LAB N°0006 L

RAPPORTO DI PROVA / *TEST REPORT*

NUMERO / NUMBER

0996\DC\REA\22

DATA DI EMISSIONE / EMISSION DATE

29/07/2022

BUSINESS AREA

BA Product Conformity Assessment

LABORATORIO / LABORATORY

Reaction to Fire

IDENTIFICAZIONE E DESCRIZIONE DEL CAMPIONE / SPECIMEN DESCRIPTION

BATTENS 30

CLIENTE / CUSTOMER

ForMe Srl
S.S. 275 km. 14,400
73030 SURANO (LE)

NORMA DI RIFERIMENTO / REFERENCE STANDARD

EN 13823:2020 - Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item

CSI S.P.A. A SOCIO UNICO SOGGETTA AD ATTIVITÀ DI DIREZIONE E COORDINAMENTO DI IMQ GROUP S.R.L.
REA MI 1466310
R.I./C.F./P.I. 11360160151
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Sede legale
Italia | 20030 Senago (MI) | Cascina Traversagna 21
direzione-csi@legalmail.it | info@csi-spa.com | www.csi-spa.com

Dati generali / General data

Data ricevimento campione / Date of test specimen arrival:	05/07/2022
Data accettazione campione /Date of test specimen acceptance:	05/07/2022
Data inizio prove / Test beginning date:	20/07/2022
Data fine prove / Test end date:	20/07/2022
Luogo di prova/ Test site:	Viale Lombardia, 20, 20021 Bollate (MI) Italia
Deviazione dai metodi di prova/ Deviations from test methods:	NO/NO

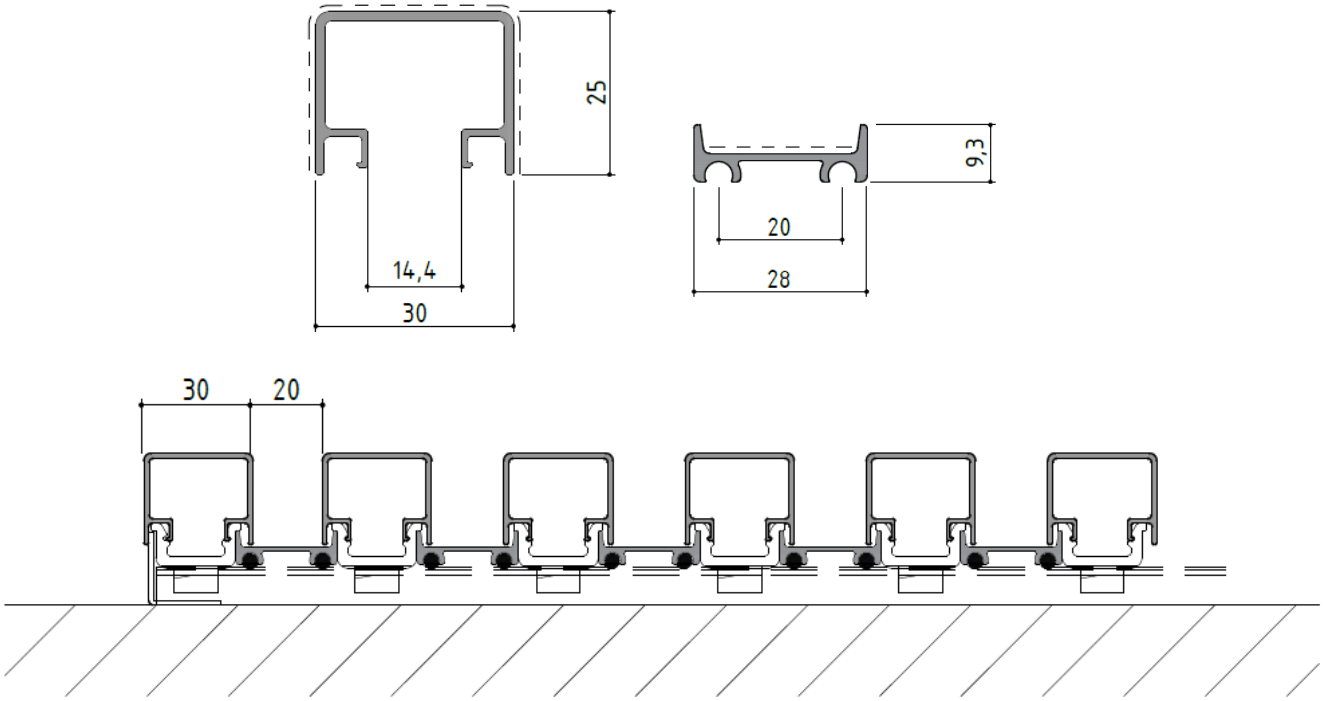
Campionamento/Sampling

Il campionamento e il prelievo iniziali sono stati eseguiti dal Committente della prova. / The initial sampling has been done by the customer.

Campioni analizzati / Samples tested:

3 provette campione denominate / 3 specimens of sample identified:
BATTENS 30

Descrizione	:	Sistema di rivestimento in alluminio composto da una gamma di profili da 25 mm, distanziatori universali da 20 mm verniciati a polvere base poliestere.
Description	:	Aluminum coating system consisting of a range of 25 mm profiles, universal 20 mm polyester-based powder-coated spacers.
Spessore / Thickness	:	1,5 mm
Massa areica / Mass per area:		10,8 kg/m² (vernice/paint 200 g/m²)



Tipo di substrato: Calcio silicato conforme alla norma EN 13238:2010.
Substrate type: Calcium silicate complying to standard EN 13238:2010.

Allestimento del campione: Campione spaziato 40 mm dal sottofondo.
Specimen mounting and fixing: Sample spaced 40 mm from the substrate.

Condizionamento secondo EN 13238: 23 °C - 50 % u.r. fino a massa costante.
Conditioning compliing EN 13238: 23 °C - 50 % r.h. until constant mass.

Dichiarazioni / Statement

I risultati di prova contenuti nel presente rapporto si riferiscono esclusivamente al campione provato / Test results contained in this test report pertain exclusively to the tested specimen

Il presente rapporto non può essere riprodotto parzialmente senza l'autorizzazione del Responsabile del Centro / This test report cannot be reproduced partially without the consent of the test center 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

Risultati / Results:

Metodo di prova / Test method: EN 13823:2020

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	66,0 a/at 549s 66,0 a/at 549s	3,1	No/No	8,2	30,5	No/No
2	22,6 a/at 828s 22,6 a/at 828s	2,5	No/No	7,9	71,9	No/No
3	20,2 a/at 489s 16,7 a/at 660s	0,9	No/*No*	7,8	65,8	No/*No*
Media *Average*	**36,3 35,1**	**2,2**	**No/*No***	**8,0**	**56,1**	**No/*No***

FIGRA = fire growth rate index; THR = total heat release; LFS = lateral flame spread; SMOGRA = smoke growth rate index; TSP = total smoke production; FDP = flaming droplets or particles

DATA ***Date***	**Operating Sector Reaction to Fire** ***Operating Sector Reaction to Fire***	**BA Product Conformity Assessment** ***BA Product Conformity Assessment***
	Dr. Lorenzo Zavaglio	**Ing. P. Fumagalli**
29/07/2022		

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SBI Test Report

Laboratory: CSI S.p.A.
Product: BATTENS 30

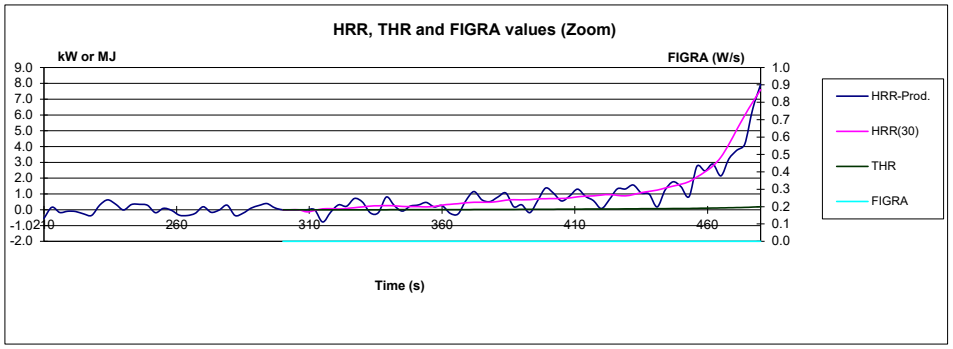
Test no.	Test date:	Print date:
1	20/07/2022	20/07/2022

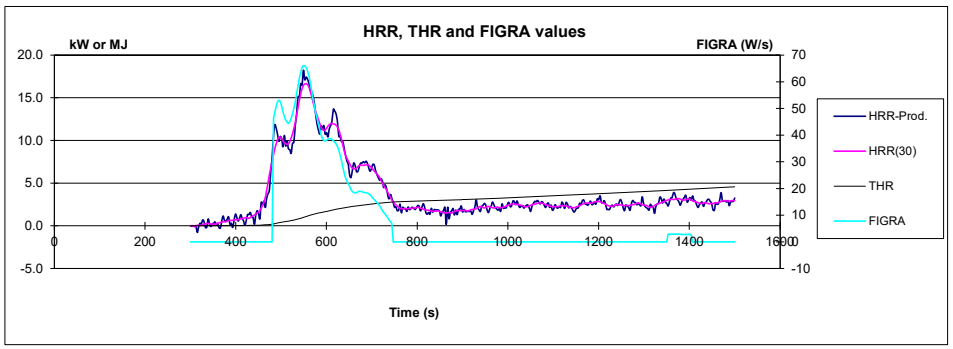
Test condition	
Baseline duct temp.$_{(t=30\text{-}90)}$ [K]	297.99
Ambient pressure. [Pa]	101770
Humidity [%]	45
k_t	0.8700
k_p	1.2400
E' [KJ/m³]	17200
Duct diameter: [m]	0.315
Baseline $O_2^*{}_{(t=30\text{-}90)}$ [%]	20.6554
Baseline $O_{2\ (t=30\text{-}90)}$ [%]	20.9476
Baseline $CO_{2\ (t=30\text{-}90)}$ [%]	0.0763
Baseline light signal $_{(t=30\text{-}90)}$	100.0424

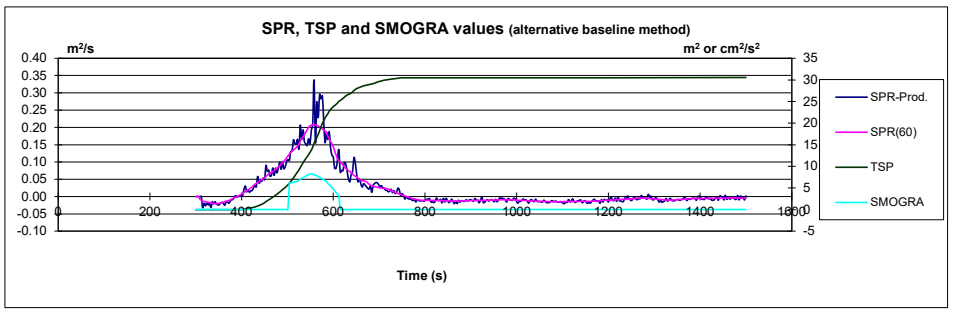
Check points	
$HRR_{av,burner}$ [KW]	30.318
$HRR_{std\ burner}$ [KW]	0.305
CO_2/O_2 $Ratio_{burner}$	0.547
$SPR_{av,burner}$ [m²/s]	0.022
$SPR_{std,\ burner}$ [m²/s]	0.004
Ambient temp. $_{(t=30\text{-}90)}$ [K]	297.80
No. of acceptable thermocouples	3
Minimum for flow [m³/s]	0.5555
Maximum for flow [m³/s]	0.6257
Burner response time [s]	12
End data O_2 [%]	20.9325
End data CO_2 [%]	0.0801
End data light signal	100.2193
Main burner average (390-450s)	
$SPR_{av,main\ burner}$ [m²/s]	0.057
$SPR_{std,\ main\ burner}$ [m²/s]	0.007

Results	
FIGRA threshold: 0.2 MJ [W/s]	**66.0**
FIGRA threshold: 0.4 MJ [W/s]	**66.0**
THR_{600} [MJ] *	**3.1**
Lateral flame spread (LFS) reach the edge?	**No**
SMOGRA [m²/s²]	**8.2**
TSP_{600} [m²] *	**30.5**
Flaming droplets/particles (FDP) (flaming <= 10 s)?	**No**
Flaming droplets/particles (FDP) (flaming > 10 s)?	**No**
Time to $FIGRA_{0.2}$ [s] *	249
Time to $FIGRA_{0.4}$ [s] *	249
Tig (2*6KW) [s] *	177
* After ignition of main burner	

Synchronisation information	Baseline	Last point
T-Duct (2.5 K drop from baseline)	318.54	303
O2 (0.05% rise from baseline)	20.6786	303
CO2 (0.02% drop from baseline)	0.2233	303





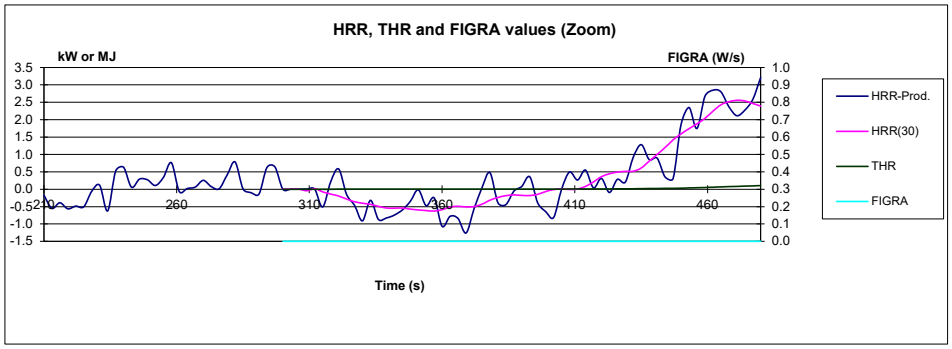


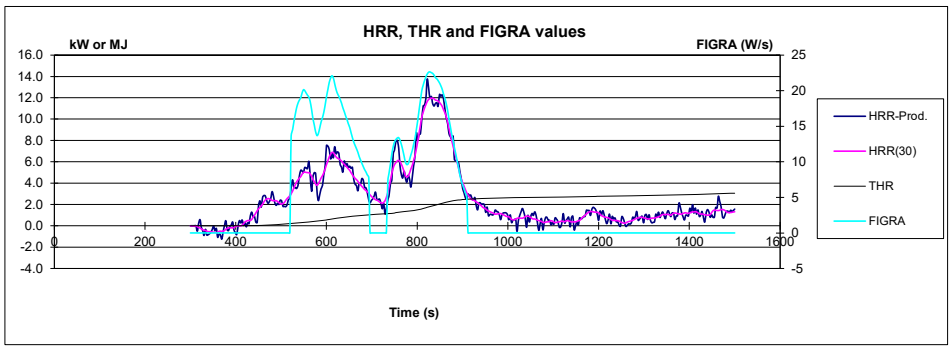
SBI Test Report

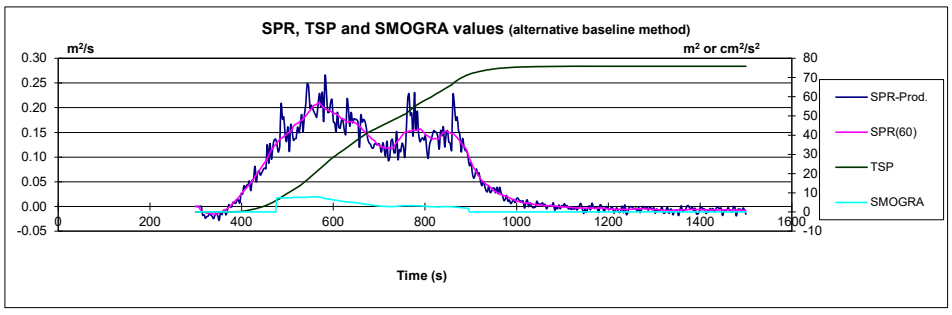
Laboratory: CSI S.p.A.
Product: BATTENS 30

Test no.	Test date:	Print date:
2	20/07/2022	20/07/2022

Test condition		Check points		Results	
Baseline duct temp.$_{(t=30\text{-}90)}$ [K]	301.71	HRR$_{av,burner}$ [KW]	30.541	FIGRA threshold: 0.2 MJ [W/s]	**22.6**
Ambient pressure. [Pa]	101787	HRR$_{std\ burner}$ [KW]	0.406	FIGRA threshold: 0.4 MJ [W/s]	**22.6**
Humidity [%]	40	CO_2/O_2 Ratio$_{burner}$	0.551	THR$_{600}$ [MJ] *	**2.5**
		SPR$_{av,burner}$ [m²/s]	0.025	Lateral flame spread (LFS) reach the edge?	**No**
k_t	0.8700	SPR$_{std,\ burner}$ [m²/s]	0.004	SMOGRA [m²/s²]	**7.9**
k_p	1.2400			TSP$_{600}$ [m²] *	**71.9**
E' [KJ/m³]	17200	Ambient temp. $_{(t=30\text{-}90)}$ [K]	298.13	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]	0.5656	Time to FIGRA$_{0.2}$ [s] *	528
		Maximum for flow [m³/s]	0.6294	Time to FIGRA$_{0.4}$ [s] *	528
		Burner response time [s]	6	Tig (2*6KW) [s] *	300
				* After ignition of main burner	
Baseline O_2"$_{(t=30\text{-}90)}$ [%]	20.6269			**Synchronisation information**	Baseline / Last point
Baseline $O_{2\ (t=30\text{-}90)}$ [%]	20.9506	End data O_2 [%]	20.9441	T-Duct (2.5 K drop from baseline)	322.06 / 312
Baseline $CO_{2\ (t=30\text{-}90)}$ [%]	0.0762	End data CO_2 [%]	0.0758	O2 (0.05% rise from baseline)	20.6758 / 312
Baseline light signal $_{(t=30\text{-}90)}$	100.0248	End data light signal	99.9199	CO2 (0.02% drop from baseline)	0.2274 / 312
		Main burner average (390-450s)			
		SPR$_{av,main\ burner}$ [m²/s]	0.057		
		SPR$_{std,\ main\ burner}$ [m²/s]	0.007		







LAB N°0006 L

SBI Test Report

Laboratory: CSI S.p.A.
Product: BATTENS 30

Test no.	Test date:	Print date:
3	20/07/2022	20/07/2022

Test condition	
Baseline duct temp.$_{(t=30\text{-}90)}$ [K]	302.24
Ambient pressure. [Pa]	101822
Humidity [%]	40
k_t	0.8700
k_p	1.2400
E' [KJ/m³]	17200
Duct diameter: [m]	0.315
Baseline $O_2^*{}_{(t=30\text{-}90)}$ [%]	20.6203
Baseline $O_{2\ (t=30\text{-}90)}$ [%]	20.9541
Baseline $CO_{2\ (t=30\text{-}90)}$ [%]	0.0758
Baseline light signal $_{(t=30\text{-}90)}$	100.0635

Check points	
$HRR_{av,burner}$ [KW]	30.575
$HRR_{std\ burner}$ [KW]	0.361
CO_2/O_2 $Ratio_{burner}$	0.546
$SPR_{av,burner}$ [m²/s]	0.024
$SPR_{std,\ burner}$ [m²/s]	0.003
Ambient temp. $_{(t=30\text{-}90)}$ [K]	298.63
No. of acceptable thermocouples	3
Minimum for flow [m³/s]	0.5908
Maximum for flow [m³/s]	0.6350
Burner response time [s]	9
End data O_2 [%]	20.9488
End data CO_2 [%]	0.0781
End data light signal	99.9526
Main burner average (390-450s)	
$SPR_{av,main\ burner}$ [m²/s]	0.057
$SPR_{std,\ main\ burner}$ [m²/s]	0.007

Results	
FIGRA threshold: 0.2 MJ [W/s]	**20.2**
FIGRA threshold: 0.4 MJ [W/s]	**16.7**
THR_{600} [MJ] *	**0.9**
Lateral flame spread (LFS) reach the edge?	**No**
SMOGRA [m²/s²]	**7.8**
TSP_{600} [m²] *	**65.8**
Flaming droplets/particles (FDP) (flaming <= 10 s)?	**No**
Flaming droplets/particles (FDP) (flaming > 10 s)?	**No**
Time to $FIGRA_{0.2}$ [s] *	189
Time to $FIGRA_{0.4}$ [s] *	360
Tig (2*6KW) [s] *	351
* After ignition of main burner	

Synchronisation information	Baseline	Last point
T-Duct (2.5 K drop from baseline)	321.95	306
O2 (0.05% rise from baseline)	20.6922	303
CO2 (0.02% drop from baseline)	0.2189	303