FOREWORD

Saudi Standards, Metrology and Quality Organization (SASO) has prepared the Saudi Standard " THERMAL REFLECTIVE COATING " based on relevant ADMO, International and National foreign Standards and references.
PAINTS AND VARNISHES
THERMAL REFLECTIVE COATING

1. SCOPE AND FIELD OF APPLICATION

This standard specifies ready-mix protective and decorative air drying thermal reflective coating based on modified acrylic water based coating with microsphere, glass and ceramic material to improve thermal insulation properties. It is suitable for both exterior use on masonry surfaces, suitable primed wood, metal 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”.
2.4 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 9117-4:2013 “Paint and Varnishes – Drying test – Part 4: Test using a mechanical recorder”.
2.7 SASO ISO 1519:2011 “Paint and Varnishes – Bend Test (Cylindrical Mandrel)”.
2.8 SASO ISO 3668:2008 “Paint and Varnishes – Visual Comparison of Color of Paints”.
2.9 SASO ISO 2813:2014 “Paints and Varnishes - Determination of gloss value at 20 degrees, 60 degrees and 85 degrees.”
2.10 SASO ISO 4624:2006 "Paints and Varnishes - Pull-off Test for Adhesion"

2.11 SASO ISO 1674-3:2013 "Paint and Varnishes - Method of Exposure to Laboratory Light Sources – Part 3: Fluorescence UV Lamps".


3. DEFINITIONS

3.1 Ceramic Microsphere: Ultrafine Ceramic Microsphere material in the form of micro hollow sphere.

3.2 Reflective Roof Coating: A non-bituminous coating labeled and formulated for application to roofs for the primary purpose of reflecting ultraviolet light or reflecting solar radiation.

3.3 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.

3.4 Vehicle: The vehicle shall consist of modified water based acrylic resin.

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 70 % 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 write on the package when tested as per clause 2.5.

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, levelling, streaking etc. when tested as per clause 2.6.

4.5 **Drying time**

The paint shall dry as follow when apply at (23±2°C and a relative humidity (50±5)

1- surface dry in not more than 4 hour hours
2- hard dry and shall become in not more than 7 days when tested as per clause 2.5.

4.6 **Lead Content**

The lead content of the paint shall not exceed 0.009% of the total mass of the paint when tested as per clause 2.6.

4.7 **Flexibility and adhesion**

A paint film with 500 microns DFT 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 when tested as per clause 2.7.

4.8 **Water Vapor Permeability**

The coating shall be prepared shall show permeability not more than 40 perm. when tested as per clause 2.12.

4.9 **Flame spread**

The coating with 500 microns DFT and after hard dry when tested as per clause 2.22 shall be flame spread class A. when tested as per clause 2.11.

4.10 **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 Gloss finish, 500 hours to Semi-Gloss and Matt finish. The change in gloss shall be less than 10% when tested as per clause 2.11.

4.11 **Fungus Growth** (when declared )

The coating with 150 microns DFT and after curing shall show no microbial growth. when tested as per clause 2.17.

4.12 **Thermal Insulation Properties**

The coating with 250 micron DFT and after curing when tested as per clause 2.14 shall show the following thermal insulation properties:

- Thermal Conductivity (K – Value) : 0.092 W/MK (Max.)
4.13 **Solar Reflectance**

The coating with recommended DFT and after curing when tested as per clause 2.15 show the following solar reflectance values as mentioned in table 1 & 2.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Performance Specification</th>
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<tbody>
<tr>
<td></td>
<td>Light Tones</td>
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<tr>
<td>Solar Reflectance for walls</td>
<td>Greater than or equal to 0.65</td>
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<td>Low Slope Roofs</td>
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<tr>
<td>Initial Solar Reflectance for roofs</td>
<td>Greater than or equal to 0.65</td>
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<tr>
<td>Maintenance of Solar Reflectance</td>
<td>Greater than or equal to 0.50 (Three years after installation under normal conditions)</td>
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</tbody>
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4.14 **Thermal Emittance**

The coating with the recommended DFT and after curing when tested as per clause 2.16 shall show thermal emittance not less than 75%.

5. **Storage Properties**

The paint when stored at a temperature of 5°C to 38 °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- **Test Methods:**

The following tests shall be carried out on samples according to item (2).

1. Examination of the apparent state of paint in the container (packing and data)
2. Non-volatile content
3. Drying time
4. Lead content
5. Water absorption
6. Strength of flexibility and adhesion
7. Properties of fire
8. Accelerated weathering
9. Determination of resistance to microorganisms
10. Thermal properties
11. Reflect sunlight
12. Thermal emission

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