MATERIAL AND EQUIPMENT STANDARD

FOR

TWO-PACK AMINE-ADDUCT CURED EPOXY PAINT

AS

PRIMER, INTERMEDIATE AND TOP COAT

ORIGINAL EDITION

OCT. 1996

This standard specification is reviewed and updated by the relevant technical committee on May 2000(1) and Sep. 2015(2). The approved modifications are included in the present issue of IPS.

FOREWORD

The Iranian Petroleum Standards (IPS) reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS are based on internationally acceptable standards and include selections from the items stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein.

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement of each project. For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The IPS is reviewed and up-dated approximately every five years. Each standards are subject to amendment or withdrawal, if required, thus the latest edition of IPS shall be applicable

The users of IPS are therefore requested to send their views and comments, including any addendum prepared for particular cases to the following address. These comments and recommendations will be reviewed by the relevant technical committee and in case of approval will be incorporated in the next revision of the standard.

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GENERAL DEFINITIONS

Throughout this Standard the following definitions shall apply.

COMPANY :

Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company and National Iranian Oil Refinery And Distribution Company.

PURCHASER :

Means the “Company" where this standard is a part of direct purchaser order by the “Company”, and the “Contractor” where this Standard is a part of contract document.

VENDOR AND SUPPLIER:

Refers to firm or person who will supply and/or fabricate the equipment or material.

CONTRACTOR:

Refers to the persons, firm or company whose tender has been accepted by the company.

EXECUTOR :

Executor is the party which carries out all or part of construction and/or commissioning for the project.

INSPECTOR :

The Inspector referred to in this Standard is a person/persons or a body appointed in writing by the company for the inspection of fabrication and installation work.

SHALL:

Is used where a provision is mandatory.

SHOULD:

Is used where a provision is advisory only.

WILL:

Is normally used in connection with the action by the “Company” rather than by a contractor, supplier or vendor.

MAY:

Is used where a provision is completely discretionary.

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1. SCOPE

This Standard specification covers the Minimum Requirements for the composition, properties, storage life, packaging, inspection and labeling of a chemical-resistant two pack amine-adduct cured epoxy paint.

Note 1:

This standard specification is reviewed and updated by the relevant technical committee on May 2000. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 112 on May 2000. These modifications are included in the present issue of IPS.

Note 2:

This standard specification is reviewed and updated by the relevant technical committee on Sep. 2015. The approved modifications by T.C. were sent to IPS users as amendment No. 2 by circular No. 460 on Sep. 2015. These modifications are included in the present issue of IPS.

2. REFERENCES

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

ANSI Z400.1/Z129.1	"Safety Data Sheet and Hazard Evaluation and Precautionary Labeling Preparation"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIAL)

Test Methods for Properties

D 2697	"Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings"
D 1296	"Odor Test"
D 1210	"Fineness of Grind"

Specification for Packaging

D 3951	"Standard Practice for Commercial Packaging"

BSI (BRITISH STANDARD INSTITUTION)

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

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-TP-100	"Engineering Standard for Paints"
IPS-C-TP-101	"Surface Preparation"
IPS-C-TP-102	"Construction Standard for Paint"

SSPC (STEEL STRUCTURES PAINTING COUNCIL)

SSPC-PA Guide 3 (Canceled) "Guide to Safety in Paint Application"

USF (US FEDERAL STANDARD)

FEDERAL TEST METHOD

"Paint, Varnish, Lacquer, and Related Materials"

Method 3011.1	"Condition in Container"
Method 4061.1	"Drying Time of Coating"
Method 4321	"Brushing Properties"
Method 4331	"Spraying Properties"

3. DEFINITION

- AMINE ADDUCT
- A curing agent formed by the partial reaction of a multi – functional aliphatic amine with an epoxy resin.
- AMINE ADDUCT EPOXY
- A generic coating type formed by the reaction of an amine adduct with an epoxy resin.
- AMINE CURE EPOXY
- A generic coating type formed by the reaction of a poly functional a mine (either aliphatic or aromatic) curing agent with an epoxy resin.

4. UNITS

This standard is based on international system of units (SI), as per IPS-E-GN-100 except where otherwise specified.

5. COMPOSITION

5.1 Ingredients and Proportions

The paint material shall be furnished in two components. Component A shall consist of epoxy resin combined with prime and extender pigments and volatile solvents; component B shall consist of a suitable polyamine resin 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 6.3) and when mixed in accordance with the manufacturer's instructions a product meeting the requirements of this specification shall result.

5.2 Percentage

The total nonvolatile solids for the admixed components of gloss colors shall be a minimum of 60 percent by volume when tested in accordance with ASTM D 2697.

6. PROPERTIES

6.1 Requirements

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

6.2 Odor

The odor of the paint material shall not be obnoxious, when tested in accordance with US Federal.

6.3 Color

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

6.4 Surface Appearance

The paint film shall be smooth, uniform and free of bubbles, pinholes, holidays, and other film irregularities. The spray applied films, dried under the standard conditions (25±2°C and relative humidity of 50±5 percent) shall provide a hard surface, free from grit, seeds, streaks, orange-peel, blisters, or other surface defects when tested in accordance with US Federal. The paint shall be easily applied by brush and spray when tested in accordance with US Federal Standard No. 141 methods 4321 and 4331. The Paint shall show no streaking, running or sagging after drying.

6.5 Setting

When tested in accordance with US Federal Standard No. 141 after standing undisturbed for 6 hours, the ready mixed and thinned paint material shall be free of setting precipitation and separation which can not be easily re-dispersed by shaking on a mechanical paint mixer.

6.6 Pot Life

Ready mixed paint shall have a minimum pot life of 6 hours, at standard conditions (25±2°C and relative humidity of 50±5 percent).

6.7 Fineness of Grind

The fineness of grind of the mixed paint shall not be less than 7 (Hegman-unit) for the gloss paints. The tests shall be made 1 hour after mixing, in accordance with US Federal.

6.8 Flexibility

The mixed paint shall show no evidence of cracking, chipping or flaking, when tested in accordance with US Federal.

6.9 Toxicity

The suitability of paint for contact with food and potable water shall be certified by local official health service department when required by the purchaser.

TABLE 1

PAINT COLOR	COLOR No. TO BS 381 C	COLOR No. RAL (APPROX.)
Sea green	217	6017
Middle brown	411	8007
Light grey	631	7033
White	595	1000

7. STORAGE LIFE AND PACKAGING

7.1 Storage Life

The product shall meet the requirements of Clause 5 after storage of at least 12 months from the date of delivery, in a full tightly covered container at normal condition.

7.2 Condition in Container

The paint (both components A and B) as received shall show no evidence of levering, skinning, or hard settling of pigment, the container shall not be affected. The material shall be easily dispersed

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 Std. No. 141, after storing for 12 months from the date of delivery.

7.3 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) hardener marked "Component B". The packaging shall meet the relevant requirement of ASTM D 3951 unless otherwise specified by the Purchaser.

7.4 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.

7.5 Marking

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

8. INSPECTION

8.1 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.

8.2 The supplier shall be responsible for the performance and costs for all laboratory test requirements as specified in this Standard specification.

8.3 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.

8.4 Samples submitted to the purchaser will be tested in the purchaser's laboratory or in a responsible commercial laboratory designated by the Purchaser.

8.5 The supplier 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 7.7) furnished by the supplier or collected by the purchaser shall be properly identified with each lot (see 7.8) of product.

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

8.7 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.

8.8 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.

9. LABELING

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

9.2 Marking of Containers

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

Name: Amine Adduct Cured Epoxy Paint

Specification: IPS-M-TP-202

MESC No.: .....

Flash point °C: .....

Stock No.: .....

Date of manufacture: .....

Quantity of paint in container: .....

Type of spray: .....

Kind and size of spray nozzle tip: .....

Pot life (hours): .....

Lot or batch number: .....

Information and warnings (if needed): .....

Kind of thinner: Maximum temperature resistance: .....

Manufacture's name and address: .....

Suitable for contact with food: ..... Yes ☐ No ☐

Suitable for contact with potable water: .....Yes ☐ No ☐

Design Guide: .....

MSDS: .....

Inspection date: .....

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

9.3 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. Painting shall be in accordance with IPS-C-TP-102.

9.4 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.