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CSIRO

Our ref: FCO-2913/4117

L & A Fazzini Manufacturing Pty Ltd
23-25 Wentworth Street
GREENACRE NSW 2190

Attention Mr Fazzini,

FIRE TESTED PERFORMANCE OF YOUR TRIMESH AND VERMITEX®TH WALL AND/OR CEILING COMPOSITE MEMBRANE SYSTEM WHEN EMPLOYED AS A HORIZONTAL / VERTICAL MEMBRANE BARRIER SUBJECTED TO:

A) ISO 834 /AS 1530 /BS 476.20 /ASTM E119 CELLULOSIC FIRES; AND

B) BS 476-20 (APPENDIX D) /UL 1709 /ASTM E1529 /RABT (TRAIN & VEHICLE) /RWS & HC MODIFIED RAPID RISE /HYDROCARBON FIRES

Your e-mail of 26 March
Assessment Number FCO-2913

INTRODUCTION

As requested we have analysed the available information on the likely performance of Vermitex TH Partition insulation when applied to separating elements (vertical and/or horizontal) used for construction in industrial applications. The information includes

- your post test analysis numbered DOC- HCM/JUNE 2010/TEST on a fire-resistance test to the HC inc (MOD) fire curve and reported in FSH 1420 conducted on 3 June 2010, on a hollow core precast slab element;
- sponsored investigation report numbered FSH 1468 on a 2 hour fire-resistance test to HCinc, carried out on 7 April 2011 on three concrete elements;
- sponsored investigation report numbered FSH 1345 on a 4 hour fire-resistance test to ASTM E 1529 (Hydrocarbon Pool Fire -Rapid Rise) carried out on 18 December 2008, on a sprayed ceiling and structural steel elements;
- sponsored investigation report numbered FSV 1198 on a 4 hour fire-resistance test to ASTM E 119 carried out on 15 June 2006, on a sprayed Vermitex®TH non-load bearing wall element;
- sponsored investigation report numbered FSZ 1406 Hose stream test (for 2 hour fire exposure) according to ASTM E 2226 and ASTM E 119 however with a 2 hour fire resistance;
- test to RWS (TNO Report 1998-R116-rev1) carried out on 13 October 2009, on a sprayed Vermitex®TH non-load bearing wall element;
- sponsored investigation FSV 1374 report on a 2 hour fire-resistance test to RWS (TNO Report 1998-R116-rev1 RWS Fire) carried out on 13 October 2009, on a sprayed Vermitex®TH non-load bearing wall element;

- sponsored investigation FSV 1375 report on a 2 hour fire-resistance test to RWS (TNO Report 1998-R116-rev1) carried out on 13 October 2009, on a sprayed Vermitex®TH non-load bearing ceiling element, inclusive of pipe and other services;

- sponsored investigation report numbered FSZ 1206 Hose stream test (4 hour fire exposure) according to ASTM E 2226 and ASTM E 119 (on 3 July 2006), on a sprayed Vermitex®TH non-load bearing wall element;

- data from CSIRO test numbered FSP 1305 (29 November 2007) to the RABT Train Curve;

- CSIRO sponsored investigation report numbered 1598 on a full-scale fire-resistance report conducted on 14 July 1982;

- data from our test numbered FS *3049/1696* (30 July 1998); and our test reports numbered FSP 0836 (Vermitex®TH to HC in test numbered FS *3356/2110 (19* December 2000), FSP 0837 (Vermitex®TH to HC) , FSP 1070 (1st Test Vermitex®TH to ISO 4 hour), FSP 1070 (2nd Test Vermitex®TH to modified French HC peaks at 1350°C), FSP 1071 (3rd Test Vermitex®TH to BS EN 1363 Parts 1 and 2, FSP 1071 (4th Test Vermitex®TH to BS EN 1363 HC) and FSH 0981;

- Australian Standard 3600, British Standard 8110 Parts 1 & 2, Euro code 1 & 2 and EN 1363 -1 & 2;

- Australian Standard 1530, Methods for fire tests on building materials, components and structures, Part 4-1997, Fire-resistance tests of elements of building construction;

- British Standard 476, Fire tests on building materials and structures, Part 20: 1987, Method for the determination of the fire resistance of elements of construction (general principles);

- British Standard 476, Fire tests on building materials and structures, Part 24: 1987, Method for the determination of the fire resistance of ventilation ducts; and

- ISO 834-1: 1999, Fire-resistance tests-Elements of building construction-Part 1: General requirements.

You wish to apply designated thicknesses of your Vermitex®TH /Trimesh Partition sprayed insulation material to various elements to achieve specified fire performances to the various HC fire curves commonly adopted in the construction of Industrial plants including the severe heating conditions of the HC modified (HC inc) curve.

ANALYSIS

As indicated by the documentation listed above, this Division has conducted fire- resistance tests incorporating your sprayed insulation system applied to various elements. The applied thicknesses in these tests varied approximately from 45 mm to 85 mm.

As a result of this series of hose stream tests, fire tests and fire-resistance tests the stickability of your spray insulation to concrete elements was verified and the insulation performance established.

In June of 2010 and in 19 December 2008 this Division conducted fire-resistance tests numbered FSH 1420 (HC^{inc} Mod) and FSH 1345 (ASTM E1529) on the Vermitex®TH sprayed directly (unreinforced) to concrete elements and to a suspended membrane ceiling system comprising your Vermitex®TH and Trimesh sprayed over a compressed fibre cement (CFC) panel as well as a further portion of suspended membrane ceiling system comprising your Vermitex®TH and Trimesh only.

The above systems represent the Vermitex®TH as standalone spray applied coating or the Vermitex®TH and Trimesh prefabricated as a sprayed panel system. Your Vermitex®TH system has now been extensively tested in various configurations. The materials and construction systems adopted above have been originally tested as a ceiling system since 1982 and were also successfully tested (refer fire test SI 1589) in 1982.

Your Trimesh panels have been capable of supporting both your ceiling as well as wall separating construction for periods up to 4 hours. The wall was supported off 10 mm rods placed at 600 mm centres whilst the ceiling was supported at 1200 x 1200 centres with 12mm rods centres without the aid of a suspended sub-frame.

On the 15 of October this division completed tests FSV 1374 and FSV 1375 which were carried out to comply with the RWS Fire curve noted in TNO Standard 1998-CVB-RI161-rev 1 and included a non-load bearing Wall system and your Vermitex®TH Panel and Panel jointing system with numerous penetrating elements suitable for bearing loads from electrical and mechanical services.

As required under NFPA 5000 the wall was instrumented to comply with ASTM E-119 and heated to the requirements of the RWS curve.

On completion the wall was subjected to and passed the required Hose stream Test required by NFPA and ASTM wall tests to comply with ASTM E 2226.

CONCLUSION/OPINION

Based on the observed performance of your Vermitex® TH sprayed protection systems for unrestricted horizontal ceilings and wall membranes (height restrictions noted on Tables 1 to 3) during standard fire tests to many fire curves including European, American and International codes, it is the opinion of this Division that you could use the combination of the Trimesh and Vermitex® TH to construct walls, ceilings and air plenums for the conveying of fresh air or smoke spill systems.

Based on the test evidence and performance from the fire-resistance tests conducted at this facility, it is the opinion of this Division that your Vermitex®TH sprayed cementitious coating when sprayed in approved thicknesses in conjunction with your Trimesh panels has proven that the composite system has the inherent ability to:

a) remain stable, and your proprietary termination details combined with the adhesion to abutting non-combustible surface, negate the passage of hot products of combustions as well as prevent the leakage of fresh air during non-fire conditions;

b) ensure the temperature on the cold face of the plenum does not exceed 180° C for specific periods of time during fire events according to the thickness of the composite system;

c) Successfully pass the Hose Stream Test to ASTM E-2226 when sprayed with a minimum thickness of 70 mm of Vermitex®TH ;

Table 1

TRIMESH & VERMITEX®TH SYSTEM THICKNESS FOR VERTICAL AND HORIZONTAL SEPARATIONS WITH FIRE EXPOSURE FROM EITHER DIRECTION (Compliance to ISO 834, AS 1530.4, BS 476 Part 22, ASTM E119)				
Fire Resistance in minutes for Integrity and Insulation	-/60/60	-/120/120	-/180/180	-/240/240
Max. Wall height 3000 mm	45	55	65	75
Max. Wall height 5000 mm	50	60	70	80
Max. Wall height 7000 mm	55	65	75	85

Table 2

TRIMESH & VERMITEX®TH SYSTEM THICKNESS FOR VERTICAL AND HORIZONTAL SEPARATIONS WITH FIRE EXPOSURE FROM EITHER DIRECTION (Hydrocarbon Fires to EN 1363:1 & 2, BS 476-20 App. D, UL 1709, ASTM E1529)				
Fire Resistance in minutes for Integrity and Insulation	-/60/60	-/120/120	-/180/180	-/240/240
Max. Wall height 3000 mm	48	58	68	78
Max. Wall height 5000 mm	53	63	73	83
Max. Wall height 7000 mm	58	68	78	88

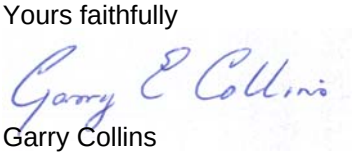
Table 3

TRIMESH AND VERMITEX®TH SYSTEM THICKNESS FOR VERTICAL AND HORIZONTAL SEPARATIONS WITH FIRE EXPOSURE FROM EITHER DIRECTION (Rapid Rise /Hydrocarbon Fires to RWS, RABT (Train & Vehicles) and HC French Modified)				
Fire Resistance in minutes for Integrity and Insulation	-/60/60	-/120/120	-/180/180	-/240/240
Max. Wall height 3000 mm	51	61	71	81
Max. Wall height 5000 mm	56	66	76	86
Max. Wall height 7000 mm	61	71	81	91

TERM OF VALIDITY

This opinion will lapse on 31 March 2017. Should you wish us to re-examine this Assessment with a view to the possible extension of its term of validity, would you please apply to us three to four months before the date of expiry. This Division reserves the right at any time to amend or withdraw this opinion in the light of new knowledge.

Yours faithfully



Garry Collins
Manager, Fire Testing and Assessment
26 March 2012