

**MATERIAL AND EQUIPMENT STANDARD**

**FOR**

**AMINE-CURED EPOXY RESIN AS PRIMER,**

**INTERMEDIATE, AND TOP-COAT**

**FOR**

**ATMOSPHERIC ENVIRONMENT**

**CONTENTS :**

**PAGE No.**

<b>1. SCOPE .....</b>	<b>2</b>
<b>2. REFERENCES .....</b>	<b>2</b>
<b>3. UNITS .....</b>	<b>3</b>
<b>4. COMPOSITION .....</b>	<b>3</b>
<b>5. PROPERTIES.....</b>	<b>3</b>
<b>6. STORAGE LIFE AND PACKAGING.....</b>	<b>4</b>
<b>7. INSPECTION.....</b>	<b>5</b>
<b>8. LABELING.....</b>	<b>5</b>

**1. SCOPE**

This Standard Specification covers the minimum requirements for the composition, properties, storage life, packaging, inspection and labeling of a tow-pack amine-cured epoxy resin paint for atmospheric environment.

**2. REFERENCES**

Throughout this Standard the following standards and codes are referred to. The editions of these standards and codes that are in effect at the time of publication of this Standard shall, to the extent specified herein, form a part of this Standard. The applicability of changes in standards and codes that occur after the date of this Standard shall be mutually agreed upon by the Company and the Vendor:

**ANSI (AMERICAN NATIONAL STANDARD INSTITUTE)**

ANSI Z129.1 "Precautionary Labeling of Hazardous Industrial Chemicals Standards"

**ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIAL STANDARDS)**

**Test Method for Properties:**

D 2697 "Test Method for Volume Volatile Matter in Clear or Pigment Coating"

**Specification for Packaging:**

D 3951 "Standard Practice for Commercial Packaging"

**BSI (BRITISH STANDARD INSTITUTION)**

BS 381C "Specification for Color for Identification Coding and Special Purposes"

**IPS (IRANIAN PETROLEUM STANDARDS)**

(Not applicable for procurement)

E-TP-100 "Paints"

**SSPC (STEEL STRUCTURES PAINTING COUNCIL) Volume 2**

SSPC-PA "Guide to Safety in Paint Application"

**NACE (NATIONAL ASSOCIATION OF CORROSION ENGINEERING)**

NACE "Amine Cured Epoxy Resin Coatings for Resistance to Atmospheric Corrosion"  
Publication 6B170

**US FEDERAL STANDARD**

Federal Test Method Standard "Paint, Varnish, Laquer, and Related Materials"

Method 3011.1 "Condition in Container"

Method 4061.1 "Drying Time of Coating"

Method 4321	"Brushing Properties"
Method 4331	"Spraying Properties"
Method 4401	"Odor Test"
Method 4411.1	"Finess of Grind"
Method 4541	"Working Properties and Appearance of Dried Film"
Method 6221	"Flexibility"

### 3. UNITS

This Standard is based on International System of Units (SI), except where otherwise specified.

### 4. COMPOSITION

**4.1** The paint shall be furnished in two components. Component A shall consist of bisphenol-A epichlorohydrine resin combined with pigments and suitable solvent. Component B shall consist of suitable polyamine properly combined with volatile solvents and act as the curing agent for Component A.

Components A and B shall be packaged separately and furnished in kit form (see 7.2) and when mixed and applied in accordance with the manufacturer's instructions a product meeting the requirements of this Standard specification shall result. The ingredients used in the manufacture of these products shall be best commercially available.

#### 4.2 Percentage

The total solids for the admixed components of this paint shall not be less than 35% by volume when tested in accordance with ASTM D 2697.

### 5. PROPERTIES

#### 5.1 Requirements

The mixed paint in the ratio recommended by manufacturer shall meet requirements of Subclauses 5.2 through 5.9.

#### 5.2 Odor

The odor of the paint material shall not be obnoxious, when tested in accordance with US Federal Standard No. 141 Test Method 4401.

#### 5.3 Color

The color shall be as specified by the Purchaser with reference to Table 1.

#### 5.4 Spraying Properties

Spray applied coats of mixed the paint on a steel panel to a dry film thickness between 25  $\mu\text{m}$  and 28  $\mu\text{m}$  and observe for spraying properties in accordance with Methods 4331 and 4321 of US Federal Test Method Standard No. 141. The paint shall spray satisfactorily in all respects and shall show no running, sagging, or streaking the dried film shall show no dusting, mottling, or color separation and shall present a smooth lusterless finish free from seediness.

**5.5 Flexibility**

Determine flexibility in accordance with Method 6221 of US Federal Test Method Standard No. 141. Draw down a film of the mixed paint shall not be cracking or flaking when subjected to the flexibility.

**5.6 Drying Time**

The drying time of the paint at 21°C shall not exceed 2 hours for touch-dry and 2 hours for recoat condition, nor 6 hours for the dry-hard condition when tested in accordance with US Federal Standard No. 141 Test Method 4061.1.

**5.7 Fineness of Grind**

The fineness of grind of the mixed paint shall not be less than 10-7 (Hegmant-unit), for the colors paint. The tests shall be made 1 hour after mixing, in accordance with US Federal Standard No. 141 Test Method 4411.1 and ASTM D 1210.

**TABLE 1 - COLOR CODE**

<b>PAINT COLOR</b>	<b>COLOR No. TO BS 381 C</b>	<b>COLOR No. RALL (APPROX)</b>
Arctic blue	112	5024
Sea green	217	6017
Brilliant green	221	6002
Canary yellow	309	1018
Light straw	384	1000
Middle brown	411	8007
Signal red	537	3020
Light orange	557	2000
Light gray	631	7033

**5.8** The paint shall also meet the properties reported in the NACE Publication 6B170 (Amine Cured Epoxy Resin Coatings for Resistance to Atmospheric Corrosion).

**6. STORAGE LIFE AND PACKAGING**

**6.1 Storage Life**

The product shall meet the requirements of Clause 5 after storage of at least 24 months from the date of delivery, in a full tightly covered container at normal condition.

**6.2 Condition in Container**

The paint as (both components A and B) received shall show no evidence of livering, skinning, or hard settling of pigment, the container shall not be affected. The material shall be easily mixed in liquid portion by hand stirring to form a smooth, homogeneous paint free from persistent foam when tested in accordance with Method 3011.1 of US Federal Test Method No. 141, after storing for 24 months from the date of delivery.

**6.3 Packaging**

The epoxy paint shall be supplied in a kit, packaged as a unit consisting of pigmented compound marked "Component A" and the unpigmented (or clear) hardner marked "Component B". The packaging shall meet the relevant requirement of ASTM D 3951 (88) unless otherwise specified by the Purchaser.

## 6.4 Packing

Packing shall be accomplished in a manner which will insure acceptance by common carrier, at lowest rate, and will afford protection against physical or mechanical damage during shipment.

## 6.5 Marking

Shipment marking information, in addition to the labeling required (see 8.2) shall be provided on interior package and exterior shipping containers.

## 7. INSPECTION

**7.1** All materials supplied under this Standard specification shall be subject to timely inspection by the Purchaser or his authorized representative. The Purchaser shall have the right to reject any material(s) supplied which is (are) found to be defective under this Standard specification. In case of dispute, the arbitration or settlement procedure, established in the procurement documents shall be followed.

**7.2** The supplier and/or manufacturer shall be responsible for the performance and costs for all laboratory test requirements as specified in this Standard specification.

**7.3** The supplier shall place free of charge at the disposal of the Purchaser's inspector(s) all means necessary for carrying out their inspection, specification results or tests, checking of conformity of materials with this Standard specification, checking of marking and packing and temporary acceptance of materials.

**7.4** The Supplier and/or Manufacturer shall furnish the Purchaser with a certified copy of results of tests made by the manufacturer covering physical and performance characteristics of each batch (see 7.8) of product to be supplied under this Standard specification. The supplier shall furnish, or allow the purchaser to collect samples of the material representative of each batch of product. Certified test reports and samples (see 7.&) furnished by the supplier or collected by the purchaser shall be properly identified with each lot (see 7.8) of product.

**7.5** Prior to acceptance of the supplier's material, samples of material submitted by the supplier or collected by the purchaser will be tested in the wittiness as the purchaser inspector. If any sample is found not to conform to this Standard specification, material represented by such sample will be rejected.

**7.6** The number of samples for testing shall consist of 10 percent of the lot or batch (see 7.8), but in no case shall be less than one or more than 10 containers. The results of the tests on two specimens (top and bottom) shall be averaged for each test specified in this Standard specification to determine conformance with the specified requirements.

**7.7** A lot or batch shall consist of an indefinite number of containers offered for acceptance and filled with a homogeneous mixture of material from one isolated container, or filled with a homogeneous mixture of material manufactured by a single plant run (not exceeding 24 hours) through the same processing equipment, with no change in ingredient material.

## 8. LABELING

**8.1** Refer to ANSI Standard Z 129.1 precautionary labeling of Hazardous Industrial Chemicals.

### 8.2 Marking of Containers

Each container kit (contain Components A and B) shall be legibly marked with the following information:

**Name: Amin Adduct Cured Epoxy Paint**

**Specification: IPS-M-TP-250**

MESC. No.: .....  
Flash Point °C: .....  
Stock No.: .....  
Date of manufacture: .....  
Quantity of paint in container: .....  
Kind of thinner: Maximum temperature resistance: .....  
Type of spray: .....  
Kind and size of spray nozzle tip: .....  
Pot life (hours): .....  
Lot or batch number: .....  
Additional Sticker: .....  
Manufacture's name and address: .....  
Design guide: .....

For guidance on the usage of this paint for various application/environment and temperature range, reference shall be made to IPS-E-TP-100.

**8.3 Direction for Use**

In addition to the manufacturer's instructions for use, consisting complete instructions covering uses, surface cleanliness, mixing, thinning, application method, application condition, pot life, wet and dry film thickness per coat, temperature and humidity limitation, drying time, etc., with each kit, the following directions shall also be supplied with each container of paint, "This paint is intended for use on primed substrates. The surface of substrates shall be prepared in accordance with IPS-C-TP-101 before applying the primer".

Apply by brush or spray to the specified film thickness or, if none is specified, to at least 125 (5 mils) microns dry. When application is by spraying, the equipment and operator technique shall be properly adjusted to prevent dry spray and to deposit a wet film of paint on the substrate. Clean the equipment with suitable thinner both before and after use. The surface to be painted shall be dry and the surface temperature shall be at least 3°C above the dew point.

**8.4 Direction for Safety**

In addition to the manufacturer's instructions for safety, the following directions shall also be supplied with each container of paint.

- This paint is hazardous because of its flammability and potential toxicity. Proper safety precautions shall be observed to protect against these recognized hazards. Safe handling practices are required and should include but not be limited to, the provisions of SSPC-PA Guide 3, "A Guide to Safety in Paint Application" and to the following.
- Keep paint away from heat, sparks, and open flame during storage, mixing, and application. Provide sufficient ventilation to maintain vapor concentration at less than 25% of the lower explosive limit.
- Avoid prolonged or repeated breathing of vapors or spray mists, and prevent contact of the paint with the eyes or skin.
- Clean hands thoroughly after handling paint and before eating & smoking.
- Provide sufficient ventilation to insure that vapor concentration do not exceed the published permissible exposure limits. When necessary, supply appropriate personal protective equipment and enforce its use.
- This paint may not comply with some air pollution regulation because of its hydrocarbon solvent content.