

DRAFT UGANDA STANDARD

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Two-pack epoxy primer — Specification

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The Executive Director
Uganda National Bureau of Standards
P.O. Box 6329
Kampala
Uganda
Tel: +256 417 333 250/1/2
Fax: +256 414 286 123
E-mail: info@unbs.go.ug
Web: www.unbs.go.ug

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The committee responsible for this document is Technical Committee UNBS/TC 302, *Paints, varnishes and related products*.

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DEAS 1051:2021

ICS 87.040

DRAFT EAST AFRICAN STANDARD

Two-pack epoxy primer — Specification

EAST AFRICAN COMMUNITY

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P.O. Box 1096,
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Tanzania
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Foreword

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Two-pack epoxy primer — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for a two- pack epoxy solvent based primer used for protection of iron, steel and galvanized iron and steel against atmospheric corrosion in an industrial or marine environment.

It's also used as an anticorrosive primer for decks, deck fittings and cargo holds and for use at maintenance and repair or on board maintenance.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASTM F735-17, *Standard Test Method for Abrasion Resistance of Transparent Plastics and Coatings Using the Oscillating Sand Method*

ISO 1524, *Paints, varnishes and printing ink — Determination of fineness of grind*

ISO 2812-1, *Paints and varnishes — Determination of resistance to liquids — Part 1: Immersion in liquids other than water*

ISO 2813, *Paints and varnishes — Determination of specular gloss of non-metallic paint films at 20°, 60° and 85°*

ISO 2884-2, *Paints and varnishes — Determination of viscosity using rotary viscometers — Part 2: Disc or ball viscometer operated at a specified speed*

ISO 3251, *Paints varnishes and plastics — Determination of non- volatile matter content*

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*

ISO 3856-6, *Paints and varnishes — Determination of "soluble" metal content — Part 6: Determination of total chromium content of the liquid portion of the paint — Flame atomic absorption spectrometric method*

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 6503 *Paints and varnishes -- Determination of total lead — Flame atomic absorption spectrometric method*

ISO 6504-3, *Paints and varnishes — Determination of hiding power — Part 3: Determination of contrast ratio of light coloured paints at a fixed spreading rate*

ISO 9117-1, *Paints and varnishes — Drying tests — Part 1: Determination of through-dry state and through-dry time*

ISO 9117-3, *Paints and varnishes — Drying tests — Part 3: Surface-drying test using ballotini*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

ISO 17132, *Paints and varnishes — T-bend test*

3 Terms and definitions

For the purposes of this document, the definitions given in ISO 4618 and the following apply:

- 3.1 component**
a term used to describe each of two parts of the paint, which when mixed together form the pigmented epoxy layer
- 3.2 epoxy primer**
a paint consisting essentially of epoxy resin base, polyamide, amine adduct or other hardeners with appropriate pigments, solvent and additives mixed together in the proportions recommended by the manufacturer
- 3.3 protective coating system**
total number of coats of paint or related product which are to be applied or which have been applied to a substrate to provide corrosion protection
- 3.4 pot life**
the maximum time during which a coating material supplied as separate components should be used after they have been mixed together
- 3.5 Volatile organic compound content**
the mass of the volatile organic compounds present in a coating material, as determined under specified conditions
- 3.6 volatile organic compound (VOC)**
fundamentally, any organic liquid and/or solid that evaporates spontaneously at the prevailing temperature and pressure of the atmosphere with which it is in contact
- 3.7 ready for use**
the state of a product when it is mixed in accordance with the manufacturer's instructions in the correct proportions and thinned if required using the correct thinners so that it is ready for application by the approved method

4 Requirements

4.1 General requirements

4.1.1 Condition in the container

When visually examined, the two-pack epoxy primer shall be free from skins, uncharacteristically coarse particles, foreign matter and lumps. The container shall be free from rust and moulds.

4.1.2 Odour

The odour of the two-pack epoxy primer- in the container, during and after application shall not be abnormally pungent, offensive or disagreeable.

4.1.3 Settling

The epoxy primer shall be free from settling. Settling if any, shall be easily incorporated by stirring.

4.6 Application properties

The epoxy primer shall be supplied in two containers as a unit. Always mix a complete unit in the proportions applied. The application shall be done in accordance with manufacturer's instructions.

4.2 Specific requirements

4.2.1 Wet coat

The wet mixed material shall also comply with the requirements given in the Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Requirements for the wet coat of two pack epoxy primer

S/N	Characteristic		Requirement	Test method
i.	Total lead content, ppm, max.		90	ISO 6503
ii.	Solids content, %,m/m, min.		50	ISO 3251
iii.	Skin formation		Shall show no skin formation	Annex A
iv.	Viscosity, pa.s		0.4 – 0.8	ISO 2884-2
v.	Pot life, h, max		8	Annex B
vi.	Hiding power, %, min.		90	ISO 6504-3
vii.	Fineness of dispersion, /Fineness of grind Hegman-Type Gage, µm, max.		30	ISO 1524
viii.	Drying time at 25 °C ± 2 °C, h, max.	Hard drying	24	ISO 9117-1
		Surface drying	4	ISO 9117-3
ix.	Chromium, ppm in dried paints, max.		5	ISO 3856-6

4.2.1 Dry coat

The dry coat of the two pack epoxy primer shall comply with the requirements given in the Table 2 when tested in accordance with the test methods specified therein.

Table 2 — Requirements for the dry coat, two pack epoxy primer

S/N	Characteristic	Requirement	Test method
i.	Dry film thickness per coat	30 µm, min.	Mikro test method
ii.	Finish	Smooth, uniform in colour and	Visual examination

S/N	Characteristic	Requirement	Test method
		appearance	
iii.	Gloss at 60°, min.	6 %	ISO 2813
iv.	Scratch hardness using 15 N	No such scratches shall produce a bare metal	ASTM F735-17
v.	Flexibility and adhesion using 12 mm mandrel	There shall be no visible damage or detachment of film after 48 h	ISO 17132
vi.	Resistance to liquids other than water	The film shall not show signs of disintegration or change of colour to a great extent. The loss of gloss shall not be more than 50 % of the original gloss	ISO 2812-1

4.3 Quantity of material

The quantity of material shall not be less than the declared volume at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ when tested in accordance with Annex D.

5 Packaging and marking

5.1 Packaging

The epoxy primer shall be packed in suitable containers that prevents it from deterioration during storage, transportation and normal handling.

5.2 Marking

5.2.1 Marking on the container

5.2.1.1 The marking shall be either in English, Kiswahili or French or in combination as agreed between the manufacturer and the supplier. Any other language shall be optional.

5.2.1.2 Each container shall be marked legibly and indelibly with the following:

- a) name of the product as “Two pack epoxy primer”;
- b) manufacturers name and physical address;

NOTE The name, physical address of the distributor/supplier and trademark may be added as required.

- c) net content in L;
- d) date of manufacture;
- e) spreading capacity, in m^2/L ;
- f) instructions for use;
- g) pot-life life at 25°C ; and
- h) an indication of flammability.

5.2.2 Marking on the label of the container

Each label of the container shall be marked legibly and indelibly with the following:

- a) date of manufacture;
- b) instructions for use;
- c) pot-life;
- d) shelf life;
- e) colour; and
- f) batch number.

7 Sampling

Sampling shall be done in accordance with ISO 15528.

Annex A

(normative)

Examination of skin formation

A.1 Apparatus

The following apparatus are required:

A.1.1 Container, one metal container of 250 ml with a tight fitting lid.

A.1.2 Spatula

A.2 Test conditions

The test shall be carried out at a temperature of $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and a relative humidity of 65 ± 2 per cent.

A.3 Procedure

The procedure shall be as follows:

A.3.1 Stir and pour 125 ml to 130 ml of the paint into the container, place the lid on tightly and momentarily invert the container to seal the lid.

A.3.2 Allow the container to stand upright for 7 days.

A.3.2 Open the container and test the surface of the paint with a spatula for any skin formation. Examine the walls and the lid for the presence of the skin.

Annex B (normative)

Determination of pot life

B.1 General

The time taken to double the viscosity from the original value shall be considered the pot life of the material.

B.2 Apparatus

Test panels.

B.3 Reagents

Component parts, i.e. base and hardener or catalyst.

B.4 Procedure

B.4.1 Thoroughly mix component parts in the ratio specified by the paint manufacturer to give a sample of 200 mL by volume.

B.4.2 Within 10 min of mixing, determine the viscosity using a rotating paddle viscometer.

B.4.3 Allow the mixed sample of paint to stand in a suitable airtight container and determine viscosity at the end of the specified time.

B.5 Report

Report whether viscosity has doubled at 25 °C within 6 h.

Annex C **(normative)**

Resistance to alkali

C.1 Apparatus

C.1.1 Test panels

C.1.2 Vessel, made of inert material, capable of holding test liquids and test panels.

C.2 Reagents

5 % sodium hydroxide solution.

C.3 Procedure

C.3.1 Prepare and condition the test panels for at least 16 h under standard conditions given in ISO 3270 i.e. $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity.

C.3.2 Immerse panels to a depth of 50 % for 24 h in 5 % sodium hydroxide solution contained a beaker. Stand or hang the test piece in an approximately vertical position in the beaker. If several test pieces are loaded at the same time, make sure that they are spaced 5 mm apart.

C.3.3 Withdraw the panels, wash with distilled water, and examine immediately for any objectionable alteration in the surface such as discoloration, change in gloss, blistering, softening, swelling, loss of adhesion.

C.3.4 If desired, allow the panels to recover after 24 h and examine for return of the original properties.

C.3.5 In general, it will not be necessary to seal the edges of the applied film. If the reagent effect is noted only around the panel edges, the test should be repeated using a suitable edge sealer.

C.4 Report

C.4.1 Report the type of effect, if any.

C.4.2 Detail of the test panel (including thickness) and surface pre-treatment of the substrate.

C.4.3 Dry film thickness of the coating, in micrometers.

Annex D (normative)

Determination of the quantity of material

D.1 Apparatus

D.1.1 Graduated measuring cylinder

D.1.2 Empty container

D.2 Procedure

Measure out the volume of the paint by pouring it into the measuring cylinder and emptying the paint into an empty container. Measure out until all the paint is finished and record the total volume of the paint by adding up the volume.

D.3 Calculation

The measured volume shall be expressed as follows:

$$\% \text{ of volume measured is } \frac{V - V_1}{V} \times 100$$

where

V_1 is the total measured volume; and

V is the declared volume.

Bibliography

KS 1985-1:2017, *Marine paints — Specification — Part 1: Two-pack epoxy primer marine paint*

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