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**High gloss synthetic enamel paint —  
Specification**

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## **Foreword**

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

CD 232 was prepared by Technical Committee RSB/TC 24, *Chemicals and Consumer Products*.

In the preparation of this standard, reference was made to the following standard:

- 1) SANS 630, Decorative high gloss enamel paints
- 2) SANS 515, Decorative paint for interior use

The assistance derived from the above source is hereby acknowledged with thanks.

This second edition cancels and replaces the first edition (RS 232:2014 of which has / have been technically revised.

## **Committee membership**

The following organizations were represented on the Technical Committee on *Chemicals and Consumer Products* (RSB/TC 24) in the preparation of this standard.

University of Rwanda/College of Sciences and Technology (UR/CST)

Rwanda Investigation Bureau (RIB)

AGROPY Ltd

AMEKI Color

Shalom Paints

Rwanda Environment Management Authority (REMA)

AMACO Paints

Rwanda Association of Professional Environmental Practitioners (RAPEP)

Rwanda Standards Board(RSB) – Secretariat

## Introduction

Enamel paint is paint that air dries to a hard, usually glossy, finish, used for coating surfaces that are outdoors or otherwise subject to hard wear or variations in temperature.

Synthetic resins, and are totally different in composition; vitreous enamel is applied as a powder or paste and then fired at high temperature. There is no generally accepted definition or standard for use of the term enamel paint, and not all enamel-type paints may use it.

Typically, the term "enamel paint" is used to describe oil-based covering products, usually with a significant amount of gloss in them, however recently many latex or water-based paints have adopted the term as well. The term today means "hard surfaced paint" and usually is in reference to paint brands of higher quality, floor coatings of a high gloss finish, or spray paints. Most enamel paints are alkyd resin based. Some enamel paints have been made by adding varnish to oil-based paint.

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## High gloss synthetic enamel paint — Specification

### 1 Scope

This Draft Rwanda Standard specifies the requirements for two grades of air-drying gloss enamel paints for use on suitably primed and uncoated steel, wood, masonry, hard board, compressed fiber board and similar materials used in the construction and finishing of buildings.

### 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.

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

ASTM D 2371, *Standard test method for pigment content of solvent reducible paints*

ASTM D 2697, *Standard test method for volume non-volatile matter in clear or pigmented coatings*

ASTM D 2805, *Standard test method for hiding power of paints by Reflectometry*

ASTM D 3273, *Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber*

ASTM D 3359, *Standard test methods for measuring adhesion by tape test*

ASTM D 4400, *Standard for test method for sag resistance of paints using a multinotch applicator*

ASTM D 610, *Standard practice for evaluating degree of rusting on painted steel surfaces*

ISO 11890-2, *Paints and varnishes — Determination of volatile organic compound (VOC) content -- Part 2: Gas-chromatographic method*

ISO 13076, *Paints and varnishes — Lighting and procedure for visual assessments of coatings*

ISO 1513, *Paints and varnishes — Examination and preparation of samples for testing*

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

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

ISO 6504-1, *Paints and varnishes — Determination of hiding power — Part 1: Kubelka-Munk method for white and light-coloured paints*

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*

RS EAS 85-10, *Methods of test for Paints, Varnishes, lacquers and enamels—Part 10: Flexibility test Substrate1*

### 3 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO 4618 and the following apply.

#### 3.1

##### **air-drying**

curing of a coating by oxidation or solvent evaporation by exposure to air without heat or catalyst

#### 3.2

##### **weathering**

surface deterioration of a coating surface during outdoor exposure

#### 3.3

##### **specular gloss**

ratio of the luminous flux reflected from an object in the specular direction for a specified source and receptor angle to the luminous flux reflected from glass with a refractive index of 1.567 in the specular direction

### 4 Grades

High Gloss enamels paints shall be one of the following grades:

- a) Grade 1: high hiding; and
- b) Grade 2: regular hiding



## 5 Requirements

### 5.1 General requirements

#### 5.1.1 Odour

The paint shall not have any objectionable odour and shall not have a putrid odour during or after application.

#### 5.1.2 Condition in the container

When the paint from a newly opened container is examined in accordance with ISO 1513, it shall be free from lumps, loose skins, extraneous matter and colour separation. If any settlement is observed, the paint shall be capable of being readily redispersed to a smooth homogenous state by using a palette knife.

#### 5.1.3 Storage stability

When examined in accordance with ISO 1513, the paint shall be stable during its shelf life.

#### 5.1.4 Anti-fungal properties

**5.1.4.1** The paint shall not contain mercury, but when tested in accordance with ASTM D3273, it shall provide fungicidal protection equivalent to 0.1 % mercury as metal by total weight of the paint. The manufacturer, when requested by a competent authority, shall document and prove evidence of the technology used to provide such protection and laboratory analysis for fungal protection.

**5.1.4.2** The paint shall have sufficient preservatives to prevent any spoilage and shall maintain its native performance for a minimum of 18 months.

**5.1.4.3** When the paint is tested in accordance with RS EAS 85–10, the paint film shall be flexible and shall not crack, shall not flake or show loss of adhesion.

**5.1.4.4** The paint shall not contain any carcinogens, mutagens, reproductive toxins, hazardous air pollutants or ozone-depleting compound as ingredients. Volatile Organic Compounds (VOC) concentration of the product shall not contain more than the amount specified in table-1 using the test method therein and 280 °C as boiling point.

NOTE Volatile Organic compounds which are commonly found in conventional paints include aldehydes, formaldehyde, benzene, toluene, styrene, xylene and dibutyl and biethyl phthalate, among others.

**5.1.4.5** The paint shall not contain any of the following ingredients:

- a) 1,2-dichlorobenzene;
- b) Alkyphenol ethoxylates;
- c) Formaldehyde or formaldehyde-donors;

d) Phthalates; and

e) Triphenyl tins and tributyl tins.

## 5.2 Specific requirements

5.2.1 The paint shall comply with the requirements given in Table 1, when tested in accordance with the methods described therein.

Table 1 — Specific requirements for High gloss synthetic enamel paint

S/N	Parameters	Requirements		Test methods
		Grade 1	Grade 2	
1	Pigment. % by wet of enamel	28 – 40	28 – 40	ASTM D 2371
2	60° Specular gloss	≥ 70	70	ISO 2813
3	Reflectance	≥ 85	85	ISO 2813
4	Anti-Sag index, min	8	8	ASTM D 4400
5	Wet hiding power (white paint), m <sup>2</sup> /L, min.	10.7	8.2	ASTM D 2805 ISO 6504-1;
6	Corrosion. %	0.05	0.5	ASTM D 610
7	Adhesion (base paint thickness), µm	58	78	ASTM D 3359
8	Drying time, h, max.	Surface dry time	4	ISO 9117-3
		Hard dry time	16	ISO 9117-1
9	Volatile Organic Compounds, % m/m, max.	0.5	0.5	ISO 11890-2
10	Solids content, %m/m, min.		52	ASTM D 2697
11	Heavy metals (Lead as Pb), ppm, max.	90	90	ISO 6503

5.2.2 When the color of the paint shall be compared visually with the unexposed panel in accordance with ISO 13076, the colour difference rating shall not be more than the units specified in table 2.

Table 2 — Colour difference ratings permissible after artificial weathering

Colour	Colour ratings	
	Grade 1	Grade 2
All colours except yellow, orange and red.	1	2
Yellow, orange and red	2	3

## 6 Packaging and labelling

### 6.1 Packaging

6.1.1 The paint shall be packed in clean, dry plastic or metallic containers. In a freshly opened container, there shall be no rusting of the container.

6.1.2 The container shall be strong enough to withstand normal handling conditions and shall be adequately sealed to prevent leakage and contamination of the contents during normal transportation and handling.

## 6.2 Labelling

6.2.1 Each container, or label securely fixed to the container, shall be clearly, legibly and indelibly marked with the following information:

- a) the manufacturer's name and address; the brand name of the product if any, may be added;
- b) product name as "High Gloss Enamel Paint" or "Medium Gloss Enamel Paint";
- c) the words "Grade 1, high hiding" or "Grade 2, regular hiding", as applicable;
- d) the colour of the paint, in words or as pictorial;
- e) batch identification;
- f) date of manufacture and expiry; and
- g) net weight; and

6.2.2 Adequate information on the following (a leaflet can be affixed on the product):

- a) the appropriate amount of product needed for a specific job;
- b) instructions for use, storage, disposal and safety requirements
- c) ventilation requirements during paint application as well as drying period;
- d) occupational health and safety as well as emergency interventions; and
- e) proper disposal or recycling for leftover product and packaging containers.

## 7 Sampling

Sampling shall be done in accordance with ISO 15528.



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