

مشروع نهائي

OS 240/2020

الدهانات و الورنيشات – دهانات الالكيد اللامعة وشبه اللامعة والمطفأة للأسطح  
الداخلية والخارجية

**Paints and Varnishes – Gloss, Semi Gloss and Matt Alkyd Enamel  
Paint for Interior and Exterior Surfaces**

يعتمد:

ICS: 87.040

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تاريخ الاعتماد : / / هـ، الموافق / / ٢٠٢٠ م  
صفة الإصدار :

## تقديم

المديرية العامة للمواصفات والمقاييس جهاز التقييس الوطني بالسلطنة أنشئت بموجب المرسوم السلطاني رقم ١٩٧٦/٣٩، ومن مهامها إعداد المواصفات القياسية العمانية واللوائح الفنية إستناداً للمرسوم السلطاني رقم ١ / ٨٧

وقد قامت دائرة المواصفات بالمديرية بإعداد المواصفة القياسية العمانية رقم OS 197/2020، الخاصة بـ" الدهانات و الورنيشات – دهانات الالكيد اللامعة وشبه اللامعة والمطفأة للأسطح الداخلية والخارجية " " Paints and Varnishes – Gloss, Semi Gloss and Matt Alkyd Enamel Paint for Interior and Exterior Surfaces"، وقد تم إعداد المشروع باللغتين العربية والإنجليزية بعد إستعراض المواصفات القياسية العربية والأجنبية والدولية والمؤلفات المرجعية، والقوانين ذات الصلة.

وقد اعتمدت هذه المواصفة كمواصفة قياسية عمانية ملزمة، بتاريخ // هـ، الموافق / / م، على أن تلغي المواصفة القياسية العمانية رقم (OS 240/1990) وتحل محلها.

## **Paints and Varnishes – Gloss, Semi Gloss and Matt Alkyd Enamel Paint for Interior and Exterior Surfaces**

### **1- SCOPE AND FIELD OF APPLICATION:**

This Omani Standard is concerned with air-drying gloss, semi-gloss and matt paints for use on primed or unprimed interior and exterior wood, metal, or masonry surfaces.

### **2- COMPLEMANTRY REFERNCES**

- 2.1 ISO 15528 " paints and varnishes and raw materials for paints and varnishes –sampling".
- 2.2 ISO 1513 " paints and varnishes- examination and preparation of sampling for testing".
- 2.3 ISO 3251 “Paints, varnishes and plastics-Determination of non- volatile- matter content”.
- 2.4 Saudi Standard No. SASO 2194 " Paints and varnishes- Method for testing Consistency of the paints by stomer viscometer"
- 2.5 ISO 3668 "Paints and varnishes- Visual comparison of the color of paints".
- 2.6 ISO 1524 “Paints, varnishes and printing inks -Determination of fineness of grind " .
- 2.7 ISO 3856-1 “Paints and varnishes – determination of " soluble " metal content – part1: determination of lead content - flame atomic absorption spectrometric method and dithizone spectrophotometric method
- 2.8 ISO 1523 Determination of flash poin- Close Cup Equilibrium method"
- 2.9 ISO 9117-1 Paints and varnishes -- Drying tests -- Part 1: Determination of through-dry state and through-dry time
  
- 2.10 ISO 28199-1 Paints and varnishes -- Evaluation of properties of coating systems related to the application process - - Part 1: Relevant vocabulary and preparation of test panels"
- 2.11 ISO 28199-2 "Paints and varnishes -- Evaluation of properties of coating systems related to the application process - - Part 2: Colour stability, process hiding power, re-dissolving, overspray absorption, wetting, surface texture and mottling"
- 2.12 ISO 28199-3 "Paints and varnishes -- Evaluation of properties of coating systems related to the application process - - Part 3: Visual assessment of sagging, formation of bubbles, pinholing and hiding power"
  
- 2.13 ISO 1519 "Paints and varnishes -- Bend test (cylindrical mandrel)"
  
- 2.14 ISO 1518 " Paints and varnishes — Determination of scratch resistance — Part 1:Constant-loading method and Part 2:Variable-loading method
  
- 2.15 ISO 2812-2 " Paints and varnishes -- Determination of resistance to liquids -- Part 2: Water immersion method

- 2.16 ISO 6504-1 Paints and varnishes -- Determination of hiding power -- Part 3: Determination of contrast ratio of light-coloured paints at a fixed spreading rate"
- 2.17 ISO 11507 "Paints and Varnishes-Exposure of coatings to artificial weathering -- Exposure to fluorescent UV lamps and water.
- 2.18 ISO 2813 "Paints and varnishes -- Determination of gloss value at 20 degrees, 60 degrees and 85 degrees"
- 2.19 ISO 3549 "Zinc dust pigments for paints -- Specifications and test methods"

### 3- DEFINITIONS

#### 3.1 Enamel (enamel paint):

One of a class of finishes obtained by melting siliceous materials. The term is also used in the paint industry to describe varnishes or paints which simulate in appearance the flow, smoothness and gloss of vitreous. The same broad definition applies to enamel paint and hard gloss paint.

#### 3.2 Gloss :

The degree to which a painted surface possesses the property of reflecting light in mirror-like manner (specular reflection).

#### 3.3 Vehicle:

The liquid portion of the paint in which the pigment is dispersed and it is composed of the binder, additives, and the thinner if any.

#### 3.4 Pigment:

The insoluble dispersed particles in a paint which give the dried film its characteristic properties of colour and opacity.

#### 3.5 Binder:

The non-volatile portion of the vehicle of a paint. It binds or cements the pigment particles together and the paint film as a whole to the material to which it is applied.

#### 3.6 Thinner :

Volatile liquids added to paints or varnishes to facilitate application and to aid penetration by lowering gaster viscosity. They should be completely miscible with the paints or

varnish at ordinary temperature and should not cause precipitation of the non-volatile portion either in the container or in the film during drying. For some purposes thinner containing a small proportion of non-volatile material may be used. Thinner contains little portion of non volatile materials may be used for some purposes.

**3.7 Skinning :**

The formation of a surface skin on paints or varnishes in the container.

**3.8 Flash point :**

Minimum temperature of a liquid at which the vapours given off are sufficient to form a flammable mixture with air under specified conditions of test.

**3.9 Drying :**

The process of change of a coat of paint or varnished from the liquid to solid state, due to evaporation of solvent, physical-chemical reaction of binding medium or combination of these causes.

**4 – REQUIREMENTS:****4.1 Composition :**

The gloss enamel paint shall consist of pigments of pure type free from extenders and have good colour performance. The white pigment shall be chalk-resisting titanium dioxide of rutile type, zinc oxide may be used up to 10% maximum of the total mass of pigment. The vehicle shall be of a suitable type of alkyd resin with thinners and driers, anti skinning agents, wetting agents and suspension agents. The vehicle shall be free from rosin or rosin derivative.

**4.2 Condition in container :**

The material shall have no evidence of biological growth, levering, skinning, and putrefaction, hard settling of the pigment, lumps, or corrosion of the container. Any settled pigment shall be readily dispersible in the liquid medium by stirring with paddle to produce smooth homogeneous emulsion paints, free from persistent foam. The material shall have no irritating or offensive odor.

**4.3 Non-volatile content :**

The percent of non-volatile content of the gloss enamel shall not be less than 50% by weight when tested according to clause (2.3).

#### **4.4 Consistency :**

The paint shall be in such a condition that stirring readily produces a smooth uniform mixture of good consistency. It shall have viscosity of (70-120) kreb unit at  $(23 \pm 2)$  °C when tested according to clause (2.4).

#### **4.5 Colour:**

The colour of the paint shall be close to the approved reference sample and as written on the container when tested according to clause (2.5).

#### **4.6 Fineness of grind:**

The partial size of the paint shall be less than 30micrometers when tested according to clause (2.6).

#### **4.7 Lead content:**

The lead content shall not exceed 0.009% of the total mass of the paint when tested according to clause (2.7).

#### **4.8 Flash point :**

The flash point of the paint shall not be less than 30 °C when tested according to clause (2.8).

#### **4.9 Application properties :**

The paint shall be suitable for application by brush, roll or spray.

The resulting paint film shall be smooth glossy uniform film free from any seeds suns, streaks and any other surface defects.

When the paint is brushed it shall be easily brushed posses good leveling properties free from brush marks.

#### **4.10 Drying time :**

- The paint shall have surface drying time not more than 2-4 hours.

The paint shall become hard-dry in a time not more than 16 hours at wet film thickness of 100 µm glass substrate at temperature of  $(23 \pm 2)$  °C and maximum percentage humidity of  $(50 \pm 5)$ % when tested according to clause (2.9).

#### **4.11 Appearance of dried film (finish):**

After the drying time as per clause 4.11 is finished, the paint adherent and substantially free from mottling, color separation, running sagging or wrinkling. And shall be as regards finish to a film prepared by the same method in the same time from the approved reference sample when tested according to clauses (2.10, 2011, 2.12).

**4.12 Flexibility and adhesion :**

A film of the paint shall withstand mandrel of 3mm diameter, bonding without chipping or flaking and remain firmly adherent to the test panel, no peeling off to be observed when tested according to clause (2.13).

**4.13 Scratch resistance:**

The paint film shall withstand a scratch test load of not less than 800g. After 7 days (aging) and temperature of  $(23 \pm 2) ^\circ\text{C}$  and maximum percentage humidity of  $(50 \pm 5)\%$ , applying the film or dry film thickness on  $(25-30) \mu\text{m}$ . The panel test should be made of tin or steel when tested according to clause (2.14).

**4.14 Water resistance:**

When tested according to clause (2.15), A film of the paint shall show no wrinkling or blistering immediately after removal of the panel from water. The film of the paint shall be no more than slightly affected when examined 2 hours after removal and after 24 hours air drying the portion of the panel which was immersed in water shall be almost indistinguishable from the portion which was not immerse with regard to hardness. The paint shall applying on glass panel, Immersion time and aging time shall be accordingly to the agreement between the consumer and supplier.

**4.15 Dry opacity : (White & light (pastel) colour) :**

The paint when applied shall give a minimum dry film contrast ratio of more than 90% for white paint and 95% for coloured paint for  $100 \mu\text{m}$  film thickness when tested according to clause (2.16)..

**4.16 Accelerated weathering:**

**4.16.1** The paint layer shall show no blisters, chalking, discoloration, or any abnormal appearance after 300 hours of accelerated weathering in the case of gloss enamel and 200 hours in the case of semi-gloss when tested according to clause (2.17). The test should not exceed 5%. If there any changes, they shall not exceed 5% and this test is done only for interior matt emulsions.

**4.16.2 Criteria for Accelerated weathering test:**

- **Application rods:** Aluminum rods in a suitable size and treated with chromate
- **Application:** By the application machine (wire rod or hollow mold) with a thickness of 150 microns.
- **Drying Time: 7 days, Temperature:  $(23 \pm 2) ^\circ\text{C}$ , Humidity:  $(50 \pm 5)\%$ ,** followed by 72 hours in temperature of  $(40 \pm 20) ^\circ\text{C}$ .

- **Type of lamps: UVB lamps.**
- **Test Duration: according to clause (2.17).**

#### **4.17 Colour fastness to light (for interior use only):**

The paint shall show no darkening or other changes in appearance when subjected to 72 hours exposure for direct sun or any other light source according to clause (2.17).

#### **4.18 Gloss:**

A film of the paint when applied by 150 µm gap Block or Wire Bar applicator on gloss panels of 15 cm x 10 cm x 2 mm size shall have a specular gloss value not less than 80 for gloss enamel, and between 35 to 55 for semi gloss enamel when measured at 60° angle. The panels for the test shall be dried for 24 hours at  $(25 \pm 1)^\circ \text{C}$  and at a relative humidity of not more than 70%, according to clause (2.18).

#### **4.19 Keeping properties:**

The paint when stored under normal storage condition in shed at temperature not exceed  $(38 \pm 1)^\circ \text{C}$  in the original sealed container shall retain properties specified in this standard for a period of not less than 12 months.

### **5- SAMPLING :**

- 5.1 Take representative sample of the paint not less than 500 ml according to the methods mentioned in ISO 15528 “paints and varnishes and raw materials for paints and varnishes –sampling”.
- 5.2 Samples shall be prepared to tests according to the methods mentioned in ISO 1513 “paints and varnishes-examination and preparation of sampling for testing”.

### **6- METHODS OF TESTING :**

6.1 The following tests shall be carried out on the filled containers selected according to item 5.1 after carrying out the visual examination of the labeling information.

- 6.1.1 Visual examination
- 6.1.2 Determination of zinc oxide pigment
- 6.1.3 Determination of non – volatile content
- 6.1.4 Determination of color
- 6.1.5 Determination of fineness of grind
- 6.1.6 Determination of water content
- 6.1.7 Determination of lead content
- 6.1.8 Determination of flash point
- 6.1.9 Determination of surface drying time
- 6.1.10 Determination of appearance of dried film (finish)

- 6.1.11 Determination of flexibility and adhesion
- 6.1.12 Determination of scratch
- 6.1.13 Determination of water resistance
- 6.1.14 Determination of dry opacity
- 6.1.15 Determination of specular gloss
- 6.1.16 Determination of Colour fastness to light
- 6.1.17 Determination of Resistance to Accelerated Weathering

**7- PACKING :**

The paints shall be packed in suitable clean, dry and air-tight containers, the containers shall be filled as to have an ullage for 15% maximum. The allowed tolerance should be  $\pm$  2% of the content.

**8- LABELLING :**

Each container shall be legibly and indelibly marked in Arabic or both Arabic & English by the following information:

- The name and the type of the paint.
- The colour of the paint should be shown on the container
- The name of the manufacturer or his trade mark.
- Country of origin
- If the paint manufacturer is under license it should be mentioned
- Batch number (in English or Arabic)
- Date of production (month-Year)
- Volume in liter of the the paint in the container (in arabic and English)
- Application instruction
- Any warning information concerning the paint
- Warning : "Do not use this container for keeping food stuff"

## REFERENCES

## المراجع :

- Saudi Arabian Standard No. 472/2002 "Paints and varnishes- oil alkyd shiny and not shiny " Saudi Arabian Standards Organization  
- Part 1303 from US legalization of Consumer Products Commission to reduce lead content from 0.006% to 0.009

- المواصفة القياسية السعودية رقم ٤٧٢/٢٠٠٢ " الدهانات والورنيشات- دهانات الألكيد الزيتيه اللماعه وغير اللماعه"، الهيئة العربية السعودية للمواصفات والمقاييس  
- البند 1303 من التشريع الأمريكي الخاص بمفوضية حماية المستهلك الخاص بتعديل نسبة تركيز الرصاص في الأصباغ من 0.06% إلى 0.009%