : - make

Advani-Oerlikon: Supercito	D & H : Supra Therme	ESAB: Ferro Weld-2 / ESAB 36 H
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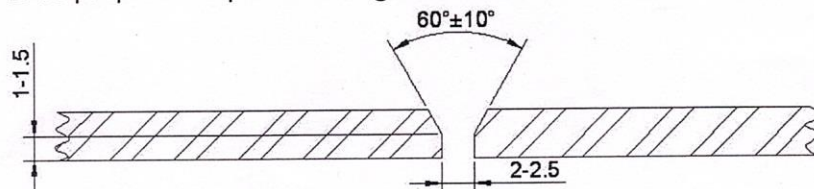
B MIG WELDING:- (Flux core wire 1.6 mm or 1.8 mm)

Solid wire core for MS -- ER 70S-6

For SS-- ER-308 L /ER309 L

Make- Ador /D&H/Esab/D&H Sechron/Cotmac

4.1.3 Edges to be prepared as per following sketch:



4.1.4 Root pass welding to be carried out buy using 2.5 mm welding electrodes ,further filling may be done either by 3.15 mm or 4.0 mm electrodes/Root pass welding to be carried out by 1.2 mm to 1.8 mm dia flux core wire ,further filling by 1.2 mm to 1.8 mm flux core wire.

4.1.5 Ensure root weld is uniform and penetration is proper.

4.1.6 Between two passes, remove slag and clean weld surfaces.

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4.1.7 In case of undercut grind the weld surface smooth and fill up with 2.5 mm welding electrode/wire core.

4.1.8 Employ down hand method for welding.

4.2 CHECK POINTS:

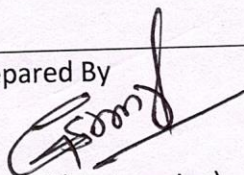
Audit checks are conducted for the quality of welding of every ceralin item. The Die Penetration test is to be carried as per E&D:331 after each root pass.

The visual examination of welding is to be carried out as per detail below:

1. The weld shall be free of cracks.
2. The face of weld shall be flush with the surface of base metal & weld shall merge smoothly with base metal. Undercut shall not exceed 1 mm & welding reinforcement shall not exceed 3 mm.
3. The root of weld shall be inspected & there shall be no evidence of cracks, incomplete fusion or inadequate joint penetration.
4. The weld shall be free from overlap.
5. The weld shall be free from accumulated slag the sum of the greatest dimensions of which shall not exceed 6 mm.
6. Grinding is not allowed on weld bead.
7. Grinding of all gas cut portion to be ensured (including lifting lug)

4.3 Welder Qualification: Welder qualification test to be done strictly for each welder as per AWS D-1.1 by a third party NABL accredited lab once in a year.

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5. PAINTING PROCEDURE:

5.1. This procedure covers the requirements of primer and Final paint for M. S. Casing for in-land applications/costal region/export

5.2. This procedure specifies the painting requirements to provide adequate surface protection.

5.3. SPECIFICATION OF PRIMER/PAINT:-

Type of paint	Specification	Make
Alkyd Red Oxide Zinc Phosphate Primer	As per IS:12744 –DFT 30 Mic /coat	Berger ,Asian Paint , Dulux
General Purpose Aluminium Paint	As per IS:2339-DFT 30 mic/coat	Berger ,Asian Paint , Dulux
For costal region /Export / Special items ,paint type to be specified by the customer	As per specification provided by the customer	Berger ,Asian Paint , Dulux

SURFACE PREPARATION:-

5.3.1. Surface of component shall be thoroughly cleaned before the application of primer paint by either Power Tool cleaning (SSPC-SP3) or Abrasive Blast cleaning. The surface shall be free from dust, rust, weld, slag, spatters, oil, grease etc.

5.4. APPLICATION OF PAINT:-

5.4.1. Surface prepared as mentioned above shall be applied with one coat of Alkyd Red Oxide Zinc Phosphate primer (as per IS:12744) where no special primer is mentioned for M.S. Casing.

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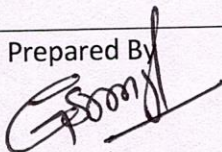
5.5. GENERAL:-

- 5.5.1. Paint make Berger /Dulux / Asian shall be used as supplied by the supplier without any addition of thinner.
- 5.5.2. Primer shall be thoroughly stirred before application. Primer can either be applied on surface by brushing or spraying using compressed air uniformly. The thickness of the primer shall not be less than 30 microns/coat (where no other specifications are mentioned).
- 5.5.3. Adequate drying time is to be allowed after each coat before next coat of paint.
- 5.5.4. No painting is required in case of Stainless Steel components, unless otherwise specified.
- 5.5.5. For all machined components, rust preventive fluids shall be used (where no other specifications are mentioned).
- 5.5.6. Rusting of received material at BHEL IP will be treated as use of poor paint / process and the same will be out rightly rejected or repainting will be done on the risk and cost of supplier on the discretion of BHEL.

5.6. Inspection:-

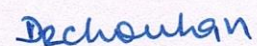
- 5.6.1. Surface preparation, primer coating shall be checked at appropriate stages by executing agency before proceeding to next operation.

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