DIVISIONE: **COSTRUZIONI**
DIVISION: ***CONSTRUCTION***

LABORATORIO: **REAZIONE**
LABORATORY: ***REACTION***

RAPPORTO DI PROVA
(Test Report)

N° **0794\DC\REA\14_1**

Data: *Date:* **31/10/2014**

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE:
SPECIMEN DESCRIPTION:

Nome commerciale / *Product Name*: **VERTEMA**

Descrizione / *Description*: **Vedi pagina 2** / ***See page 2***

DATI IDENTIFICATIVI DEL CLIENTE:
CLIENT:

Nome / *Name*: **ELCOM DI BARALE GIUSEPPE E RICCARDO S.n.c.**
Indirizzo / *Address*: **Via Provinciale, 4/A**
Città / *City*: **12088 Roccaforte Mondovì (CN)**

NORMA DI RIFERIMENTO:
REFERENCE STANDARD:

Norma Tecnica / *Technical standard:*
EN 13823:2010 - Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item

DISTRIBUZIONE ESTERNA:
OUTSIDE DISTRIBUTION:

Originale cliente
Original : Client

DISTRIBUZIONE INTERNA:
INSIDE DISTRIBUTION:

Copia capo laboratorio
Copy: Head of laboratory

ENTE DI ACCREDITAMENTO:
ACCREDITATION BODY:

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

LAB N°0006
Signatory of EA, IAF and ILAC
Mutual Recognition Agreements

DATI GENERALI / *GENERAL DATA*:

- Data ricevimento campioni / *Product supply date*: **10/10/2014**
- Data esecuzione prove / *Date of test*: **28/10/2014**
- Identificazione delle norme di riferimento / *Standard reference identification*: **EN 13823:2010** **EN 13238:2010**

Campionamento / *Sampling*: **Provette di materiale fornite dal cliente.** ***Specimens supplied by the client.***

Condizionamento secondo EN 13238 / *Conditioning compliing EN 13238*: **23 °C - 50 % u.r. per 336 ore (massa costante)** ***23 °C - 50 % r.h. for 336 hours (constant mass)***

- Procedura normalizzata / *Standard procedure*: **SI** / ***YES***
- Deviazione dai metodi di prova / *Standard procedure deviation*: **NO** / ***NO***
- Controllo calcoli / *Calculation check*: **SI** / ***YES***

CAMPIONI ANALIZZATI / *SAMPLES TESTED*:

- 3 provette campione denominate / 3 *specimens of sample identified*:

VERTEMA

Descrizione: **Pannello multistrato con strato a vista in cemento alleggerito con polistirene e strato isolante in polistirene espanso**

Description: ***Multilayer panel with lightweight concrete with polystyrene front side and expanded polystyrene insulation layer***

Spessore: **145 mm (strato a vista 20mm, strato isolante 125 mm)**

Thickness: ***145 mm (top layer 20mm, insulation layer 125 mm)***

Massa areica: **20,5±0,5 kg/m^2**

Mass per area unit: ***20,5±0,5 kg/m^2***

Densità strato superiore: **755±5 kg/m^3**

Top layer density: ***755±5 kg/m^3***

Densità strato inferiore: **12,5±0,5 kg/m^3**

Bottom layer density: ***12,5±0,5 kg/m^3***

Tipo di substrato ..... : **Calcio silicato conforme alla norma EN 13238.**
Substrate type ..... : ***Calcium silicate complying to standard EN 13238.***

Allestimento del campione ..... : **Appoggiato su supporto incombustibile.**
Specimen mounting and fixing .. : ***Loose laid on non combustible substrate.***

DICHIARAZIONE / *STATEMENTS*:

- I risultati di prova contenuti nel presente rapporto si riferiscono esclusivamente al campione provato.
  Test results contained in this test report relate only to specimens tested.

- Il presente rapporto non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile del Centro.
  The test report shall not be reproduced except in full without the written approval of the Managing Director.

- I dati tecnici riportati nella descrizione del campione sono desunti dalla scheda tecnica allegata dal cliente al campione di prova.
  The technical data reported on the specimen description are taken from client technical sheet.

- I risultati di prova si riferiscono esclusivamente al comportamento dei provini di un materiale nelle particolari condizioni della prova; essi non sono destinati ad essere l'unico criterio per la valutazione della pericolosità potenziale del materiale in opera.
  The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

FOTOGRAFIE / *PHOTOGRAPHS*:

Vista frontale ala lunga
Long wing front view

Angolo verticale esterno dell'ala lunga
Long wing vertical outer edge

Sezione / *Section*

RISULTATI / *RESULTS*:

- Metodo di prova / *Test method*

EN 13823:2010

Identificazione provetta ***Specimen identification***	**FIGRA 0.2MJ/0.4MJ [W/s]**	**THR [MJ]**	**LFS [Si/*Yes* – No/*No*]**	**SMOGRA [m^2/s^2]**	**TSP [m^2]**	**FDP [No/*No* - <10s - >10s]**
1	Soglia non raggiunta *Threshold not reached*	0,3	No/*No*	Soglia non raggiunta *Threshold not reached*	26,6	No/*No*
2	Soglia non raggiunta *Threshold not reached*	0,3	No/*No*	Soglia non raggiunta *Threshold not reached*	26,8	No/*No*
3	Soglia non raggiunta *Threshold not reached*	0,3	No/*No*	Soglia non raggiunta *Threshold not reached*	26,9	No/*No*
Media ***Average***	**0** **0**	**0,3**	**No/*No***	**0**	**26,8**	**No/*No***

FIGRA = fire growth rate index

THR = total hest release

LFS = lateral flame spread

SMOGRA = smoke growth rate index

FDP = flaming droplets or particles

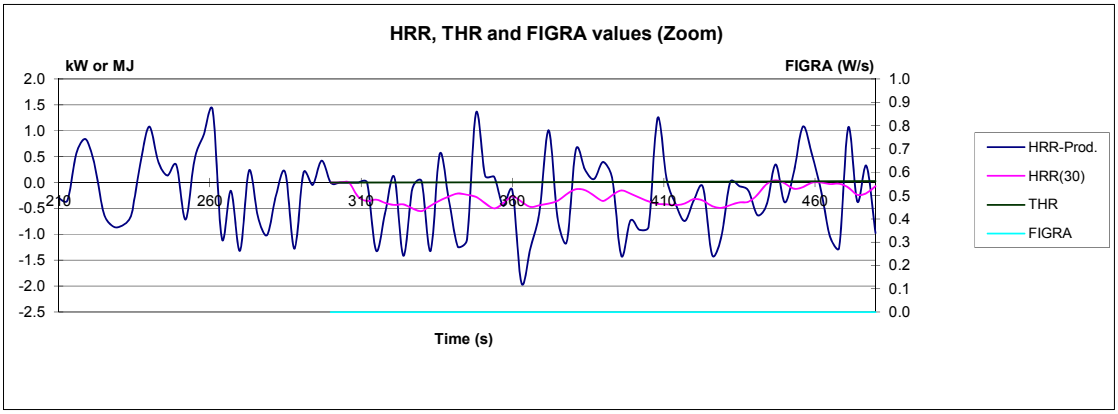
DATA *Date*	RESP. DIVISIONE *Division Head*	RESP. DEL CENTRO *Managing Director*
31/10/2014	Paolo Fumagalli	Raoul Gatti

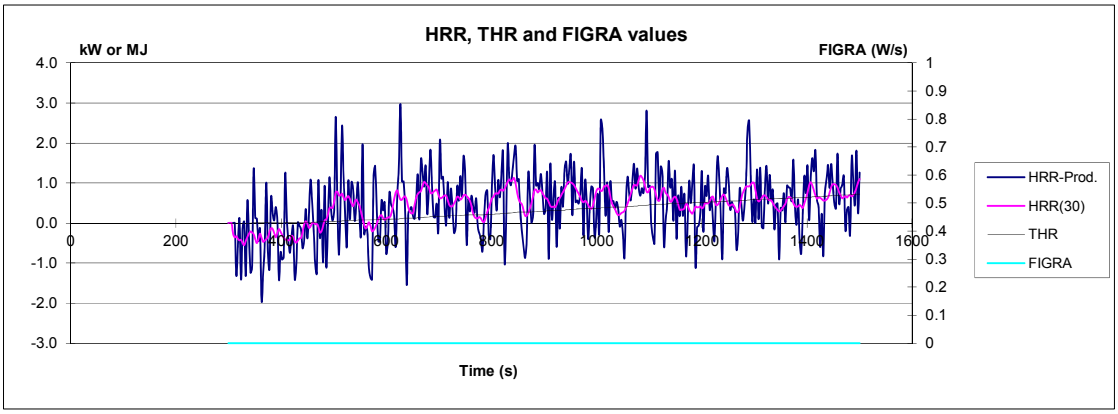
SBI Test Report

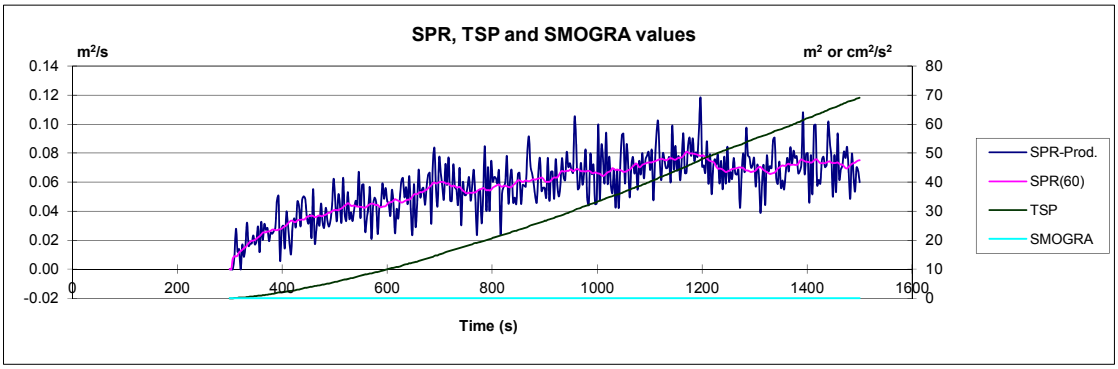
Laboratory: CSI S.p.A.
Product: VERTEMA

Test no.	Test date:	Print date:
1	28/10/2014	28/10/2014

Test condition		Check points		Results	
Baseline duct temp.$_{(t=30\text{-}90)}$ [K]	288.68	$HRR_{av,burner}$ [KW]	30.459	FIGRA threshold: 0.2 MJ [W/s]	**0.0**
Ambient pressure. [Pa]	101202	$HRR_{std\ burner}$ [KW]	0.759	FIGRA threshold: 0.4 MJ [W/s]	**0.0**
Humidity [%]	50	CO_2/O_2 $Ratio_{burner}$	0.548	THR_{600} [MJ] *	**0.3**
		$SPR_{av,burner}$ [m²/s]	0.070	Lateral flame spread (LFS) reach the edge?	**No**
k_t	0.9000	$SPR_{std\ burner}$ [m²/s]	0.009	SMOGRA [cm²/s²]	**0.0**
k_p	1.0800			TSP_{600} [m²] *	**26.6**
E' [KJ/m³]	17200	Ambient temp. $_{(t=30\text{-}90)}$ [K]	288.06	Flaming droplets/particles (FDP) (flaming <= 10 s)?	**No**
Duct diameter: [m]	0.315	No. of acceptable thermocouples	3	Flaming droplets/particles (FDP) (flaming > 10 s)?	**No**
		Minimum for flow [m³/s]	0.5370	Time to $FIGRA_{0.2}$ [s] *	0
		Maximum for flow [m³/s]	0.6144	Time to $FIGRA_{0.4}$ [s] *	0
		Burner response time [s]	15	Tig (2*6KW) [s] *	Not reach
				* After ignition of main burner	
Baseline O_2^a $_{(t=30\text{-}90)}$ [%]	20.7670			**Synchronisation information**	Baseline / Last point
Baseline $O_{2\ (t=30\text{-}90)}$ [%]	20.9496	End data O_2 [%]	20.9528	T-Duct (2.5 K drop from baseline)	308.98 / 303
Baseline $CO_{2\ (t=30\text{-}90)}$ [%]	0.0224	End data CO_2 [%]	0.0216	O2 (0.05% rise from baseline)	20.6658 / 303
Baseline light signal $_{(t=30\text{-}90)}$	99.9563	End data light signal	98.6552	CO2 (0.02% drop from baseline)	0.1782 / 303







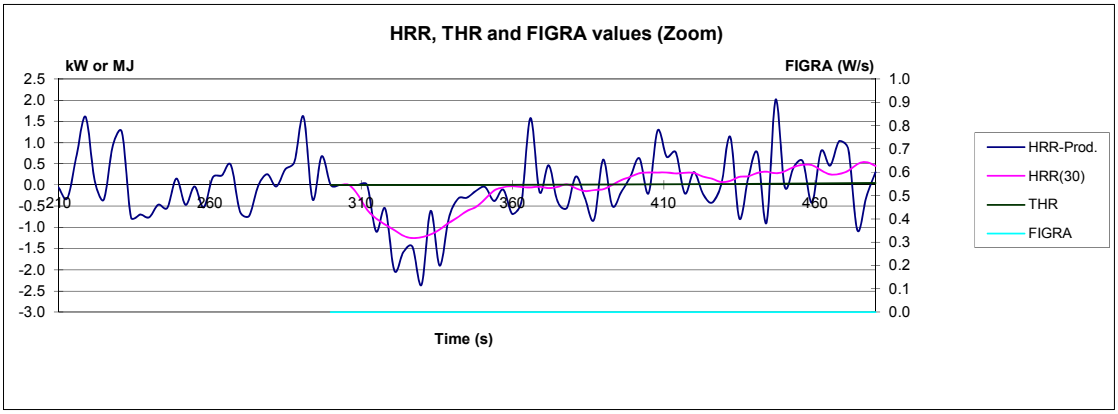
Mod. 38 - Rev. 6

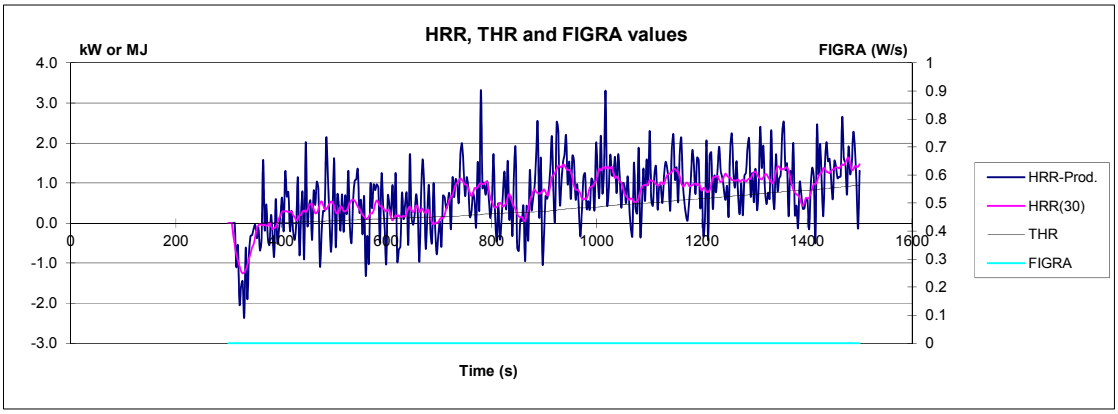
SBI Test Report

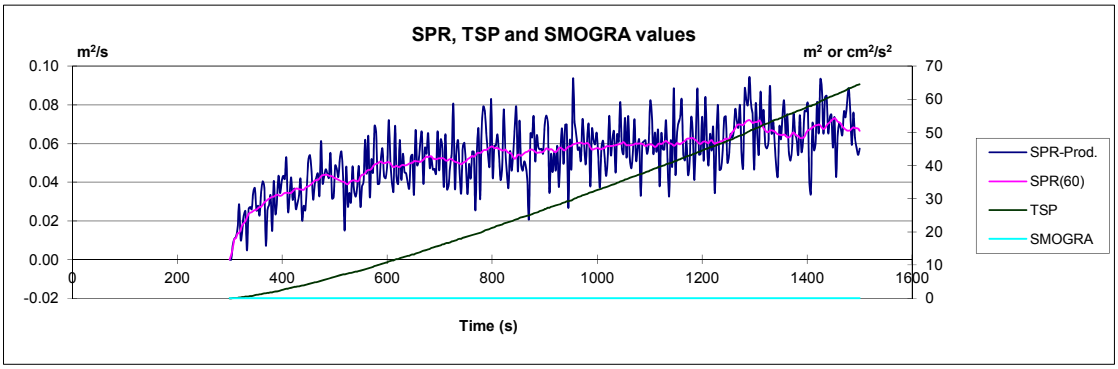
Laboratory: CSI S.p.A.
Product: VERTEMA

Test no.	Test date:	Print date:
2	28/10/2014	28/10/2014

Test condition		Check points		Results	
Baseline duct temp.$_{(t=30-90)}$ [K]	290.07	$HRR_{av,burner}$ [KW]	30.005	FIGRA threshold: 0.2 MJ [W/s]	**0.0**
Ambient pressure. [Pa]	101141	$HRR_{std\ burner}$ [KW]	0.674	FIGRA threshold: 0.4 MJ [W/s]	**0.0**
Humidity [%]	50	CO_2/O_2 $Ratio_{burner}$	0.547	THR_{600} [MJ] *	**0.3**
		$SPR_{av,burner}$ [m²/s]	0.062	Lateral flame spread (LFS) reach the edge?	**No**
k_t	0.9000	$SPR_{std\ burner}$ [m²/s]	0.009	SMOGRA [cm²/s²]	**0.0**
k_p	1.0800			TSP_{600} [m²] *	**26.8**
E' [KJ/m³]	17200	Ambient temp. $_{(t=30-90)}$ [K]	289.71	Flaming droplets/particles (FDP) (flaming <= 10 s)?	**No**
Duct diameter: [m]	0.315	No. of acceptable thermocouples	3	Flaming droplets/particles (FDP) (flaming > 10 s)?	**No**
		Minimum for flow [m³/s]	0.5481	Time to $FIGRA_{0.2}$ [s] *	0
		Maximum for flow [m³/s]	0.6340	Time to $FIGRA_{0.4}$ [s] *	0
		Burner response time [s]	12	Tig (2*6KW) [s] *	Not reach
				* After ignition of main burner	
Baseline O_2^a $_{(t=30-90)}$ [%]	20.7454			**Synchronisation information**	Baseline / Last point
Baseline $O_{2\ (t=30-90)}$ [%]	20.9452	End data O_2 [%]	20.9446	T-Duct (2.5 K drop from baseline)	310.01 / 303
Baseline $CO_{2\ (t=30-90)}$ [%]	0.0228	End data CO_2 [%]	0.0223	O2 (0.05% rise from baseline)	20.6729 / 303
Baseline light signal $_{(t=30-90)}$	99.9548	End data light signal	99.5264	CO2 (0.02% drop from baseline)	0.1720 / 303







SBI Test Report

Laboratory: CSI S.p.A.
Product: VERTEMA

Test no.	Test date:	Print date:
3	28/10/2014	28/10/2014

Test condition		Check points		Results	
Baseline duct temp.$_{(t=30-90)}$ [K]	290.81	$HRR_{av,burner}$ [KW]	30.214	FIGRA threshold: 0.2 MJ [W/s]	**0.0**
Ambient pressure. [Pa]	101142	$HRR_{std\ burner}$ [KW]	0.545	FIGRA threshold: 0.4 MJ [W/s]	**0.0**
Humidity [%]	50	CO_2/O_2 $Ratio_{burner}$	0.549	THR_{600} [MJ] *	**0.3**
		$SPR_{av,burner}$ [m²/s]	0.063	Lateral flame spread (LFS) reach the edge?	**No**
k_t	0.9000	$SPR_{std\ burner}$ [m²/s]	0.009	SMOGRA [cm²/s⁴]	**0.0**
k_p	1.0800			TSP_{600} [m²] *	**26.9**
E' [KJ/m³]	17200	Ambient temp. $_{(t=30-90)}$ [K]	289.44	Flaming droplets/particles (FDP) (flaming <= 10 s)?	**No**
Duct diameter: [m]	0.315	No. of acceptable thermocouples	3	Flaming droplets/particles (FDP) (flaming > 10 s)?	**No**
		Minimum for flow [m³/s]	0.5447	Time to $FIGRA_{0.2}$ [s] *	0
		Maximum for flow [m³/s]	0.6417	Time to $FIGRA_{0.4}$ [s] *	0
		Burner response time [s]	12	Tig (2*6KW) [s] *	Not reach
				* After ignition of main burner	
Baseline O_2^a $_{(t=30-90)}$ [%]	20.7430			**Synchronisation information**	Baseline / Last point
Baseline $O_{2\ (t=30-90)}$ [%]	20.9526	End data O_2 [%]	20.9484	T-Duct (2.5 K drop from baseline)	310.76 / 303
Baseline $CO_{2\ (t=30-90)}$ [%]	0.0224	End data CO_2 [%]	0.0215	O2 (0.05% rise from baseline)	20.6787 / 303
Baseline light signal $_{(t=30-90)}$	99.9693	End data light signal	99.7702	CO2 (0.02% drop from baseline)	0.1723 / 303