QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

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**CLIENT:** **Hydro-Blok**
6029 238th Street SE
**Woodinville, WA 89701**

| Test Report No: QA-976 | Date: May 30, 2025 |
|---|---|

**SAMPLE ID:** The client identified the following test material as **Hydro-Blok foam core backer board**

**SAMPLING DETAIL:** Test samples were submitted to the laboratory directly by the client. No special sampling conditions or sample preparation were observed by QAI.

**DATE OF RECEIPT:** Samples were received at QAI on February 26, 2025.

**TESTING PERIOD:** April 8– May 30, 2025.

**AUTHORIZATION:** QAI Test Proposal Number 25JB02042 signed by Brian Dunn on February 18, 2025.

**TEST REQUESTED:** Physical properties testing in accordance with ANSI A118.18-23 Foam Core Backer Boards

**TEST PROCEDURES:** Detailed test methods and procedures are provided on subsequent pages of this report.

**TEST RESULTS:** Hydro-Blok foam core backer board **Met** the requirements of Physical properties testing in accordance with ANSI A118.18-23. Detailed test results are provided on subsequent pages of this report.

**Prepared By**

Rocky Hale
Material Test Technician

**Signed for and on behalf of QAI Laboratories, Inc.**

Digitally signed by Jarred L. Johnson
Date: 2025.06.16 08:47:09 -05'00'

Jarred Johnson
Project Reviewer

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## SUMMARY OF RESULTS

| Test Description | Test Method | Test Results | Requirements | Pass or Fail |
|---|---|---|---|---|
| Shear Bond Strength | Section 4.1 | 7 day-116 psi<br>7-day water immersion 95 psi | >50 psi | Pass |
| Facial Dimensions (variations from nominal) | ASTM C473, Section 18 and Section 19 | Section 18 – 36 in.<br>Section 19 - 60 in. | ±1/8 in. | Pass |
| Nail-Head Pull-Through | ASTM D1037, section 15 | with Hydro-Blok fastener 125 lb. | ≥75 lb. | Pass |
| Flame Spread/Smoke Developed Indices | ASTM E84 | FSI ≤ 10 and SDI ≤ 55 | FSI ≤ 75 and SDI ≤ 450 | Pass |
| Flexural Strength | ASTM C203 4-point flex | 791 psi | >212 psi | Pass |
| Linear Expansion with change in moisture content | ASTM D1037 Section 24 | Parallel 0.008%<br>Perpendicular 0.025% | ≤0.2% | Pass |
| Fungus Resistance | ASTM G21 | 0 no growth | Less than or equal to 1 | Pass |
| Squareness | ASTM C473, section 15 | 0 in. | ≤ 1/32 in./ft of the length of the specimen | Pass |
| Thickness (variation from nominal) | ASTM C473, section 16 | 0.028 in. | ± 0.04 in. | Pass |
| Waterproofness | ANSI A118.10, section 4.5 | No wetness | No wetness shall be observed | Pass |
| Waterproofness of Assembly | IAPMO PS 106 | No wetness | No wetness shall be observed | Pass |
| Robinson Floor Test | ASTM C627 | No Damage | Passes Cycles 1 through 3 | Pass |

**Seven-day shear strength** **PASS**

Select four specimens for testing. Support shear bond specimens in the shear bond test jig (Section 4.1.3) and test individually. Test with a compression loading rate of 200 psi per minute such that the specimens are stressed to failure. Record these values as seven-day shear strength.

| Specimen | Width in. | Length in. | Ultimate Load, lbs. | Bond Strength, psi |
|---|---|---|---|---|
| 1 | 3.662 | 3.785 | 1617 | 116.66 |
| 2 | 3.693 | 3.827 | 1583 | 112.01 |
| 3 | 3.685 | 3.741 | 1640 | 118.96 |
| 4 | 3.675 | 3.825 | 1662 | 118.23 |
| Average (Psi) | - | - | - | **116** |

**Requirement:** Average shear strength greater than 50 psi.

**Seven-day water immersion shear strength** **PASS**

Immerse the remaining four specimens in water for seven days after curing in air for seven days. Immediately upon removal from the water, support shear bond specimens in the shear bond test jig (Section 4.1.3) and test individually. Test with a compression loading rate of 200 psi per minute such that the specimens are stressed to failure. Record the values as seven-day water immersion shear strength.

| Specimen | Width in. | Length in. | Ultimate Load, lbs. | Bond Strength, psi |
|---|---|---|---|---|
| 1 | 3.686 | 3.826 | 1206 | 85.52 |
| 2 | 3.661 | 3.754 | 1297 | 94.37 |
| 3 | 3.677 | 3.750 | 1335 | 96.82 |
| 4 | 3.669 | 3.842 | 1469 | 104.21 |
| Average (Psi) | - | - | - | **95** |

**Requirement:** Average shear strength greater than 50 psi.

**Facial dimensions**

Specimens shall be tested in accordance with ASTM C473, Section 18 for width and Section 19 for length.

**18. Width**

*Summary of Test Method*—The width of panel products is evaluated by measuring the edge-to-edge dimension of a full-size specimen.

*Procedure:* Measure the width of an individual gypsum panel by placing the measuring device perpendicular to the edges of the panel product when measurements are taken.

The width of an individual gypsum panel product is the maximum of two readings taken not less than 48 in. apart and about 6 in. away from both ends of the specimen.

*Report*—Report the width as the average width of not less than three specimens to the nearest 1⁄32 in.

**Result:**

| **Specimen** | Width 1 (in) | Width 2 (in) | Average Width (in) | **Average Width (in)** |
|---|---|---|---|---|
| 1 | 36 | 36 | 36 | 36 |
| 2 | 36 | 36 | 36 | |
| 3 | 36 | 36 | 36 | |

**19. Length**

*Summary of Test Method*—The length of panel products is evaluated by measuring the end-to-end dimension of a full-size specimen.

*Procedure:* Measure the length of an individual panel product by placing the measuring device parallel with the edges when measurements are taken. The length of a specimen is the maximum of two readings taken about 3 in. away from both edges of the specimen.

*Report*—Report the length as the average length of not less than three specimens to the nearest 1⁄8 in.

**Result:**

| **Specimen** | Length 1 (in) | Length 2 (in) | Average Length (in) | **Average Length (in)** |
|---|---|---|---|---|
| 1 | 60 | 60 | 60 | **60** |
| 2 | 60 | 60 | 60 | |
| 3 | 60 | 60 | 60 | |

## Nail-head pull-through PASS

Specimens shall be tested in accordance with ASTM D1037, Section 15. The test method shall utilize a roofing nail with a 0.375 in. diameter head and a shank diameter of 0.121 in. **If specified by the manufacturer of the foam core backer board, an alternate design nail, screw and washer systems, or similar may be used.** A pilot-hole having a maximum diameter of 0.121 in. shall be drilled at the center of the foam core backer board specimen and the roofing nail is then driven through the pilot-hole into the specimen. Record the force required to pull the fastener through the test specimen.

**Testing to ASTM D1037;** Section 15 Nail-Head Pull-Through utilizing

Procedure: Two samples **Hydro-Blok Building Panel** were cut to size 3” x 6”, a **Hydro-Blok** anchor screw was inserted in the center of each test sample. Two samples were conditioned in air at 70°F and 50% humidity for 48 hours. Samples were then tested, and results can be seen below in Table 1.

Screw Head Diameter; 0.800 inch.
Screw Shank Diameter; 0.141 inch

**Requirement: ≥ 75 lb.**

**Table 1 Hydro-Blok Screw Kit**

| Sample | Maximum Load (lbf) |
|---|---|
| 1 | 121 |
| 2 | 129 |
| Average | **125** |

**Flame Spread Index and Smoke-Developed Index** **PASS**

Specimens shall be tested in accordance with ASTM E84 and in compliance with the IRC for residential applications, the IBC for commercial applications, or applicable building codes. Test specimen configuration must be reported along with results.

Hydro-Blok Foam Core Backer Panel.

**Requirements: FSI 75 and SDI 450**

**Results: FSI – 10; SDI -55: See Test Report QA-976FT-1**

## Flexural strength PASS

Specimens shall be tested in accordance with ASTM C203, Method II, Procedure B. Specimens shall not be less than 4 in. x 12 in. Specimens were conditioned at 73±3°F and 50±5% humidity for at least 24 hours.

**Results:**

| Sample | Width in. | Thickness in. | lbf | psi |
|---|---|---|---|---|
| 1 | 4.085 | 0.505 | 118 | 849.51 |
| 2 | 4.084 | 0.510 | 119 | 840.20 |
| 3 | 4.068 | 0.512 | 112 | 787.70 |
| 4 | 4.064 | 0.515 | 99 | 688.86 |
| **Average** | | | | **791** |
| **Std. dev.** | | | | **73.68182** |

**Requirement: > 212 psi**

## Linear expansion with change in moisture content PASS

Specimens shall be tested in accordance with ASTM D1037, Section 24. Specimens shall not be less than 3 in. x 12 in.

**Testing to ASTM D1037-12;** Section 24. Linear Expansion with Change in Moisture Content

**Procedure:** Testing was conducted in accordance with ASTM D1037-12, Section 24, *Linear Expansion with Change in Moisture Content.* Two 12"x3" specimens were cut from samples, one specimen (1) with the long side parallel to the long dimension of the panel and the other specimen (2) perpendicular. Then conditioned to practical equilibrium at a relative humidity of 50±2% and a temperature of 68±6ºF and the length of each specimen was measured. The specimens were then conditioned to practical equilibrium at a relative humidity 90±5% and a temperature of 68±6ºF and the length of each specimen was measured. Results can be seen below in Table 1.

**Test Requirements:** ≤0.2%
**Test Results average of 2** **0.016%**

**Table 1**

| Sample | Length at 68°F & 50% Humidity | Length at 68°F & 90% Humidity | % change |
|---|---|---|---|
| 1 | 12.003 | 12.004 | 0.008 |
| 2 | 12.025 | 12.028 | 0.025 |
| **Average** | | | **0.016** |

**Fungus resistance** **PASS**

Specimens shall be tested in accordance with ASTM G21.

All materials, equipment, reagents, water, nutrient-salts Agar, and spore suspensions used during the testing of the specimens complied with the applicable sections of ASTM G21-15(2021). A listing of the fungal cultures used is contained in Table 1 of this report.

At the start of the testing three (3) specimens and three (3) control specimens were placed in separate Petri dishes, which had been prepared with solidified agar. The samples were then inoculated with a composite spore suspension sprayed from a sterilized atomizer until the entire surface was moistened.

The specimens were covered and incubated in a Temperature/Humidity chamber that maintained a temperature between 28 and 30ºC (82 and 86ºF) and a minimum of 85% relative humidity for a period of 28 days.

Samples were microscopically evaluated at the end of 28 days, in accordance with section 9.3. Section 9.3 prescribes a rating, as listed in Table 2 of this report, for the visual effects. Results of the evaluation are reported in Table 3 of this report, with photographic evidence shown in Figure 1

Table 1- Fungal Cultures Used in Composite Spray

| Fungi | ATCC No. | MYCO No. |
|---|---|---|
| *Aspergillus Brasiliensis (Formally known as niger)* | 9642 | 386 |
| *Penicillium pinophilum* | 11797 | 391 |
| *Chaetomium globosum* | 6205 | 459 |
| *Trichoderma virens* | 9645 | 365 |
| *Aureobasidium pullulans* | 15233 | 279 |

Table 2- Rating of Growth

| Observed Growth on Specimens (Sporulating or Non-Sporulating, or Both) | Rating |
|---|---|
| None | 0 |
| Traces of growth (less than 10% | 1 |
| Light growth (10 to 30%) | 2 |
| Medium Growth (30 to 60%) | 3 |
| Heavy growth (60% to complete coverage) | 4 |

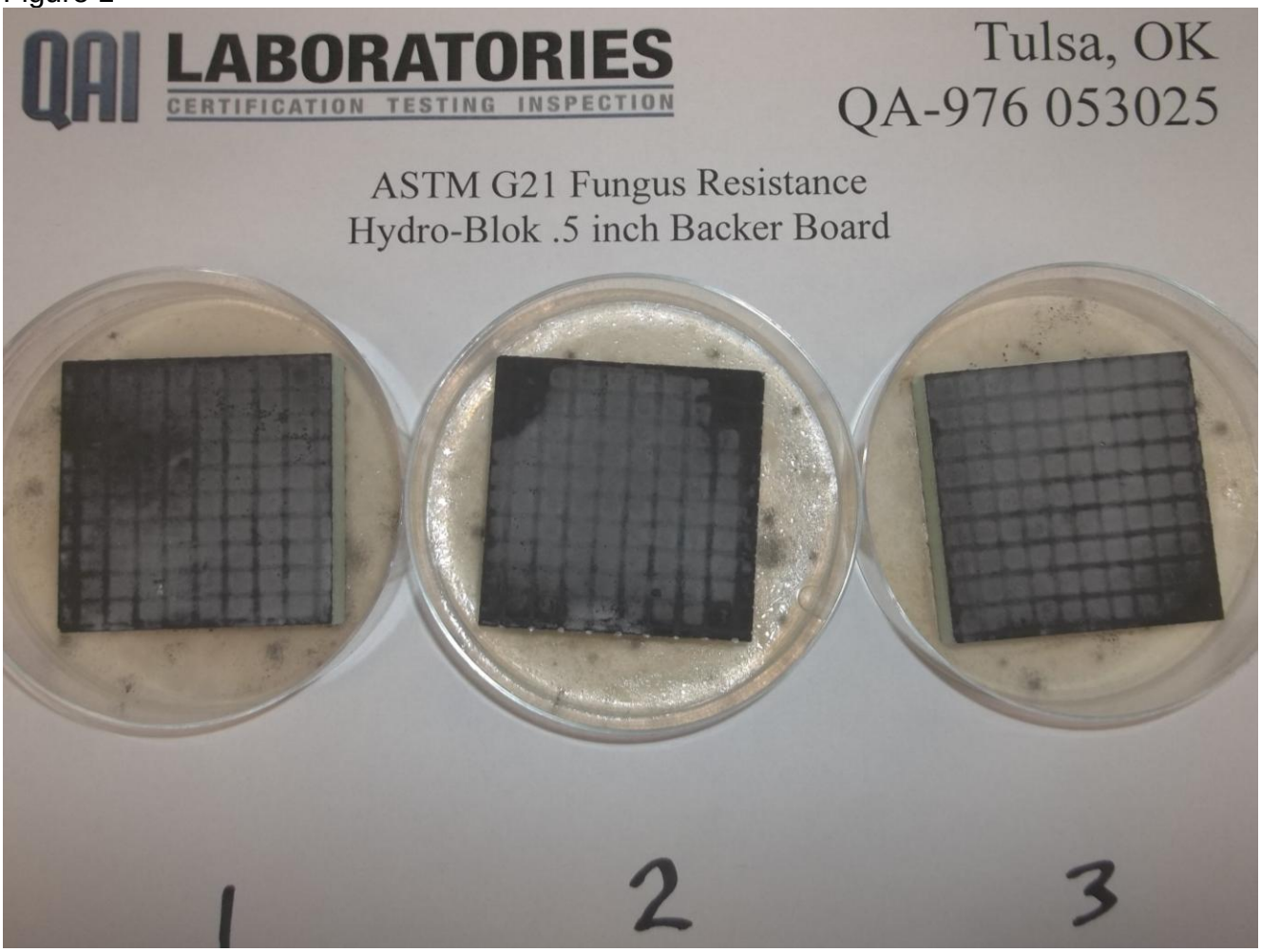
Table 3-Results

| Sample ID | Hydro-Blok Backer Board |
|---|---|
| Start Date | 5/02/25 |
| End Date | 5/30/25 |

| Specimen | Rating |
|---|---|
| 1 | 0 |
| 2 | 0 |
| 3 | 0 |
| Controls | 4 |

**Requirement:** Less than or equal to 1

Figure 1



**Squareness** **PASS**

Specimens shall be tested in accordance with ASTM C473, Section 15.

**15. End Squareness**

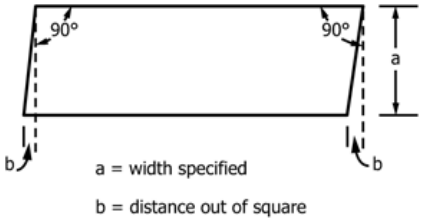
*Summary of Test Method*—The end squareness of panel products is evaluated by drawing a line perpendicular to the edge of a full width specimen to its opposite edge and measuring the length of the side of the triangle formed.

*Procedure*—Three specimens were used for measurements. Place one edge of the square flush against the edge of the panel product with the apex of the square at one corner of the product. Determine the distance *b*, to the nearest 1⁄16 in. at the specified distance *a*. Distance is measured from the apex of the square.

*Report*—Report the average of distance *b* to the nearest 1⁄8 in.

**Result: average of three panels; A = 36”; B = 0”**

**Requirement: ≤ 1/32 in./ft of the length of the specimen**



## Thickness PASS

Specimens shall be tested in accordance with ASTM C473, Section 16**.**

**16. Thickness**

*Summary of Test Method*—The thickness of panel products is evaluated by measuring the thickness of the specimen with a micrometer.

*Procedure*— Three specimens were used for measurements. Cut 12" off from each end of panel, then mark measurement points at approximately equal points across the width at each end of the panel product. Measure the thickness of the panel product with the micrometer not less than 1⁄2 in. from cut ends. Five readings were taken at each end of the panel

*Report*—Calculate the thickness of each specimen as the sum of the individual readings taken on each panel product specimen then divided by the quantity of individual readings made on each specimen. Calculate and report the sample thickness as the average measured thickness of all the specimens in the sample to the nearest 0.001 in.

**Requirement: ± 0.04 in**

**Result: 0.028**

**Results:**

| **Specimen** | T 1 (in) | T 2 (in) | T 3 (in) | T 4 (in) | T 5 (in) | Thickness (in) | **Sample Thickness (in)** |
|---|---|---|---|---|---|---|---|
| 1 | 0.490 | 0.506 | 0.515 | 0.508 | 0.495 | **0.5037** | **0.498** |
| | 0.497 | 0.505 | 0.514 | 0.503 | 0.504 | | |
| 2 | 0.493 | 0.500 | 0.508 | 0.496 | 0.497 | **0.4995** | |
| | 0.490 | 0.497 | 0.502 | 0.503 | 0.509 | | |
| 3 | 0.486 | 0.488 | 0.499 | 0.490 | 0.191 | **0.4918** | |
| | 0.490 | 0.496 | 0.495 | 0.489 | 0.494 | | |

**Waterproofness** **PASS**

Specimens shall be tested in accordance with ANSI A 118.10, Section 4.5.

**Performance criteria:** The specimen shall be left under hydrostatic pressure for 48 hours and examined for evidence of moisture penetration.

**Result: No water penetration**

**Waterproofness of assembly** **PASS**

Specimens shall be tested in accordance with IAPMO PS106, Section 5.1.3 and with following test assembly structure. Two specimens of nominal ½" thick foam core backer board, each in a minimum size of 32 x 32 inches square, are installed to a standard framed wall with a 90° corner, in accordance with manufacturer's recommendation. The seam and fastener points between both specimens are sealed, reinforced, and treated in accordance with the foam core backer board manufacturer's installation instructions. The test structure is allowed to cure in accordance with manufacturer's requirements. Using a 30° full jet spray nozzle, installed at a distance of 4 ft. from the specimen's seam, a continuous water spray is then aimed at the center of the specimen's seam at an angle of 45°.The test duration is 30 minutes. The water flow rate is 3 gpm, and the water temperature is 104 ± 9°F. The test specimen is inspected for water transmission through the specimens and/or seam between specimens.

**Performance Requirements:** There shall be no water leakage through the wall-floor joints.

**Result: No water penetration**

**Robinson floor test** **PASS**

Products intended for floor applications shall be tested in accordance with ASTM C627. The test assembly shall consist of a wood subfloor with joists spaced 16" on center covered with 23/32 in. exterior grade plywood sheeting, foam core backer board installed per manufacturer's instructions, and Type X-3 tiles, and grout joint width should be reported. Installation materials and installation procedures for the testing shall be specified by foam core backer board manufacturer. components used in the test must be disclosed.

**Hydro-Blok Foam Core Panel with 12” x 12” Porcelain Tile with 1/4" grout lines, modified mortor, and standard sanded grout.**

**Requirement: Passes Cycles 1 through 3.**


******End of Test Report******