



CHEMICAL RESISTANT EPOXIDE FINISHING PAINT

1.0 GENERAL:

This specification governs the quality requirements of Chemical resistant epoxide finishing paint (two pack system) suitable for application by brushing or spraying.

The paint shall be compatible on surfaces painted with epoxide priming paint conforming to BHEL specification AA 561 05.

2.0 APPLICATION:

To protect the outside surfaces of equipment from the effects of salty atmosphere, atmospheric gases forming acids with water and other mineral acids.

3.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no national standard covering this material. However, assistance has been derived from the following national standard:

IS: 14209-1994: Epoxy Enamel, Two Component, Glossy.

4.0 COLOUR:

As specified on BHEL order.

5.0 FINISH:

Smooth and full glossy.

6.0 FREEDOM FROM DEFECTS:

The paint shall remain free from defects like hard settling of pigments, skinning when kept in closed container and livering (excess viscosity build up) during its rated shelf life.

The dried paint film shall be free from defects like bittyness, floating of pigments, wrinkles, orange peeling, surface haze, colour fading, hard particles, etc.,

Revisions:

As per 40th MOM of MRC-CPO

APPROVED:

INTERPLANT MATERIAL
RATIONALISATION COMMITTEE-MRC (CPO)

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**7.0 CHEMICAL COMPOSITION:**

The material shall be based on two components epoxy system with suitable pigments and supplied as base and accelerator. The mixing ratio of base and accelerator shall be as per supplier's recommendations. The type and content of the binding material shall be based on epoxy resin with an epoxy content of 350 to 500.

The material when determined by IR spectography or thin layer chromatography shall be strictly adhered to the **TYPE APPROVED SAMPLE**.

8.0 TEST SAMPLES:

Tender samples will not be required when once the type approval is given and the supplier concerned has to declare that the material for which the tender is given is of the same quality as the type approved sample.

Representative samples of the material shall be drawn and treated as per IS 101.

9.0 PROPERTIES:

Unless otherwise specified, when tested in accordance with relevant parts of IS : 101, the test samples shall show the following properties:

9.1 Consistency:

40 - 60 seconds in Ford cup No. 4 at $27 \pm 2^{\circ}\text{C}$.

9.2 Drying Time:

Surface dry : 1 hour, max.

Hard dry : 12 hours, max.

9.3 Fineness of grind:

6, minimum on Hegman's gauge.

9.4 Gloss at 60° :

61, minimum.

9.5 Scratch Hardness:

After the film is cured for 7 days at room temperature or 2 hours drying at 70 to 80°C and after 24 hours air drying and tested under a load of 2000g, no such scratch as to show the bare metal shall be produced.



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9.6 Flexibility And Adhesion:

The film shall show no sign of damage, detachment or cracking when tested after 7 days curing at room temperature or 2 hours drying at 70 - 80°C after 24 hours air drying by Erichen tester 5-8, mm.

9.7 Weight:

Between 11 and 12 kg per 10 litres of mixed paint.

9.8 Non-volatile Matter Content:

50%, minimum by weight of the base paint.

9.9 Pigment (Type Test):

20% minimum by weight of the base paint.

9.10 Epoxy Resin Content (Type Test):

30% minimum by weight of the base paint after finding the pigment and non-volatile matter content.

9.11 Resistance to Salt Spray:

The panels prepared from the material shall show no sign of corrosion after continuous exposure for a period of 7 days in the salt spray cabinet.

9.12 Impact Test (DEF-1053):

The film shall not show any sign of damage with a minimum impact of 250 kg-cm.

9.13 Chemical Resistance Test (Appendix-1):

Panels prepared and tested in accordance with Appendix-1 of this specification, when immersed in the liquids at the time, temperature and concentration specified below shall not show any sign of deterioration. Minor changes in colour is acceptable. The film shall not soften, get detached or become brittle.

10% Nitric acid by volume at 60±2°C for 12 hours.

20% Sulphuric acid by volume at 60±2°C for 8 hours.

10% Hydrochloric acid by volume at 60±2°C for 24 hours.

25% Sodium hydroxide by volume at 60±2°C for 12 hours.

Petrol at room temperature for 24 hours.

Methyl ethyl ketone at room temperature for 24 hours.

9.14 Pot Life (Appendix-2):

6 hours, minimum.

**10.0 TYPE APPROVAL:**

Samples for type approval testing shall be accepted only from those manufacturers whose manufacturing and testing facilities are considered satisfactory to ensure continuous supply of good product.

11.0 TEST CERTIFICATE:

Unless otherwise stated, three copies of test certificates shall be supplied along with each consignments, giving the following information.

In addition, the supplier shall ensure to send one copy of the test certificates along with the despatch documents to facilitate quick clearance of the material.

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|--|----------------------------------|
| 1. AA 561 31, Rev 07: Chemical resistant epoxide finishing paint | |
| 2. Colour | 3. Finish |
| 4. Freedom from defects | 5. Chemical composition |
| 6. Consistency | 7. Spreading capacity |
| 8. Mass per 10 liters | 9. Drying/Curing Time |
| 10. Heat resistance test | 11. Fineness of grind |
| 12. Gloss | 13. Non-volatile matter content |
| 14. Scratch Hardness | 15. Flexibility and adhesion |
| 16. Resistance to salt spray | 17. Chemical Resistance test |
| 18. Compatibility | 19. Impact test |
| 20. Pot life | 21. Date of manufacture & Expiry |

12.0 KEEPING PROPERTY:

When stored in covered dry place in the original sealed containers under normal temperature conditions, the base and accelerator shall retain the properties individually for a period of 12 months after the date of manufacture which shall not be earlier than one month from the scheduled delivery date mentioned in BHEL order, such that the mixed paint shall conform to the properties specified in this specification.

13.0 PACKING AND MARKING:

Unless otherwise stated, base and accelerator shall be packed separately in steel containers of appropriate capacities. Each container shall bear the following information:

AA 561 31: Chemical resistant epoxide finishing paint
 BHEL Order No.
 Manufacturers/ Supplier's name
 Type No./Brand name / Shade
 Date of manufacture / Batch/Lot No.
 Expiry date
 Mixing ratio (if any)
 Quantity supplied:
 Special instructions (if any)

14.0 ENVIRONMENTAL REQUIREMENTS:

The supplier shall furnish Material Safety Data Sheet (**MSDS**) covering all information relating to human safety and environmental impacts of the hazardous materials particularly during their transportation, storage, handling and disposal alongwith each supply.

Each container shall be marked with corresponding symbol and minimum worded cautionary notice for flammable / corrosive / toxic / harmful / irritant and oxidizing etc. as applicable.

14.0 REFERRED STANDARDS (Latest Publications Including Amendments):

- | | | | |
|--------------|-------------|--------------|-------------|
| 1. IS: 101 | 2. IS: 2932 | 3. IS: 14209 | 4. AA 56105 |
| 5. DEF: 1053 | | | |

**APPENDIX 1 - CHEMICAL RESISTANCE TEST (CI: 9.13)**

150±2 X 100±2 mm mild steel panels shall be first cleaned from just by rubbing with abrasive paper and suitable solvent.

One coat of the Chromate primer is applied over the cleaned panel on both the sides. After 24 hours of air drying one coat of the finish paint is applied. After 24 hours another coat of the finish paint is applied and dried at 60° to 65° C for 2 hours or alternatively cured for 7 days at room temperature. The sides of the panel shall be protected with wax coating.

The dried painted panel shall be tested by immersing in respective reagent solution in a closed desecrator and any damaging effect to the film is observed. The film shall not become brittle. Softening and detachment of the film is not acceptable. Slight change in colour is permissible.

APPENDIX 2 - DETERMINATION OF POT LIFE (CI: 9.14)

About 100ml of the mixed paint prepared by mixing the base and accelerator in the recommended proportions is taken in a beaker. The paint shall be such that it should be usable by brush under a specified pot life of 6-16 hours at room temperature.

In order to check whether the paint has gelled or not, a small quantity of the mixed paint is dissolved in the recommended thinner. It should not dissolve if the paint has gelled and vice-versa.