INSTITUTE OF BUILDING TECHNOLOGY

5001 East Philadelphia Street
Ontario, California – USA 91761-2816
Ph: 909.472.4100 | Fax: 909.472.4243
http://www.iapmoibt.org

TEST REPORT

Report Number: 2912-21001 **Project Number:** 36894

Report Issued: November 1, 2021 **Contact:** Mark Cron

Client: **Interra USA, Inc.**
(A subsidiary of JK Holdings Co., Ltd)
900 SW 16th Street Suite #125
Renton, WA 98057
Tel: (425) 277-7850

Code/Standard: ASTM E84-2018b, *Standard Test Method for Surface Burning Characteristics of Building Materials*

ASTM E2768-11 (2018) *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials* (30 min Tunnel Test)

Product(s) Tested: *GRAVIO Non-combustible Decorative Wall Cladding*

Conclusion: Testing in accordance with the standards referenced above resulted in a "Class A" Rating.

Prepared & Submitted By:

Sanjay "Jay" Mishra
Vice President of Building Product Testing

1.0 SURFACE BURNING CHARACTERSTICS

Standard: ATM E84-2018b, *Standard Test Method for Surface Burning Characteristics of Building Materials*

Samples: Interra USA provided the samples for testing. No independent sampling was done by IAPMO IBT. One carton of the test sample was received at the IAPMO IBT laboratory in Ontario, CA on September 23, 2021. The carton was submitted to QAI by IAPMO IBT for testing.

Laboratory: QAI Laboratories, Rancho Cucamonga, CA (IAS-TL-220).

Results: Flame Spread = **0**
Smoke Density = **5**

Conclusion: Testing in accordance with ASTM E84-18b resulted in a "Class A" Rating. Further details are presented in subsequent pages of this report.

Extended Test

Standards: a) Section 2303.2 of 2018 International Building Code, referencing ASTM E84, extended 20 minutes.
b) ASTM E2768-11 (2018) *Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials* (30 min Tunnel Test)

Results: Flame Spread = **0**
Smoke Density = **5**

Both ASTM E84 and ASTM E2768 test reports from QAI Laboratories are attached.

Note: In the current 2021 IBC, the ASTM E84 that is referenced is the 2018b version, which uses red oak to calibrate the smoke number. This will be the case until 2024 when the next International Building Code version will be published as it updates every 3 years.

END OF REPORT

QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

8385 White Oak Avenue
Rancho Cucamonga, CA 91730
909.483.0250 ph. | 909.483.0336 fx.

CLIENT: **IAPMO Institute of Building Technology (IBT)**
4755 E. Philadelphia Street
Ontario, CA 91761

Test Report Number :	**RJ8273F-1b**	**Date:**	**October 27, 2021**

SAMPLE ID: The client identified the following test material as:
GRAVIO Non-combustible decorative wall.

SAMPLING DETAIL: Test Samples were submitted to the Laboratory directly by the client. No sampling or sample preparation were observed by QAI staff.

DATE OF RECEIPT: Samples were received at QAI facilities on: October 1, 2021

TESTING PERIOD: Friday, October 15, 2021

AUTHORIZATION: Testing was authorized by Jay Mishra for proposal 21DN0706-04R1 signed 10-18-2021 Purchase order # - IB0241 Rev. Project no. 36984.

TEST REQUESTED: Perform standard flame spread and smoke density developed classification tests on the sample supplied by the Client in accordance with ASTM E84 - 18b "Standard Method of Test for Surface Burning Characteristics of Building Materials". The foregoing test procedure is comparable to UL 723, ANSI/NFPA No. 255, and UBC No. 8-1..

TEST RESULTS:

Flame Spread	**Smoke Developed**
0	**5**

CONCLUSION: When tested in accordance to ASTM E84-18b the tested material resulted in a Class 'A'. Detailed test results are presented in the subsequent pages of this report

Prepared By

Victor A Peinado

Victor.A.Peinado
Senior Fire Technician

Signed for and on behalf of
QAI Laboratories, Inc.

Brian Ortega

Brian Ortega
Senior Analyst / Fire Technology

SCOPE: This fire-test-response standard is used for the comparative surface burning behavior of building materials is applicable to exposed surfaces such as walls, ceilings and others. The test is conducted with the specimen in the ceiling position with the surface to be evaluated exposed face down to the ignition source. The material, product, or assembly shall be capable of being mounted in the test position during the test. Thus, the specimen shall either be self-supporting by its own structural quality, held in place by added supports along the test surface, or secured from the back side. 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.

USE: The use of supporting materials on the underside of the test specimen has the ability to lower the flame spread index from those which might be obtained if the specimen could be tested without such support. These test results do not necessarily relate to indices obtained by testing materials without such support.

Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

PROCEDURE: A brief overview of the method is as follows: The test specimen, a material between 20 and 24 inches in width by 24 feet +/- 12 inches in length is loaded onto the water cooled ledge of the fire test chamber when tested to ASTM E84 or CAN/ULC-S102. If tested to CAN/ULC-S102.2 the specimen is tested on the chamber floor. The inside dimensions are 17 3/4 inches +/- 1/4" wide by 12 inches +/- 1/2" deep by 25 feet long. The fire test chamber is a rectangular horizontal duct with a removable lid. The sides and base of the chamber are lined with an insulated firebrick with pressure tight observation windows down one side for a technician to observe flame progression during the duration of the 10-minute test period. The chamber lid is lowered into test position with non combustible concrete board placed between the specimen and chamber lid. A draft of 240 feet per minute which is maintained inside the test chamber throughout the test period by the means of an electronic fan afterburner and an electronically controlled damper door system located downstream of the test chamber in the exhaust ducting. The test is started when the test flame is ignited at the front of the test chamber. An electronic photocell system located in the exhaust system downstream from the test chamber is used to plot the smoke developed for use in calculating the smoke developed index while a technician plots the flame spread distance used in determining the flame spread index. The test is run for the 10 minute duration in accordance to the method.

(See Diagrams in the Appendix of this report.)

PREPARATION AND CONDITIONING:

The Sample Board material was delivered to QAI in 18 inches wide X 4 Foot long X 0.375 inches thick Pieces. 6 of these Pieces were used for the test. (See Photos in Appendix of this report). The specimen was placed in the conditioning room (maintained at 73 ± 5° F and a relative humidity of 52 ± 5%) for a minimum of 72 hours prior to testing.

MOUNTING METHOD:

The test ready sample consiting of 6 pieces measuring 18 inches wide X 4 feet long and an overall test thickness of 0.375 inches were supported with metal rods spaced at 24 inch intervals and 2 inch hexagonal mesh to fulfill the chamber requirements for testing. Prior to testing the samples were covered with 1/4 inch cement board as required in the test method.

ASTM E84 TEST RESULTS:

CLIENT NAME:	**IAPMO Institute of Building Technology (IBT)**	**TEST DATE:**	10/15/2021
SAMPLE ID:	GRAVIO Non-combustible decorative wall.		
SAMPLE IGNITION:	**01:23**	Minutes / Seconds	
MAX FLAME FRONT:	**0.0**	Feet	
TIME TO MAXIMUM SPREAD:	**00:00**	Minutes / Seconds	
TEST DURATION:	**10:00**	Minutes / Seconds	
SUMMARY: FLAME SPREAD:	**0**	*0 Unrounded*	
SMOKE DEVELOPED:	**5**	*3 Unrounded*	

OBSERVATIONS:

Test sample did ignite briefly at 1:23 and then self extinguish.The sample surface quickly charred and there was no forward flame front progression from the centerline of the burners. The test was terminated at 30:00.

SUMMARY OF ASTM E84 / UL 723 RESULTS:

Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5.
Smoke Density values over 200 are rounded to the nearest figure divisible by 50.

In order to obtain the Flame Spread Classification, the above results should be compared to the following table:

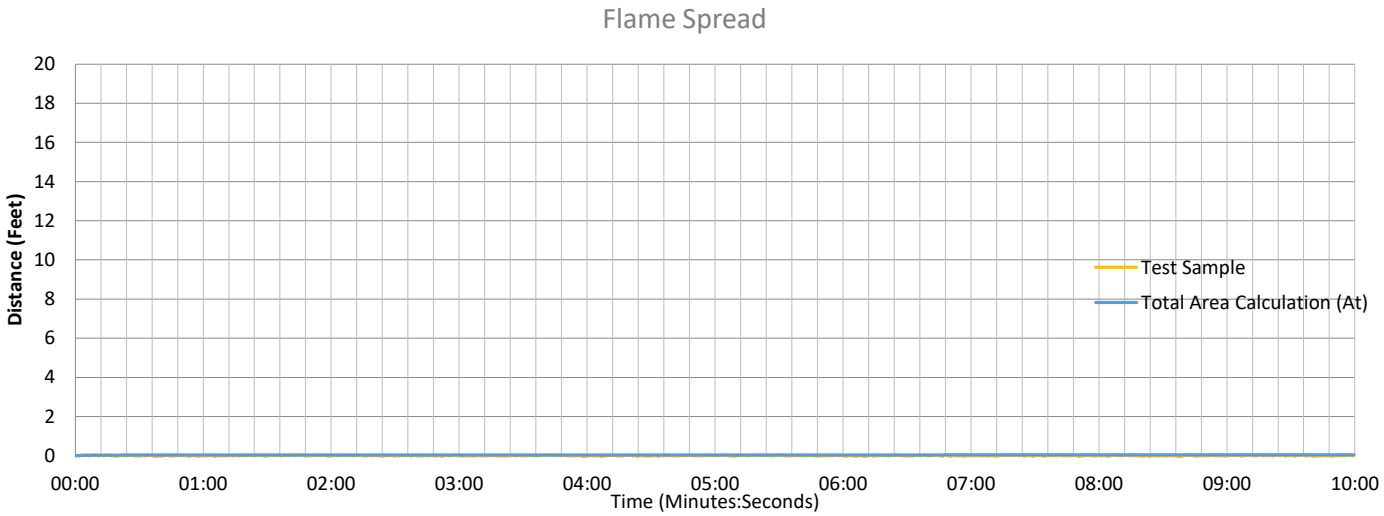
NFPA CLASS[1]	IBC CLASS[2]	FLAME SPREAD	SMOKE DEVELOPED
A	A	0 through 25	Less than or equal to 450
B	B	26 through 75	Less than or equal to 450
C	C	76 through 200	Less than or equal to 450

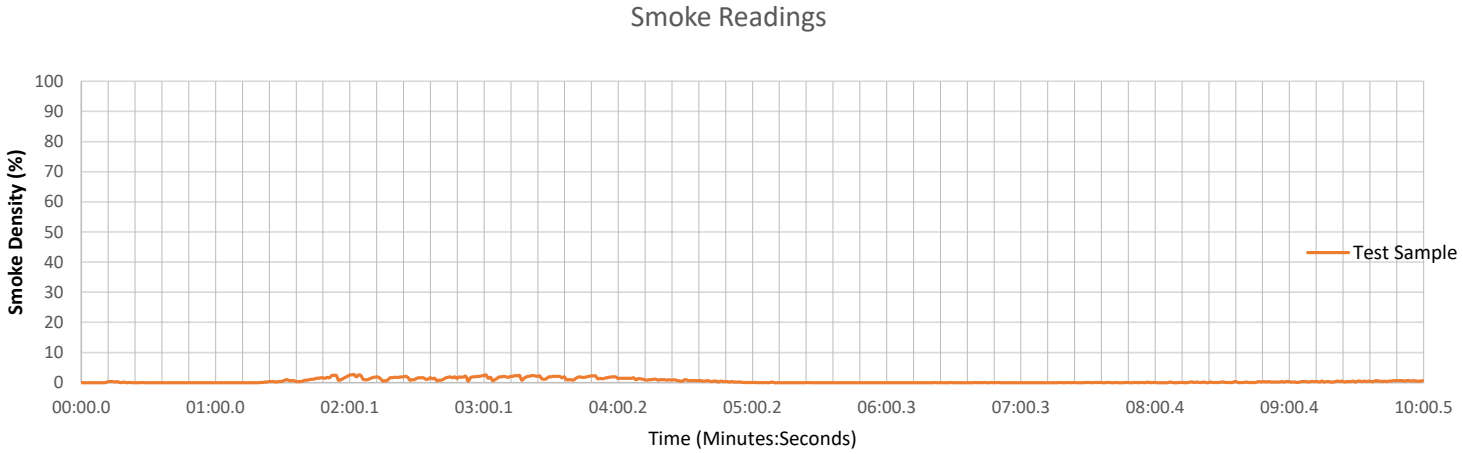
BUILDING CODES CITED:

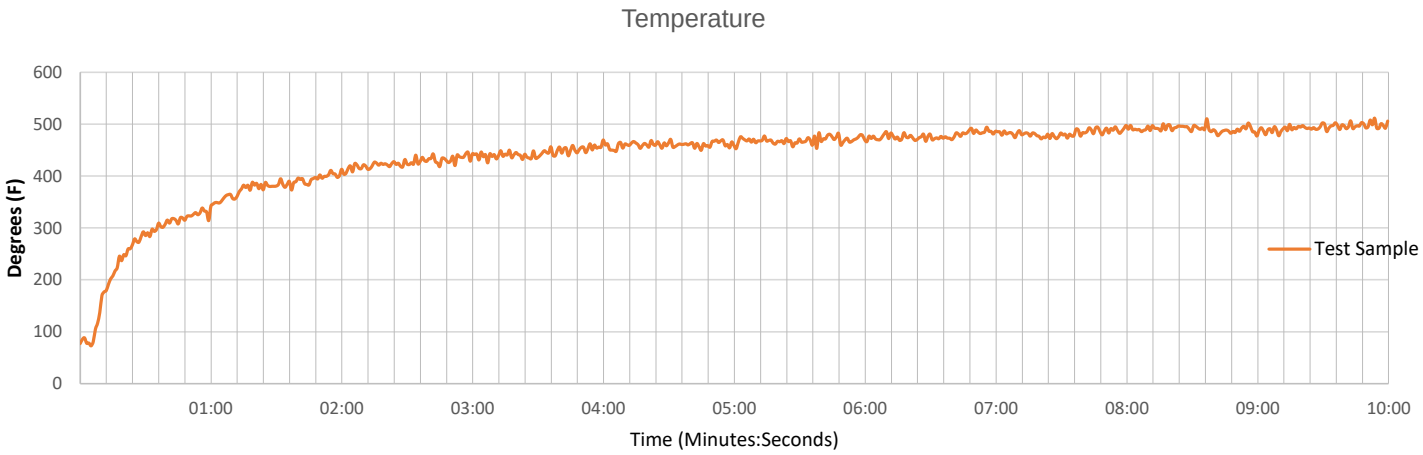
1. National Fire Protection Association, ANSI/NFPA No. 101, "Life Safety Code"

2. International Building Code, Chapter 8, Interior Finishes, Section 803.

RESULTS CONTINUED:







APPENDIX

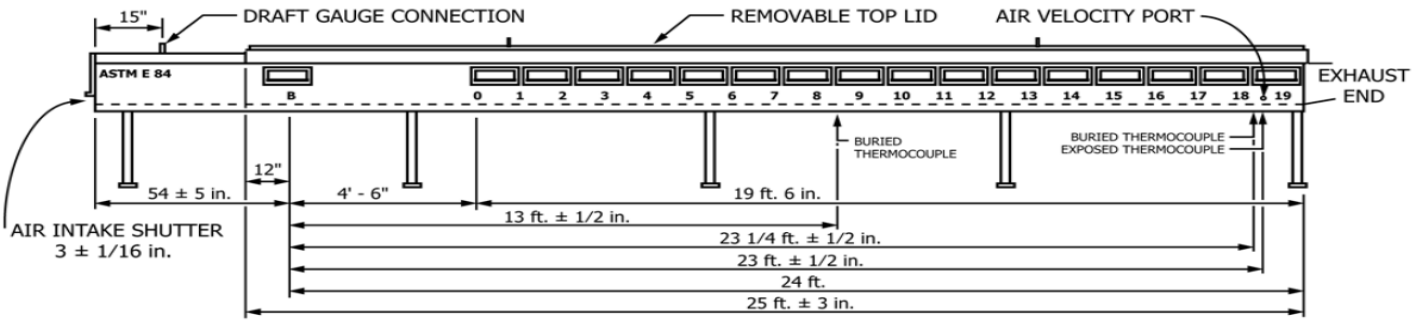


Diagram 1. Test Chamber side view showing critical dimensions.

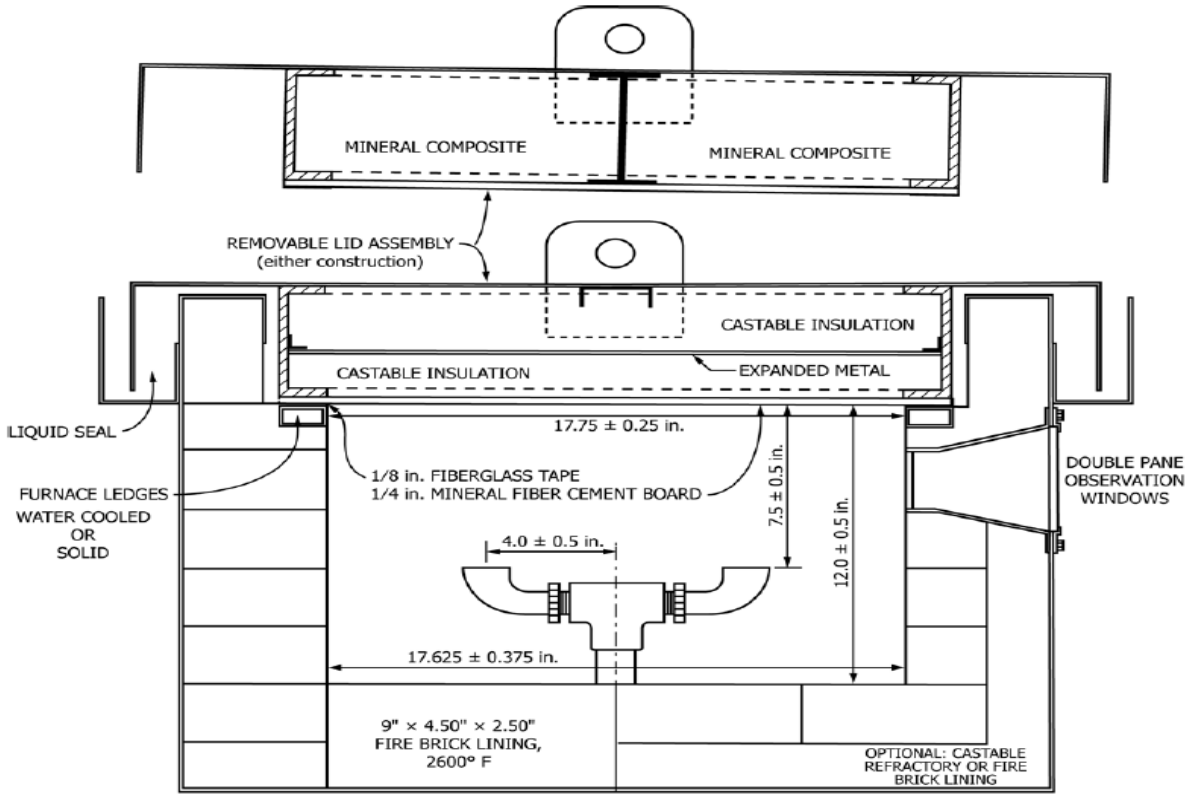


Diagram 2. Test Chamber looking down chamber showing critical dimensions.

APPENDIX

Size: 3 / 8 inch×18 inch×6-0feet, 2pcs /carton（17.76sqft）, 33lbs /carton

Packing: Carton box

Base material: Volcanic silicates fiber-reinforced multi-layer board

Surface: Deep carving style embossing and special multicolor coating finish

Edge Processing: Halving lap joint in all sides

Various certifications: Non-combustible materials approved by the Minister of Land, Infrastructure, and Transport NM-4565

Formaldehyde regulations: Labeling exempted product

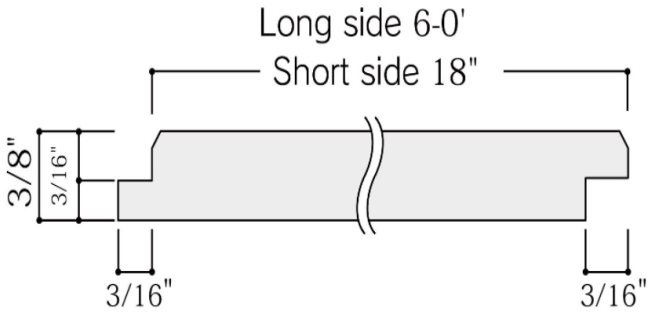


Photo 1. Surface of Specimen Tested

*****<<<END OF TEST REPORT>>>*****

QAI LABORATORIES
CERTIFICATION TESTING INSPECTION

8385 White Oak Avenue
Rancho Cucamonga, CA 91730
909.483.0250 ph. | 909.483.0336 fx.

CLIENT: **IAPMO Institute of Building Technology (IBT)**
4755 E. Philadelphia Street
Ontario, CA 91761

Test Report Number :	**RJ8273F-1b**	**Date:**	**October 27, 2021**

SAMPLE ID: The client identified the following test material as:
GRAVIO Non-combustible decorative wall.

SAMPLING DETAIL: Test Samples were submitted to the Laboratory directly by the client. No sampling or sample preparation were observed by QAI staff.

DATE OF RECEIPT: Samples were received at QAI facilities on: October 1, 2021

TESTING PERIOD: Friday, October 15, 2021

AUTHORIZATION: Testing was authorized by Jay Mishra for proposal 21DN0706-04R1 signed 10-18-2021 Purchase order # - IB0241 Rev. Project no. 36984.

TEST REQUESTED: Testing in accordance with the following:

a) Section 2303.2 of 2018 International Building Code, referencing

ASTM E84, extended 20 minutes.

b) ASTM E2768-11 (2018) *Standard Test Method for Extended Duration Surface burning characteristics of Building Materials (30 min Tunnel Test).*

C)Test method to UBC No. 8-1 and SFM 12-7A-5 per Chapter 7A of the 2019 California Building Code, Ignition -Resistant Material 30 minute test.

TEST RESULTS:

Flame Spread	**Smoke Developed**
0	**5**

When tested in accordance to Section 2303.2 of 2018 International Building Code, referencing ASTM E84, Extended 20 minutes, and ASTM E2768-11-(2018) the tested material resulted in a Class 'A during the first 10 minutes of the test with a flame spread of: 0 feet from the center line of the burners during the 30-minute flame exposure. The product met the above specification for Ignition Resistant Material. Detailed results are presented in the subsequent pages of this report.

Prepared By

Victor A Peinado

Victor.A.Peinado
Senior Fire Technician

Signed for and on behalf of
QAI Laboratories, Inc.

Brian Ortega

Brian Ortega
Senior Analyst / Fire Technology

SCOPE: This fire-test-response standard (ASTM E2768-11(2018) is used for the comparative surface burning behavior of building materials is applicable to exposed surfaces such as walls, ceilings and others. The test is conducted with the specimen in the ceiling position with the surface to be evaluated exposed face down to the ignition source. The material, product, or assembly shall be capable of being mounted in the test position during the test. Thus, the specimen shall either be self-supporting by its own structural quality, held in place by added supports along the test surface, or secured from the back side. 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.

USE: The use of supporting materials on the underside of the test specimen has the ability to lower the flame spread index from those which might be obtained if the specimen could be tested without such support. These test results do not necessarily relate to indices obtained by testing materials without such support.

Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

PROCEDURE: The test is conducted in accordance with 2018 IBC Section 2303.2 following ASTM E84 andASTM E2768-11 (2018)., extended an additional 20 minutes. A brief overview of the method is as follows: The test specimen, a material between 20 and 24 inches in width by 24 feet +/- 12 inches in length is loaded onto the water cooled ledge of the fire test chamber. The fire test chamber is a rectangular horizontal duct with a removable lid. The inside dimensions are 17 3/4 inches +/- 1/4" wide by 12 inches +/- 1/2" deep by 25 feet long. The sides and base of the chamber are lined with an insulated firebrick with pressure tight observation windows down one side for a technician to observe flame progression during the duration of the 10-minute test period. The chamber lid is lowered into test position with non combustible concrete board placed between the specimen and chamber lid. A draft of 240 feet per minute which is maintained inside the test chamber throughout the test period by the means of an electronic fan afterburner and an electronically controlled damper door system located downstream of the test chamber in the exhaust ducting. The test is started when the test flame is ignited at the front of the test chamber. An electronic photocell system located in the exhaust system downstream from the test chamber is used to plot the smoke developed for use in calculating the smoke developed index while a technician plots the flame spread distance used in determining the flame spread index. The test is run for the 10 minute duration to determine the Flame Spread and Smoke Developed Index then the test is continued for an additional 20 minute period with Maximum flame spread recorded. Testing was extended an additional 20 minutes, and observations made regarding signifcant progressive combustion and flame spread through extended duration.

CONDITIONS OF CLASSIFICATION:

13.1 The test method has the following conditions of classification for a material or product to be classified as Meeting the requirements of this standard:
13.1.1 The flame spread index shall be 25 or less as determined for the initial 10 min test period,
13.1.2 The flame front shall not progress more than 10.5 ft (3.2 m) beyond the centerline of the burners at any time during the 30 min test period. This is considered evidence of no significant progressive combustion in this test method.

CBC 2019-IGNITION-RESISTANT MATERIAL.

A type of building material that resists ignition or sustained flaming combustion sufficiently so as to reduce losses from wildland-urban interface conflagrations under worst-case weather and fuel conditions with wildfire exposure of burning embers and small flames, as prescribed in Section 703A and SFM Standard 12-7A-5, Ignition-Resistant Material.

PREPARATION AND CONDITIONING:

The Sample Board material was delivered to QAI in 18 inches wide X 4 Foot long X 0.375 inches thick Pieces. 6 of these Pieces were used for the test.. The specimen was placed in the conditioning room (maintained at 73 ± 5° F and a relative humidity of 52 ± 5%) for a minimum of 72 hours prior to testing.

MOUNTING METHOD:

The test ready sample consiting of 6 pieces measuring 18 inches wide X 4 feet long and an overall test thickness of 0.375 inches were supported with metal rods spaced at 24 inch intervals and 2 inch hexagonal mesh to fulfill the chamber requirements for testing. Prior to testing the samples were covered with 1/4 inch cement board as required in the test method.

Section 2303.2 of 2018 International Building Code, referencing ASTM E84, Extended 20 minutes, and ASTM E2768-11 (2018) TEST RESULTS:

CLIENT NAME:	**IAPMO Institute of Building Technology (IBT)**		**TEST DATE:**	10/15/2021
SAMPLE ID:	GRAVIO Non-combustible decorative wall.			
SAMPLE IGNITION:		**01:23**	Minutes / Seconds	
MAX FLAME FRONT:	During 10-minute test	**0.0**	Feet	From 4.5' Mark.
MAX FLAME FRONT:	During 30-minute test.	**0.0**	Feet	From center line of Burner.
TIME TO MAXIMUM SPREAD:		**00:00**	Minutes / Seconds	
TEST DURATION:		**30:00**	Minutes / Seconds	
SUMMARY:	FLAME SPREAD:	**0**	*0 Unrounded*	
	SMOKE DEVELOPED:	**5**	*3 Unrounded*	

OBSERVATIONS:

Test sample did ignite briefly at 1:23 and then self extinguish.The sample surface quickly charred and there was no forward flame front progression from the centerline of the burners. The test was terminated at 30:00.

SUMMARY OF ASTM E84 / UL 723 RESULTS:

Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5.
Smoke Density values over 200 are rounded to the nearest figure divisible by 50.

In order to obtain the Flame Spread Classification, the above results should be compared to the following table:

NFPA CLASS[1]	IBC CLASS[2]	FLAME SPREAD	SMOKE DEVELOPED
A	A	0 through 25	Less than or equal to 450
B	B	26 through 75	Less than or equal to 450
C	C	76 through 200	Less than or equal to 450

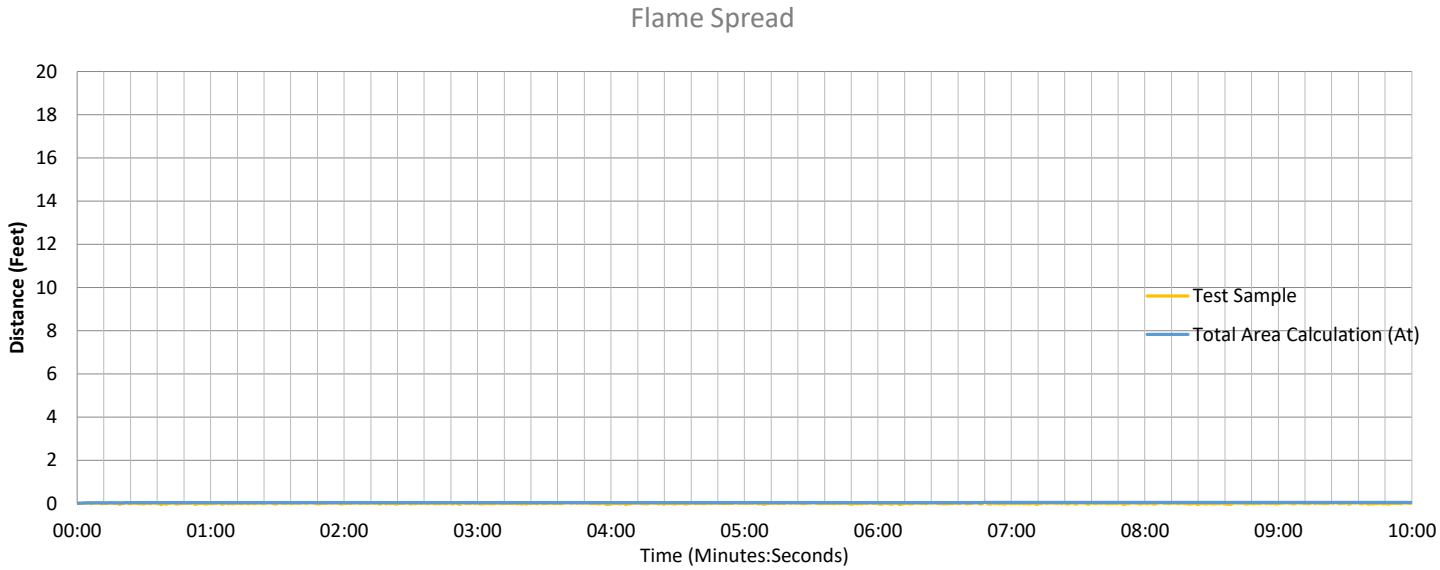
BUILDING CODES CITED:

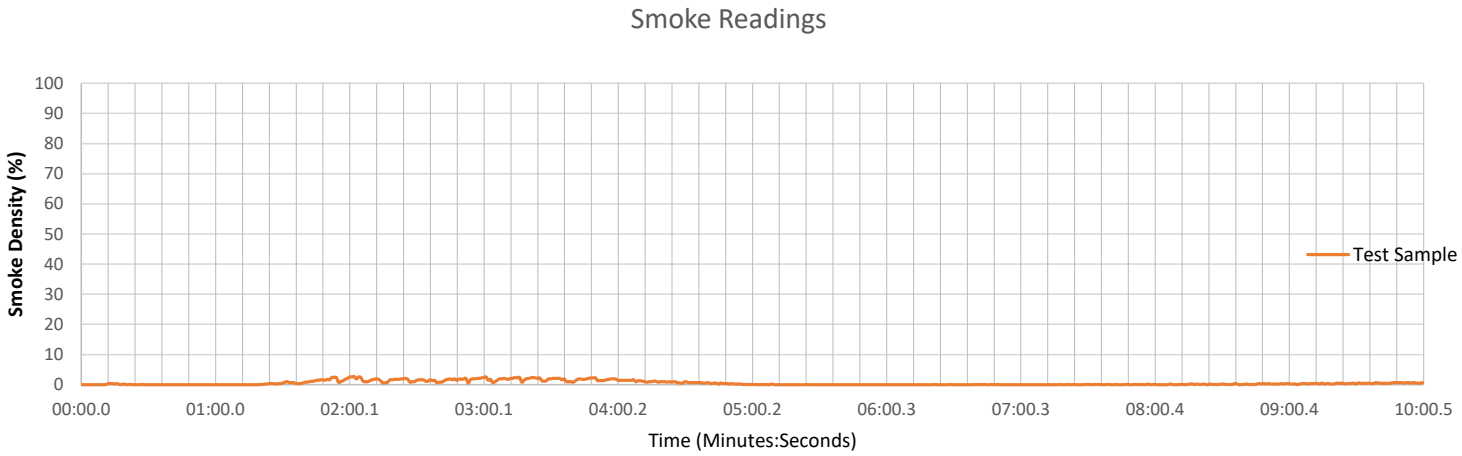
1. National Fire Protection Association, ANSI/NFPA No. 101, "Life Safety Code"

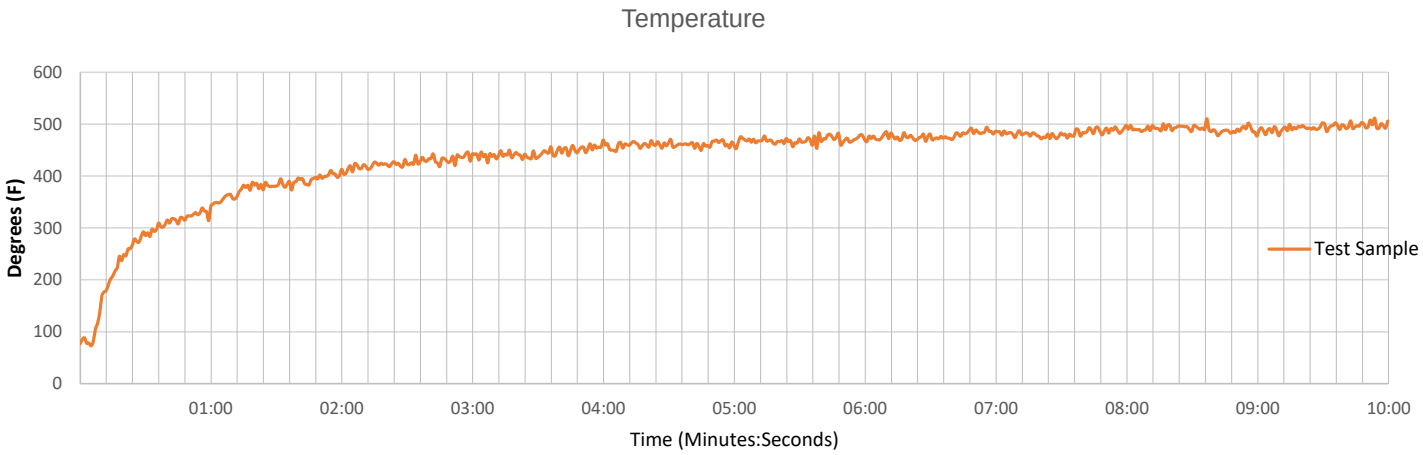
2. International Building Code, Chapter 8, Interior Finishes, Section 803.

3. California Building Code, 2019 Edition, Chapter 7A, Section 703A.

RESULTS CONTINUED:







APPENDIX

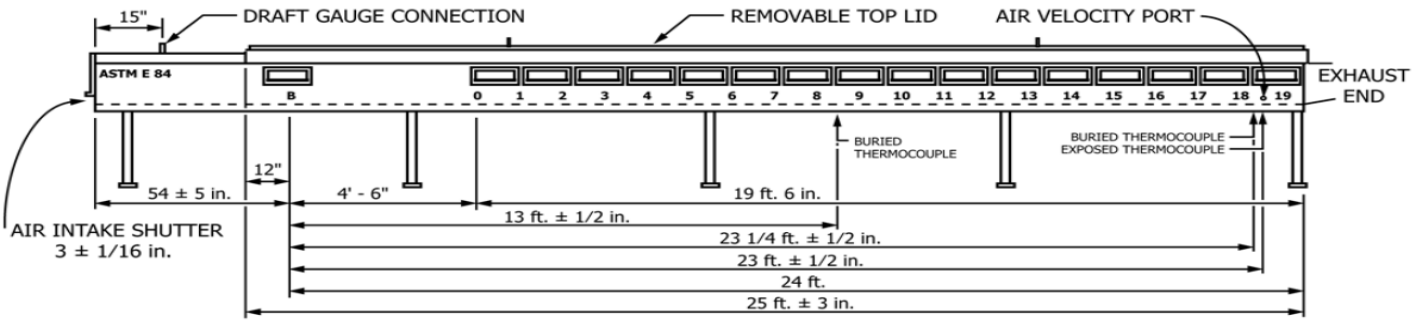


Diagram 1. Test Chamber side view showing critical dimensions.

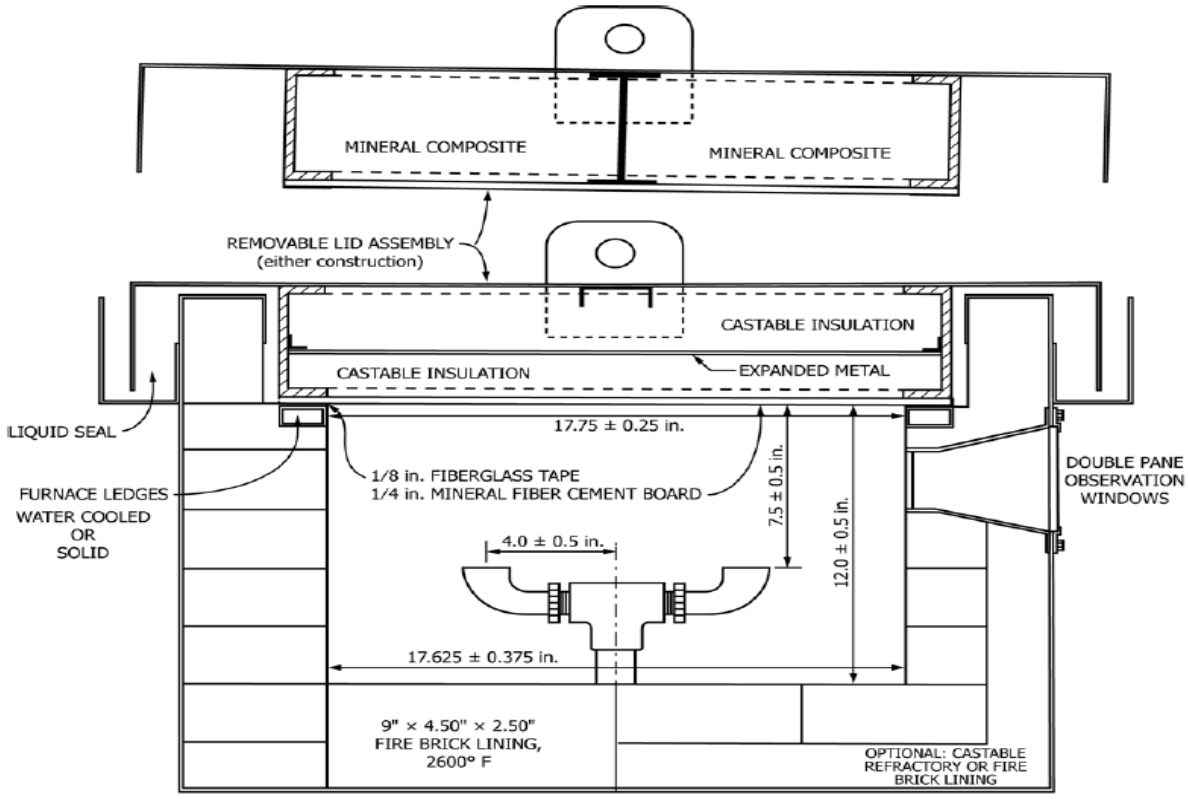


Diagram 2. Test Chamber looking down chamber showing critical dimensions.

APPENDIX

Size: 3 / 8 inch×18 inch×6-0feet, 2pcs /carton（17.76sqft）, 33lbs /carton

Packing: Carton box

Base material: Volcanic silicates fiber-reinforced multi-layer board

Surface: Deep carving style embossing and special multicolor coating finish

Edge Processing: Halving lap joint in all sides

Various certifications: Non-combustible materials approved by the Minister of Land, Infrastructure, and Transport NM-4565

Formaldehyde regulations: Labeling exempted product

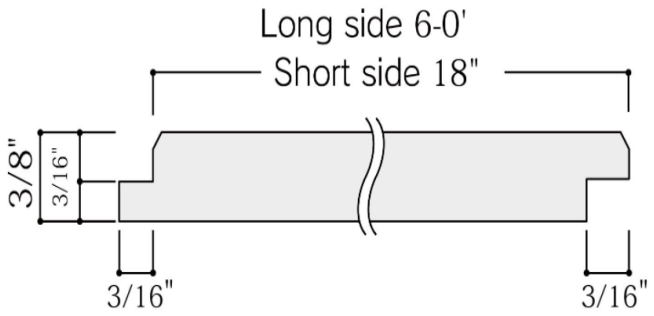


Photo 1. Surface of Specimen Tested

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