P9–1–3

PRODUCT STANDARD
AME BHOPAL

AM 54173 REV. 07

PAINTING OF BHEL LARGE AND MEDIUM RANGE MOTORS AND COMPONENTS

1. GENERAL

This standard details the process to be followed to provide a chemical resistant paint finish on Siemen's design large and medium range motors and components. The dried paint film shall be smooth, glossy and scratch resistant. The painted surface shall be resistant to chlorine, contaminated atmosphere as well as corrosive alkaline, ammonia, acidic and salty atmospheres.

2. MATERIAL

2.1.	Etch Primer	AA 56103
2.2.	Chemical Resistant Epoxide finishing paint (Light grey Shade No. 631 of IS:5 unless otherwise specified in OGA/GA Drawing).	AA 56131
2.3	Chemical Resistant Epoxide priming paint	AA 56105
2.4.	Thinner for AA 56131	AA 56708
2.5.	Thinner for AA 56105	AA 56708
2.6.	White Spirit	AA 56701

3. PREPARATION OF THE PAINTS

3.1. Mixing of the constituents of epoxide paints

These paints as supplied consist of two separate ingredients, namely base and accelerator. Shortly before mixing and use, these shall be thoroughly stirred. The base and the accelerator shall be accuratly mixed together in the proportions as per the recommendations of the supplier detailed in Annexure–1.

Accelerator should be added to the base and not the base to the accelerator. The paints shall be mixed with continuous stirring until a uniform consistency is obtained.

REV	DATE	ALT / CHD.

TITLE: PAINTING OF SIEMENS LARGE AND MEDIUM RANGE MOTORS AND COMPONENTS

REVISIONS

REV	DATE	ALT / CHD.
07	7.06.05	ALT. LDV / CHD.

CL. 2.2 & ANNEXURE –I CL. 2 MODIFIED. DRG.UPDATED & REDRAWN.

DISTRIBUTION
AME–1
PLM–3 FBM–4
IMM–3 PRM–4
GTG(EM)–1

	NAME	SIGN	DATE
DRN.	LDV		21.11.95
CKD.	AKB	Sd/–	21.11.95
APPD.	SAS	Sd/–	21.11.95

LDV/AMDrg./AM54173

3.1.1. Consistencies of the paints AA 56131 and AA 56105:

The paints mixed as per clause 3.1 shall be used at the consistencies as given below:–

Paint Specification	Flow time of the paint in IS cup No. B–4 (IS:3944)
	For spraying
1. AA 56105 2. AA 56131	30 ± 2 Sec. 30 ± 2 Sec.

The above consistencies shall be adjusted using thinners for epoxy paints AA 56131/AA 56105 and these flow times shall be maintained independent of normal temp. variations within shopfloor painting area.

IMPORTANT NOTE:

After mixing, the paint shall be allowed to mature for 1/2 hour. The mixed paint shall be used within 8 hours.

3.2. Safety Precautions:

AA 56131 and AA 56101 Epoxy paints are liable to cause irritation to the skin. This may transpire into inflammation, swelling, rash or postules on the hands, arms and occassionally on whole of the body.

Following precautions should be observed while handling these materials:

i) Work place and storage, rooms should be adequately ventilated.

ii) Before starting the work, hands should be washed with soap and water and good barrier cream applied.

iii) Maximum care should be taken to avoid splashes on the skin.

iv) Splashings on the skin should be immediately washed with soap and water.

v) After the work, hands, arms and face should be washed with soap and water followed by thorough drying with a clean cloth.

vi) Spray painting:
Same shall be done in a specially designed painting booth.

In case painting is required to be done by spraying in open area then the operators should be provided with safety masks and place of painting should be sufficiently away from source of fire e. g. welding, hand grinding etc.

4. SURFACE PREPARATION:
It is necessary that surface to be painted is free from loose dust, mill scale, rust, grease, oil, old paint etc. For this the surface preparation shall be as per AA 067 41 01.
Any loose swarf or shot shall be removed with a dry brush or air blast and first primer coat applied before on set of rusting. The time should however not exeed 24 hours.
NOTE : In ideal condition first coat of priming paint sholud be applied over "virgin" i.e. just shot blasted surface.

5. APPLICATION OF PAINT : Painting shall be done by spraying process only. Brush painting is not allowed.

5.1. Application of first coat of AA 56105 (Primer paint).
Priming paint AA 56105 as prepared in Clause 3.1.1 shall be applied over the surface by spraying.

5.1.1. Drying of paint
The painted surfaces shall be allowed to air dry for a minimum period of 12 hours.

5.2. Application of second coat of Epoxide primer AA 56105
Surface shall be degreased where necessary. Second coat of epoxide to AA 56105 shall be applied in accordance with Clause 5.1. Refer Clause 6.2 for coating thickness (DFT).

5.2.1. Drying of the paint

The painted surfaces shall be allowed to air dry for a minimum period of 12 hours.

5.3. Application of first coat of AA 56131 (finishing paint)
Immediately before painting the surface shall be cleaned with white spirit where necessary. Any damage which has been caused to the previous coat shall be repaired depending upon the serverity of the damage. After the repairs, the surface shall be painted with AA 56131 paint as prepared in clause 3.1.1 by spraying.

5.3.1. Drying of the paint
The painted surface shall be allowed to air dry for minimum period of 12 hours.

5.4. Application of second coat of AA 56131 (Finishing paint)
Surface shall be cleaned with white spirit where necessary. Another coat of AA 56131 paint shall be applied in accordance with clause 5.3 above.

5.4.1. Drying of the paint
The pinted surfaces shall be allowed to air dry for minimum period of 12 hours. At this stage it is suitable for handling, writing stc.

Note: 1. The time gap between any two successive coats shall not be more than 7 days.

2. The final painted surface develops optimum mechanical, chemical properties after 7 days of drying.

6. INSPECTION FOR PROCESS CONTROL.

6.1. Quality control inspector shall visually inspect the finished components for various paint film defects such as gloss, uniformity of shade, wrinkles, orange peel effects, blistering etc.

6.2. Thickness
The dried film thickness(DFT) after Etch Primer coat if any & 2 coats of primer shall be 40 to 50 microns, when measured by using a suitable instrument for the non—destructive measure—ment of the coats as detailed in IS 6012:1970. Similarly DFT shall be 100 to 140 microns (0.1 to 0.14 mm) after 4 coats (2 primer+2 finish coats). Additional finishing coats may be given to acheive the thickness for a specific application. It can be achieved by giving further finishing coats.

6.3. Adhesion by tape test
This test is carried out by applying & removing pressure sensi—tive adhesive tape over cuts made in the paint film to ensure that adhesion of paint film to matallic substrate is adequate.

The test shall be carried out generally in line with ASTM D 3359 except that transparent pressure sensitive Adhesive tape of 25 mm width, shall conform to IS: 13262 or should bear ISI mark.

Method A of ASTM D 3359 shall be followed in case thickness of film is greater than 125 microns and acceptance criterion shall be "4A" Viz trace peeling or removal along incisions, and method B of ASTM D 3359 shall be followed when thickness of paint film is between 50 to 125 microns and acceptance criterion shall be "4B", Viz small flakes of the coating are detached at intersections, less than 5% of the area is affected.

7. REPAIR OF DAMAGED PAINT WORK:

7.1. Local damage unrusted:
Where local damage to the paint work has occured without subsequent rusting, the damaged area shall be cleaned with white spirit. The number of paint coates shall be applied sufficient to provide a dry film thickness, not less than that of the surrounding paint.

7.2. Local damage rusted:
Where local damage to the paint work with subsequent rusting has occured, the rust shall be removed by mechanical procedure as per clause 4 and followed by subsequent procedure laid down in clause 7.1.

7.3. Extensive damage:
In case of extensive damage entire old film shall be removed and surface prepared as per clause 4 and repainted.

8. Checklist for painting of Equipments as per Annexture II.

Note : 1. This standard is being issued by AME, in line with the decision taken to issue painting Spec. by all Engineering Divisions. The contents of the Spec. are maintained exactly same as given in TSD Spec. No. BP 067 41 77.

ANNEXTURE – I

1. Mixing Ratio of Chemical Resistant Epoxide Priming Paint to AA 56105.
(Stocked in factory Main Stores).

TABLE – I

Supplier's Name	Mixing Ratio in Parts by Volume
	Base : Accelerator
Jenson Nicholson, Asian, Goodlass	3 : 1
Garware	5 : 1
Alkali Chemicals	6 : 1

2. Mixing Ratio of Chemical Resistant Epoxide Finishing Paint to AA 56131.

TABLE – II

Supplier's Name	Mixing Ratio in Parts by Volume
	Base : Accelerator
Shalimar, Goodlass	3 : 1
Asian Paints, Alkali Chemicals	4 : 1
Garware	3 : 2

ANNEXTURE – II

CHECKLIST FOR PAINTING PROCESS FOR ELECTRICAL MACHINE GROUP

(To be filled by shop)

1. DATE : .....
2. W. O. NO & SL. NO. : .....
3. SURFACE PREPARATION : .....SOLVENT.
   ..... MECHANICAL CLEANING
4. DATE OF EXPIRY : .....
5. VISCOSITY : .....
6. MIXING RATIO : .....
   (For 2 pack system)
7. NAME OF PAINTER : .....

INSPECTION AND QUALITY CHECKS.

(To be filled by QC Personnel)

1. VISUAL OBSERVATION

SHADE	OK	NOT OK
FINISH	SMOOTH	NOT UNIFORM
GLASS	GLOSSY	MATT.
SAGGING	PRESENT	ABSENT

2. THICKNESS (DFT) : .....Microns.
3. ADHESION BY TAPE TEST : (If felt necessary)

OK	NOT OK

SIGNATURE : .....

NAME : .....

DESIGNATION : .....

BHARAT HEAVY ELECTRICALS LIMITED
Tiruchirappalli - 620 014

BHUSAWAL THERMAL POWER PLANT, 1 X 660 MW
M/s. MAHAGENCO, JALGOAN DIST., MAHARASHTRA
CUSTOMER NO. U6/1727, UNIT-6
PAINTING SCHEDULE

Prepared by	**K. Srinivasan** **Senior Engineer/ Plant Lab**		**Document No: PL: C3 - PS / 1727**
Reviewed by	**D. Vijayakumar** **SM /PE/FB**		**Revision No: 00 Dated: 11-06-2018**
Approved by	**A. Santha kumari** **AGM / Plant Lab**		**Sheet No. 01 of 11**

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RECORD OF REVISIONS

Rev. No	Date	Details of revision	Remarks
00	11-06-2018	New	Prepared in line with MAHAGENCO Bid Specification. No. DG/BSL U-6/2011/ T-1 & clarifications to Bidding Documents.

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 PS1AC	Collector & Separator Vessels (Except Internals), Supports 04 –147,321,547;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	1	--	--	Synthetic enamel paint (Long Oil Alkyd) to IS2932 (DFT = 20µm/ coat)	2	International orange Shade No: 592 of IS 5	70
2 PS5B	Collector & Separator Vessels Internals & foundation materials 04-347; Machined components and threaded surfaces (Dd items): 07-302,303,309,331,360,361,362,393;09-303,304; 12-306,314,317,324,327,328,344,348,354,393; 17-304,306,319;19-304,306,307;21-602,605; 24-352,803,818,823,827,842;28-700; 32-700; 35-010,190,700; 39-012,700; 41-710;42-700,710; 43-710;45-710;47-710;48-019;65-710;67-710;	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20µm per coat	2	--	--	--	--	--	40
3 PS 1JT	Buck stays 08-001,003,006,007,111,501,503,901, 08-910;34-100,200,300; Boiler supporting structures, Columns, Girders, Bracings 35-211,212,213,214,221,222,231,232; 35-311,312,321,322,331,332,341,342,351; 35-352,361,362, 381,382; 35-383, 390,441,442; 35-443, 451,452,453; 35-511,512,513;35-521,522,523; 35-531,532,533,993,995;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35µ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35µm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25µm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2* 1	Light Grey Shade No: 631 of IS5	140

 # Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

S. 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	
3 PS 1JT (continuation)	36-110,150,311,312,313,314; 36-315,316,321,322,323,324,325, 36-326,331,613,993; <u>Galleries, Stair-ways & inter connecting Walkways</u> 36-332,333,334,335, 341,342; 36-343,344,345,351,352,353,354,355; 36-361,362,363; 36-391,392,393,394; 36-395,610,620,740; 38-210,299,310; 38-381,410,510,610,710,993; 39-101,102, 39-141,142,150, 300,301,304,305,306,993; 48-015,115,225,265,385,435,465,485,495; 48-665,911,912;	Blast cleaning to SA2 ½ or SSPC-SP10 (Near white metal) with surface profile 35µ	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 35µm per coat	2	--	--	#Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 25µm per coat # Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2* 1	Light Grey Shade No: 631 of IS5	140
4 PS3	Components >95° C Insulated other than components in Sl.No.6 &8 Ring Headers, Down Comers, Hot air Headers outside the gas path etc. 05-155,227,231,251,327,330,350; 07-110,125,223,231,232; 10-174,178,191,274,278,283,284, 10-285,291;12-178,900; 15-136,178;15-236,278;17-504,807,900; 18-001,010;19-701,702,753,903;21-600; 24-800,805,806,807,808,809,811,815; 32-010,210,810; 33-970; 37-010; 42-020,030,128,150,158; <u>Hot Air:</u> 48-202, 207,208,212,214, 48-222,224,232,234,262,264,267,662,664,667. <u>Flue Gas:</u> 48-372,382,384,386,432,434 48-462,464,482, 484,492,494;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	No paint	No paint	Red oxide	60

Out of 3 coats of finish paint, *first coat of synthetic enamel finish paint to 25 microns shall be given at shop / subcontracting works. Second coat of synthetic enamel finish to 25 microns and third coat of synthetic enamel paint to 20 microns shall be applied at site.

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 PS9	Components >95° C and <400ºC uninsulated other than components coming in gas path. 20-511; 24-820,824,835,860,865,867; 42-200,300,358;48-200,915;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. II DFT 20 µm per coat	1	Aluminum	40
6 PS10	**Components uninsulated other than components coming in gas path.** Temp: >400°C & <600°C 09-003,004,005,503; 28-220;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I DFT 20 µm per coat	1	Aluminum	40
7 PS2	Loose tubes, SH, RH & Eco. coils, 11-074,078,374,378,406,416,467, 11-487,606,608,684,694,716,718, 11-767; 11-769,787,791,916,918,967,969,987,991; 12-184,187,368,405,514,515; 12-524,544,554,803,805;12-852,903,914,917; 12-924,927,928,944,948,954,968; 16-079,201,202,203,270,379; 19-402,802,814,824,884; 19-914,924,984;	SSPC – SP2 or SSPC – SP3 Hand tool / Power tool cleaning	Red Oxide Zinc Phosphate Dip coat primer to PR: CHEM: 09 – 03 DFT=35µm per coat	1*	--	--	No paint	No paint	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.

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	
8 PS1A	Miscellaneous casing sheets, fuel piping, duct plates, expansion joints and coal handling items 07-409,431,460,461,462,502,503,531,560; 12-906,907;21-601,604,700; 24-350,700,804; 24-817,822,825,826,836,837,840; 24-841,855,950,955,960; 30-219,233,234,235; 36-611, 621; 38-611; 39-302; 41-350,390,500; 42-001,002,005,010,046,065,070; 42-120,152,154; 42-157;43-004,005,104,105,200;45-200,801; 45-802,804,805,858;47-261,263,858; <u>Cold Air</u> 48-012,014,018,112,114,141; <u>Tempering Air:</u> 48-142,144,145,204,205; 65-736;67-204,272,276,283,801,802,803; 95-088,089,091,485;96-186;97-585,591,592; Handling equipments: 99-099,100,300,400,600;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc Phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	1	--	--	Synthetic Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Smoke Grey Shade No: 692 of IS5	70

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	
9 PS3	Components >95° C coming in the gas path, Headers, Commissioning Spares &erection Materials, Miscellaneous materials etc., 05-137,147;06-400,401, 434,437; 06-451,453,455,500,501,731,732; 06-734, 737,741,744, 747,751,752; 06-753,755;07-315,316,318,423,993; 10-182,183,184,185;11-408,491; 12-850,993; 17-506;19-763,783,793,850,851,852,853; 20-998;24-993; 30-215; 30-103,223,224; 31-010,104; 34-390,400,500; 35-111,112,121,122,130,140,150; 36-130,327;42-858; 48-993;65-200;67-200;97-282,590; 20-988;21-987,988;24-987,988; 24-989;41-988;42-988;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	No paint	No paint	Red oxide	60
10 PS6	Hand rails and posts, ladders / rungs 34 - 820,850; 35 - 821,822, 823,851; 36 -820,851,852,853; 38 - 820,850;39 - 820,850; Floor Grills, Guard plates 34-810;35 -811;36-811,812,813,814; 38 -810;39 – 810;	Acid pickling to SSPC-SP8	Hot dip Galvanizing to a coating weight of 610 g/m^2 (minimum) Refer Notes given below **							

Notes **: Guard plates, Hood Ladders, Stringer channels, angles and plates shall be painted as per painting scheme prescribed in Sl. No: 03

PAINTING SCHEME FOR VALVES

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	
11 PS 10	Cast carbon steel valves (Conventional) Cast alloy steel valves (Conventional) All API valves, QCNRV, SV & SRV <u>Silencers,</u> 24-885; 21-800,825; <u>Safety valves & ERV</u> 21-850; 24-880,881;	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20µm per coat	1	--	--	Heat Resistant Aluminium Paint to IS 13183 Gr. I/DFT 20µm per coat	1	Aluminium	40
--	Forged valves	Chemical cleaning	Phosphating to a coating weight of 1500 mg per sq.ft.	--	--	--	--	--	--	--
12 PS 1AS	Soot Blower components (Outside surface – shell) 20-051,054,201,204,794,962;	SSPC-SP3/ Power Tool Cleaning	Red Oxide Zinc phosphate Primer (Alkyd Base) to IS 12744 DFT= 30µm per coat	2	--	--	Syn. Enamel paint (Long Oil Alkyd) to IS 2932 DFT= 20µm per coat	2	Verdigris Green Shade No. 280 of IS5	100
	HP / LP system	SSPC-SP3/ Power Tool Cleaning	Heat Resistant Aluminium Paint to IS 13183 Gr.I 20µm per coat	2	--	--	--	--	--	40

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	
13 PS15	For CLH & VLH* PGs 07,08,12,17,19,21,24,47,48 &80 07-402,403,405,505;12-506; 17-904,906,919; 19-506,507,904,905,906,907; 24-351,353,810; 48-206,395;	Abrasive blast cleaning to Sa2½ 35- 50 µm	Epoxy zinc rich Primer to IS 14589 Gr II %VS = 35(min)	1 DFT =40 µm Per coat	--	--	Aliphatic acrylic poly-urethane paint %VS = 35(min)	1 DFT= 30µm Per coat	Phirozi blue Shade No. 176 of IS 5	70
14 PS8A	Components >95 C & < 150 C, un-insulated Fuel pipes 47-269;	SSPC-SP3/ Power Tool Cleaning	General purpose Aluminium paint to IS 2339 DFT= 20µm per coat	1	--	--	General purpose Aluminium paint to IS 2339 DFT= 20µm per coat	1	Aluminum	40
15 PS 5B	All Columns below '0' level (embedded in concrete) PGs 34, 35,36,38 39	SSPC-SP1/ or SSPC – SP3 Solvent / Power Tool Cleaning	Rust Preventive Fluid to PR: CHEM: 09 – 04 DFT=20µm per coat	2	--	--	--	--	--	40

*- For components other than CLH & VLH, Painting scheme shall be as given in Sl. No. 8.

NOTES:

1. **Rust Preventive Coating should be given on HSFG Bolt and nut threads.**
2. **All threaded and other surfaces of foundation bolts and its materials, insulation pins, Anchor channels, Sleeves, machined surfaces and retainers 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.**
3. **Ground shade/ colour of Finish paints & identification tag/Band for equipments, pipings pipe service, boiler supporting structures and other boiler components shall be followed.**
4. **Refer respective engineering document for all sub-vendor items not covered under this document.**
5. **No painting is required for Stainless Steel, non-ferrous & galvanized components. Abrasive blast cleaning to SSPC-SP6 (Sa2) shall be done to prepare the surfaces of hot worked pipes prior to application of primer.**
6. **Wherever inside surfaces of components under PGMA 48 – XXX & others, need protection till erection, two coats of Red-oxide zinc phosphate primer paint to IS12744 to a DFT of 60 microns followed by 1 coat of synthetic enamel paint to IS 2932 – shade smoke grey shall be applied, after blast cleaning. For items meant for spares and subcontracting where no further processing is involved, the painting scheme selected shall be the same as that of similar product configuration/ description.**
7. **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, 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).**
8. **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 shall be followed and the painting shall be done as described in Sl.No.8.**
9. **For all commissioning components-erection materials (xx-993) two coats of Redoxide Zinc Phosphate Primer shall be applied to meet the temporary protection till erection, after power tool cleaning. This painting Schedule is valid for only Customer No: U6/1727- 1X660 MW BOILER for MAHAGENCO BHUSAWAL TPP.**
10. **Touch-up painting of damaged areas shall be carried out as per clause no. 15.1 of Page. No. 80 of 555 of Section – 4, Volume – II, master specifications of bid specification no. DG/BSL U-6/2011/ T-1.**
11. **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.**
12. **For very small components like clamps etc. Sl.no.8 shall be followed with power tool cleaning.**
13. **Only weldable primer 2 coats to a DFT of 50µ (2x25µ) shall be applied on both external and internal surfaces within 50mm from the end of the component to be welded subsequently at site. At those locations no other paint shall be applied. All small components (less than 300x300 mm in dimension) shall be given only weldable primer.**
14. **DUs coming under Constant Load Hangers (CLH)/ Variable Load Hangers (VLH) shall be painted as per the system - PS 15 indicated in Sl. No. 13 of the table. However, for DUs other than CLH/VLH, the painting shall be as per Painting Scheme PS 1A indicated in Sl. No. 8 of the table.**
15. **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.**
16. **All threaded components of spring assemblies and turnbuckles shall be galvanized and achromatized to 15 microns minimum thickness.**
17. **Soot blower components i.e Valve head assembly having high surface temperature (> 200 and <600 deg. C) shall be applied with HR aluminium IS13183 Gr.II paint (up to 400 deg.C) and Gr.I paint (up to 600 deg.C)**
18. **Handrails of PGMA under Sl. No. 3 need to be galvanized in line with scheme for handrails (i.e. Sl .No. 10). For chequered plates having thickness <=5mm, surface preparation can be power tool cleaning to St3 and painting shall be in line with Sl. No. 8.**
19. **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.**
20. **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.**
21. **Painting of bunker structures to be in line with painting scheme of supporting structures (Sl. No. 3).**

Details for paint procurement & application purposes

Sl.No.	Generic nature of paint	Theoretical Covering Capacity Sq.m per Litre.	No. of pack	Volume solids, % (min)**	DFT in microns per coat (approx.)	Shade	Shade No. to IS5	Mode of appln.	Over coating interval, Hrs.
1	Epoxy Zinc rich primer to IS14589 Gr.II	8	2	35	40	Grey	--	Spray	24
2	Aliphatic acrylic polyurethane paint to IS 13213	12	2	40	30	Phirozi – Blue.	176	Spray	24
3	Heat resistant Aluminium paint to IS 13183 Grade I/II	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 to PR: CHEM: 09-03	10	1	--	35	--	---	Dip	12
6	Long oil alkyd synthetic enamel finish paint to IS2932	10	1	--	20	Reqd. shade	Corrpdg. Shade no.	Brush / Spray	12
7	Temporary Rust preventive fluid to PR: CHE: 09 – 04	10	1	--	20	--	--	--	12
8	General purpose Aluminium paint to IS 2339	10	2	--	20	Aluminum	--	Brush	12

Brush painting is accepted, if recommended by the Paint suppliers. The covering capacity of paints specified is only approximate.
The paints and Rust Preventive fluid shall be procured from BHEL's approved suppliers. ** Values are indicative.