

Fire Resistance Test



MID-TERM REPORT * (SEE NOTE)

NUMBER	1605057-01 pSBI ENGLISH	Work sheet: 21500534
DATE OF ISSUE	May 23 rd , 2016	
NOTIFIED BODY	Notified body for the European Regulation of the Construction Products N° 305/2011 with number n° 1981.	
PAGES	The report consists of 10 pages consecutively numbered an annex of 1 page.	
TEST SPECIMEN	Type: WALLS AND CEILINGS COVERINGS	Reference: "KLIU CORK"
	Manufacturer: MEHTA STONE EXPORT HOUSE	
CONCERNING TO	UNE EN 13823:12 Reaction to fire tests for building products	
APPLICANT	KLIU SOLUTIONS, S.L. C/ DOMÉNECH I MONTANER, 9 08191 RUBÍ (BARCELONA) - SPAIN	
DATE/S OF TEST	Reception of specimens: 09/05/2016	Beginning of tests: 18/05/2016
	End of tests: 18/05/2016	

NOTE: This mid-term report is doesn't represent a valid classification. Not signed. This report is only for informative purposes for the company.

The result of this/these test/s only refers to the object/s tested.

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1. TEST SAMPLE

1.1. Description and identification of the item tested. Inspection before the test

Sample corresponding to a 10mm thickness calcium fibrosilicate on which is projected a covering made of projected cork with mineral charges and alumina, light beige colour, all this according to information provided by the customer, and thus referred to as:

- "KLIU CORK
" (Ref. AIDIMA: 1605057-01)



Long wing detail sample

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2. TEST METHOD

3.1. Sample mounting

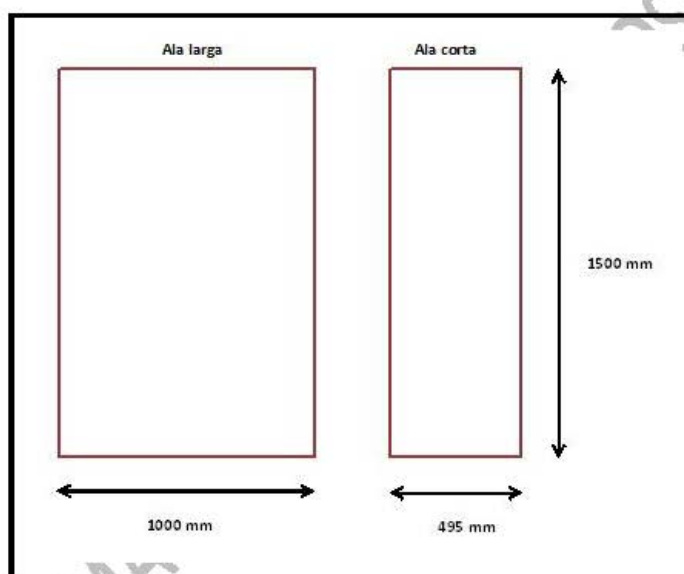
Sample mounting for SBI according to UNE-EN 13823:12

Assembly is done according to standard conditions according to the UNE-EN 13823:12.

The sample consists of two wings, called wing short and long wing, with the following dimensions: short wing (495x1500) mm long wing (1000 x1500) mm.

These two wings of the test material are arranged in upright position, forming a corner with a right angle, being exposed to the burner at the bottom.

The samples are mounted according to the figure according to the standard UNE-EN 13823:12.



3.2. Test description

Test method of burning behaviour by exposure to thermal attack caused by a single burning item

One sample is tested, formed from two wings (short wing and long wing), 495 mm x 1500 mm and 1000 mm x 1500 mm and corresponding thickness, forming a corner where a fire is caused in standard conditions.

The specimens are conditioned to $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and a relative humidity of $50\% \pm 5\%$, according to the standard UNE-EN 13238:11, either by a fixed period of time, either to constant weight.

The tests are performed in the equipment called SBI (Single Burning Item), which consists of a test chamber, a test apparatus (sample holder cart, burner, frame, hood, collector and ducting), and the smoke extraction system and team general measures.

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The test principle is to have the two wings of the test material in a vertical position in right angle so that they are exposed to a burner located in the lower corner (main burner). The flames are obtained by combustion of propane gas, injected through a sand bed with an output power $(30,7 \pm 2,0)$ kW.

The behaviour of the sample is evaluated over a period of 20 minutes, determining performance parameters such as heat emission, smoke production, lateral spread of flame and drop inflamed particles.

A short time before the main burner ignition is used to quantify heat and smoke produced only by the burner, using an identical burner away from the sample and called auxiliary burner.

Measurements are taken either automatically or by visual observation. The extraction pipe is equipped with temperature sensors for measuring the attenuation of light, the molar fraction of oxygen and carbon dioxide, and the flow induced by the pressure difference in the canal. These amounts are recorded automatically and used to calculate the volume flow, the energy release (HRR) and smoke production rate (SPR).

The main visual observations are: lateral spread of flame and drop inflamed.

So, as the test results are determined / calculated:

- $FIGRA_{0,4MJ}$ (W/s): Maximum value of coefficient of heat release rate for the sample and the moment is started, using a threshold THR (amount of heat evolved) of 0.4 MJ.
- THR_{600s} (MJ): Total amount of heat released from the sample in the first 600 seconds of the start of exposure to the main burner.
- $SMOGR$ (m^2/s^2): Smoke production rate. Maximum value of the ratio of the speed of production of smoke by the sample and the time during which it is produced.
- TSP_{600s} (m^2): Total production smoke of the sample in the first 600 seconds of the start of exposure of main burner flames.
- LSF_{edge} : Lateral flame spread along the long wing of the sample.
- Droplets or flamed particles with inflammation times higher or lower than 10 seconds.



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3. TEST RESULTS

Test method of burning behaviour by exposure to thermal attack caused by a single burning item

- "KLIU CORK" (Ref. AIDIMA: 1605057-01)

	SAMPLE 1	SAMPLE 2	SAMPLE 3
Test date	18/05/2016	N.D.	N.D.
DEVICE SPECIFICATIONS AND CONDITIONS BEFORE TESTING			
Flow profile kt (-)	0,994	N.D.	N.D.
O2 calibration time delay (s)	10	N.D.	N.D.
CO2 calibration time delay (s)	9	N.D.	N.D.
Relative Humidity (%)	61	N.D.	N.D.
Barometric pressure (Pa)	98877	N.D.	N.D.
Light transmission (%)	100,00	N.D.	N.D.
Oxygen molar percentage (%)	20,97	N.D.	N.D.
CO2 molar percentage (%)	0,05	N.D.	N.D.
Room temperature (°C)	22	N.D.	N.D.
Test area temperature (°C)	30	N.D.	N.D.
RECORDED EVENTS			
Sudden flames (Y/N)	Yes	N.D.	N.D.
Smoke off hood extraction. (Y/N)	No	N.D.	N.D.
Falling of parts of the sample (Y/N)	No	N.D.	N.D.
Fixing failure (Y/N)	No	N.D.	N.D.
Collapse of the sample (Y/N)	No	N.D.	N.D.
Anticipated end of test (Y/N)	No	N.D.	N.D.
CONDITIONS AFTER TESTING			
Light transmission (%)	96,33	N.D.	N.D.
Oxygen molar percentage (%)	20,72	N.D.	N.D.
CO2 molar percentage (%)	0,24	N.D.	N.D.

N.D: Not determined.



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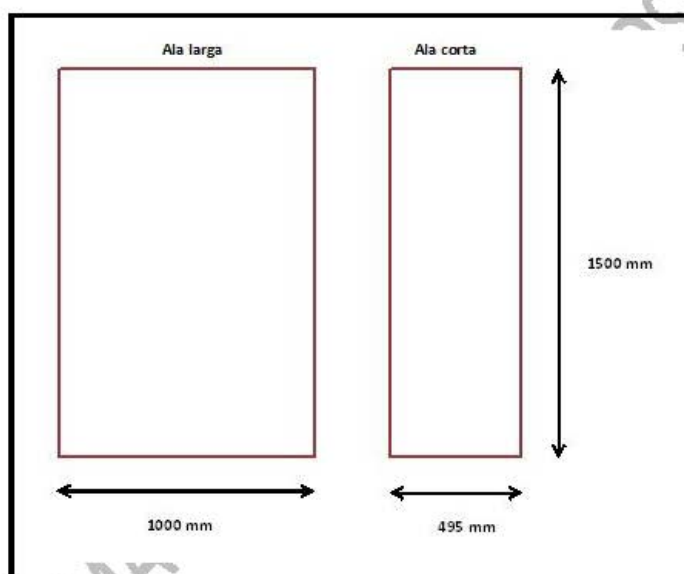
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Light transmission (%)	100,00	N.D.	N.D.
Oxygen molar percentage (%)	20,97	N.D.	N.D.
CO2 molar percentage (%)	0,05	N.D.	N.D.
Room temperature (°C)	22	N.D.	N.D.
Test area temperature (°C)	30	N.D.	N.D.
RECORDED EVENTS			
Sudden flames (Y/N)	Yes	N.D.	N.D.
Smoke off hood extraction. (Y/N)	No	N.D.	N.D.
Falling of parts of the sample (Y/N)	No	N.D.	N.D.
Fixing failure (Y/N)	No	N.D.	N.D.
Collapse of the sample (Y/N)	No	N.D.	N.D.
Anticipated end of test (Y/N)	No	N.D.	N.D.
CONDITIONS AFTER TESTING			
Light transmission (%)	96,33	N.D.	N.D.
Oxygen molar percentage (%)	20,72	N.D.	N.D.
CO2 molar percentage (%)	0,24	N.D.	N.D.

N.D: Not determined.



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VISUAL OBSERVATIONS			
LFS to the edge (Y/N)	No	N.D.	N.D.
Flaming droplets / particles in flames = 10 s (Y/N)	No	N.D.	N.D.
Flaming droplets / particles in flames > 10 s (Y/N)	No	N.D.	N.D.
CALCULATIONS OF RESULTS			
FIGRA 0,2MJ (W/s)	8,36	N.D.	N.D.
FIGRA 0,4MJ (W/s)	8,36	N.D.	N.D.
THR600s (MJ)	0,98	N.D.	N.D.
TSP600s (m ²)	42,60	N.D.	N.D.
SMOGRA (m ² /s ²)	2,30	N.D.	N.D.
TEST DATA OBTAINED AFTER FIBROSILICATE TEST			
SPRav_burner (390-450 s) (KW)			N/A
Desviación típica SPRav_quemador (390-450 s) (KW)			N/A
CORRECTED CALCULATIONS			
Corrected parameter	SAMPLE 1	SAMPLE 2	SAMPLE 3
TSP600s (m ²)CORRECTED	N/A	N.D.	N.D.
SMOGRA (m ² /s ²)CORRECTED	N/A	N.D.	N.D.

N/A: Not applied. N.D. Not determined

PARAMETER	SINGLE VALUE (not valid for classification)
FIGRA 0,2MJ (W/s)	8,36
FIGRA 0,4MJ (W/s)	8,36
THR600s (MJ)	0,98
SMOGRA (m ² /s ²)	2,30
TSP600s (m ²)	42,60
LFS (Y/N)	No
drops/particles flamed (Y/N)	No

MID-TERM CLASSIFICATION

This classification is informative. It does not represent a valid classification, because three replicates of SBI test and complementary test (EN ISO 11925-2:2011) are needed.

B-s1,d0

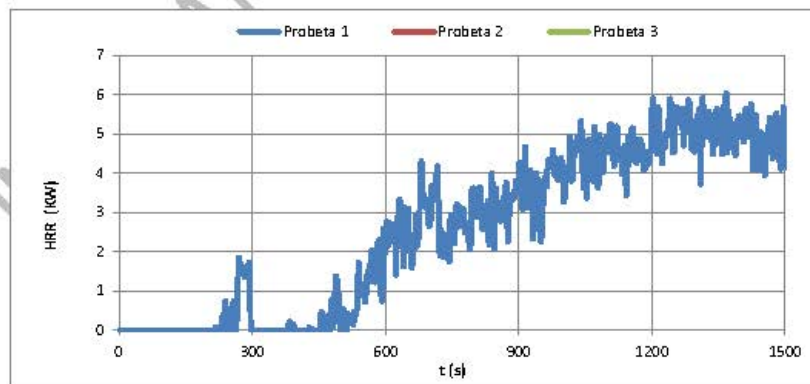
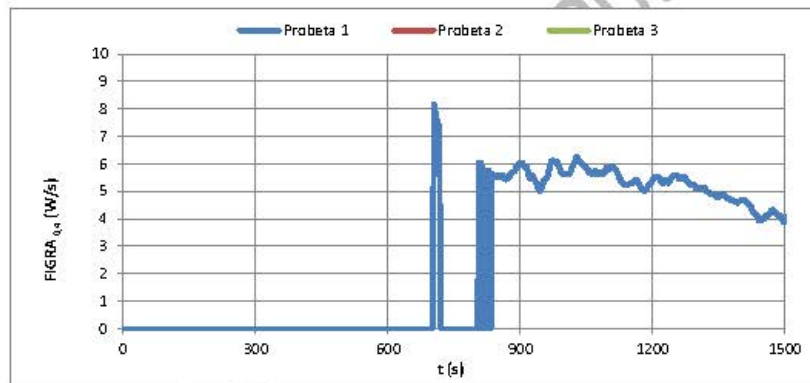
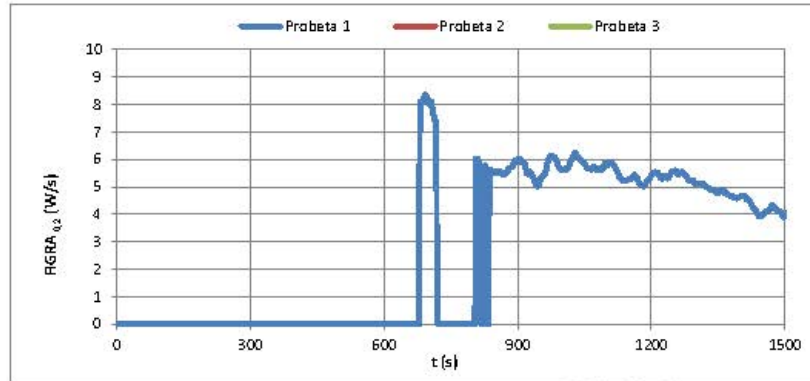
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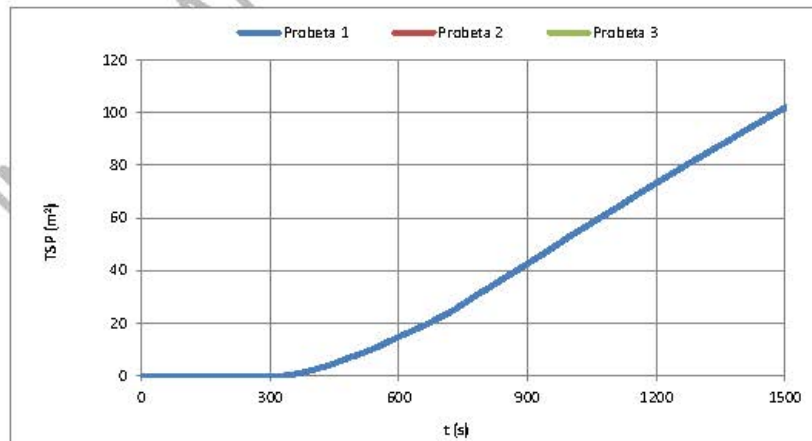
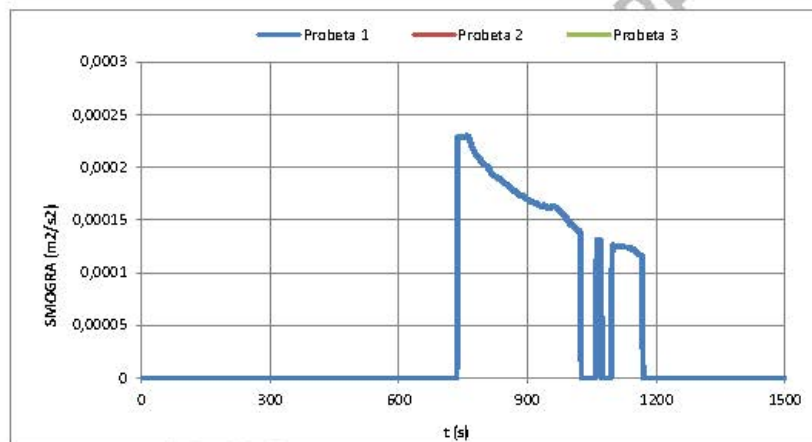
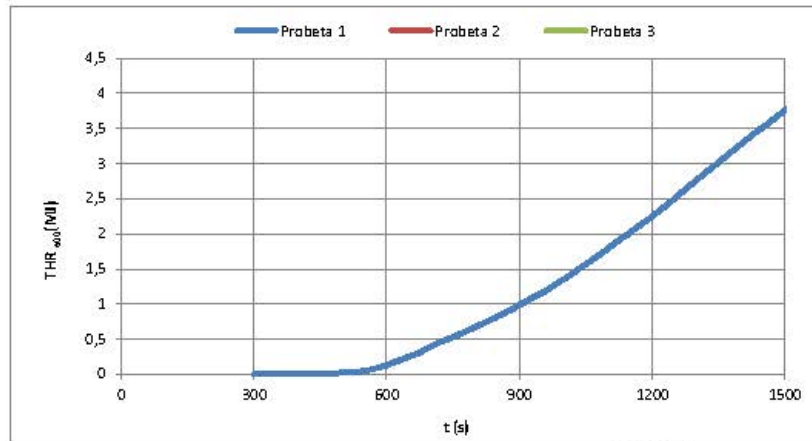
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4. GRAPHICAL REPRESENTATIONS

- "KLIU CORK" (Ref. AIDIMA: 1605057-01)



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5. PHOTOGRAPH AFTER TESTING

- "KLIU CORK" (Ref. AIDIMA: 1605057-01)



Sample after testing



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ANNEX

CLASSES OF BEHAVIOUR TO FIRE REACTION FOR CONSTRUCTION PRODUCTS EXCLUDING FLOOR COVERINGS ACCORDING TO STANDARD UNE EN 13501-1:07 +A1: 2010

Class	Test method (s)	Classification criteria	Additional declaration required
A1	UNE-EN-ISO 1182:2011 ⁽¹⁾ , and	$\Delta T \leq 30^\circ\text{C}$; and $\Delta m \leq 50\%$; and $t_f = 0$ (that is, no sustained flaming)	-
	UNE-EN-ISO 1716:2011	$PCS \leq 2,0 \text{ MJ}\cdot\text{kg}^{-1}$ ⁽¹⁾ ; and $PCS \leq 2,0 \text{ MJ}\cdot\text{m}^{-2}$ ⁽²⁾ (2a); and $PCS \leq 1,4 \text{ MJ}\cdot\text{m}^{-2}$ ⁽³⁾ ; and $PCS \leq 2,0 \text{ MJ}\cdot\text{kg}^{-1}$ ⁽⁴⁾	-
A2	UNE-EN-ISO 1182:2011 ⁽¹⁾ , or	$\Delta T \leq 50^\circ\text{C}$; and $\Delta m \leq 50\%$; and $t_f \leq 20\text{s}$	-
	UNE-EN-ISO 1716:2011; and	$PCS \leq 3,0 \text{ MJ}\cdot\text{kg}^{-1}$ ⁽¹⁾ ; and $PCS \leq 4,0 \text{ MJ}\cdot\text{m}^{-2}$ ⁽²⁾ ; and $PCS \leq 4,0 \text{ MJ}\cdot\text{m}^{-2}$ ⁽³⁾ ; and $PCS \leq 3,0 \text{ MJ}\cdot\text{kg}^{-1}$ ⁽⁴⁾	-
	UNE-EN-13823:2012 (SBI)	$FIGRA_{a,2} \leq 120 \text{ W}\cdot\text{s}^{-1}$; and $LFS < \text{sample edge}$; and $THR_{600s} \leq 7,5 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming Drops/particles ⁽⁶⁾
B	UNE-EN 13823:2012 (SBI); and	$FIGRA_{a,2} \leq 120 \text{ W}\cdot\text{s}^{-1}$; y $LFS < \text{sample edge}$; y $THR_{600s} \leq 7,5 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming Drops/particles ⁽⁶⁾
	UNE-EN-ISO 11925-2:2011 ^(2b) . Exposure = 30s	$F_s \leq 150\text{mm}$ in 60s	Flaming Drops/particles ⁽⁶⁾
C	UNE-EN 13823:2012 (SBI); and	$FIGRA_{a,4} \leq 250 \text{ W}\cdot\text{s}^{-1}$; and $LFS < \text{sample edge}$; and $THR_{600s} \leq 15 \text{ MJ}$	Smoke production ⁽⁵⁾ ; and Flaming Drops/particles ⁽⁶⁾
	UNE-EN-ISO 11925-2:2011 ^(2b) . Exposure = 30s	$F_s \leq 150\text{mm}$ in 60s	Flaming Drops/particles ⁽⁶⁾
D	UNE-EN 13823:2012 (SBI); and	$FIGRA_{a,4} \leq 750 \text{ W}\cdot\text{s}^{-1}$	Smoke production ⁽⁵⁾ ; and Flaming Drops/particles ⁽⁶⁾
	UNE-EN-ISO 11925-2:2011 ^(2b) . Exposure = 30s	$F_s \leq 150\text{mm}$ in 60s	Flaming Drops/particles ⁽⁶⁾
E	UNE-EN-ISO 11925-2:2011 ^(2b) . Exposure = 15s	$F_s \leq 150\text{mm}$ in 20s	Flaming Drops/particles ⁽⁶⁾
F	UNE-EN-ISO 11925-2:2011 ^(2b) . Exposure = 15s	$F_s > 150\text{mm}$ in 20s	Flaming Drops/particles ⁽⁶⁾

(1) For homogeneous products and substantial components of non-homogeneous products

(2) For any non-substantial component of non-homogeneous products.

(2a) Alternatively, for any non-substantial component having a $PCS \leq 2.0 \text{ MJ/m}^2$, as long as the product meets the following criteria UNE-EN 13823:2012 (SBI): $FIGRA_{a,4} \leq 250 \text{ W}\cdot\text{s}^{-1}$; y $LFS < \text{sample margin}$; and $THR_{600s} \leq 4.0 \text{ MJ}$; and $s1$; and $d0$.

(3) For any internal non-substantial component of non-homogeneous product

(4) For the product as a whole

(5) $s1 = \text{SMOGRAM } 30\text{m}^2\cdot\text{s}^{-2}$ and $\text{TSP600s} \leq 50\text{m}^2$; $s2 = \text{SMOGRAM } 180\text{m}^2\cdot\text{s}^{-2}$ and $\text{TSP600s} \leq 200\text{m}^2$;

$s3 = \text{neither } s1 \text{ nor } s2$

(6) $d0 = \text{No flaming droplets and particles in UNE-EN 13823:2012 (SBI) in 600s}$; $d1 = \text{No flaming droplets and particles for more than 10s in UNE-EN 13823:2012 (SBI) in 600s}$; $d2 = \text{neither } d0 \text{ nor } d1$; the ignition of the paper in UNE-EN-ISO 11925-2:2011 determines a classification $d2$.

(7) Success = no ignition of the paper (without classification); Fail = ignition of the paper (d2 classification)

(8) Under conditions of surface flame attack and, if suitable for end conditions of product use, of edge flame attack.

