


P9-1-3		PRODUCT STANDARD		AM 54173		REV. 07								
		AME BHOPAL		PAGE 01 OF 07										
<p align="center"><u>PAINTING OF BHEL LARGE AND MEDIUM RANGE MOTORS AND COMPONENTS</u></p>														
<p>1. GENERAL</p> <p>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.</p>														
<p>2. MATERIAL</p>														
<p>2.1. Etch Primer AA 56103</p>														
<p>2.2. Chemical Resistant Epoxide finishing paint (Light grey Shade No. 631 of IS:5 <u>unless otherwise specified in OGA/GA Drawing</u>). AA 56131</p>														
<p>2.3. Chemical Resistant Epoxide priming paint AA 56105</p>														
<p>2.4. Thinner for AA 56131 AA 56708</p>														
<p>2.5. Thinner for AA 56105 AA 56708</p>														
<p>2.6. White Spirit AA 56701</p>														
<p>3. PREPARATION OF THE PAINTS</p>														
<p>3.1. Mixing of the constituents of epoxide paints</p> <p>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 accurately mixed together in the proportions as per the recommendations of the supplier detailed in Annexure-1.</p> <p>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.</p>														
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	CL. 2.2 & ANNEXURE -I										CKD.	AKB	Sd/-	21.11.95
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P9-1-3



PRODUCT STANDARD AME BHOPAL

AM 54173

REV.
07

PAGE 02 OF 07

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	30 \pm 2 Sec.
2. AA 56131	30 \pm 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 occasionally 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) Splashing 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.

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P9-1-3		PRODUCT STANDARD AME BHOPAL	AM 54173 PAGE 03 OF 07	REV. 07
CONFIDENTIAL AND COPYRIGHT THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY		<p>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.</p>		
	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 exceed 24 hours. NOTE : In ideal condition first coat of priming paint should 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 severity of the damage. After the repairs, the surface shall be painted with AA 56131 paint as prepared in clause 3.1.1 by spraying.		

P9-1-3		PRODUCT STANDARD AME BHOPAL	AM 54173 PAGE 04 OF 07	REV. 07
		5.3.1. Drying of the paint The painted surface shall be allowed to air dry for minimum period of 12 hours.		
CONFIDENTIAL AND COPYRIGHT THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY		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 pintoed 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 measurement 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 sensitive 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.		

P9-1-3		PRODUCT STANDARD AME BHOPAL	AM 54173	REV. 07
			PAGE 05 OF 07	
<p>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.</p>				
<p>7. REPAIR OF DAMAGED PAINT WORK:</p>				
<p>7.1. Local damage unrusted: Where local damage to the paint work has occurred without subsequent rusting, the damaged area shall be cleaned with white spirit. The number of paint coats shall be applied sufficient to provide a dry film thickness, not less than that of the surrounding paint.</p>				
<p>7.2. Local damage rusted: Where local damage to the paint work with subsequent rusting has occurred, the rust shall be removed by mechanical procedure as per clause 4 and followed by subsequent procedure laid down in clause 7.1.</p>				
<p>7.3. Extensive damage: In case of extensive damage entire old film shall be removed and surface prepared as per clause 4 and repainted.</p>				
<p>8. Checklist for painting of Equipments as per Annexure 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.</p>				

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P9-1-3



PRODUCT STANDARD AME BHOPAL

AM 54173

REV.
07

PAGE 06 OF 07

ANNEXTURE – I

- 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

- 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

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P9-1-3		<h2 style="margin: 0;">PRODUCT STANDARD</h2> <h2 style="margin: 0;">AME BHOPAL</h2>		<h1 style="margin: 0;">AM 54173</h1>	REV. 07
				PAGE 07 OF 07	

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 :

OK	NOT OK
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(If felt necessary)

SIGNATURE :
 NAME :
 DESIGNATION :