

CLIENT: **International Fireproof Technology, Inc.**
17528 Von Karman Ave.
Irvine, CA 92614
And
International Carbide Technology
No. 1-17, Toa-Chan, 13 Ling
Lu-Chu Hsiang
Kern-Ko Village
Taiwan, Rep, of China

Test Report No: TJ6783-4	Report Date: October 29, 2019
---------------------------------	--------------------------------------

SAMPLE ID: Wood floor assembly consisting of dimensional wood joists, 3.5 inches of spray-applied foam plastic insulation and wood subfloor with 34 mils wet film thickness of DC315 coating applied over exposed foam and wood joists. Test 7, Sample 2.

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 September 20th, 2019 in good condition.

TESTING PERIOD: September 27th, 2019.

AUTHORIZATION: Proposal 19DB062502

TEST PROCEDURE: Testing to the following methods with the deviations found on page 5:

- ASTM E119-16a, "Standard Test Methods for Fire Tests of Building Construction and Materials" (ASTM E119).
- CAN/ULC S101-07, "Standard Methods of Fire Endurance Tests of Building Construction and Materials" (CAN/ULC S101).

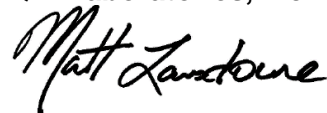
TEST RESULTS: The International Fireproof Technology, Inc. assembly outlined on page 3 of this report, met the temperature rise and burn through requirements when evaluated to 1 hour fire exposure as outlined per ASTM E119 and CAN/ULC S101 evaluated on a reduced sample size.

Prepared By



J. Brian McDonald
Operations Manager

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



Matt Lansdowne
Director of Engineering



Table of Contents

Introduction:	3
Sample Description:	3
Test Apparatus:	4
Test Results:	5
Conclusions:	6
APPENDIX A	7

Introduction:

This report documents the fire testing conducted by QAI Laboratories for International Fireproof Technology, Inc, wood floor assembly consisting of dimensional wood joists, 3.5 inches of spray-applied foam plastic insulation and wood subfloor with 34 mils wet film thickness of DC315 coating applied over exposed foam and wood joists. Test 7, Sample 2.

Testing was performed on a reduced assembly size, following the time temperature fire exposure as outlined in ASTM E119 and CAN/ULC-S101, with the deviations as noted on Page 5 of this report.

Sample Description:

Sample description is listed from non-fire side to exposed surface.

COMPONENT	DESCRIPTION	
Assembly	Overall Size:	72 inches width x 58 inches height, 9 in thickness.
	Description:	Wood floor joists with wood sub floor and spray applied foam plastic insulation with DC315 coating.
	Orientation:	Horizontal
Floor Sheathing	Type:	2-layer ¾ inch T&G plywood with joint perpendicular to the joists. Joints offset minimum of 24 inches between subfloor layers.
	Size:	¾ inch thickness.
	Fasteners:	Glued with PL premium adhesive and fastened with 2 in x.094 ring shank nails spaced 6 in OC along
Framing	Type:	Spruce-Pine-Fir (SPF) Grade #2 lumber.
	Size:	2 inches by 10 inches nominal size.
	Spacing:	24 inches on center (OC).
	Fasteners:	4 - 10d round head nails.
Insulation:	Type:	SES Nexseal 2.0
	Thickness:	3.5 inches nominal.
	Density:	2.0 lbs/ft ³ target density.
	Installation:	Spray-applied into stud cavity, to target thickness of 3.5 inches.
Coating:	Type:	DC315 intumescent.
	Thickness	34 mils applied wet mils thickness uniformly applied over the exposed spray-applied polyurethane foam insulation and wood joists.

Table 1. Test Assembly Description

Test Apparatus:

The furnace used in the tests is a pilot-scale fire burning apparatus with interior dimensions of 60 in. in height, 60 in. in width, and 52 in. in depth.

Temperatures within the furnace were monitored using four thermocouples. The temperatures are controlled by adjusting fuel to the furnace burners to conform to the time/temperature curve specified by the test standards.

Unexposed temperatures were monitored by thermocouples (TCs). The TC's were placed at nine locations per section 7.3.1.2 of the referenced standard. The temperatures were recorded continuously for the duration of the test, and the temperature rise data are provided graphically in Figure 5 and 6 in Appendix A.

The wall section is mounted in a vertical orientation, into a steel frame specimen holder. The specimen holder is then rolled up to the furnace and secured by chain and straps to the furnace opening.

One pressure tap was installed through the back wall of the test furnace. The pressure tap was attached and monitored by a Setra model 264 pressure transducer (ID# A300442). The furnace pressure was controlled by adjusting a damper in the furnace exhaust stack.



Figure 1: Furnace Interior

Thermocouple Location:

Nine thermocouples were used in this test were placed uniformly across the non -fire side of the floor / ceiling assembly evaluated, with a thermocouple located along the plywood subfloor joint.

Deviations from the Test Standard:

The purpose of this test was for R&D and was not tested at the required sample size of 100 ft.².

In addition, the required number of furnace thermocouples were not met due to the reduced sample size.

Hose stream testing was not performed.

TEST REQUIREMENTS:

1. No through penetration of flames or hot gasses during evaluation.
2. Temperature rise average cannot exceed 250°F above ambient (noted 81°F at start of test).
3. Maximum temperature cannot exceed 325°F above ambient (noted 81°F at start of test).
4. During hose stream, no through passage of water through the assembly.

Test Results:

Observations

The following observations were taken over the duration of the fire test:

Table 2: Test Observations of Test Assembly

Test Time (min)	Unexposed Side Observations
00:00	Test initiated
00:30	Light charring noted on wall
05:00	Most of face of test sample has charred and intumesced
10:00	Little change in conditions above
30:00	A few small pieces of material have fallen to the furnace floor, steady performance overall
59:59	Temperature (maximum and average) not exceeded for 1 hour exposure
1:00:00	Test Concluded

Flaming and Penetration

No flaming occurred on the unexposed face of test assembly, and no through penetrations or openings were observed during the 1 hour fire test.

THIS REPORT IS THE CONFIDENTIAL PROPERTY OF THE CLIENT ADDRESSED. THE REPORT MAY ONLY BE REPRODUCED IN FULL. PUBLICATION OF EXTRACTS FROM THIS REPORT IS NOT PERMITTED WITHOUT WRITTEN APPROVAL FROM QAI. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED FOR THE INDIVIDUAL PROJECT FILE REFERENCED. THE RESULTS OF THIS REPORT PERTAIN ONLY TO THE SPECIFIC SAMPLE(S) EVALUATED.

Unexposed Temperature Rise

The maximum temperature limit of 325°F above initial was not reached for the tested assembly during the 60 minutes test.

The average temperature limit of 250°F above initial was not reached for the tested assembly during the 60 minutes test.

Hose Stream Test

The hose stream test was not performed.

Conclusions:

QAI performed testing following the time temperature fire exposure as outlined in ASTM E119 and CAN/ULC S101, with the deviations found on page 5, on a wood floor assembly consisting of dimensional wood joists, 3.5 inches of spray-applied foam plastic insulation and wood subfloor with 34 mils wet film thickness of DC315 coating applied over exposed foam and wood joists. Test 7, Sample 2.

The evaluated assembly met the temperature rise on the non-fire side requirements per ASTM E119 and CAN/ULC S101 when exposed evaluated for 1 hour of fire exposure.

APPENDIX A

Page	Title
8	Furnace Time Temperature Curve
9	Unexposed Time Temperature Curve

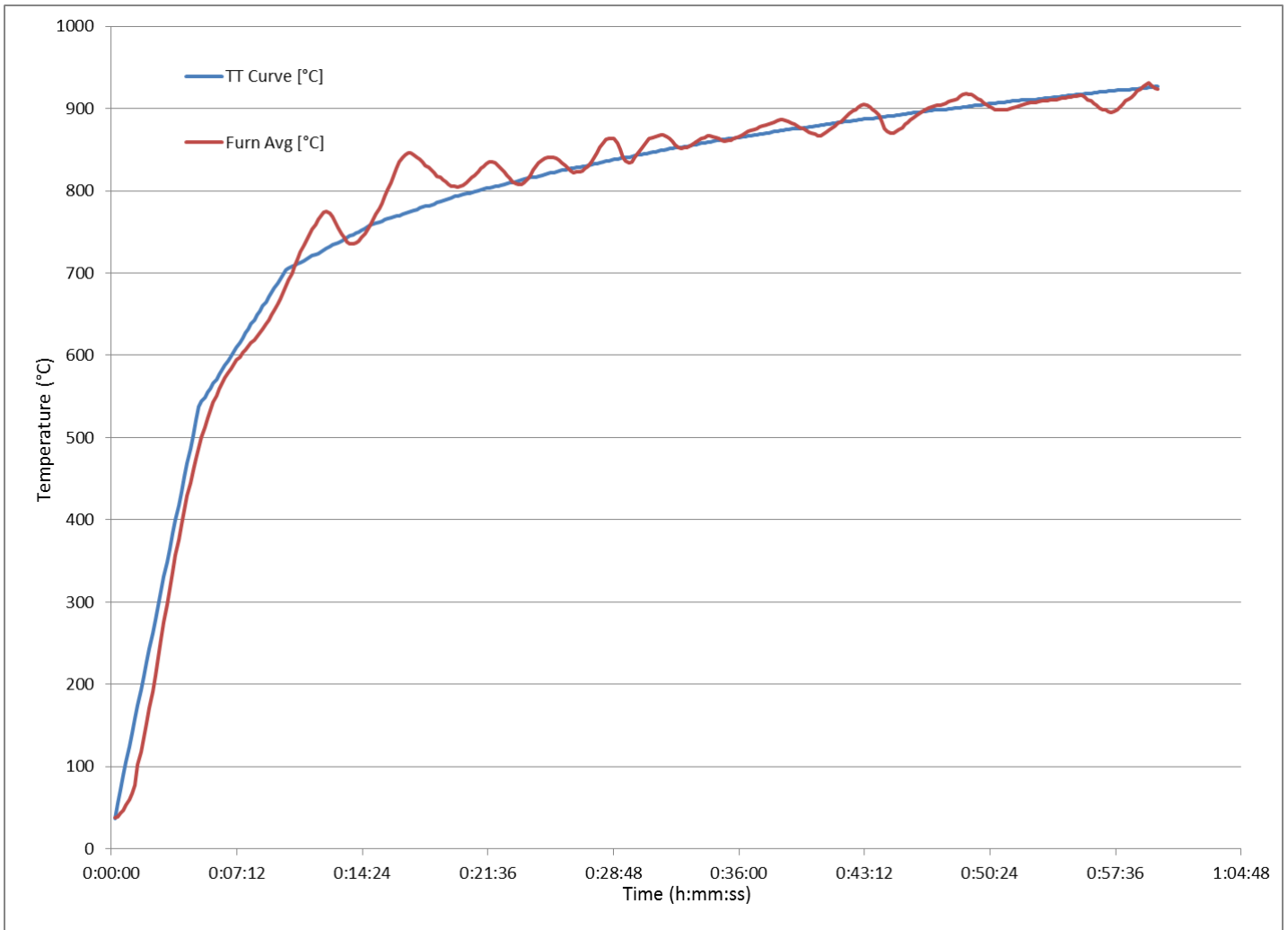


Figure 3: Furnace Time Temperature Curve

THIS REPORT IS THE CONFIDENTIAL PROPERTY OF THE CLIENT ADDRESSED. THE REPORT MAY ONLY BE REPRODUCED IN FULL. PUBLICATION OF EXTRACTS FROM THIS REPORT IS NOT PERMITTED WITHOUT WRITTEN APPROVAL FROM QAI. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED FOR THE INDIVIDUAL PROJECT FILE REFERENCED. THE RESULTS OF THIS REPORT PERTAIN ONLY TO THE SPECIFIC SAMPLE(S) EVALUATED.

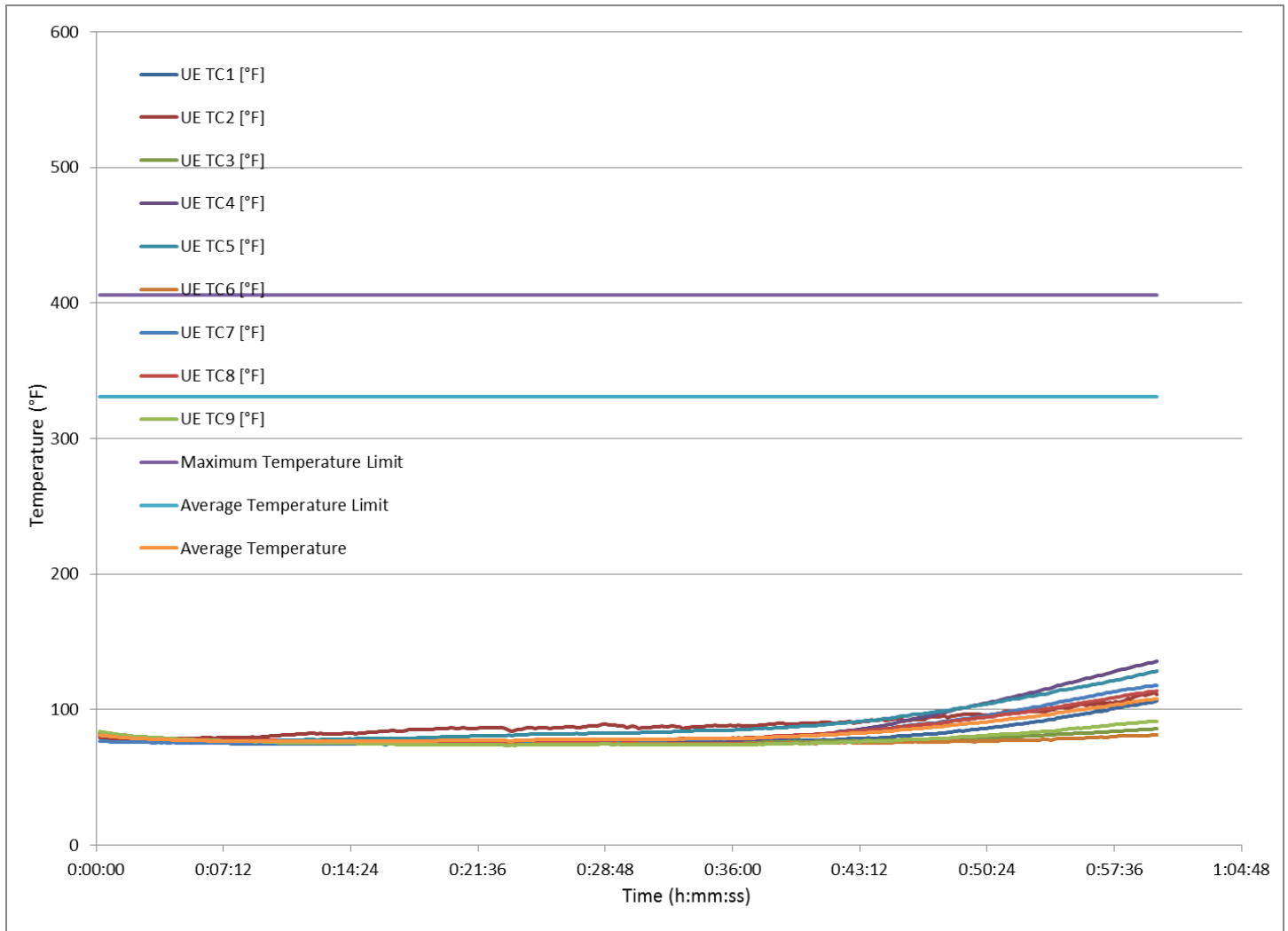


Figure 4: Unexposed Time Temperature Curves

***** END OF REPORT *****

THIS REPORT IS THE CONFIDENTIAL PROPERTY OF THE CLIENT ADDRESSED. THE REPORT MAY ONLY BE REPRODUCED IN FULL. PUBLICATION OF EXTRACTS FROM THIS REPORT IS NOT PERMITTED WITHOUT WRITTEN APPROVAL FROM QAI. ANY LIABILITY ATTACHED THERETO IS LIMITED TO THE FEE CHARGED FOR THE INDIVIDUAL PROJECT FILE REFERENCED. THE RESULTS OF THIS REPORT PERTAIN ONLY TO THE SPECIFIC SAMPLE(S) EVALUATED.