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PAINTS AND VARNISHES

HIGH GLOSS SYNTHETIC ENAMEL PAINT - Specification

ZAMBIA BUREAU OF STANDARDS

AMENDMENTS ISSUED SINCE PUBLICATIONS

Amdt No.	Date	Text affected
1	24/03/2026	Viscosity

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ZAMBIA BUREAU OF STANDARDS

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FOREWORD

This National Standard has been prepared by the Paints, Adhesives and Varnishes Technical Committee (TC 4/6) in accordance with the procedures of ZABS. All users should ensure that they have the latest edition of this publication as standards are revised from time to time.

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The preparation of this Standard has been undertaken by the Paints, Adhesives and Varnishes Technical Committee (TC 4/6). The developments in the construction sector in Zambia necessitated the formulation of this standard. In its preparation assistance was derived from

SAZS 356: 1993 - High gloss synthetic enamel paint, published by Standards Association of Zimbabwe

KS 2661-2:2017 Paints, varnishes, coatings and related products - Determination of total lead Part 2: Maximum permissible content of total lead based on dry weight

Consideration was also accorded to the prevailing practice in the country

ACKNOWLEDGEMENT

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ZAMBIA BUREAU OF STANDARDS

Zambian Standard

HIGH GLOSS SYNTHETIC ENAMEL PAINT - Specification

1 SCOPE

This Zambian 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 high gloss' meaning the premium product.

2 NORMATIVE REFERENCES

ZS 284 Part 1	Paints and varnishes-Methods of test Part 1 - Determination of volatile and non-volatile matter
ZS 284 Part 2	Paints and varnishes-Methods of test Part 2 - Determination of coarse and foreign matter
ZS 284 Part 3	Paints and varnishes-Methods of test Part 3 - Determination of viscosity
ZS 284 Part 4	Paints and varnishes-Methods of test Part 4 - Determination consistency of paints by means of Krebs-Stormer viscometer
ZS 284 Part 5	Paints and varnishes-Methods of test Part 5 - Determination of application properties
ZS 284 Part 6	Paints and varnishes-Methods of test Part 6 - Determination of drying properties - Surface drying test
ZS 284 Part 7	Paints and varnishes-Methods of test Part 7 - Determination of specular gloss of paints film at 85°
ZS 284 Part 9	Part 8 - Visual comparison of the colour of paints Part 9 - Determination of reflectance of white paints
ZS 284 Part 10	Paints and varnishes-Methods of test Part 10 - Comparison of contrast ratio (hiding power) of paints of the same colour
ZS 284 Part 18	Paints and varnishes-Methods of test Part 18 - Determination of fineness of grind
ZS 284 Part 19	Paints and varnishes-Methods of test Part 19 - Determination of rosin and rosin derivatives
ZS 284 Part 23	Paints and varnishes-Methods of test Part 23 - Determination of spraying consistency
ZS 284 Part 25	Paints and varnishes-Methods of test Part 25 - Determination of resistance to artificial weathering
ZS 284 Part 26	Paints and varnishes-Methods of test Part 26 - Determination of colour stability

ZS 284 Part 27	Paints and varnishes-Methods of test Part 27 - Determination of air-drying and baking properties
ZS ISO 6503	Paints and varnishes - Determination of total lead - Flame atomic absorption spectrometric method.
ZS 1185	Paints, varnishes, and related products — Requirements for total lead content based on dry weight.

3 COMPOSITION

3.1 Volatile content

When determined in accordance with ZS 284 Part 1, the volatile content of the paint shall be not more than 60% m/m for black, dark red and maroon and not more than 50 % m/m for other colours.

3.2 Vehicle

The vehicle shall consist of a long drying or semi-drying oil modified alkyd resin or other suitable synthetic resin polymer. Rosin and rosin derivatives when tested in accordance with ZS 284 Part 19, shall not be present.

3.3 Pigment

The choice of pigment shall be left to the manufacturer.

3.4 Special ingredients

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

3.5 Noxious ingredients

The paint shall not contain chlorinated hydrocarbons and benzole.

4 REQUIREMENTS

4.1 A temperature of $24 \pm 1^{\circ}\text{C}$ and a relative humidity of $60 \pm 5\%$. All tests shall be carried out at standard test conditions unless otherwise stated

4.2 Viscosity

When tested in accordance with ZS 284 Part 4, the viscosity of the paint at $24 (\pm 1)^{\circ}\text{C}$ shall be between 69 – 120 Krebs units.

4.3 Application properties

When tested in accordance with ZS 284 Part 5 with a lapping time of 3 minutes 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 able to be sprayed at a viscosity of 28 to 30 seconds in a Ford-4 cup at $24 (\pm 1) ^\circ\text{C}$ when reduced with a suitable solvent as recommended by the manufacturer.

After the enamel has been reduced to spraying consistency and tested as described in ZS 284 part 23 there shall be no perceptible colour difference between the two dry surfaces.

4.4 Fineness of grind

When determined in accordance with ZS 284 Part 18, the fineness of grind reading for the unthinned paint shall not exceed $10 \mu\text{m}$.

4.5 Drying time

When tested in accordance with ZS 284 Part 27, the drying time of a wet film of the unthinned paint produced by a standard $75 \mu\text{m}$ film applicator shall be as follows:

- | | | |
|----|-------------|------------------------|
| a) | Touch dry | Not more than 4 hours |
| b) | Surface dry | Not more than 16 hours |
| c) | Hard dry | Beyond 24 hours |

4.6 Appearance

The paint when applied at a spreading rate of $10 \text{ m}^2/\text{l}$ to vertical surfaces shall be uniform and glossy with no evidence of runs, sags, brush marks, bloom, specks, flotation or other film defects.

4.7 Directional reflectance for white paint

When tested in accordance with ZS 284 Part 9, the daylight 45-degree, 0-degree, luminous directional reflectance shall be 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 $65 \mu\text{m}$ per coat. The panels shall be aged for 48 hours at $24 \pm 1^\circ\text{C}$ and $60 \pm 5\%$ relative humidity before testing.

4.8 Gloss

When tested in accordance with ZS 284 Part 7, the paint film, after drying for 48 hours at $24 \pm 1^\circ\text{C}$ and $60 \pm 5\%$ relative humidity, shall have specular reflection of not less than 80% (60° Head, Glossmeter).

The same film after drying for 7 days at $24 \pm 1^\circ\text{C}$ and $60 \pm 5\%$ relative humidity, shall have a specular reflection of not less than 80% (60° Head Glossmeter).

4.8.1 Retention of gloss

The paint film, when tested in accordance with the method described in ZS 284 Part 25, shall have a specular reflection, after three months exposure, of not less than 70% (60° Head Glossmeter).

4.9 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 days and recovery for a period of 7 days:

Apply two coats of the well mixed sample by brush at a spreading rate of 10 m²/l to the clean steel panels in accordance with ZS 284 Part 27, of size 150 mm x 100 mm. Allow the panels to age 24 hours in diffused daylight after application of the second coat at 24 ± 1°C and 60 ± 5% relative humidity. Place in a cupboard that excludes all light for a period of 14 days. 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 hour old panel prepared in a similar manner.

4.10 Colour

Unless otherwise agreed between purchaser and manufacturer,

4.11 Weathering

When tested for 1000 hours in accordance with ZS 284 Part 25, the paint film shall not;

- a) show chalking, checking or cracking,
- b) have a 60° specular gloss of less than 40,
- c) have a colour change rating lower than the appropriate value given below:

Table 1 - visual colour change rating

Colour	Visual colour change rating* min
All colours except yellow and orange	6
Yellow and orange	4

Based on a figure of 10 for no defects.

4.11 Odour

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

4.12 Toxicity

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

4.122 Lead Restriction

The material shall be tested for restriction from lead in accordance with ZS 1185 and ZS ISO 6503. When thus tested the material shall not contain lead or compounds of lead or mixtures of both, calculated as Metallic lead exceeding 90 ppm.

4.13 Hiding power

When tested in accordance with ZS 284 Part 10, the wet hiding power of paints of the colours given in Table 2 using a 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 in Table. 2.

Table 2 - hiding power of paints

Colour	Reflectance, %	Minimum Wet Hiding Power m ² /l
White	> 80	8.0
Black	Nil	25.0
Pastels Blue, Green, Grey Cream, Pink	> 60	10.0
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

4.14 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 of other signs of container instability.

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

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

4.15 Skinning

When tested in accordance with ZS 284 Part 28, the paint shall not show any sign of skinning after 48 hours.

4.16 Durability

See Annex A.

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

4.17 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.

5 SAMPLING

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

6 MARKING

Each container complying with Clause 4 of this standard shall be clearly and permanently marked with the following:-

- a) the manufacturer's name, address and/or trade mark on the side of the container;
- b) volume of the material/or net mass in the container.
- c) name or number of colour on the container.
- d) the batch identification , date of manufacture and date of expiry.
- e) the type of paint i.e. high gloss synthetic enamel, on the side of the container.
- f) the storage precautions.
- g) the containers may also be marked with the ZABS Certification Mark.

Note on the use of the certification mark

The Zambia Bureau of Standards is the owner of the registered certification mark shown below, the independent assurance that the product conforms to the requirements of this Zambian Standard. This certification mark may be used by manufacturers only under licence from the Bureau. Particulars of the condition under which licenses are granted may be obtained from the Director, Zambia Bureau of Standards, and P.O. BOX 50259 LUSAKA 15101.



ANNEX A

DURABILITY

The information in this Appendix is additional to that in the specification and has been included purely for amplification.

It is anticipated that the paint shall, when properly used on correctly prepared surfaces, have a useful life of not less than 18 months when applied on all normal external surfaces under Zambian 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

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