

BHARAT HEAVY ELECTRICALS LIMITED
Heavy Plates & Vessels Plant, Visakhapatnam-530012

GSECL UKAI 1X800 MW UNIT 7
UKAI GUJARAT
Customer No: 8117, 1x100 TPH - Auxiliary Boiler
PAINTING SCHEDULE
GSECL Drawing No: DOC-8117-MECH-PNT-001

Prepared by	K Munayya Drughtsman Gr.II		Document No: 8117-ENPNT-DOC-001
Reviewed by	K Tarakesh Deputy General Manager/Engineering		Revision No. 00, Dated: 04.05.2026
Approved by	K. Tarakesh Deputy General Manager/Engineering		Sheet No. 1 of 11

We confirm that this document meets all the contract requirements including safety and statutory requirements and facilitate ease of operation and maintenance. In case any deviation is found, BHEL shall carry out all required changes/ modifications without any cost implications to GSECL. In addition, Penalty on account of noncompliance of contract specification as deemed fit by the Employer shall be recovered.

RECORD OF REVISIONS

Rev. No.	Date	Details of revision	Remarks
0	04.05.2026	First Submission	

Sl. No.	PGMA/Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
1	<u>Drum (Except Internals)</u> 04-114, 210	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.1, DFT=20µm/coat.	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr.1, DFT=20µm/coat.	1	Aluminium	40
2	<u>Drum Suspension</u> 04-144	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate primer (Alkyd base) to IS 12744, DFT=25µm/coat.	2	--	--	Synthetic Enamel (long oil alkyd) to IS2932, DFT=25µm/coat.	2	Smoke Grey Shade No: 692 of IS5	100
3	<u>Drum Internals, Foundation materials and DD items (threaded and machined surfaces only)</u> 04-114, 210; 21-700; 24-351, 625, 627, 642, 700; 35-010, 700; 39-010; 42-011,700; 48-700; 81-318;	SSPC-SP3/ Power Tool Cleaning	Rust preventive Fluid to PR: CHEM: 09-04, DFT=25µm/coat.	1	--	--	--	--	--	25
4	<u>Boiler Supporting Structures, Columns, Girders, Bracings:</u> 35-110,210,310,410,610,611; 36-391; 39-110, 303; <u>Galleries, Stair-ways & inter connecting Walkways</u> 36-210-220, 230, 390,850 <u>Buckstays</u> 08-100 <u>Flue Gas Duct System supporting Structures</u> 48-335,015,115,205,385,495:	Blast cleaning to SA2 ½ (Near white metal) conforming to ISO 8501-1 with surface profile 40-60 µm	Inorganic Ethyl Zinc Silicate Primer DFT=70µm per coat (refer sheet 10, Sl.no.10 for details)	1	Polyamide cured epoxy with MIO content. Minimum 100µm DFT per coat (refer sheet 10, Sl.no.09 for details)	1	Two pack Aliphatic isocyanate cured acrylic Finish paint DFT 70µm. (refer sheet 10, Sl.no.2 for details)	1	Grey White Shade To RAL 9002	240

Sl. No.	PGMA/Description	Surface Preparation & Surface Profile	Primer coat		Intermediate coat		Finish coat			Total DFT µm (min)
			Paint	No. of coats	Paint	No. of coats	Paint	No. of coats	Shade	
5	<u>Components >95°C Insulated other than components in Sl.No. 7 & 9</u> <u>Headers, Pipes & Fittings outside the gas path</u> 10-170, 270; 12-850, 900,901, 993; 18-001;19-701,702,851,901; 21-600, 602, 603, 604, 700; 24-352, 600, 603, 620, 624, 627, 628, 635, 642, 700; 80-300, 417, 420, 421, 450, 451, 453; 81-005, 026, 318; <u>Hot Air:</u> 48-200,204, 207, 382 & 384,772,774,775;	Blast cleaning to SA2 ½ (Near white metal) with surface profile 35-50 µm	Inorganic Ethyl Zinc Silicate Primer DFT=60µm per coat	1	--	--	--	--	GREY	60
6	<u>Components >95°C uninsulated other than components coming in gas path.</u> 07-431; 09-001, 002, 003; 12-901; 24-642; 28-220; 42-200, 300; 48-915; 81-104	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT= 20µm/ coat.	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT= 20µm/ coat.	2	Aluminium	60
7	<u>Loose Tubes, SH. Coils, ECo</u> 11-170,12-903,19-850,104;	SSPC-SP2 or SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03 DFT=35µm/ coat.	1*	--	--	--	--	Red Oxide	35

*- In lieu of dip painting, 2 coats of brush painting of Red oxide Zinc Phosphate primer to a coating thickness of 60µ is also permitted in line with Sr.No.9.

NOTES:

1. Rust Preventive Coating should be given on HSFG Bolt and nut threads.
2. Machined surfaces and all retainers are to be applied with a coating of Temporary Rust Preventive oil.
3. All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves, shall be coated with Temporary Rust Preventive Fluid and during execution of civil works; the dried film of coating shall be removed using organic solvents.
4. Ground shade/ Colour of Finish paints & identification tag/Band for equipments, pipings pipe service, boiler supporting structures and other boiler components shall be followed as per tender.
5. PGMA's under Sub-Vendor items are not indicated. For all bought-out and sub-vendors items including PGMA's mentioned above falling under the scope of BHEL, the same scheme as for main equipment as covered in this document shall be followed.
6. This painting Scheme is valid for only Customer No: 8117 (BHEL-HPVP Unit), Auxiliary Boiler -1X100 TPH (Net) catering to GSECL UKAI-1x800 MW UNIT 07.
7. No painting is required for Stainless Steel, non-ferrous & galvanized components.
8. Wherever inside surfaces of components under PGMA 48 – XXX & other PGMA's, need protection till erection, two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns shall be applied, after power tool cleaning. This includes duct inside surfaces, truss, beams, gusset plate, guide vanes, divider plates, rectifier, divider vanes, etc coming in the gas path.
9. The Temporary Rust Preventive coating that already been applied on any components, tubes, pipes etc., shall be visually inspected for good adherence. If the coating is intact, direct coating of alkyd based red oxide paints over the coating is permitted. In case, the coating has peeled off over a large area, then the coating is to be removed by suitable solvents / heating to 350 –400 °C for an hour before primer paint application –but, in this case, it should be ensured that the minimum surface cleanliness required for primer paint application shall be SSPC – SP2 (equivalent – Hand Tool cleaning).
10. In components, wherever plates / sheets of thickness less than or equal to 5 mm and rods of <25mm/tubes/drain pipes are used, power tool / hand tool cleaning to SSPC – SP3 / SP2 shall be followed and the painting shall be done as described in SI.No.8.
11. For all commissioning components-erection materials (xx-993) two coats of Red oxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning.
12. Touch-up paintings, making good any damaged shop painting and completing any unfinished portion of the shop coat shall be carried out as per clause applicable painting scheme.
13. All components covered under different PGMA's are to be painted. In case any component is left out, the same shall be deemed to be included under the relevant section based on paint logic approved.
14. For very small components like clamps etc. which are not having feasible dimensions for blast cleaning, painting scheme of SI.No.8 shall be followed.
15. For very small components with weldable primer at edges, the entire component shall be applied with weldable primer. Structural members having welded connections at site, relevant area can be painted with primer paint instead of Weldable primer.
16. All temporary/transport structures, are to be painted with 1 coat of Red oxide Zinc Phosphate primer (Alkyd Base) to IS 12744-DFT-30μ and 2 coats of Synthetic Enamel paint (Long Oil Alkyd) to IS 2932-DFT-2X20μ Shade Yellow –Shade No. 356 of IS 5- Total DFT 70μ. These are to be cut & removed at site after erection. (It excludes components covered under Sr. No. 4 & 9 of description table).
17. For internal protection of Pipes, tubes, headers and other pressure parts, Volatile Corrosion Inhibitor (VCI) pellets shall be put (after sponge testing/ draining/ or drying) and subsequently end capped. The dosage of VCI pellets shall be approximately 100 g/ Cu.m. For tubes typically 4 – 5 tablets per end are to be put. For C & I items, the dosage of self-indicating Silica Gel (colourless) shall be 250 g/ cu.m. (About 2 to 3 bags weighing approximately 100 grams each). VCI pellets shall not be used for stainless steel components and its composite associates.
18. All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.

19. Soot blower components i.e Valve head assembly having high surface temperature (> 200 and <600 deg. C) shall be applied with protective coating as per PS9* (IS-13183 Gr.-II up to 400 deg.C and IS-13183 Gr.I up to 600 deg.C)
20. Corner plate, sheet channel and fixing pins of PG 32 shall be painted as per scheme PS3 to total DFT of 60 microns.
21. It is mandatory that for finish coat each layer shall have a permanent DFT and free from any paint defects like sags, wrinkles etc. Total DFT of a component correspond to respective painting scheme has to be ensured and recorded by inspection agency as per QP.
22. For chequered plates having thickness ≤ 5 mm, surface preparation can be power tool cleaning to SP3 and painting shall be in line with SI. No. 8.
23. Handrails, step treads of PGMA under SI. No. 4 need to be galvanized in line with scheme for handrails (i.e. SI .No. 10).
24. Inside surfaces of fabricated structure (e.g. Box type column) shall be painted with two coats of red oxide primer paint during fit up stage.
25. All steel structures shall be provided with painting as given in the specification. Further, painting system shall also meet the requirements of corrosivity category C3 (durability high) as per ISO 12944.
26. Surfaces prepared as per the surface preparation scheme indicated herein shall be applied with primer paint within 6 hours after preparation of surfaces.

Painting Scheme - Details for procurement & application purposes

Sl. No.	Generic nature of paint	Theoretical Covering Capacity (Sq.m/L)	No. of pack	Volume solids % (min)	DFT per coat (microns)	Shade	Shade No. (ISS)	Mode of application	Over coating interval (hrs)
1	Epoxy Zinc rich primer to IS14589 Gr II (latest)	8	2	35	40	Grey	--	Spray	24
2	Aliphatic acrylic Polyurethane paint as per IS13213	13	2	40	30	DA Grey / Phirozi blue	632 / 176 of ISS	Airless Spray	24
3	Heat resistant Aluminium paint to IS 13183 Grade I/II/III	10	1	--	20	--	--	Brush / Spray	24
4	Red oxide zinc phosphate primer paint to IS 12744	10	1	--	30	--	--	Brush / Spray	12
5	Red oxide Zinc Phosphate Dip coat primer paint (PR: CHEM: 09-03)	10	1	--	35	--	--	Dip	12
6	Long oil alkyd synthetic enamel finish paint to IS2932	17	1	--	20	Required shade	Corresponding shade no.	Brush / Spray	12
7	Temporary Rust preventive fluid (PR CHE: 09-04)	10	1	--	25	--	--	--	12
8	General purpose Aluminium paint to IS 2339	10	2	--	20	Aluminium	--	Brush	12
9	Self-priming surface tolerant high build epoxy paint	8	2	80	100	--	--	Brush / Spray	12
10	High Build Epoxy MIO coating (polyamide cured, intermediate coat as per IS 16943)	5	2	60	120 (min)	Brown	--	Airless Spray	24
11	Inorganic ethyl self-curing zinc silicate primer (IS 14946, Zn 75% min)	7	2	60	80 (min)	Grey	--	Airless Spray	24
12	HB Chlorinated Rubber Based Zinc Phosphate Primer – Colour Grey	8	1	40	50	Grey	--	Brush / Spray	12

The covering capacity of paints specified is only approximate.

The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers.

Painting of Damaged Areas

(Areas where the paint has deteriorated badly by erosion and areas where the paint film has lost its adhesion and where the steel has rusted appreciably, should be repainted as follows)

[illegible]

