Likely fire performance of floor/ceiling system incorporating Firefree88 intumescent paint applied to metal ceiling tiles

Assessment Report

Author: Brett Roddy
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Client: Firefree Coatings, Inc

Inquiries should be address to:

Fire Testing and Assessments	Author	The Client
Infrastructure Technologies 14 Julius Avenue North Ryde, NSW 2113 Telephone +61 2 94905444	Infrastructure Technologies 14 Julius Avenue North Ryde, NSW 2113 Telephone +61 2 9490 5500	Firefree Coatings, Inc. 580 Irwin Street, Suite 1 San Rafael, CA USA Telephone + 1 415-459-6488

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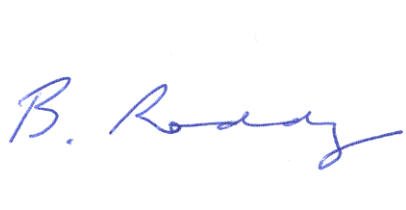
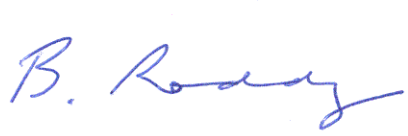
Report Authorization:

AUTHOR	REVIEWED BY	AUTHORISED BY
Brett Roddy	Chris Wojcik	Brett Roddy
		
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Executive summary

This report provides the re-assessment of this Division on the likely performance of a floor/ceiling system incorporating Firefree88 intumescent paint applied to metal ceiling tiles.

It is the opinion of the Division that a timber-framed floor/ceiling system comprising a pressed metal ceiling attached to the underside of a structurally sound floor system by means of minimum 50-mm x 25-mm timer battens would be capable of achieving fire-resistance levels (FRL) of 60/60/60 if tested in accordance with AS 1530.4-1997 provided that:-

(i) the underside of the pressed metal ceiling is primed and coated with at least 1250 µm of Firefree 88 as per the procedure provided in the Appendix A; and

(ii) the pressed metal ceiling, fixings and the timber battens are in good condition.

Likely fire performance of floor/ceiling system incorporating Firefree88 intumescent paint applied to metal ceiling tiles

1 Introduction

This report provides the re-assessment of this Division on the likely performance of a floor/ceiling system incorporating Firefree88 intumescent paint applied to metal ceiling tiles.

2 Supporting Data

2.1 Western Fire Center, Inc, Kelso Washington USA report numbered PN00050

On 17 May 2000 a pilot scale fire-resistance test was conducted by Western Fire Center, USA on a floor/ceiling system measuring approximately 1200 mm x 1200 mm. The small-scale test, described in the United States of America Uniform Building Code (UBC) Standard 26-2, Test Methods for the Evaluation of Thermal Barriers, uses a horizontal exposure furnace to subject specimens to a standard time-temperature curve as specified in UBC Standard 7-1. This time-temperature curve, while not being exactly equivalent to the standard time-temperature curve specified AS 1530.4, it does fall within the specified tolerances and is therefore acceptable for the purpose of evaluating system performance.

The specimen under test comprised 100-mm wide x 300-mm deep ceiling joists, 25-mm thick x 300-mm wide Oak sheeting with T & G pine flooring over and 50 mm x 25 mm Douglas Fir battens with embossed tin ceiling attached to the underside. The pressed metal ceiling was then painted with 10 dry mils (~250 µm) of Envirotrol primer and 40 dry mils (1000 µm) of Ff88 intumescent paint.

This test was terminated at 60 minutes at which time there was no failure of the system with regard to integrity or insulation on the unexposed face of the specimen. The observed performance stated that:-

- at 38 minutes the battens started to char;
- at the conclusion of the test the exposed coating was noted to have intumesced by approximately 25 mm and the intumescent layer was intact at the conclusion of the test; and
- at the conclusion of the test the joists and battens were heavily charred but still intact.

3 Proposal

The proposal is to analyse the likely fire-resistance levels of a timber-framed floor/ceiling system comprising a pressed metal ceiling attached to the underside of a structurally sound floor system.

4 Analysis

The test dated 17 May 2000 was conducted on a new construction and as it is critical that the pressed metal ceiling remains in place for the duration of the test, the results are only applicable when the pressed metal ceiling, fixings and the timber battens are in good condition. Additionally, in order to increase the conservatism an additional 10 mils (250 µm) of Ff88 is specified.

5 Conclusion

It is the opinion of the Division that a timber-framed floor/ceiling system comprising a pressed metal ceiling attached to the underside of a structurally sound floor system by means of minimum 50-mm x 25-mm timer battens would be capable of achieving fire-resistance levels (FRL) of 60/60/60 if tested in accordance with AS 1530.4-1997 provided that:-

(i) the underside of the pressed metal ceiling is primed and coated with at least 1250 µm of Firefree 88 as per the procedure provided in the Appendix A; and

(ii) the pressed metal ceiling, fixings and the timber battens are in good condition.

6 Term of validity

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Appendix A

FIREFREE SYSTEMS AUSTRALASIA

Firefree 88 for Compressed Metal Ceilings

Interior

Surfaces must be clean, cured, and firm. Dry and free of dust, oil, grease or wax.

Remove any other contaminants that may adversely affect Firefree 88's performance. Thoroughly examine surfaces scheduled to be painted before commencing work. Record and report in writing to Project Manager, Engineer or Owner any condition that may potentially affect proper application and appearance. DO NOT commence work until all such defects have been corrected. **Do not apply Insultec B 500X or Firefree 88 if air temperature is below 15 degrees C. Firefree 88 should not be applied if air temperature is above 30 degrees C.**

Air circulation is important. Firefree 88 usually dries in about 4 hours at 450 microns wet. In humid conditions it may take 6 to 8 hours to dry. MAKE SURE THAT PAINT IS COMPLETELY DRY BEFORE APPLYING THE NEXT COAT. If the paint runs let it tack then use a brush or roller to feather it out. If you need to sand Firefree 88 use 100 grit sandpaper. ALWAYS USE A WET FILM GAUGE TO MEASURE EACH COAT.

Measure the moisture content of surfaces using a moisture meter. Do not apply material unless the moisture content is below the following maximums: Cement 8%, Masonry and Concrete 15%, Wood 12%.

	APPLICATION METHOD	THEORETICAL SPREAD RATE	WET⇒ DRY FILM THICKNESS MICROMETRES	WASH UP	RECOAT TIME IN HOURS
FIRST COAT Insutec B 500X	B, R or S	3.5	350⇒ 250	Water	6
SECOND COAT Firefree 88	B, R or S	2.5	420⇒ 300	Water	6
THIRD COAT Firefree 88	B, R or S	2.5	420⇒ 300	Water	6
FOURTH COAT Firefree 88	B, R or S	2.5	420⇒ 300	Water	8
FIFTH COAT Firefree 88	B, R or S	2.5	490⇒ 350	Water	8

DO NOT THIN FIREFREE 88. If you need to strain Ff88 only use gauze the size used in fly screen doors.
Application Method: B-Brush, R-Roller, S-Spray

Spray Equipment: Graco 500HD pump or larger at 3000psi. Graco 237 – 476 Texture gun. Tip 27 Thou.
Spray Equipment: Envirotrol 15 or 17 thou tip at 3000psi

This product can be tinted or over coated with an acrylic paint. In wet areas it is advisable to over coat Ff 88 with a gloss or Semi-Gloss oil based enamel paint.

Special Note: Apply one coat of acrylic or oil based primer over Firefree 88 before applying latex enamel or oil based enamel finish coat.

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References

The following informative documents are referred to in this Report:

AS 1530.4-1997	Methods for fire tests on building materials, components and structures Part 4: Fire-resistance tests of elements of building construction.
PN00050	Test report from the Western Fire Center, Inc, Kelso Washington USA.

CONTACT US

t 1300 363 400
+61 3 9545 2176
e enquiries@csiro.au
w www.csiro.au

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FOR FURTHER INFORMATION

Infrastructure Technologies
Brett Roddy
Manager, Fire Testing and Assessments
t +61 2 94905449
e brett.roddy@csiro.au
w www.csiro.au/Organisation-Structure/Flagships/Future-Manufacturing-Flagship/Infrastructure-Technologies/Fire-safety.aspx