

Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

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DONGGUAN OUYAXUAN DECORATIVE BUILDING MATERIALS LTD.
ROOM 101, BUILDING 1, NO. 27, HENGLONG ROAD, DAOJIAO TOWN, DONGGUAN CITY

Sample Description : Silicon-free Artificial Stone
Manufacturer : Dongguan Ouyaxuan Decorative Building Materials Ltd.
Supplier : Dongguan Ouyaxuan Decorative Building Materials Ltd.

Source of Sample : SENT BY CLIENT.
Sample Receiving Date : DEC. 09, 2024
Testing Period : DEC. 09, 2024 TO FEB. 25, 2025

| Test Requested | Result |
|---|------------|
| Silicon (Si) | See Result |
| Halogen | See Result |
| Antimicrobial activity test | See Result |
| Antifungal activity test | See Result |
| High Temperature Resistance | See Result |
| Stain Resistance Test | See Result |
| Chemical Resistance Test | See Result |
| Modulus of Rupture | See Result |
| Compressive Strength | See Result |
| Flexural Strength | See Result |
| Rupture Energy | See Result |
| Point Impact | See Result |
| Absorption by Weight and Density | See Result |
| Abrasion Resistance | See Result |
| Mohs Scratch Hardness | See Result |
| Radioactivity | See Result |
| Linear Thermal Expansion Coefficient | See Result |
| ASTM E84-2023d Standard Test Method for Surface Burning Characteristics of Building Materials | See Result |

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Melody Zhang



Melody Zhang
Authorized Signatory



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Test Conducted

Test Part Description

| SN ID | Sample No. | SGS Sample ID | Description |
|-------|------------|-------------------------|-------------|
| SN1 | A1 | SHA24-0282400-0001.C001 | White solid |

Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) “-“ = Not Regulated

Silicon (Si)

Test Method: With reference to ASTM D 4004-06(2017), analysis was performed by ICP-OES.

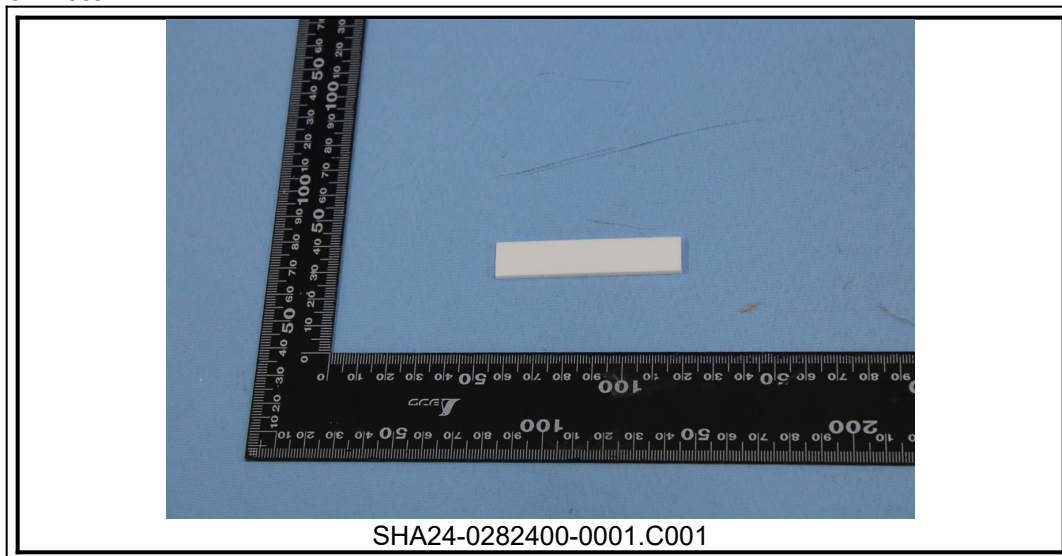
| Test Item(s) | Unit(s) | MDL | A1 |
|--------------|---------|-----|-----|
| Silicon (Si) | mg/kg | 50 | 148 |

Halogen

Test Method: With reference to EN 14582:2016, analysis was performed by IC.

| Test Item(s) | Unit(s) | MDL | A1 |
|--------------|---------|-----|----|
| Fluorine(F) | mg/kg | 20 | ND |
| Chlorine(Cl) | mg/kg | 50 | ND |
| Bromine(Br) | mg/kg | 50 | ND |
| Iodine(I) | mg/kg | 50 | ND |

Sample Photo:



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Sample Description:

| Sample No. | SGS Sample ID | Description |
|------------|--------------------|---------------|
| 1 | ASH24-0090033-0001 | sample in bag |
| 2 | ASH24-0090033-0002 | sample in bag |

Test Requested: Selected test(s) as requested by applicant:Antimicrobial activity test

Test Method: ASTM E 2180-24 Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials

ASH24-0090033-0001

| Test organism(s) | Escherichia coli ATCC 8739 |
|---|----------------------------|
| Test inoculum (CFU/mL) | 2.1×10^6 |
| Control Sample-0 h (CFU/cm ²)* | 1.2×10^5 |
| Control Sample-24 h (CFU/cm ²)* | 1.2×10^6 |
| Treated sample-24 h(CFU/cm ²)* | 7.4×10^5 |
| Reduction (%) | 38.3 |

Notes:

The control sample is plastic film without antimicrobial activity, provided by SGS laboratory.

*expressed as the antilog of the geometric mean of the recovered number of organisms.

Sterilization of treated test specimens: Sterilized by wiping with 75 % ethanol resolved in water.

Test Requested: Selected test(s) as requested by applicant: Antifungal activity test

Test Method: ASTM G 21-15(2021)e1 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

ASH24-0090033-0002

| Test organism(s) | Concentration of spores (spores /mL) | Observed growth rating on specimens(after 28 days) |
|------------------|--------------------------------------|--|
| *Test organism | 1.0×10^6 | 0** |

Notes:

1.*Test organism: Aspergillus brasiliensis ATCC 9642, Talaromyces pinophilus ATCC 11797, Chaetomium globosum ATCC 6205, Trichoderma virens ATCC 9645, Aureobasidium pullulans ATCC 15233

Aspergillus brasiliensis is historically known as A.niger.

Talaromyces pinophilus is historically known as P.pinophilum.

Trichoderma virens is historically known as Gliocladium virens.

2.According to ASTM G 21-15(2021)e1 Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi, observed fungi growth rating on the specimens include:

0-None

1-Traces of growth (less than 10%)

2-Light growth (10 to 30%)

3-Medium growth (30 to 60%)

4-Heavy growth (60% to complete coverage)

3.** The microscope(50 X) was used to confirm the observation.

4.Test surface: Bright surface.



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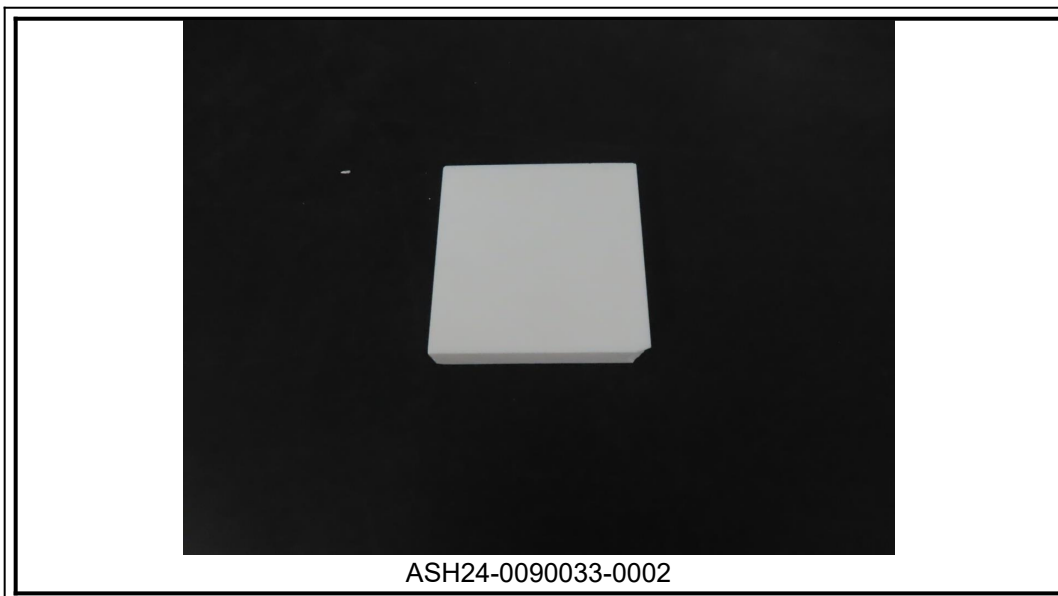
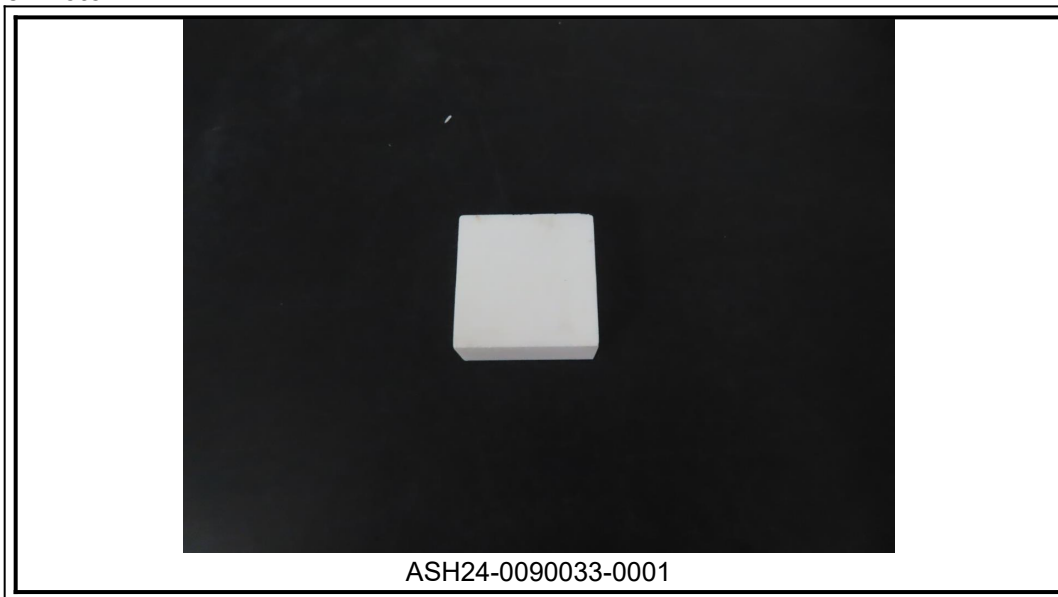
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Sample Photo:



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Test Item: High Temperature Resistance

Test Method: With Reference to ANSI NEMA LD 3-2005 Section 3.6 Hot Oil Method

Test Condition:

Specimen: 100mm×100mm×20.0mm, 3pcs

Test temperature: 180°C

Contact time: 20min

Cooling time: 24h

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | Test Result |
|-----------------------------|--------------|
| High Temperature Resistance | a: No effect |

Note:

- No effect-no change in color or surface finish.
- Slight effect-a change in color or surface finish only visible at certain angles or directions.
- Moderate effect-a change in color or surface finish visible from all angles and directions, but does not appreciably alter the original condition of the specimen.
- Severe effect-a change in color or surface finish which obviously and markedly alters the original condition of the specimen.



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Test Item: Stain Resistance Test

Test Method: With Reference to IAPMO/ANSI Z124.6-2007 Section 5.2

Test Condition:

Specimen: 100mm×100mm×20.0mm, 10pcs

Testing face: Front view

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | | Contact Time | Test Result | |
|---|---------------------------------------|--------------|-------------|-----------|
| | | | Covered | Uncovered |
| Stain Resistance Test | Black Crayon | 16h | Rating 1 | Rating 1 |
| | Black Liquid Shoe Polish | | Rating 1 | Rating 1 |
| | Blue Washable Ink | | Rating 1 | Rating 1 |
| | Gentian Violet Solution | | Rating 2 | Rating 2 |
| | Beet Juice | | Rating 1 | Rating 1 |
| | Grape Juice | | Rating 1 | Rating 1 |
| | Lipstick (contrasting color) | | Rating 1 | Rating 1 |
| | Hair Dye (contrasting color) | | Rating 2 | Rating 2 |
| | Iodine Solution (1% alcohol solution) | | Rating 2 | Rating 2 |
| | Wet Tea Bag | | Rating 1 | Rating 1 |
| Sum of all the individual strain rating | | | 26 | |

Rating code:

| Numerical rating | Description |
|------------------|--|
| 1 | Non staining |
| 2 | Removable by alcohol or naphtha |
| 3 | Removable by first application of standard scouring powder |
| 4 | Removable by two standard scouring powder |
| 5 | Stain remaining after the aforementioned cleanings |



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Test Item: Chemical Resistance Test

Test Method: With Reference to IAPMO/ANSI Z124.6-2007 Section 5.5

Test Condition:

Specimen: 100mm×100mm×20.0mm, 15pcs

Testing face: Front view

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | | Contact Time | Test Result | |
|-----------------------|--|--------------|-------------|------------|
| | | | Covered | Uncovered |
| Stain Resistance Test | Naphtha | 16h | Unaffected | Unaffected |
| | Ethyl alcohol | | Unaffected | Unaffected |
| | Amyl acetate | | Unaffected | Unaffected |
| | 1 part commercial house ammonia, solution, 9 parts water by volume | | Unaffected | Unaffected |
| | Citric acid, 10% water solution | | Unaffected | Unaffected |
| | Urea, 6.0% water solution | | Unaffected | Unaffected |
| | Hydrogen peroxide solution, 3% water solution | | Unaffected | Unaffected |
| | Concentrated sodium hypochlorite solution | | Unaffected | Unaffected |
| | Toluene | | Unaffected | Unaffected |
| | Ethyl acetate | | Unaffected | Unaffected |
| | Lye solution, (1 to 2% water solution) | | Unaffected | Unaffected |
| | Acetone | | Unaffected | Unaffected |
| | Trisodium phosphate, (5 parts TSP to 95 parts water by weight) | | Unaffected | Unaffected |
| | Vinegar | | Unaffected | Unaffected |
| | Pine oil | | Unaffected | Unaffected |



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Test Item: Modulus of Rupture

Test Method: ASTM C99/C99M-24

Test Condition:

Specimen: 200mm×100mm×60.0mm, 10pcs (5pcs for each condition)

Dry condition: Dry at 60°C for 48 hours to constant weight

Wet condition: Immerse in water at 22°C for 48h

Support span: 180mm

Test speed: 5000N/min

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | | Test Result | | | | | |
|--------------------------|---------------|------------------|------|------|------|------|---------------|
| | | Individual value | | | | | Average value |
| Modulus of Rupture (MPa) | Dry condition | 19.9 | 21.2 | 17.4 | 17.9 | 21.5 | 19.6 |
| | Wet condition | 30.4 | 31.8 | 35.5 | 34.9 | 28.2 | 32.2 |



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Test Item: Compressive Strength

Test Method: ASTM C170/C170M - 24a

Test Condition:

Specimen: 50mm×50mm×50.0mm, 10pcs, 5pcs for each condition

Dry condition: Dry at 60°C for 48 hours to constant weight

Wet condition: Immerse in water at 22°C for 48h

Test speed: 0.5 MPa/s

Product type: Quartz

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | | Test Result | | | | | | |
|----------------------------|-----|------------------|-----|------|------|------|---------------|--------------------|
| | | Individual Value | | | | | Average Value | Standard Deviation |
| Compressive Strength (MPa) | Dry | 112 | 110 | 99.4 | 99.8 | 101 | 104 | 6.1 |
| | Wet | 125 | 105 | 94.7 | 118 | 99.4 | 108 | 12.7 |



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Test Item: Flexural Strength

Test Method: ASTM C880/C880M-24

Test Condition:

Specimen: 350mm×100mm×30.0mm, 10pcs, 5pcs for each condition

Dry condition: Dry at 60°C for 48 hours to constant weight

Wet condition: Immerse in water at 22°C for 48h

Test speed: 4MPa/min

Product type: Quartz

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | | Test Result | | | | | | |
|-------------------------|-----|------------------|------|------|------|------|---------------|--------------------|
| | | Individual Value | | | | | Average Value | Standard Deviation |
| Flexural Strength (MPa) | Dry | 15.6 | 13.6 | 12.9 | 12.5 | 12.1 | 13.3 | 1.4 |
| | Wet | 26.8 | 23.2 | 23.7 | 29.1 | 25.7 | 25.7 | 2.4 |



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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

Page: 11 of 24

Test Item: Rupture Energy

Test Method: EN 14158:2004

Test Condition:

Specimen: 200mm×200mm×14.5mm, 6pcs (1pc as control specimen)

Treatment condition: Dry at 70°C to constant weight

Initial height: 100mm

Steel ball: 1Kg

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | Test Result | | | | | |
|--------------------|------------------|------|------|------|------|---------------|
| | Individual Value | | | | | Average Value |
| Rupture Energy (J) | 2.84 | 6.32 | 4.80 | 7.22 | 5.22 | 5.28 |



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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

Page: 12 of 24

Test Item: Point Impact

Test Method: With Reference to IAPMO/ANSI Z124.6-2007 Section 4.2.1

Test Condition:

Specimen: 810mm×660mm×14.6mm, 2pcs

Steel ball: 0.225kg

Height: 610mm

Test Face: Front View

Lab Environmental Condition: (23±2)°C, (50±5)%RH

Test Result:

| Test Item | Test Result |
|--------------|-------------|
| Point Impact | Unbroken |



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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

Page: 13 of 24

Test Item: Absorption by Weight and Density*

Sample Description: See photo

Test Method: Refer to ASTM C97/C97M-18

Test Condition:

Specimen: 50mm×50mm×15mm, 5pcs

Condition: Dry in an oven at (60±2)°C for 48h → Cool them to room temperature in a desiccator →

Immerse in distilled water at (22±2)°C for 48h

Test Result:

| Specimen No. | 1 | 2 | 3 | 4 | 5 |
|---|------|------|------|------|------|
| Absorption by weight (%) | 0.02 | 0.02 | 0.05 | 0.04 | 0.07 |
| Mean water absorption (%) | 0.04 | | | | |
| Standard deviation (%) | 0.03 | | | | |
| Density (kg/m ³) | 2127 | 2130 | 2126 | 2127 | 2127 |
| Mean density (kg/m ³) | 2127 | | | | |
| Standard deviation (kg/m ³) | 2 | | | | |

*Test project was carried out SGS-CSTC Standards Technical Services Co., Ltd. Xiamen Branch Testing Center.



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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

Page: 14 of 24

Test Item: Abrasion Resistance*

Sample Description: See photo

Test Method: Refer to ASTM C241/C241M-21

Test Condition:

Specimen: 50mm×50mm×15mm, 3pcs

Condition: Dry in an oven at (60±2)°C for 48h → Cool them to room temperature in a desiccator →

Abrasion resistance test → Immerse in distilled water at (22±2)°C for 1h

Load: 2000g

Revolutions: 225

Test surface: polished

Test Result:

| Specimen No. | 1 | 2 | 3 |
|--|----|----|----|
| Abrasive hardness value, H _a | 21 | 21 | 27 |
| Mean abrasive hardness value, H _a | 23 | | |

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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

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Test Item: Mohs Scratch Hardness*

Sample Description: See photo

Test Method: Refer to ASTM C1895-20

Test Condition:

Specimen: 300mm×300mm×15mm, 1pc

Test surface: polished

Test Result:

| Test Point No. | 1 | 2 | 3 |
|---|---|---|---|
| No scratch (highest numerical hardness point) | 3 | 3 | 3 |
| Scratch (lowest numerical hardness point) | 4 | 4 | 4 |

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Test Report

No.: SHHL241207290201SD

Date: FEB. 25, 2025

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Test Item: Radioactivity *

Sample Description: See photo

Test Method: GB 6566-2010

Test Condition:

Specimen: Powder, made from original sample

Test Result:

| Test items | Requirement in GB 6566-2010 (Class A) | Test Results |
|--------------------------------------|--|--------------|
| Internal exposure index I_{Ra} | ≤ 1.0 | < 0.1 |
| External exposure index I_{γ} | ≤ 1.3 | < 0.1 |

Specific activity of the nuclides

| Nuclides | Units | Specific activity |
|----------|-------|-------------------|
| Ra-226 | Bq/kg | 1.4 |
| Th-232 | | 1.2 |
| K-40 | | 0.0 |

Note: The sample complies with requirements of GB 6566-2010 Class A decorative materials.

Requirements of GB 6566-2010:

| | |
|-----------------------------|---|
| Main materials for building | Comply with $I_{Ra} \leq 1.0$, $I_{\gamma} \leq 1.0$ In case of hole rate $> 25\%$, it shall comply with $I_{Ra} \leq 1.0$, $I_{\gamma} \leq 1.3$ |
| Decorative materials | Class A: Comply with $I_{Ra} \leq 1.0$, $I_{\gamma} \leq 1.3$ |
| | Class B: Comply with $I_{Ra} \leq 1.3$, $I_{\gamma} \leq 1.9$, but not comply with the requirement of Class A |
| | Class C: Comply with $I_{\gamma} \leq 2.8$, but not comply with the requirements of Class A & Class B |

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Test Report

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Date: FEB. 25, 2025

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Test Item: Linear Thermal Expansion Coefficient*

Sample Description: See photo

Test Method: Refer to ASTM C531-18

Test Condition:

Specimen: 127mm×13mm×10mm, 4pcs

High temperature: 100°C, 16h

Low temperature: 23°C, 16h

Test Result:

| Specimen No. | 1 | 2 | 3 | 4 |
|---|------|------|------|------|
| Linear thermal expansion coefficient ($10^{-6}/^{\circ}\text{C}$) | 35.7 | 39.8 | 31.6 | 23.5 |
| Mean value ($10^{-6}/^{\circ}\text{C}$) | 32.6 | | | |

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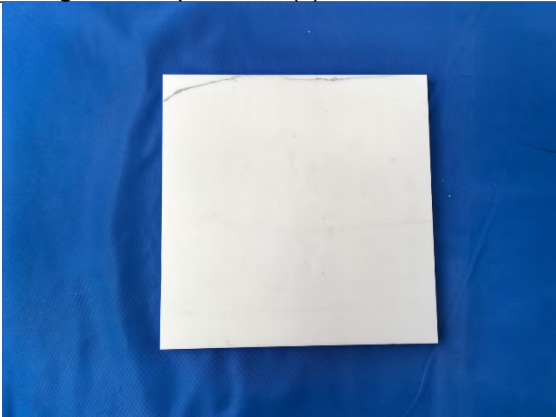

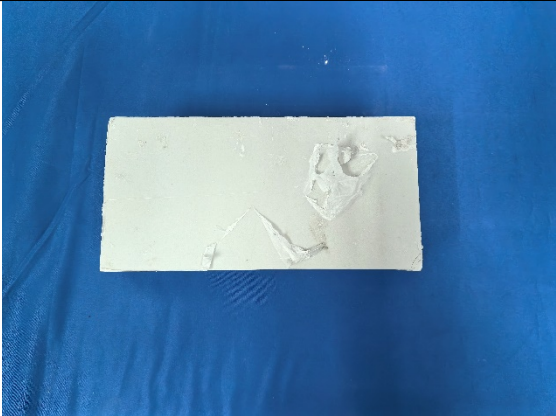



Test Report

No.: SHHL241207290201SD

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Original Sample Photo(s):

| | |
|---|--|
|  |  |
| High Temperature Resistance / Stain Resistance Test / Chemical Resistance Test - Front View | High Temperature Resistance / Stain Resistance Test / Chemical Resistance Test - Back View |
|  |  |
| Modulus of Rupture - Front View | Modulus of Rupture - Back View |
|  |  |
| Compressive Strength - Front View | Compressive Strength - Back View |



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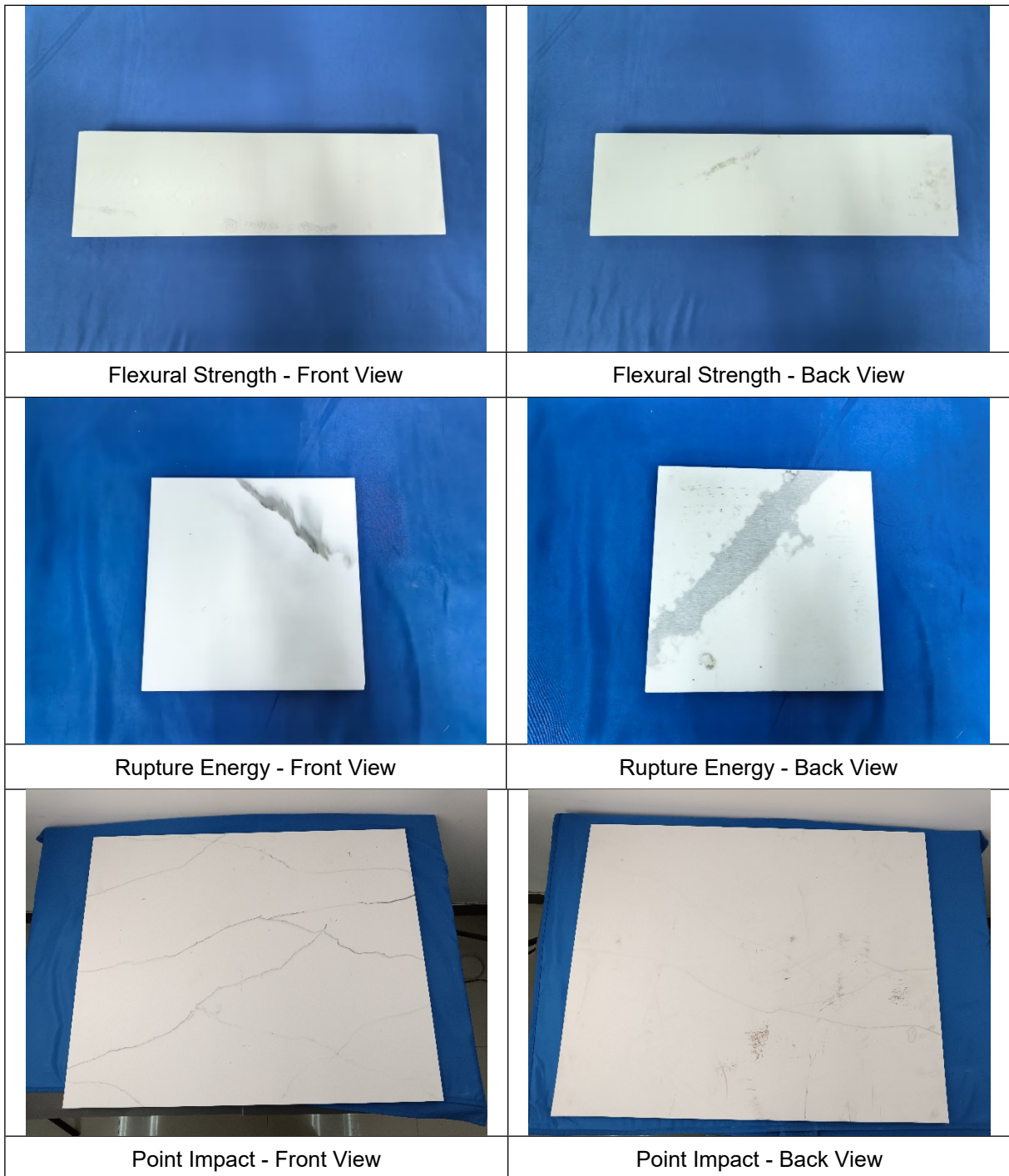
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Test Report

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Absorption by Weight and Density* / Abrasion Resistance* / Mohs Scratch Hardness*
/ Radioactivity* / Linear Thermal Expansion Coefficient*



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Test Report

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The below testing was performed by SGS other internal laboratory.

I. Test conducted

This test was conducted in accordance with ASTM E84-2023d Standard Test Method for Surface Burning Characteristics of Building Materials.

II. Introduction

The method, designated as ASTM E84-2023d, Standard Method of Test for Surface Burning Characteristics of Building Materials, is designed to determine the relative surface burning characteristics of materials under specific test conditions. Results are expressed in terms of flame spread index (FSI) and smoke developed index (SDI).

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame spread and smoke developed index are reported. However, there is not necessarily a relationship between these two measurements.

III. Test procedure

The tunnel is preheated to 65.6°C (150°F), as measured by the floor-embedded thermocouple located 7.09m (23.25 ft) downstream of the burner ports, and allowed to cool to 40.6°C (105°F), as measured by the floor-embedded thermocouple located 3.96m (13 ft) from the burners. At this time the tunnel lid is raised and the test sample is placed along the ledges of the tunnel so as to form a continuous ceiling 7.32m (24 ft) long, 304.8mm (12 in) above the floor. The lid is then lowered into place.

Upon ignition of the gas burners, the flame spread distance is observed and recorded every 30 seconds. Flame spread distance versus time is plotted ignoring any flame front recessions. If the area under the curve (A) is less than or equal to 97.5 ft·min, FSI = 0.515·A; if greater, FSI = 4900/(195·A).

The test results for smoke shall be plotted and the area under the curve shall be divided by the area under the curve for heptane, multiplied by 100, and rounded to the nearest multiple of five to establish a numerical smoke-developed index (SDI).

IV. Conditioning

Prior to testing, the sample was conditioned,

To a constant weight at a temperature of 23±2.8°C (73.4±5°F) and at a relative humidity of 50±5%.

Sample details

| | |
|--------------------|--|
| Sample description | Silicon-free artificial stone (provided by client) |
| Color | White + Grey |
| Thickness | 15.0mm |
| Area density | 31.1 kg/m ² |
| Exposed face | Printed surface |

Mounting methods:

The specimen was self-supporting and placed directly on the inner ledges of the tunnel.

The specimen is consisted of 5 pieces of 550mm wide by 1460mm long, all sections jointed end-to-end.



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Test results:

| Flame Spread Index, FSI | Smoke-developed Index, SDI |
|-------------------------|----------------------------|
| 0 | 0 |

Rating:

The National Fire Protection Association Life Safety Code 101, Chapter 10, Section 10.2.3 Interior Wall and Ceiling Finish Classification, has a means of classifying materials with respect to Flame Spread and Smoke Developed when tested in accordance with ASTM E84 or UL 723 Method of Test of Surface Burning Characteristics of Building Materials.

International Building Code, Chapter 8, Interior Finishes, Section 803 Wall and Ceiling Finishes, was classified in accordance with ASTM E 84 or UL 723. Such interior finish materials shall be grouped in the following classes in accordance with their flame spread and smoke-developed indexes.

The classifications are as follows:

| Index | Class A | Class B | Class C |
|-----------------------|---------|---------|---------|
| Flame Spread Index | 0-25 | 26-75 | 76-200 |
| Smoke-developed Index | 0-450 | 0-450 | 0-450 |

Since the tested sample received a Flame Spread Index 0 and a Smoke-developed Index 0, it would **meet** the requirements of **Class A** interior Wall & Ceiling Finish Category.



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Test Report

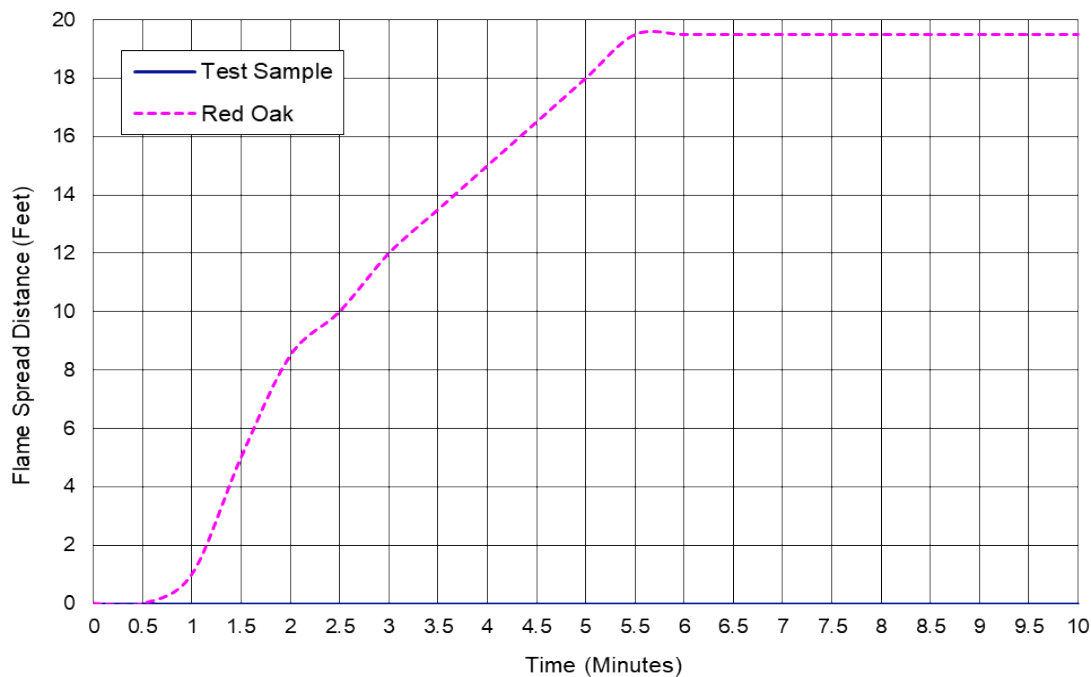
No.: SHHL241207290201SD

Date: FEB. 25, 2025

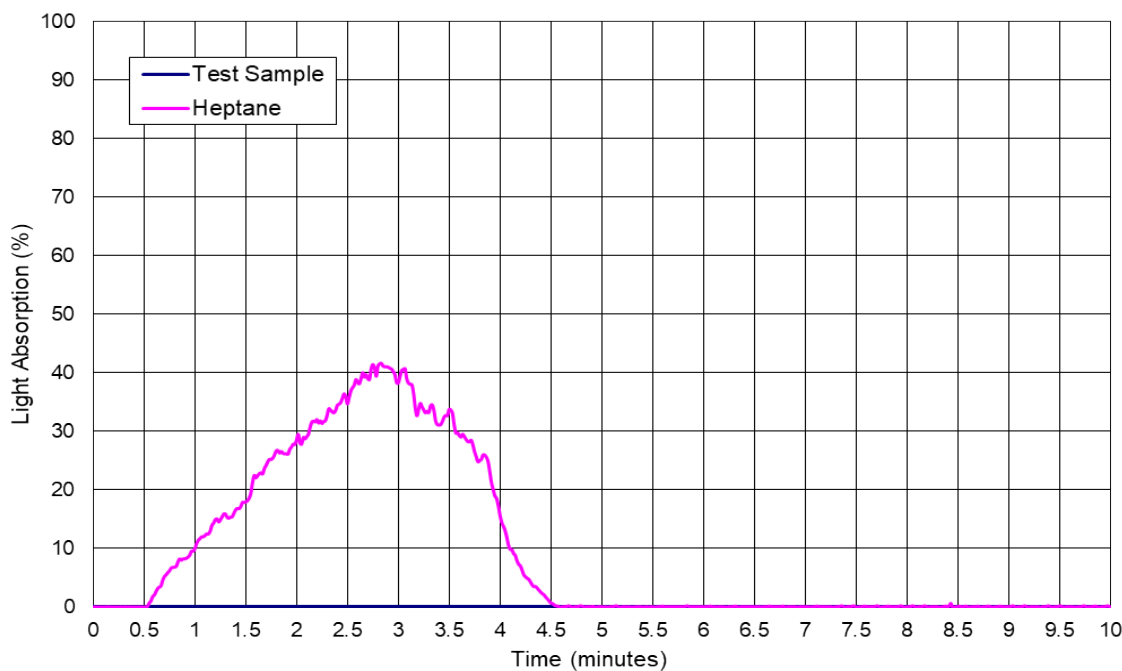
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Graphical results:

Flame Spread Chart



Smoke Developed Chart



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Test Report

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Observations:

| | |
|------------------------|----------------|
| Time to ignition (sec) | Not ignited |
| Time to Max. FS (sec) | Not Applicable |
| Maximum FS (feet) | 0 |
| Observations | Cracking |

Photo Appendix:



SGS authenticate the photo on original report only

Remark:

1. Since the data and / or information above division line of front page is provided by the applicant, the relevant results or conclusions of this report are only made for these data and / or information, SGS shall not be responsible for the authenticity and integrity of such data and information and the validity of the results and / or conclusions arising therefrom. Testing results only apply to the sample as received.
2. The declaration of conformity is based on acceptance limits chosen based on simple acceptance ($w = 0$, $AL = TL$).

Statements of conformity are reported as:

Passed - The measured values were observed in tolerance at the points tested.

Failed - One or more measured values were observed out of tolerance at the points tested.

End of Report



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