



REPORT NUMBER: 102646550COQ-001
ORIGINAL ISSUE DATE: August 9, 2016

EVALUATION CENTER
Intertek Testing Services NA Ltd.
1500 Brigantine Drive
Coquitlam, B.C. V3K 7C1

RENDERED TO

Ward Manufacturing
117 Gulick Street
Blossburg, PA 16912 USA

PRODUCT EVALUATED: WF 20C CSST1 in. Diameter Conduit
EVALUATION PROPERTY: Surface Burning Characteristics

Report of testing WF 20C CSST 1 in. Diameter Conduit for compliance with the applicable requirements of the following criteria: CAN/ULC S102.2-10, *Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials and Assemblies.*

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TEST REPORT

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2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for Ward Manufacturing, to evaluate the surface burning characteristics of nominal 1 in. diameter WF 20C CSST. Testing was conducted in accordance with the standard methods of CAN/ULC S102.2-10, *Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials and Assemblies*.

This evaluation began August 8, 2016 and was completed the August 9, 2016.

3 Test Samples

3.1. SAMPLE SELECTION

Samples were submitted to Intertek directly from the client and were not independently selected for testing. The sample panels were received at the Evaluation Center on July 8, 2016.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The sample product was identified by the client as nominal 1 in. diameter WF 20C CSST Conduit with a black jacketing.

For each trial run, a 24 ft. length of conduit was placed under each burner port of the flame spread tunnel and fastened to a reinforced cement board substrate using plumbers tape. A layer of 6mm reinforced cement board was placed on top of the sample, the tunnel lid was lowered into place, and the samples were then tested in accordance with CAN/ULC S102.2-10.

4 Testing and Evaluation Methods

4.1. TEST STANDARD

The results of the tests are expressed by indexes, which compare the characteristics of the sample under tests relative to that of select grade red oak flooring and inorganic-cement board.

(A) Flame Spread Rating:

This index relates to the rate of progression of a flame along a sample in the 25 foot tunnel. A natural gas flame is applied to the front of the sample at the start of the test and drawn along the sample by a draft kept constant for the duration of the test. An observer notes the progression of the flame front relative to time.

The test apparatus is calibrated such that the flame front for red oak flooring passes out the end of the tunnel in five minutes, thirty seconds (plus or minus 15 seconds).

(B) Smoke Developed:

A photocell is used to measure the amount of light, which is obscured by the smoke passing down the tunnel duct. When the smoke from a burning sample obscures the light beam, the output from the photocell decreases. This decrease with time is recorded and compared to the results obtained for red oak, which is defined to be 100.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

(A) Flame Spread

The resultant flame spread ratings are as follows:
(Rating rounded to nearest 5)

1 in. dia WF 20C CSST Conduit	Flame Spread	Flame Spread Rating
Run 1	0	0
Run 2	1	
Run 3	0	

(B) Smoke Developed

The areas beneath the smoke developed curve and the related classifications are as follows:
(Classification rounded to nearest 5)

1 in. dia WF 20C CSST Conduit	Smoke Developed	Smoke Developed Classification
Run 1 (Blue)	13	15
Run 2 (Red)	16	
Run 3 (Natural)	11	

(C) Observations

During the test, the sample surface ignited between 71 and 81 seconds; the flame began to progress along the sample until it reached the maximum flame spread. This was the case for all three test runs.

6 Conclusion

The samples of 1 in. diameter WF 20C CSST Conduit, submitted by Ward Manufacturing, exhibited the following flame spread characteristics when tested in accordance with CAN/ULC S102.2-10, *Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering, and Miscellaneous Materials and Assemblies*.

A series of three test runs was conducted to conform to the requirements of the National Building Code of Canada.

Sample Material	Flame Spread Rating	Smoke Developed Classification
1 in. dia WF 20C CSST Conduit	0	15

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK TESTING SERVICES NA LTD.

Tested and
Reported by:


Greg Philp
Technician – Building Products

Reviewed by:


Riccardo DeSantis
Manager – Building Products

APPENDIX A

DATA SHEETS

CAN/ULC S102.2-10 DATA SHEETS
Run 1

Standard: Canadian ULC S102.2

Page 1 of 2

Client: Ward Manufacturing
Date: 08 08 2016
Project Number: 102646550
Test Number: 1
Operator: Greg Philp
Specimen ID: WF 20C CSST Nominal 1 in. Dia Conduit

TEST RESULTS

FLAMESPREAD INDEX: 0

SMOKE DEVELOPED INDEX: 15

SPECIMEN DATA . . .

Time to Ignition (sec): 74
Time to Max FS (sec): 0
Maximum FS (mm): 0.0
Time to 527 C (sec): Never Reached
Time to End of Tunnel (sec): Never Reached
Max Temperature (C): 265
Time to Max Temperature (sec): 596
Total Fuel Burned (cubic feet): 46.00
FS*Time Area (M*min): 0.0
Smoke Area (%A*min): 23.9
Unrounded FSI: 0.0
Unrounded SDI: 13.4

CALIBRATION DATA . . .

Time to Ignition of Last Red Oak (Sec): 42.0
Red Oak Smoke Area (%A*min): 178.4

Tested By: 

Reviewed By: 

CAN/ULC S102.2-10 DATA SHEETS Run 1

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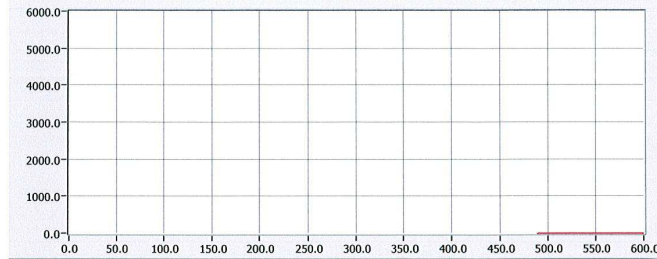
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Specimen ID: WF 20C CSST Nominal 1 in. Dia Conduit

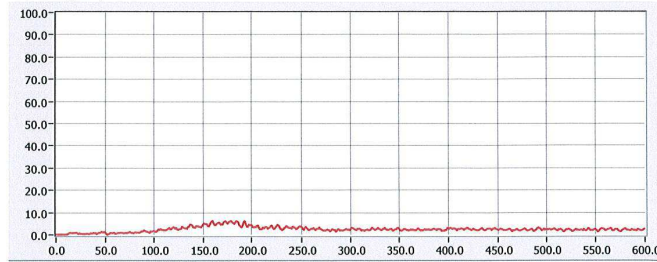
Test No.: 102646550

Standard: Canadian ULC S102.2

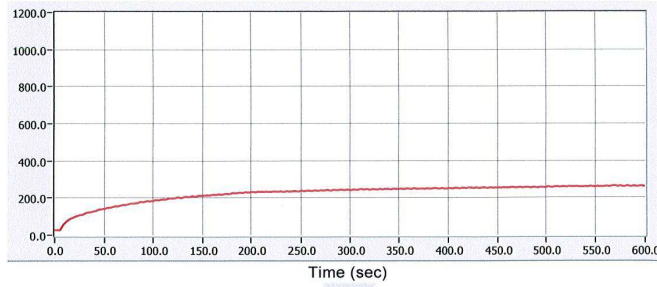
FLAME SPREAD (MM)



Smoke (%A)



Temperature (°C)



Time (sec)

600

Tested By: *[Signature]*

Reviewed By: *RD*

CAN/ULC S102.2-10 DATA SHEETS
Run 2

Standard: Canadian ULC S102.2

Page 1 of 2

Client: Ward Manufacturing
Date: 08 09 2016
Project Number: 102646550
Test Number: 2
Operator: Greg Philp
Specimen ID: WF 20C CSST Nominal 1 in. Dia Conduit

TEST RESULTS

FLAMESPREAD INDEX: 0
SMOKE DEVELOPED INDEX: 15

SPECIMEN DATA . . .

Time to Ignition (sec): 71
Time to Max FS (sec): 424
Maximum FS (mm): 66.2
Time to 527 C (sec): Never Reached
Time to End of Tunnel (sec): Never Reached
Max Temperature (C): 267
Time to Max Temperature (sec): 533
Total Fuel Burned (cubic feet): 46.00

FS*Time Area (M*min): 0.3
Smoke Area (%A*min): 29.3
Unrounded FSI: 0.6
Unrounded SDI: 16.1

CALIBRATION DATA . . .

Time to Ignition of Last Red Oak (Sec): 42.0
Red Oak Smoke Area (%A*min): 181.7

Tested By: _____

Reviewed By: RD

CAN/ULC S102.2-10 DATA SHEETS

Run 2

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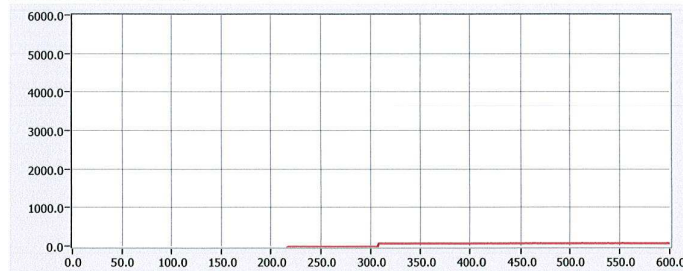
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Specimen ID: WF 20C CSST Nominal 1 in. Dia Conduit

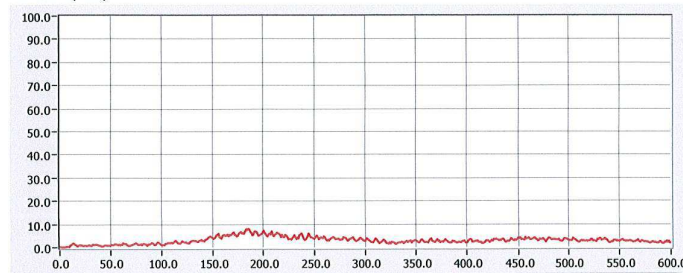
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Standard: Canadian ULC S102.2

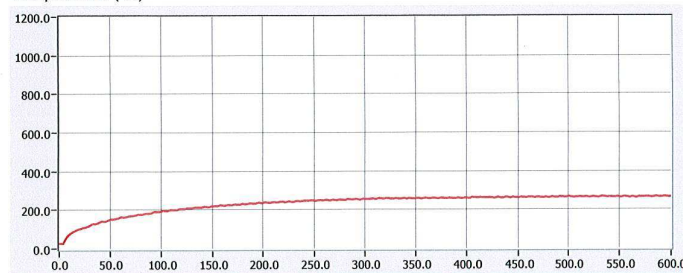
FLAME SPREAD (MM)



Smoke (%A)



Temperature (°C)



Time (sec)
600

Tested By:

Reviewed By:

CAN/ULC S102.2-10 DATA SHEETS
Run 3

Standard: Canadian ULC S102.2

Page 1 of 2

Client: Ward Manufacturing
Date: 08 09 2016
Project Number: 102646550
Test Number: 3
Operator: Greg Philp

Specimen ID: WF 20C CSST Niminal 1 in. dia Conduit

TEST RESULTS

FLAMESPREAD INDEX: 0

SMOKE DEVELOPED INDEX: 10

SPECIMEN DATA . . .

Time to Ignition (sec): 81
Time to Max FS (sec): 0
Maximum FS (mm): 0.0
Time to 527 C (sec): Never Reached
Time to End of Tunnel (sec): Never Reached
Max Temperature (C): 265
Time to Max Temperature (sec): 576
Total Fuel Burned (cubic feet): 46.00

FS*Time Area (M*min): 0.0
Smoke Area (%A*min): 19.6
Unrounded FSI: 0.0
Unrounded SDI: 10.8

CALIBRATION DATA . . .

Time to Ignition of Last Red Oak (Sec): 42.0
Red Oak Smoke Area (%A*min): 181.7

Tested By: 

Reviewed By: 

CAN/ULC S102.2-10 DATA SHEETS Run 3

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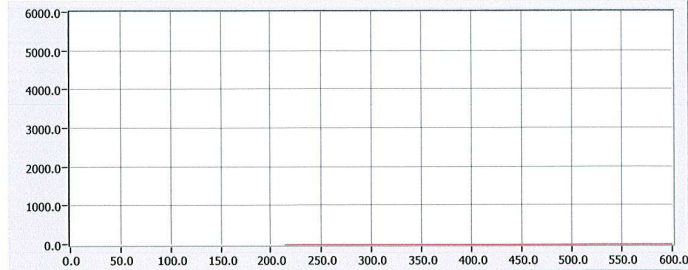
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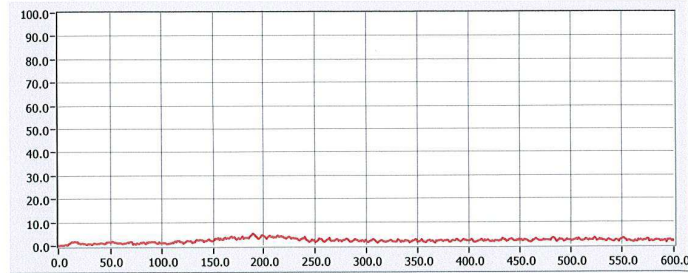
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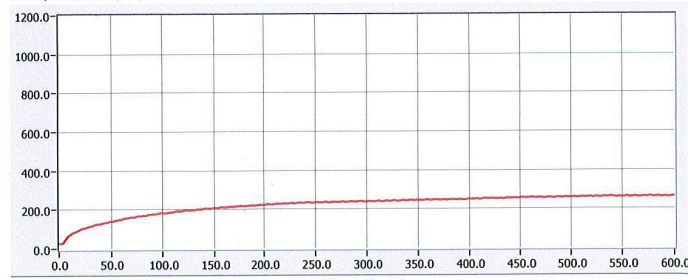
FLAME SPREAD (MM)



Smoke (%A)



Temperature (°C)



Time (sec)
600

Tested By: [Signature]

Reviewed By: [Signature]

REVISION SUMMARY

DATE	PAGE(S)	SUMMARY
August 9, 2016	All	Original Issue Date