Bodycote MATERIALS TESTING CANADA INC.

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Small-Scale Fire Endurance Test on FR Floor/Ceiling Composite Panel

A Report To:	**PYROLOGISTIX** 1645 Howe Island Dr. Howe Island, Ontario K7G 2V6
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Attention:	Charlie Cooper President
Submitted By:	Fire & Flammability
Report No.	03-02-844(D) 4 pages + 2 appendices
Date:	January 28, 2004

ACCREDITATION Standards Council of Canada, Registration #1.

REGISTRATION ISO 9002-1994, registered by QMI, Registration #001109.

SPECIFICATIONS OF ORDER

Perform small scale fire endurance test in the horizontal mounting configuration using the time/temperature curve defined by CAN/ULC-S101 (ASTM E 119), as per your request of January 22, 2004.

SAMPLE IDENTIFICATION

The test sample consisted of 2x10 dimensional fir lumber floor joists on 16-inch centres with double diagonal (opposing directions) 1x4 tongue and groove pine flooring on the top. The heat exposure side or ceiling consisted of new thin gauge stamped tin panels mounted on 1x2 dimensional fir strapping at two foot on centre. The tin was primed and then painted with PyroLogistix Fire Barrier Intumescent Paint to a minimum coating depth of 40mil dry film thickness.

(BMTC sample identification number 03-02-S0844-4)

SAMPLE CONDITIONING

The sample was tested as received from the client. Conditions in the test area were approximately 20°C and a relative humidity of 40% on the day of the test.

SUMMARY OF TEST PROCEDURE

The composite panel, approximately 1220 mm x 1220 mm, was placed with the tin panel side (ceiling surface) facing down, on top of a computer-controlled furnace. The furnace, having an exposed area of 1000 mm x 1000 mm, is programmed to follow the standard time-temperature curve specified in ASTM E 119.

Temperatures on the unexposed surface were sensed by six thermocouples scanned at 1 minute intervals.

Performance of the panel is expressed as a time period, to the nearest integral minute, of resistance to standard exposure elapsing before a defined thermal transmission criterion is observed or breakthrough of flame occurs.

TEST CONFIGURATION

The test was conducted in the horizontal mounting configuration without loading. Thermocouple locations on the unexposed side of the panel are shown in Figure 1.

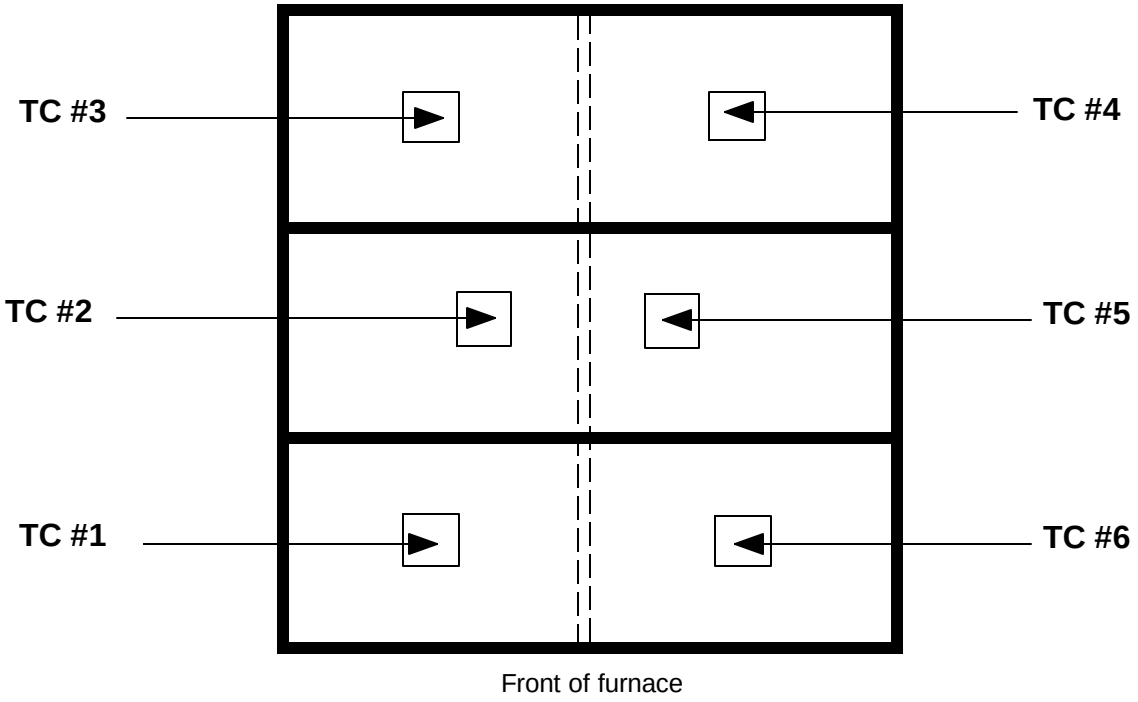
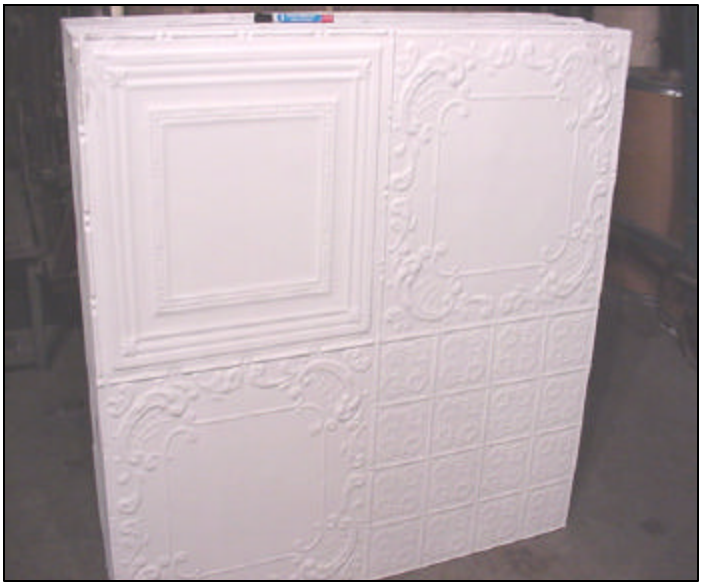


Figure 1 Thermocouple locations on the test specimen (not to scale)

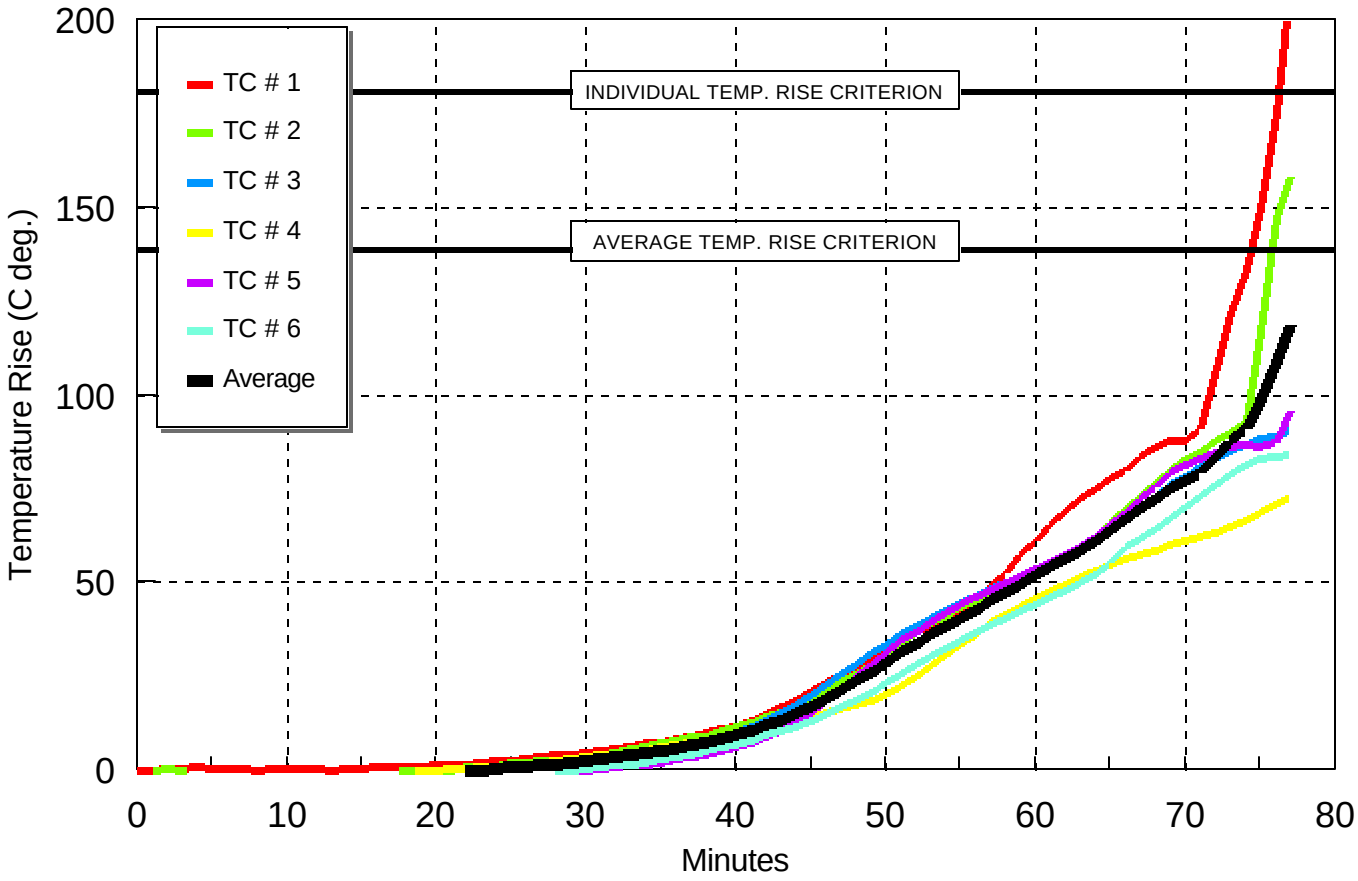


Exposed Side

Unexposed Side

TEST RESULTS

The temperature increases are illustrated graphically in Figure 2. Complete temperature data are provided in the Appendix. Furnace accuracy at the 77 minute point was 99.8% of nominal.
The furnace time/temperature curve and a brief description of the furnace are also given in the Appendix.



Elapsed Time (min)	Avg. Temp. Rise (C deg.)	Highest Ind. Rise (C deg.)	Elapsed Time (min)	Avg. Temp. Rise (C deg.)	Highest Ind. Rise (C deg.)
0	0	0	45	17	21
5	0	1	50	29	34
10	0	1	55	41	45
15	0	1	60	52	61
20	0	2	65	64	78
25	1	3	70	77	88
30	3	5	75	99	150
35	5	8	76	109	175
40	10	12	77	119	+ ***210***

\+ *exceeded individual temperature rise*

Figure 2 Unexposed surface temperature rise

OBSERVATIONS

At approximately 60 minutes, hot gases escaping around the edge, from between the layers of flooring on the unexposed side of the panel began to ignite and cause intermittent flaming along the edge of the panel in the area of TC #1. The flaming activity then began to spread to the edge of the unexposed surface, however this was considered to be an "edge effect" and not "breakthrough of flaming".

Breakthrough of flame through the flooring surface occurred just after 1 hour 5 minutes. At approximately 1 hour 10 minutes, most the surface of the panel quadrant in the area of TC #1 was flaming. The test was continued until 77 minutes, at which time the individual temperature rise criteria was exceeded and the test was terminated.

COMMENTS AND CONCLUSIONS

The specified thermal transmission criteria are for the average temperature rise not to exceed 139 C degrees or an individual temperature rise not to exceed 181 C degrees during a test exposure time for the required classification. There shall be no breakthrough of flame during the exposure period.

Breakthrough of flame through the surface of the panel occurred at 1 hour 6 minutes. The average or individual temperature rise criteria had not been exceeded at this time.

Therefore, based on breakthrough of flame, the composite panel affords a Fire Endurance Rating of 1 hour, 5 minutes.

Note: This is an electronic copy of the report. Signatures are on file with the original report.

Robert Carleton
Fire Testing Services.

Richard J. Lederle
Fire Testing Services.

Note: This report consists of a cover page, plus 4 additional pages that comprise the report "body". It should be considered incomplete if all pages are not present.

APPENDIX A

(2 pages)

Unexposed Surface Temperatures

Bodycote Materials Testing Canada Inc.
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For: PYROLOGISTIX *Report No. 03-02-844(D)*

APPENDIX B

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Furnace Temperatures