



المواصفة القياسية الكويتية

KWS 19 Part 2 /2018

الأصباغ (الدهانات) المستحلبة
الجزء الثاني: الأصباغ (الدهانات) المستحلبة للأعمال
الخارجية أو الأعمال الداخلية الخارجية

Emulsion Paints
Part 2: Emulsion Paint for Exterior Use or Interior/ Exterior
Use

الهيئة العامة للصناعة
دولة الكويت

تقديم

تمثل إدارة المواصفات والمقاييس جهاز التقييس الوطني بدولة الكويت وهي عضو مؤسس في هيئة التقييس لدول مجلس التعاون لدول الخليج العربية وهي هيئة إقليمية تضم في عضويتها أجهزة التقييس الوطنية في الدول الأعضاء، ومن مهام الإدارة إعداد المواصفات القياسية واللوائح الفنية الكويتية بواسطة لجان فنية متخصصة.

قامت اللجنة الفنية بدراسة وتحديث المواصفة القياسية الكويتية رقم 2 KWS 19 part ، التعاريف والتصنيف والخصائص وبطاقة البيانات مع إدخال تعديلات فنية عليها وذلك وفق القرار الوزاري الصادر بشأنها

**Public Authority for Industry
Specifications and Standards Department**

Final Draft

8.3.2018

Emulsion Paints

Part 2: Emulsion Paints for Exterior Use

or Interior / Exterior Use

KSS No.19/1994

Emulsion Paints for Exterior or Interior / Exterior Uses

1) Scope

1.1 This Kuwaiti Standard is concerned with the requirements and Specifications and testing methods of emulsion paints for exterior uses or interior exterior uses and their Classifications, (as well as base paints) used as topcoat in the emulsion paints for Exterior or Interior Exterior uses.

2) Normative references:

- 2.1 GSO ISO 1513 – Paints and Varnishes – Examination and Preparation of test samples
- 2.2 GSO ISO 1514 - Paints and Varnishes – standard Panels for testing
- 2.3 GSO ISO 2808 Paints and Varnishes – determination of film thickness
- 2.4 GSO ISO 15528 Paints, varnishes and raw materials for paints and varnishes – Sampling
- 2.5 GSO ISO 3270 Paints and varnishes and their raw materials - Temperatures and humidities for conditioning and testing
- 2.6 GSO ISO 2811-1 Paints and Varnishes- determination of density – Part 1: pycnometer method.
- 2.7 GSO ISO 6504-3 Paints and varnishes - Determination of hiding power - Part 3: Determination of contrast ratio of light-coloured paints at a fixed spreading rate
- 2.8 GSO ISO 2884-2 Paints and varnishes - Determination of viscosity using rotary viscometers - Part 2: Disc or ball viscometer operated at a specified speed
- 2.9 GSO ISO 3251 Paints, varnishes and plastics - Determination of non-volatile-matter content
- 2.10 GSO ISO 2813 Paints and varnishes -- Determination of gloss value at 20 degrees, 60 degrees and 85 degrees
- 2.11 GSO ISO 9117-4 Paints and varnishes -- Drying tests -- Part 4: Test using a mechanical recorder
- 2.12 ASTM D2486 standard test methods for scrub resistance of wall paints.
- 2.13 GSO ISO 1524 Paints, varnishes and printing inks -- Determination of fineness of grind
- 2.14 GSO ISO 2812-4 Paints and varnishes - Determination of resistance to liquids - Part 4: Spotting methods
- 2.15 GSO ISO 3856-1 Paints and varnishes - Determination of "soluble" metal content - Part 1: Determination of lead content - Flame atomic absorption spectrometric method and dithizone spectrophotometric method
- 2.16 GSO ISO 16474-3 Paints and varnishes - Methods of exposure to laboratory light sources - Part 3: Fluorescent UV lamps
- 2.17 GSO ISO 11890-1 Paints and varnishes - Determination of volatile organic compound (VOC) content – Part 1: Difference method
- GSO ISO 11890-2 Paints and varnishes - Determination of volatile organic compound (VOC) content Part 2: Gas-chromatographic method

3) Classifications:

Emulsion paints for exterior and interior exterior use are classified into the following:

Class (A) – premium – matt – silk – semi gloss – gloss

Class (B) – medium – matt – silk

Note: requirements of medium (semi gloss or gloss) matches with requirements of premium for these classes.

All the above classes are divided into three types of bases, base (A) for light colors, base (B) for medium colors and base (C) for dark colours.

4) Terms & Definitions:

4.1 Emulsion

A mixture formed by the incorporated of two liquids which are normally immiscible. One liquid is dispersed in the other in the form of minute drops. If the droplets remain permanently dispersed the emulsion is said to be stable and certain compounds are added as stabilizers of their power to keep the droplets dispersed.

4.2 Emulsion for paints:

A dispersion of 2 or more organic monomers which are copolymerised and dispersed in water. The dispersed phase is in the form of minute drops. The droplets remain permanently dispersed. The emulsion is said to be stable and certain compound are added as stabilizers because of their power to keep the droplet dispersed.

4.3 Vehicle:

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

4.4 Binder:

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

4.5 Thinner:

Volatile liquids added to paints or varnishes to facilitate application and to aid penetration by lowering gather 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.

4.6 Pigment

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

4.7 Base

It is a semi-finished product which needs to be tinted to be a finished coloured product and it is classified as A base, B base, and C base depending on the required colour of final product.

4.8 Opacity

The ability of a coat of paint to obscure (hide) an underlying surface.

4.9 Drying time

The time which elapses between the application of a coat of paint and the attainment of a specified dry state.

4.10 Peeling (removal)

The failure which occurs due to the bulging of a dried layer of paint or varnish upon painting with another layer, and usually appears in the form of twists.

4.10 Lifting (bulging)

This is a failure which occurs in the paint or dried painted layer and usually appears in the form of wrinkles when painted with another layer above it.

5) Characteristics & Requirements

5.1 Composition:

The emulsion paint shall consist of pigments with suitable extenders in suitable proportion in a medium consisting of any suitable stable synthetic polymer emulsion in water with other suitable ingredients as may be necessary to produce a material so as to satisfy the requirements of this standard.

5.2 Application properties:

The substance should be applicable by a regular brush or roller or by spraying as recommended by the manufacturer (Technical Data Sheet TDS). The paint layer should not reveal any lumping, foam or rough protrusions of the paint film or any undesirable properties. Further, the thin paint layer should not result in any breakdown, softening or any deformity upon painting with another layer of a surface which has been painted earlier, after the lapse of 12 hours as a maximum of air drying.

5.3 Condition in the container:

The material shall have no evidence of biological growth, leivering, 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.

5.4 Odour:

The odour of the paint shall not be putrid or otherwise offensive or irritating before, during and after application. There shall be no residual odour after 24 hours of drying.

5.5 Resistance to biological growth:

The paint in the container shall not reveal any growth of fungi during the validity period stated on the container, taking into consideration the storage properties set under clause 5.6.

5.6 Storage properties:

The paint shall retain its properties in the original sealed container when kept away from direct sunlight for a period of 12 months without any skinning forming on the surface or thickening happening during this period. If there is any settled pigment, it shall be easily stirred.

5.7 Colour fastness to light:

The paints shall show no darkening or other changes in appearance when subjected to 72 hours exposure to direct sun or any other light source.

5.8 Appearance of dried film (finish):

When a film of the paint has dried for the specified drying period, it shall have, smooth, firmly adherent and substantially free from brush marks or sagging or wrinkling, and shall in no way be inferior as regards finish to a film prepared in the same way and the same time from the approved reference sample.

5.9 The tables below (table 1 to table 7) shows the specified requirements of class (premium, medium) of emulsion paints for exterior and interior/exterior use for white colour and different base type, as well as imported paints which are pre-coloured by country of origin according to colour shade and base type specified by customer.

Table (1): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

(Premium – Matt) صنف ممتاز – مطفاً				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.32	1.32	1.2	1.2
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	10	10	10	10
Gloss ISO 2813(at angle 60°)	0-5	0-5	0-5	0-5
Surface Dry Time - Minutes ISO 9117-4 at film thickness 100 µm (Maximum)	30	30	30	30
Full Dry / Dry to hardness - Hrs. ISO 9117-4 at film thickness 100 µm (Maximum)	3	3	3	3
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1500 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	50	50	50	50
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4 (for 4 hrs.)	Pass	Pass	Pass	Pass
Artificial weathering ISO 16474-3 (at 360 hrs.)	pass	pass	pass	pass
Non Volatile Material - wt.% ISO 3251	45-57	45-57	40-57	40-57
Volatile Organic Compound** - g/L ISO 11890-1/ ISO 11890-2 (Maximum)	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

Table (2): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

(Premium – Silk) صنف ممتاز – ربع لمعة				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.1	1.1	1.1	1.1
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	5	5	5	5
Gloss ISO 2813(at angle 60°)	5-15	5-15	5-15	5-15
Surface Dry Time - Minutes ISO 9117- 4 at film thickness 100 µm (Maximum)	45	45	45	45
Full Dry / Dry to hardness - Hrs. ISO 9117- 4 at film thickness 100 µm (Maximum)	4	4	4	4
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1500 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	50	50	50	50
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4(for 4 hrs.)	pass	pass	pass	pass
Artificial weathering ISO 16474-3 (at 360 hrs.)	Pass	Pass	Pass	Pass
Non Volatile Material - wt.% ISO 3251	45-55	45-55	40-55	40-55
Volatile Organic Compound ** - g/L ISO 11890 1 / ISO 11890 2	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

Table (3): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

(Premium – Semi Gloss) صنف ممتاز – نص لمعة				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.1	1.1	1.1	1.1
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	5	5	5	5
Gloss ISO 2813(at angle 60°)	15-40	15-40	15-40	15-40
Surface Dry Time - Minutes ISO 9117- 4 at film thickness 100 µm (Maximum)	60	60	60	60
Full Dry / Dry to hardness - Hrs. ISO 9117- 4 at film thickness 100 µm (Maximum)	5	5	5	5
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1500 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	30	30	30	30
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4(for 4 hrs.)	Pass	Pass	Pass	Pass
Artificial weathering ISO 16474-3(at 360 hrs.)	pass	pass	pass	pass
Non Volatile Material - wt.% ISO 3251	40-50	40-50	40-50	40-50
Volatile Organic Compound **- g/L ISO 11890-1/ ISO 11890-2 (Maximum)	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

Table (4): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

صنف ممتاز – لمعة (Premium - Gloss)				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.1	1.1	1.0	1.0
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	5	5	5	5
Gloss ISO 2813(at angle 60°) (Minimum)	55	55	55	55
Surface Dry Time - Minutes ISO 9117- 4 at film thickness 100 µm (Maximum)	60	60	60	60
Full Dry / Dry to hardness - Hrs. ISO 9117- 4 at film thickness 100 µm (Maximum)	5	5	5	5
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1500 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	30	30	30	30
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4(for 4 hrs.)	Pass	Pass	Pass	Pass
Artificial weathering ISO 16474-3 (at 360 hrs.)	pass	pass	pass	pass
Non Volatile Material - wt.% ISO 3251	40-50	40-50	40-50	40-50
Volatile Organic Compound **- g/L ISO 11890-1/ ISO 11890-2 (Maximum)	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

Table (5): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

(Medium – Matt) متوسط – مطفاً				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.32	1.32	1.32	1.32
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	10	10	10	10
Gloss ISO 2813(at angle 60°)	0-5	0-5	0-5	0-5
Surface Dry Time - Minutes ISO 9117- 4 at film thickness 100 µm (Maximum)	30	30	30	30
Full Dry / Dry to hardness - Hrs. ISO 9117- 4 at film thickness 100 µm (Maximum)	3	3	3	3
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1200 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	50	50	50	50
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4(for 4 hrs.)	Pass	Pass	Pass	Pass
Artificial weathering ISO 16474-3 (at 360 hrs.)	pass	pass	pass	Pass
Non Volatile Material - wt.% ISO 3251	45-57	45-57	40-57	40-57
Volatile Organic Compound **- g/L ISO 11890-1/ ISO 11890-2 (Maximum)	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

Table (6): Exterior or Interior Exterior Emulsion Paints**White colour/ and base of all types**

(Medium –Silk) متوسط – ربع لمعة				
Test Description	اللون الأبيض (White)	أساس أ (Base A)	أساس ب (Base B)	أساس ج (Base C)
Specific gravity ISO 2811-1 (Minimum)	1.1	1.1	1.1	1.1
Opacity - % ISO 6504-3 (Minimum)	90	90	80	NA
Viscosity - poise ISO 2884-2 (Minimum)	5	5	5	5
Gloss ISO 2813(at angle 60°)	5-15	5-15	5-15	5-15
Surface Dry Time - Minutes ISO 9117- 4 at film thickness 100 µm (Maximum)	45	45	45	45
Full Dry / Dry to hardness - Hrs. ISO 9117- 4 at film thickness 100 µm (Maximum)	4	4	4	4
Scrub resistance * ASTM D2486 at film thickness 100 µm (Minimum 1200 cycles)	pass	pass	pass	pass
Fineness of Grind - Micron ISO 1524 (Maximum)	50	50	50	50
Alkali Resistance ISO 2812-4 (for 2 hrs.)	Pass	Pass	Pass	Pass
Lead - wt.% ISO 3856-1 (Maximum)	0.06	0.06	0.06	0.06
Water Resistance ISO 2812-4(for 4 hrs.)	Pass	Pass	Pass	Pass
Artificial weathering ISO 16474-3 (at 360 hrs.)	pass	pass	pass	pass
Non Volatile Material - wt.% ISO 3251	40-55	40-55	40-55	40-55
Volatile Organic Compound **- g/L ISO 11890-1/ ISO 11890-2 (Maximum)	50	50	50	50

*For any test sample the exposed area should not exceed (Maximum 5mm) along the same direction of the brush mark.

**In case the paint is indicated by the customer for interior exterior use the VOC test is applied

6) Sampling:

- 6.1 A sample representing the paint consignment of not less than 4 litres or 1 gallon shall be taken according to the method stipulated under clause 2.4
- 6.2 The samples shall be prepared for testing according to clause 2.1 & 2.2

7) Packing:

- 7.1 The paints shall be packed in suitable, clean, dry and tightly sealed containers, and inactive to the contents whereby the free space from the full level is 15% as a maximum.
- 7.2 A variation in the content by $\pm 2\%$ shall be allowed.

8) Labelling:

The following details shall be placed on each container in Arabic language or in Arabic and English languages, in a manner difficult to be removed.

- 8.1 Name and type of the paint, its classification according to clause 3 and the type of the base used whether A, B, or C for each class.
- 8.2 Name of the manufacturer or its trademark.
- 8.3 Country of origin
- 8.4 If the paints are manufactured according to a license, this detail shall be stated.
- 8.5 Production batch number
- 8.6 Production date (month, year), expiry date or validity period from the production date.
- 8.7 Net volume in litres or its equivalent.
- 8.8 Method of use and maximum limit for the dilution percentage whereby the paint retains its properties.
- 8.9 Any warning details relevant to this paint (example: may cause allergy upon contacting the skin)
- 8.10 Warning: it is prohibited to use containers to store foodstuff
- 8.11 Other clarification details (for example storage conditions, it should be stored in the shade, as per the technical and safety data sheet of the substance TDS).
- 8.12 Place the international logo of the United Nations Program which demonstrates hazard of paint.
- 8.13 Indicate whether the product conforms with this specification standard.

الجهات التي اشتركت في وضع المواصفات القياسية

- الهيئة العامة للصناعة - إدارة المواصفات والمقاييس - إدارة مختبرات الجودة.
- وزارة الأشغال العامة/ المركز الحكومي للأبحاث والبناء.
- المؤسسة العامة للرعاية السكنية.
- شركة أصباغ جي تي سي المحدودة GTC.
- أصباغ ناشونال NATIONAL
- شركة همبل للأصباغ البحرية - الكويت HEMPEL.
- شركة سايبس SIPES.
- شركة أصباغ ام بي سي MPC
- شركة أصباغ كي بي سي KPC
- شركة أصباغ جوتن JOTUN