

**SAUDI STANDARDS, METROLOGY AND
QUALITY ORGANIZATION**

Project No. 33388 /2023
Acrylic Thermal Reflective Coating

ICS 87.040.00

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Acrylic Thermal Reflective Coating

1. SCOPE AND FIELD OF APPLICATION

This standard specifies ready-mix white or light colors protective and decorative water-borne thermal reflective coating based on 100% acrylic Polymer with sun light reflection and waterproofing properties. It is suitable for exterior on roofs and walls, and it can be used on masonry surfaces, wood, metal, concrete, tiles, and other surfaces.

2. COMPLEMENTARY REFERENCES

- 2.1 SASO ISO4618:2014 “paints and varnishes - terms and definitions ”
- 2.2 SASO/ISO15528:2013 “Paints and Varnishes – Sampling”.
- 2.3 SASO ISO 1513:2008 “Paints and Varnishes – Examination and Preparation of samples for Testing.
- 2.4 SASO ISO 3251:2008 Paint and Varnishes-Determination of Non-Volatile matter of Paints, Varnishes and Binder for Paint and Varnishes”.
- 2.5 SASO ISO 3668:2008 “Paint and Varnishes – Visual Comparison of Color of Paints”.
- 2.6 SASO 2194:2003 "Paints and Varnishes – Test Methods for Consistency of Paints using the Stormer Viscometer."
- 2.7 SASO 779/1994 “Paints & Varnishes – Determination of Fineness of Grind”.
- 2.8 SASO ISO 9117-4:2013"Paint and Varnishes – Drying test – Part 4: Test using a mechanical recorder”.
- 2.9 SASO ISO 6503:2006 “Paint and Varnishes – Determination of Total Lead – Flame Atomic Absorption Spectrometric Method”.
- 2.10 SASO ISO 7783:2014 “Paint and Varnishes – Determination of Water Vapor Transmission Properties – Cup Method”.
- 2.12 SASO ISO 1674-3:2013 "Paint and Varnishes - Method of Exposure to Laboratory Light Sources – Part 3: Fluorescence UV Lamps".
- 2.13 SASO ISO 22196:2014 Measurement of Anti-Bacterial activity on Plastics and other Non-Porous Surfaces.
- 2.13 SASO ISO 1519:2011 “Paint and Varnishes – Bend Test (Cylindrical Mandrel)”.
- 2.15 SASO ASTM C1549:2014 Standard Practice for Laboratory Soiling and Weathering of Roofing Materials to Simulate Effects of Natural Exposure on Solar Reflectance and Thermal Emittance.
- 2.16 SASO ASTM C1371:2015 “Standard Test Method for Determination of Thermal Emittance of Materials near Room Temperature using Portable Emission meters.

2.17 Water Absorption ASTM D570 Measurement of Water Absorption and determination of the relative rate of absorption of water by plastics when immersed.

3. DEFINITIONS

- 3.1 **Reflective Coating:** A non-bituminous coating labeled and formulated for application for exterior on roofs and walls (on masonry surfaces, wood, metal, concrete, tiles, and other surfaces) for the primary purpose of reflecting ultraviolet light- Infrared light, or reflecting solar radiation.
- 3.2 **Pigments : colouring material,** generally in the form of fine particles, which is practically insoluble in the **medium** and which is used because of its optical, protective and/or decorative properties.
- 3.3 **Vehicle:** The vehicle shall consist of 100 % acrylic water-based polymer.

4. Requirements

- 4.1 **Condition in container**
The paint shall be free from grits, lumps, and skin and shall show no settling or caking. The paint shall be readily mixed manually to a homogeneous state.
- 4.2 **Non-Volatile Matter**
The non-volatile content of the paint shall not be less than 60 % by weight when tested as per clause 2.4.
- 4.3 **Color**
The color of the paint shall be close to the approved reference standard sample or the color written on the package when tested as per 2.5.
- 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 a viscosity between 90 and 120 Krebs Unit (KU) at $23 \pm 2^{\circ}\text{C}$ when tested as per 2.6.
- 4.5 **Fineness of grind**

The fineness of grind of the paint shall not be more than 30 μm when tested as per 2.7.

4.4 Application Properties

The paint shall have satisfactory application properties when applied as by manufacturer's recommendations and shall give an opaque film free from surface defects such as sagging, running, non-levelling, streaking etc.

4.5 Drying time

The paint shall dry as follow when apply at $(23\pm 2)^{\circ}\text{C}$ and a relative humidity (50 ± 5) as per clause 2.8.

- 1- Surface dry time not more than 4 hours.
- 2- Over coating interval time not less than 16 hours.
- 3- Hard dry shall become in not more than 7 days.

4.6 Lead Content

The lead content of the paint shall be 0.009 % for the total mass of the paint when tested as per clause 2.9.

4.7 Flexibility

A paint film dry film thickness as per manufacture recommendation and after curing shall withstand 6 mm diameter mandrel bending test without cracking, chipping or flaking and shall remain firmly adherent to the test panel.

4.8 Water Vapor Permeability

When tested for water vapor transmission rate, the paint film shall not exceed the maximum 100 grams per square meter per day 250 μm dry film when tested as per 2.10.

4.9 Accelerated Weathering

A film of the paint shall show no blistering, chalking, significant color fading and other surface defects after exposure for 1000 hours for all gloss finishes. The change in gloss shall be less than 10%. when tested as per clause 2.11.

4.10 Anti-fungal (when declared)

The paint film shall not show fungus growth after incubation at 25°C under 85 to 90% relative humidity for 4 weeks when tested as per 2.12.

4.11 Elongation at Break

The paint film with a dry film thickness of 1 mm dried for 28 days at $23 \pm 2^{\circ}\text{C}$ and a relative humidity $50 \pm 5\%$ shall give a minimum of 200% elongation when tested as per 2.10.

4.13 Solar Reflectance

The coating with recommended DFT (500 mic.) and after curing when tested as per clause 2.15 shall show Solar Reflectance not less than 80%.

4.14 Thermal Emittance

The coating with the recommended DFT (500 mic.) and after curing when tested as per clause 2.16 shall show thermal emittance not less than 85%.

4.15 Water absorption

The coating with the recommended DFT (500 mic.) and after curing when tested as per clause 2.17 shall show less than 2% difference.

5. Storage Properties

The paint when stored at a temperature of 5°C to 25°C in the original sealed containers shall retain the properties specified in this standard for a period of not less than 12 months.

6 Sampling

A representative sample of not less than 1 liter according to item 2/2 shall be taken from the paint in accordance with Saudi Standard mentioned in 2/3.

7. Packaging

The paint shall be packed in clean, dry, suitable containers. The containers shall be so filled as to leave an ullage of 15% maximum.

8. Marking (Labeling)

Each container shall be legibly and indelibly marked with the following information in Arabic or in both Arabic and English.

- 8/1 Name, type and color of the paint.
- 8/2 Name of the manufacturer and / or the trademark.
- 8/3 Country of Origin and weather manufactured under license to a named brand / manufacturer.
- 8/4 Batch number.
- 8/5 Date of production in month and year.
- 8/6 Mass and / or volume of the paint.
- 8/7 Application instructions.
- 8/8 Warning relating to flammability and toxicity where required.

10. REFERENCES

1. GS-11 / 2008 - Green Seal Environmental Standard for Paints and Coatings.
2. SASO ASTM D 6083 / 2007 – Specification for Liquid applied Acrylic Coating used in Roofing.

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