

CLIENT: **GENYK**
1701, 3 E Ave.
Grand-Mere, QC
G9T 2W6

Test Report No: T1296-6

Report Date: December 7, 2020

SAMPLE ID: Genyk wall assembly containing Boreal Nature Elite medium density spray applied polyurethane foam insulation with cement board and stucco finish.

SAMPLING DETAIL: The Boreal Nature Elite foam insulation was submitted directly by the client, it was not independently sampled for testing. All other building materials were sourced by QAI staff from local distributors. The stucco finish was applied by ADEX representative Karl Elmore.

DATE OF RECEIPT: The foam insulation was spray applied on November 3, 2020.

TESTING PERIOD: December 2, 2020.

AUTHORIZATION: QAI Test Proposal Number 20JL10191, signed and dated on October 19, 2020, by Yves Rondeau.

TEST PROCEDURE: Testing was conducted following the time temperature curve of CAN/ULC S101 to the following requirements:

- National Building Code of Canada 2015 (NBC), Article 3.2.3.8. Protection of Exterior Building Face, Sentence 2 CAN/ULC S101 15-Minute Stay In Place test.

TEST RESULTS: The Genyk wall assembly containing Boreal Nature Elite medium density spray applied polyurethane foam insulation with cement board and stucco finish met the requirements of NBC Article 3.2.3.8. Sentence 2 when exposed to the time temperature curve of CAN/ULC S101 for 15 minutes duration.

Prepared By



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Signed for and on behalf of
QAI Laboratories, Ltd.

Lawrence Gibson
Executive V.P.

Table of Contents

| | |
|-----------------------|---|
| Introduction: | 3 |
| Assembly Description: | 3 |
| Test Apparatus: | 4 |
| Test Conditions: | 5 |
| Test Requirements: | 5 |
| Test Results: | 6 |
| Conclusions: | 6 |
| APPENDIX A | 7 |
| APPENDIX B | 9 |

Introduction:

This report documents the fire testing conducted by QAI Laboratories Ltd. for Genyk of their wall assembly containing Boreal Nature Elite medium density spray applied polyurethane foam insulation with cement board and stucco finish. Testing was conducted following the time temperature curve of CAN/ULC-S101 to the requirements of the NBC Article 3.2.3.8. Sentence 2 following the CAN/ULC S101 15-Minute Stay in Place test. The wall was evaluated on December 2, 2020.

Assembly Description:

Table 1: Wall Description

| COMPONENT | DESCRIPTION | |
|----------------------|-----------------------------|--|
| Wall Assembly | Size: | 3.05 m (10 ft.) wide by 3.05 m (10 ft.) high by 152 mm (6 in.) thickness. |
| | Type: | Exterior Insulated wall system. |
| | Framing: | 25 Gauge 92 mm by 32 mm (3.625 in. by 1.25 in.) steel stud. |
| | Sheathing: | 13 mm (0.5 in.) DenseGlass Gold fiberglass mat gypsum. |
| | Insulation: | 102 mm (4 in.) Boreal Nature Elite medium density spray applied polyurethane foam insulation. CCMC #14140-L. |
| | Exterior Perimeter Channel: | 20 Gauge galvanized steel C-channel with dimensions of 127 mm (5 in.) depth, one 38 mm (1.5 in.) leg and one 25 mm (1 in.) leg. |
| | Exterior Z-Bar: | 20 Gauge galvanized steel Z-Bar with dimensions of 127 mm (5 in.) depth and 38 mm (1.5 in.) legs mounted horizontally spaced 406 mm (16 in.) on center. |
| | Exterior Panel: | 51 mm (0.5 in.) thick PermaBase cement board fastened to the perimeter C-channel and Z-bar using no. 8 by 32 mm (1.25 in.) self-drilling cement board screws spaced 305 mm (12 in.) on center. The board was mounted horizontally and included horizontal and vertical joints. |
| | Stucco Finish: | Base coat was applied using ADEX Drymix basecoat applied to an approx. thickness of 4 mm with ADEX standard 4.5 oz. glass fiber-reinforced mesh embedded. The finish coat was applied to coverage of approx. 0.4 m ² /kg with ADEX Elasticoat Fine Regular. |

The wall assembly was tested with the exterior face oriented towards the fire.

Test Apparatus:

The furnace used in the test is a full-scale fire burning apparatus with interior dimensions of 3.96 m (13 ft.) in height, 3.96 m (13 ft.) in width, and 0.91 m (3 ft.) in depth.

Temperatures within the furnace were monitored using nine thermocouples (TCs). The temperatures are controlled by adjusting fuel to the furnace burners to conform to the time/temperature curve specified by the test standards. Temperature measurements are recorded by a Keithley 2750 data acquisition unit (ID# DMM1) which passes the readings to a computer for graphical display and storage.

The wall assembly was mounted in a vertical steel test frame. The test frame was then rolled up to the furnace and secured by chain and straps to the furnace opening. At the end of the test, the test frame was rolled away from the furnace so that the exposed face can be subjected to the impact, erosion and cooling effects of the hose stream test.

Two pressure taps are installed along the longitudinal center line of the test assembly. The pressure taps are each attached and monitored by Setra model 264 pressure transducers (ID# Pressure T1 and Pressure T2). The furnace pressure is controlled by adjusting a damper in the furnace exhaust stack. The furnace pressure was recorded continuously for the duration of the test.

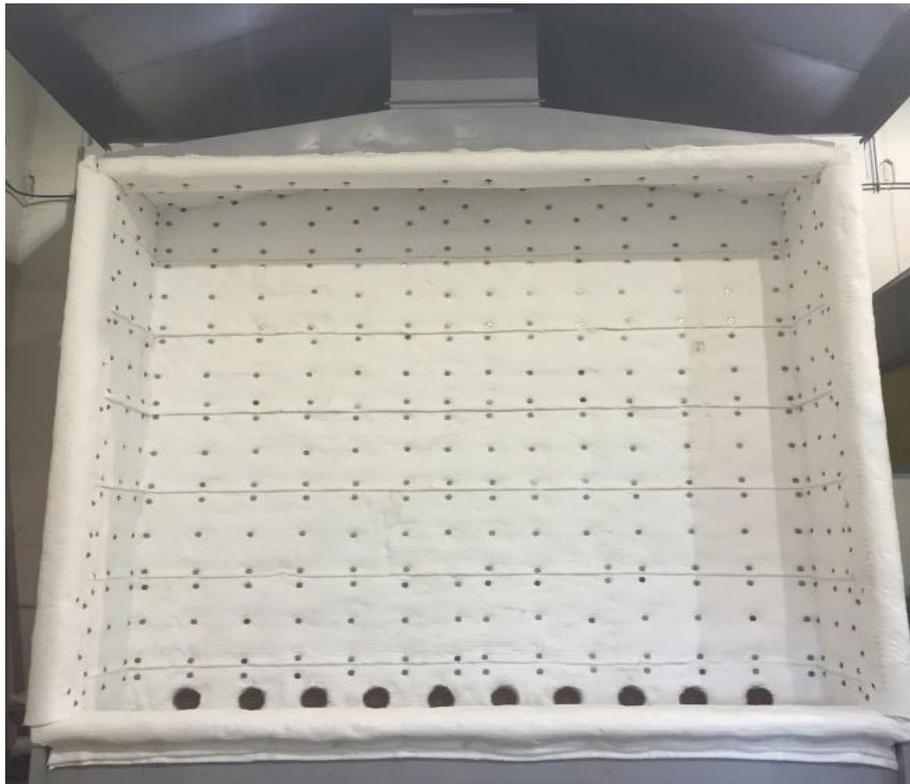


Figure 1: Full Scale Furnace

Test Conditions:

The Genyk wall assembly outlined in Table 1 was constructed in a full-scale moveable steel test frame. A ceramic fiber gasket was used to maintain an air seal between the furnace and the wall assembly.

The pressure of the furnace was monitored throughout the tests.

Prior to the fire endurance test the test assembly was moved into position in front of the furnace and the pilot burners were ignited. The fire endurance test was initiated after igniting the burners. The temperature inside the furnace was controlled to follow the standard time/temperature curve within the limits described in CAN/ULC S101.

Test Requirements:

Article 3.2.3.8. Sentence 2

- a) The fire exposed area of the wall assembly shall be not less than 9.3 m² and have no dimension less than 2.75 m.
- b) The exposed surface shall include typical vertical and horizontal joints.
- c) The test shall be continued for not less than 15 min. and the standard time/temperature curve of CAN/ULC S101, “Fire Endurance Tests of Building Construction and Materials”, shall be followed.
- d) The noncombustible protective material must remain in place and no through openings should develop that are visible when viewed normal to the face of the material.
- e) The noncombustible protective material should not disintegrate in a manner that would permit fire to propagate along the surface of the test assembly.

Test Results:

Observations

Table 2: Test Observations - Wall Assembly

| Test Time (min) | Unexposed | Exposed |
|-----------------|--------------------|--|
| 1:50 | | Darkening of the surface. |
| 2:00 | | The joints in the cement board are raised. |
| 2:19 | | Ignition of the surface. |
| 10:33 | | Flaming at the joints. |
| 15:00 | Test discontinued. | |

After the wall was rolled away from the furnace it was observed that there were no openings in the protective barrier when viewed normal to the face.

Protective Barrier

The cement board protective barrier remained in place for the duration of the test. There were a few small areas where the stucco finish had deteriorated but there were no through openings through to the spray foam insulation. The protective barrier did not deteriorate in a manner that flame could propagate along the panel surface.

Conclusions:

QAI performed testing following CAN/ULC S101 15-Minute Stay In Place as referenced by NBC Article 3.2.3.8. Sentence 2 on a Genyk wall assembly containing Boreal Nature Elite medium density spray applied polyurethane foam insulation with cement board and stucco finish.

The Genyk test assembly met the requirements above when exposed the time temperature curve of CAN/ULC S101 for 15 minutes duration and constructed as described in Table 1 of this report.

APPENDIX A

| Page | Title |
|------|--------------------------------|
| 8 | Furnace Time Temperature Curve |

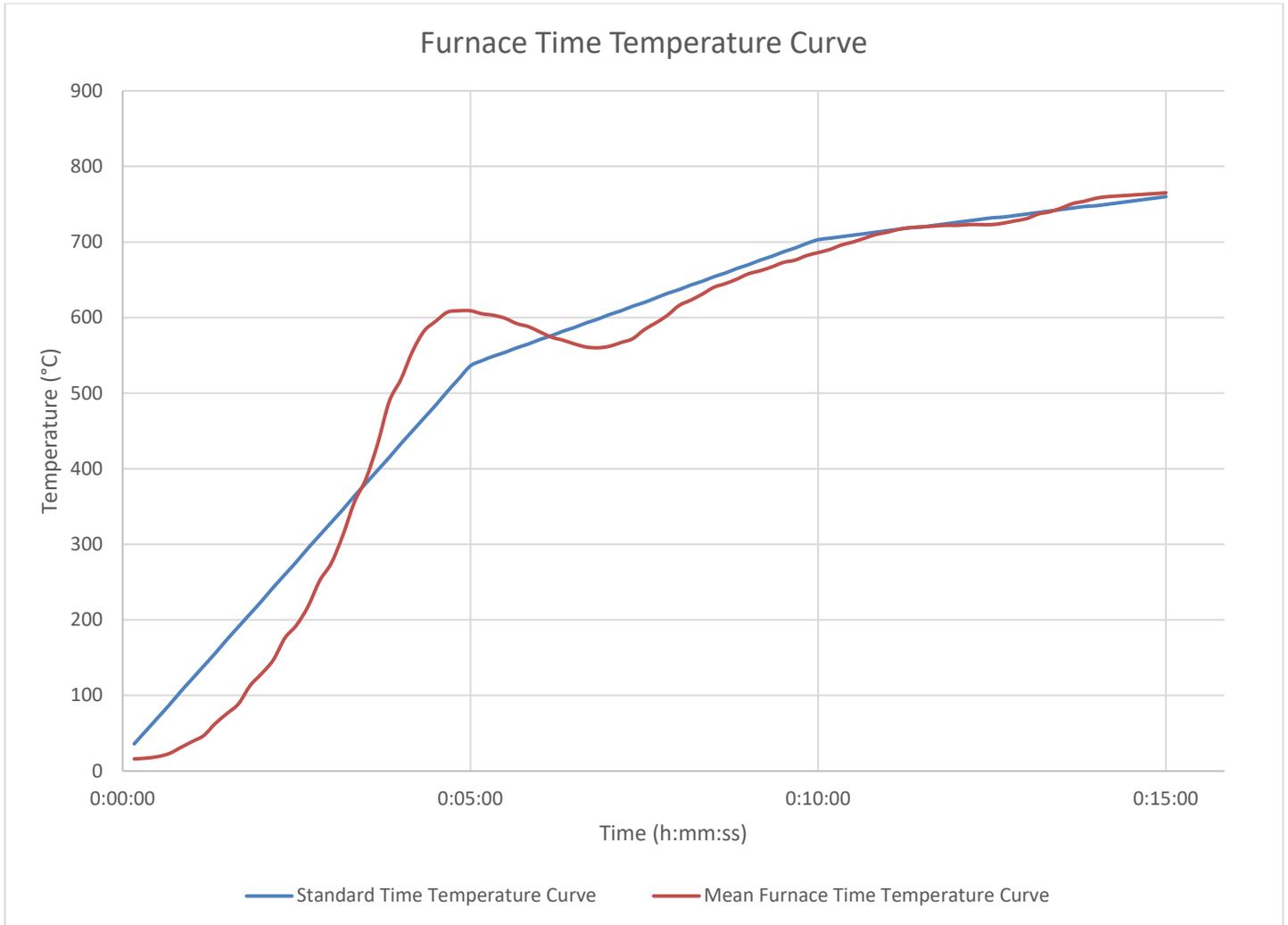


Figure 2: Furnace Time Temperature Curve

APPENDIX B

| Page | Title |
|-------------|-----------------|
| 10-11 | Sample Pictures |



Figure 3: The exposed face prior to the cement board.



Figure 4: The exposed face prior to the stucco application.

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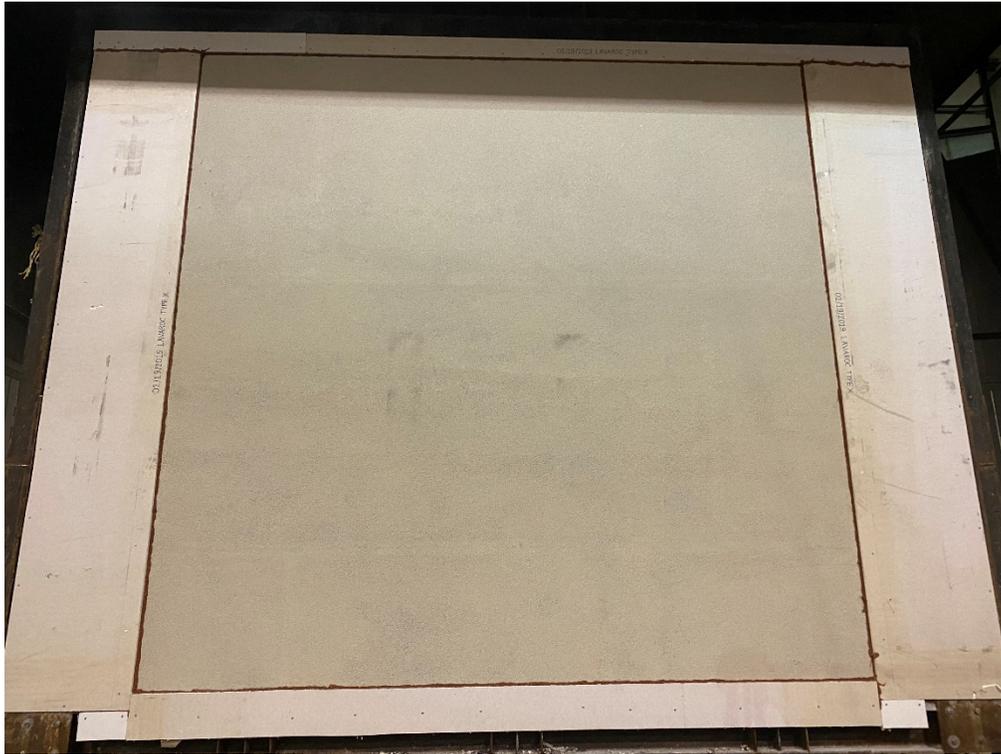


Figure 5: The exposed face prior to the fire test.



Figure 6: The exposed face after the fire test.

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