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|  | **STANDARDS ASSOCIATION OF ZIMBABWE** |

DRAFT FOR  **PUBLIC COMMENT**

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TECHNICAL COMMITTEE: **CH 002 – PAINTS AND VANISHES**

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| DRAFT ZIMBABWE SPECIFICATION FOR  HIGH GLOSS SYNTHETIC ENAMEL PAINT |

This draft is now available for **public comment**. Your views and technical comments on it would be appreciated. If you have no specific comments to make but find it generally acceptable it would be helpful if you would notify us accordingly. Suggestions entailing revisions of the text should indicate the preferred wording using the attached template. The relevant clause number should be quoted against any comment.

All comments should be sent to the Committee Secretary **Ms Ennie Pindura** at the address shown below.

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# **Foreword**

This Zimbabwe Standard ZWS 356:2025: High gloss synthetic enamel paint (alkyd type), is the first revision of ZWS 356:1993.

The standard was revised by technical committee CH 002 : Paints and Vanishes, under the general direction of the Safety, Health, Environment and Quality Standards (SHEQ) Sector.

First published 1961, as CAS K10,

Withdrawn 1987,

First revision 1993, as ZWS 356,

Second revision 1995, as ZWS 356, as amendment by MD 555 of February 1995

First reprint 2011, as ZWS 356,

Third revision 2025, as ZWS 356

This Zimbabwe Standard makes reference to the following publications:

ASTM D4214-: Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films

BS 381 C : Colour Chart.

BS 4800 : Colour Chart.

ZWS 401 : Test method for paint: Determination of volatile content.

ZWS 405 : Test method for paints: Liebermann – Storch test for rosin and rosin derivatives in paint.

ZWS 406 : Test method for paint: Daylight 45-degree, 0-degree luminous directional reflectance of surface coatings and pigments.

ZWS 420 : Test method for paints – Pretreatment of metal test panels – Abrading.

ZWS 421 : Test method for paints - Consistency of paints measured by means of a Krebs-Stormer viscometer (without stroboscope).

ZWS 426 : Test method for paints: Brushing properties of paints.

ZWS 429 : Test method for paints: Fineness of grind of paints and pastes.

ZWS 430 : Test method for paints - Drying time of paints films.

ZWS 431 : Test method for paint - Sixty degree specular reflection of paint films.

ZWS 437 : Test methods for paints – Resistance to skinning of paint, varnish and lacquer.

ZWS 439 : Test method for paint – Titanium dioxide content of white emulsion paint pigment.

ZWS 469 : Test methods for paints – Resistance of paint films to laboratory artificial weathering using fluorescent lamps. Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films

Zimbabwe Hazardous Substances and Articles Act.

ZIMBABWE STANDARD SPECIFICATION

FOR

HIGH GLOSS SYNTHETIC ENAMEL PAINT (ALKYD TYPE)

(Third Revision of ZWS 356:1995)

# **Scope**

This Zimbabwe Standard covers ready mixed high gloss synthetic resin based enamel paint for interior and exterior use as a finishing coat on metal, wood, sealed plaster walls and concrete surfaces, composition board and similar materials that have been primed or painted previously.

**Note**. The titles of publications referred to in this standard are listed in the Foreword.

# **Definition**

For the purpose of this Zimbabwe Standard the following definition shall apply:

**Standard Conditions**

A temperature of 23 ± 2 °C and a relative humidity of 50 ± 5 %.

# **Composition**

3.1 **Volatile Content**

When determined in accordance with ZWS 401, the volatile content of the paint shall not exceed a mass fraction of 45 % for black, dark red and maroon and not exceed a mass fraction of 40 % for other colours.

3.2 **Vehicle**

The vehicle shall consist of a long semi-drying oil modified alkyd resin or other suitable synthetic resin polymer. Rosin and rosin derivatives when tested in accordance with ZWS 405, shall not be present.

3.3 **Pigment**

The choice of pigment shall satisfy toxicology restrictions.

3.4 **Special Ingredients**

Small quantities of ingredients designed to produce special effects, such as ease of wetting or grinding, or to confer special properties, such as anti-skinning or anti-setting, may be incorporated in the paint.

3.5 **Noxious Ingredients**

The paint shall not contain chlorinated hydrocarbons, the benzole content shall not exceed one percent and total lead content shall not exceed 90 ppm in the dry film.

# **Consistency**

When tested in accordance with ZWS 421 or 422, the viscosity of the paint at 25 °C shall be not less than 70 or more than 75 Krebs units.

# **Application Properties**

When tested in accordance with ZWS 426 with a lapping time of 3 min, the paint shall be judged to have good brushing properties if it can be applied, crossed, laid off and joined without difficulty.

It shall also be capable of spray application to such prepared surfaces when reduced with a suitable solvent as recommended by the manufacturer.

# **Fineness of Grind**

When determined in accordance with ZWS 429, the fineness of grind reading for the unthinned paint shall not exceed 10 μm.

# **Drying Time**

When tested in accordance with ZWS 430, the drying time of a wet film of the unthinned paint produced by a standard 75 μm film applicator shall be as follows:

1. Surface dry ………… not more than 4 h

1. Hard dry …………… not more than 16 h

A pressure shall be applied for the hard dry test using a human thumb until the reading on the balance indicates 759 g (Refer to Clause 4 (b) of ZWS 430). For the hard dry test using the mechanical thumb methods, the mass of the loaded plunger shall be 9 kg (Refer to Clause 4 (c) of ZWS 430). After overnight drying, it shall be possible to sandpaper the paint film with a 320 grit wet/dry paper (used dry), without clogging the sandpaper.

# **Finish**

8.1 **Appearance**

The paint when applied at a spreading rate of 10 m2/l to vertical surfaces, shall be uniform and glossy with no evidence of runs, sags, brush marks, bloom, specks, flotation or other film defects.

8.2 **Directional Reflectance for White Paint**

When tested in accordance with ZWS 406, the daylight 45-degree, 0-degree, luminous directional reflectance of not less than 85 % relative to a freshly prepared surface of magnesium oxide. The application shall be by a suitable film applicator to produce a wet film of 60 to 65 μm per coat. The panels shall be aged for 48 h at standard conditions (see Clause 2) before testing.

8.3 **Gloss**

When tested in accordance with ZWS 431, the paint film, after drying for 48 h at standard conditions (see Clause 2) shall have a specular reflection of not less than 90° on glossmeter.

The same film after drying for 7 d at standard conditions (see Clause 2) shall have a specular reflection of not less than 90 %.

8.3.1 **Retention of gloss**

The paint film, when tested in accordance with the method described in ZWS 438, shall have a specular reflection, after three months exposure, of not less than 80 % at 60°.

8.4 **Yellowing of White Paint**

When tested in accordance with the following method the white paint shall show no yellowing after exposure in total darkness for a period of 14 d and recovery for a period of 7 d.

Apply 2 coats of the well mixed sample by brush at a spreading rate of 10 m2/l to the clean steel panels in accordance with ZWS 420 of size 150 mm x 100 mm. Allow the panels to age 24 h in diffused daylight after application of the second coat at standard condition (see Clause 2). Place in a cupboard that excludes all light for a period of 14 d. Do not open the cupboard during the testing period. At the end of this period, allow the panel to recover in diffused daylight then compare the test panels visually with a 24 h old panel prepared in a similar manner.

# **Colour**

Unless otherwise agreed between purchaser and manufacturer, the colour shall be in accordance with the British Standard colours shown in BS 381 C and BS 4800.

# **Weathering**

When tested for 500 h in accordance with ZWS 469, the paint, applied by doctor blade with a 100 μm gap and dried in a horizontal position and aged for 72 h shall:

1. show no more chalking than No. 2 when tested in accordance with ASTM D 659;

1. show no checking, cracking, blistering or flaking;

1. have a 60° specular gloss of less than 40; and

1. have a colour change rating lower than the appropriate value given below:

All colours except yellow and orange 6

Yellow and orange 4

(Based on a 0 to 10 rating with 10 showing no defects).

# **Odour**

The odour of the paint in the container and during and after application, shall not be abnormally pungent, offensive or disagreeable.

# **Hiding Power**

When tested in accordance with ZWS 425, the wet hiding power of the paints of colours given in the Table, using the Morest Chart, shall be not less than those specified in that table.

Paints of other colours shall have wet hiding powers not less than the hiding powers of the colours they most nearly approximate to in the Table.

**Table – Hiding Power**

|  |  |  |
| --- | --- | --- |
| **Colour** | **Reflectance** | **Min. Wet Hiding Power** |
| White  Black | %    > 80  Nil | m2/l    8,0  25,0 |
| **Pastels**  Blue, Green, Grey Cream, Pink | > 60 | 10,00 |
| **Light – Medium Colours**  Blue, Green, Grey  Cream, Beige, Tones and Pink | 15 – 60 | 12,0 |
| **Dark Colours**  Blue, Green, Grey  Beige, Stone, Brown and Red  Oxide | < 15 | 15,0 |
| **Yellow and Orange**  Pastel, light  Medium, Dark | > 60  < 60 | 8,0  10,0 |
| **Red**  All shades | < 30 | 7,0 |
| Maroon | < 5 | 5,0 |
| **Violet**  All shades | < 80 | 10,0 |

# **Storage Stability**

The paint as supplied shall be free of any skin, dry sediment and coarse particles and shall show no evidence of livering or curdling or other signs of container instability.

The paint shall be in such condition that stirring readily produces a smooth uniform mixture of good brushing consistency within the viscosity limits.

The paint, when stored in the original sealed containers at temperatures between 15 °C and 30 °C, shall retain the properties detailed above for a period of not less than 12 months. The viscosity shall not increase by more than 10 Krebs units.

# **Skinning**

When tested in accordance with ZWS 437, the paint shall not show any sign of skinning after 48 h.

# **Durability**

See Appendix A.

# **Sampling**

The method of sampling and size of sample shall be as agreed between the purchaser and manufacturer.

# **Containers**

The paint shall be packed in clean, dry containers. The containers shall be strong enough to withstand normal usage and shall be adequately sealed to prevent damage, leakage and contamination during normal transport and handling. The container shall not have a deleterious effect on the paint, nor the paint on the container over normal storage period of at least 12 months at the ambient temperatures in Zimbabwe.

# **Marking**

Each container complying with Clause 17 of this standard shall clearly and permanently marked with the following:

1. Name or number of colour on the container;

1. The manufacturer’s name and/or trade mark on the side of the container;

1. The date of manufacture; and

1. The type of paint, i.e. High gloss synthetic enamel, on the side of the container;

# **Appendix A – Durability**

This appendix is for information only.

It is anticipated that the paint shall, when properly used on correctly prepared surfaces, have a useful life of not less than 3 years when applied on all normal external surfaces under Zimbabwe’s climatic conditions.

“Useful life” requires that the paint shall wear away in such a manner that the surface of the material is at no time laid bare. The paint system shall show no cracking, checking, peeling or flaking but shall wear away through gradual surface erosion (chalking).

At the completion of the useful life, the paint system shall form a firm base for repainting, requiring a minimum of surface preparation.

# **Appendix B – Toxicity**

This appendix is for information only.

In accordance with the current worldwide awareness on the use and handling of hazardous substances, all raw materials prohibited by the Zimbabwe Hazardous Substances and Articles Act shall not be used.