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Emulsion paints — Specification

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In order to match with technological development and to keep continuous progress in industries, Standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

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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.

DRS 299 was prepared by Technical Committee RSB/TC 024, *Chemicals and consumer products*.

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

SANS 1586: 2007, Emulsion paints—*Specification*

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

Committee membership

The following organizations were represented on the Technical Committee on Chemicals and consumer products (RSB/TC 024) in the preparation of this standard.

Amaco Paints Company Ltd

AMEKI COLORS Ltd

Crown Paints Rwanda Ltd

Institute of Agriculture, Technology and Education of Kibungo (INATEK)

Integrated Polytechnic Regional Center — Kicukiro Campus (IPRC — Kicukiro Campus)

Ministry of Health (MINISANTE)

National Industrial Research and Development Agency (NIRDA)

Rwanda Environment Management Authority (REMA)

Rwanda Plastic Industries (RPI)

Shalom Paints Ltd

SIGMA PAINTS

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Rwanda Standards Board(RSB) – Secretariat

Emulsion paints — Specification

1 Scope

1.1 This standard specifies the requirements for three grades of emulsion paint that are based on synthetic polymers dispersed in a water phase for application over interior plaster or other masonry substrates, as one or more coats of the same grade. These three grades are suitable for both interior and exterior use.

1.2 It is accepted that there are other satisfactory end-uses for these paints, either by themselves or in systems in combination with other types of paint, but the scope of this standard does not include their use in such systems or their application over wooden, metallic, glass, plastics, off-shutter concrete, or bituminous substrates. In such cases, this standard will only apply to the paint as supplied, not to its end-use.

2 Normative references

The following referenced documents are indispensable for the application 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 of coating materials*

ISO 3251, *Paints and varnishes — Determination of non-volatile matter of paints, vanishes and binders for paints and vanishes*

ISO 3232, *Paints and varnishes — Determination of quantity of material in a container*

ISO 1514, *Paints and varnishes — Standard panels for testing*

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

ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pyknometer method*

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

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

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

ISO 950, *Paints and varnishes — Comparison of contrast ratio (hiding power) of pints of the same type and colour*

ISO 1512, *Paints and varnishes — Sampling of products in liquid or paste form*

EAS 31, *Standard specification for laundry soap*

3 Terms and definitions

For the purposes of this standard, the definitions in ISO 4618 apply.

4 Requirements

4.1 General requirements

4.1.1 Standard atmosphere shall be in accordance with the requirements of ISO 3270.

4.1.2 The paint shall be a medium consisting of any stable synthetic polymer emulsion in water containing pigments and suitable ingredients as may be necessary to produce a paint so as to satisfy the requirements of this specification.

4.1.1 Grades

4.1.1.1 Emulsion paint specified in this standard shall be one of the following grades:

a) grade 1: high hiding, scrub resistant;

b) grade 2: high hiding, washable; and

c) grade 3: general purpose, economy.

4.1.1.2 The requirements in this standard shall apply to all three grades of emulsion paint, unless otherwise indicated.

4.2 Conditions in container

4.2.1 When examined in accordance with ISO 1513, the paint shall be found to be free from lumps, surface skin, extraneous matter, corrosion products, colour separation and hard settlement.

4.2.2 The condition of the material shall be such that settling if any may be easily incorporated on stirring.

4.3 Application properties

4.3.1 Thinning or reducibility with water

4.3.1.1 When thinned with water in accordance with the manufacturer's directions for use, the paint shall mix readily to a smooth homogeneous state, without or with minimal foaming (isolated large bubbles maybe ignored). During thinning not more than 15 % (V/V) of water shall be used.

4.3.1.2 After ageing for 72 h at 23 °C ± 5 °C, the thinned paint shall show no signs of hard settlement or instability, shall remix readily to a smooth, uniform state and shall still comply with the requirements of 4.2, 4.3.2 and 4.3.3.

4.3.2 Brushing/roller application properties

The paint shall be suitable for application by brush or roller. The resulting dry film when examined 4 h after application shall not show pigment flocculation, coarseness, cissing, pitting, cracking, excessive brush marks or other undesirable characteristics.

4.3.3 Re-coating properties

4.3.3.1 When a second coat is applied 4h after the brush and roller application test (4.3.2) the second coat shall not soften the first coat and there shall be no lifting, softening or delamination of the first coat during application.

4.3.3.2 When the dry firm is examined 24 h after application of the second coat, there shall be no sagging, cissing, pitting or cracking and the paint film shall be smooth in appearance.

4.4 Fineness of grind

When tested in accordance with ISO 1524, paints shall have a fineness of grind that does not exceed 25 µm for all the three grades of paint.

4.5 Temperature stability

When a 500mL sample of the paint is stored at a temperature of either 50 °C ± 2 °C for 7 days**,** or 60 ± 2 °C for 48 h followed by 1 h at a temperature of 23 °C ± 2 °C, the paint shall still comply with the requirements of 4.2.

4.6 Other requirements

The paint shall also comply with requirements given in Table 1.

Table 1 — Requirements for emulsion paint

S/N	Characteristic	Grade requirement			Test method
		Grade 1	Grade 2	Grade 3	
1	Quantity of material	Shall not be less than 95% of the declared volume at 23 ± 2 °C.	Same as Grade 1	Same as Grade 1	ISO 3232
2	Fungus resistance	Paint panels shall be free from surface fungi growth	Same as Grade 1	Same as Grade 1	Annex A
3	Specific gravity at 23 °C	1.2 – 1.6	1.3 – 1.6	1.3 – 1.6	ISO2811-1
4	A 1.1.1 Solids Content, % (m/m), min.	50	50	50	ISO 3251
5	i) Surface drying time in minutes, max.	15	15	15	Annex B
	ii) Hard drying time in minutes, max.	30	30	30	
6.	pH	8 – 9	8 – 9	8 – 9	Annex C
7.	Titanium dioxide Content (% m/m), min	18	13	5	ISO 591-1
8.	Gloss at 20° gloss meter angle (Max)				
9	Gloss at 60° gloss meter angle (Max)	8	8	8	ISO 2813
10	Gloss at 85° gloss meter angle (Max)				
11	Opacity (hiding power) μm	100	130	150	ISO 950
12	Resistance to wet abrasion, cycle (minutes)	4000	2000	200	Annex D
13	Fineness of grind (μm) max.	25	25	25	ISO 1524
14	Contaminants (heavy metals), mg/kg, max	20	20	20	

4.7 Substances not allowed

Mercury, formaldehyde and phenol based fungicide shall not be used.

5 Sampling and inspection

5.1 Definitions

5.1.1 Defective

A test sample or a container of the emulsion paint that fails in one or more respects to comply with the relevant requirements of the standard.

5.1.2 Batch

The quantity of emulsion paint of the same grade and colour, in containers bearing the same batch identification, produced by one manufacturer, and submitted at any time for inspection and testing.

5.2 Sampling

5.2.1 Sampling shall be carried out in accordance with ISO 1512. When sampling takes place at the supplier's warehouse, the samples shall comply with the requirements of Clause 5.

5.2.2 A sample volume of 1 litre will be required for testing for compliance with this standard.

5.3 Compliance with this standard

The batch shall be deemed to comply with the relevant requirements of the standard if, on inspection of the containers in the lot and on testing of the samples taken in accordance with Clause 4, no defective is found.

6 Packaging and marking

6.1 Packaging containers

The paint shall be packaged in clean, dry, corrosion-resistant containers. The containers shall be strong enough to withstand normal usage, and shall be adequately sealed to prevent leakage and contamination of the contents during normal transportation, handling and storage.

6.2 Marking

The following information shall clearly, legibly and durably be marked on each container, or a label securely fixed to the container:

a) manufacturer's name and address and the brand name of the product;

b) words "Emulsion Paint" and the grade of paint;

c) colour and colour code;

d) batch identification number;

e) net weight of the material;

f) list of ingredients;

g) best before date; and

h) storage and usage instructions.

Annex A
(normative)

Determination of fungus resistance

A.1 Principle

Aluminium metal panel is evenly coated with two coats of the paint by brushing and then air dried for a specified period. The panel is exposed on a exposure rack for a specified period and the intensity of fungal growth is observed.

A.1.1 Exposure rack

A.1.1.1 Exposure rack shall usually support the panels at an angle of 45 ° to the horizontal.

A.1.1.2 The rack shall be so situated that the specimens are not protected or overshadowed by neighbouring objects.

A.1.1.3 The construction of the racks shall be such that the backs of the specimens are freely exposed to the atmosphere and such that water drainage does not occur from one panel to the other.

A.1.1.4 Specimens shall not be in electrical contact with metals, nor as far as possible in direct contact with wood or other porous material. If panels are supported in grooves, the suitable drainage holes shall be provided to prevent accumulation of water.

A.2 Procedure

Apply two coats of the paint by brushing on a 300 mm x 150 mm x 4 mm clean, dry, aluminium panel with ½ hour drying between coats. The edges and back of the panels shall be coated with protective paint. Expose the panels on the exposure rack and examine the fungal growth on the panels monthly, for six months

Annex B
(normative)

Determination of drying time

B.1 Apparatus

B.1.1 Drying time recorder

B.1.2 Glass panels, 50 x 100 mm

B.2 Procedure

Determine the surface and had drying times of the paint film by using a drying recorder and by carefully following the instruction manual of the equipment.

Annex C
(normative)

Determination of pH

C.1 Principle

The paint is mixed with freshly boiled water to remove the carbon dioxide and hydrogen ion concentration is measured using pH meter.

C.2 Procedure

Weigh 5.00 ± 0.01 g of the paint in a 150 mL beaker and add 50 g freshly boiled distilled water. Mix well by means of a glass rod and cool to 23 ± 2 °C. Measure the pH using glass calomel electrode.

Annex D
(normative)

Determination of resistance to wet abrasion

D.1 Principle

The painted panels are subjected to wet rubbing in the abrasion test apparatus at a specified speed and load of the brush. The panels are examined at the end of the stipulated oscillations for film defects.

D.2 Apparatus

D.2.1 Wet abrasion tester, having the following accessories:

D.2.1.1 Washing unit, of such a construction as to hold the brush in a box or holder which moves backwards and forwards in a straight line across the test panels at the rate of 38 ± 2 strokes per min. The trays shall be watertight to hold the panels.

D.2.1.2 Brush a pad made out of polyurethane foam of density 25 kg/m3 and of size 85 mm x 36 mm x 12 mm. The total mass of the brush and the holder shall be 500 g.

D.2.1.3 Fractional horsepower motor, of suitable speed to regulate the oscillations of the brush.

D.3 Reagents

D.3.1 Soap solution

Dissolve 0.5 grams of laundry soap (conforming to EAS 31, *Standard specification for laundry soap*) weighed to the nearest 0.001 g (previously dried at 105 ± 2 °C for 30 minutes) in distilled water to give 0.5 per cent (m/v) solution.

D.4 Procedure

D.4.1 Preparation of the panel

D.4.1.1 Clean a glass panel of dimensions 415 mm x 120 mm. Apply coat of the undercoating enamel to give a wet film thickness of 35 μm to 38 μm and store at 120 °C for 30 minutes. Rub down with an emery paper and wipe until the glass is removed completely.

D.4.1.2 Apply a coat of the paint by use of a brush or film applicator to give a wet film thickness of 150 μm. Allow this to air dry for 168 hours.

D.4.1.3 Dip the brush in distilled water at 25 °C for 30 min to a depth of 12 mm. Shake off excess water and soak in soap solution for 5 min. Fix the painted test panel in the tray in position with painted surface upwards. Mix the brush in its holder having a total load of 0.5 kg and adjust the stroke in such a way that not less than 10 mm of the film is left free on both ends. Start the oscillations of the brush.

D.4.1.4 Keep the panel wet by adding soap solution, at the rate of 10 to 12 drops per minute in the path of the brush. Wash with water and allow to dry, and examine the film for any defects and note the number of oscillations when these defects start showing.

Bibliography

[1] KS03 - 811, *Kenya standard specification for emulsion paint for interior and exterior use*

[2] KS 03 - 812, *Kenya standard specification for matt emulsion paint for interior and exterior use*

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