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**RAPPORTO DI PROVA N. 3653P16
TEST REPORT No.**

Flexural properties of sandwich panels

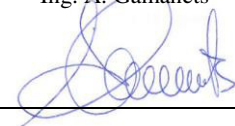
Dati generali (general data)

<u>Data di emissione</u> <i>date of issue</i>	19/07/2016	Destinatario <i>addressee</i>	Stonescreen Ltd Holborn Viaduct 24 EC1V 3BN London
Richiesta <i>application</i>	744-16	In data <i>date</i>	24/06/2016
<u>Si riferisce a</u> <i>referring to</i>			
oggetto <i>item</i>	Sandwich panel	matricola <i>serial number</i>	1602583-0100/0600
quantità <i>quantity</i>	30	operatore <i>operator</i>	FM
data delle misure <i>date of measurements</i>	From 11/07/2016 to 18/07/2016	Luogo <i>Place</i>	Pontlab, Via Lazio 4

Strumentazione di misura (measurement instruments)

Oggetto <i>Device</i>	Mechanical testing machine	Climatic chamber
Costruttore <i>Manufacturer</i>	MTS	Angelantoni
Modello <i>Model</i>	Landmark	CH250B
Matricola <i>Serial number</i>	10310807	10728

Il Responsabile del Laboratorio
Head of the Centre
Ing. A. Gamanets



Copy of the original digitally signed and filed in our offices

Procedura di prova (Testing procedure)

SCOPO (Purpose):

To compare the flexural properties of new and aged (after 2 - 4 - 6 aging cycles) on nr .30 total samples of sandwich panels, by:

- Aging of sandwich panels in accordance to ASTM C481 - Cycle B (6*25 h) test on 30 samples
- Flexural properties of sandwich panels test in accordance to ASTM C393 - Single-Point Load (Midspan) on stone side (5 samples at 0-2-4-6 aging cycles).
- Flexural properties of sandwich panels test in accordance to ASTM C393 - Single-Point Load (Midspan) on foamglass side (5 samples at 0-6 aging cycles).

The aging cycles in accordance to ASTM C481 - Cycle B are composed by:

1. Total immersion in water at $50 \pm 3^{\circ}\text{C}$ for 1 h
2. Heat in dry air at $70 \pm 3^{\circ}\text{C}$ for 3 h
3. Spray with hot water at $70 \pm 3^{\circ}\text{C}$ for 3 h
4. Heat in dry air at $70 \pm 3^{\circ}\text{C}$ for 18 h

CAMPIONI ESAMINATI (Tested Samples):

Codice identificativo campione (Id Sample)	Denominazione campione Sampl Namee)	Data accettazione (Date of acceptance)	Descrizione campione (Sample Description)	Campionamento effettuato da: (Sampling by)
1602583-0100	0 cycles stone side	10/07/2016	5 Sandwich panels	Customer
1602583-0200	0 cycles foam side	10/07/2016	5 Sandwich panels	Customer
1602583-0300	2 cycles stone side	10/07/2016	5 Sandwich panels	Customer
1602583-0400	4 cycles stone side	10/07/2016	5 Sandwich panels	Customer
1602583-0500	6 cycles stone side	10/07/2016	5 Sandwich panels	Customer
1602583-0600	6 cycles foam side	10/07/2016	5 Sandwich panels	Customer



Fig. 1: example of sample as received (dimensions



Fig. 2: tested samples

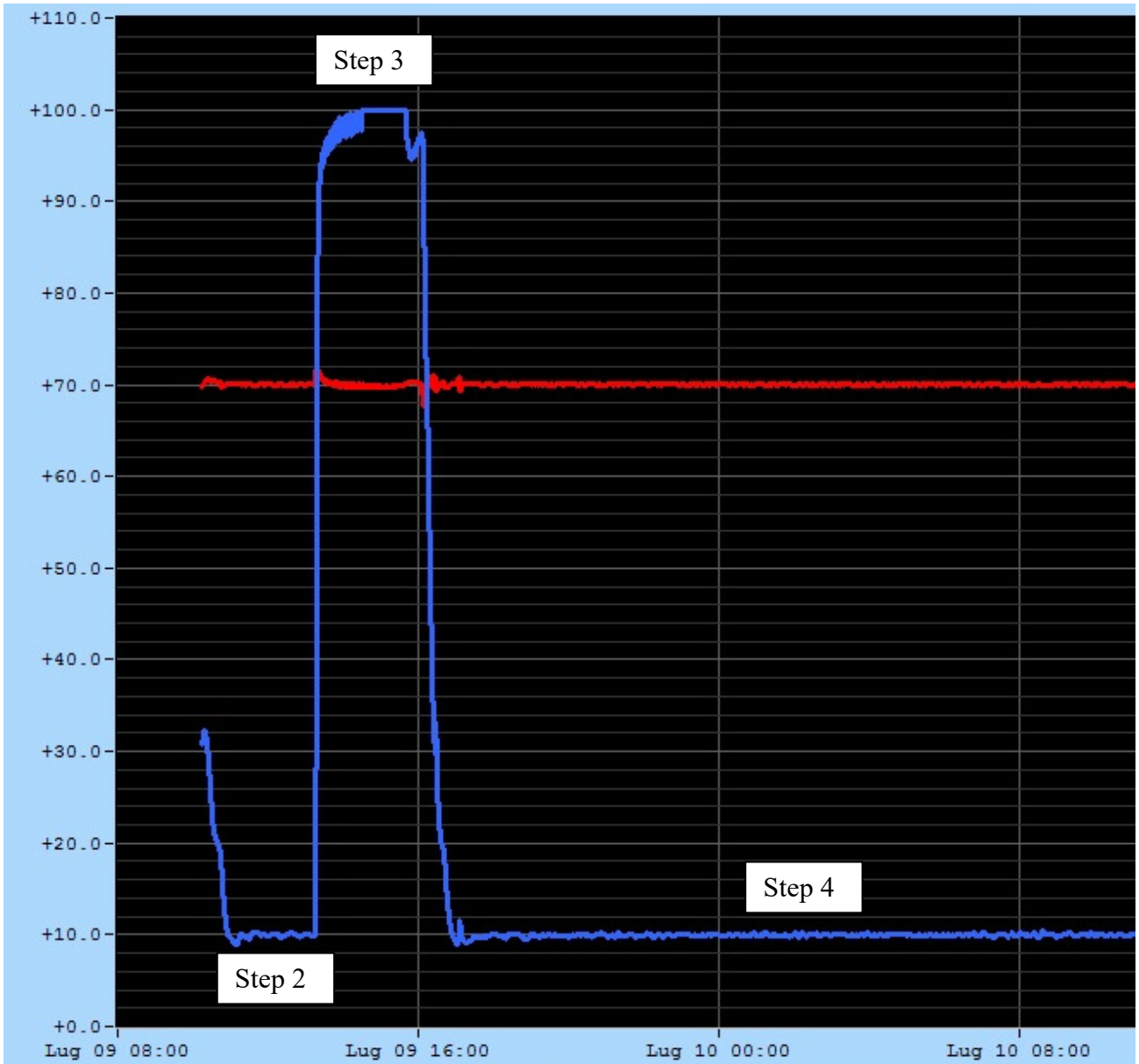


Fig. 3: ageing cycle record (red=temperature – blue=% relative humidity) for steps 2-3-4

Risultati delle analisi (*analysis results*)

In the following table, reporting the results of the bending tests, conducted according to ASTM C393, obtained after the various steps of aging cycles.

Test type	Specimen	Shear stress (Mpa)	Average	Load (N)
0 cycle stone side	1	0,44	0,62	1635
	2	0,60		2210
	3	0,64		2373
	4	0,82		3040
	5	0,60		2207
2 cycles stone side	1	0,70	0,64	2575
	2	0,72		2658
	3	0,66		2451
	4	0,46		1689
	5	0,64		2383
4 cycles stone side	1	0,71	0,72	2630
	2	0,80		2943
	3	0,56		2062
	4	0,85		3130
	5	0,69		2540
6 cycles stone side	1	0,88	0,75	3245
	2	0,68		2523
	3	0,71		2616
	4	0,79		2940
	5	0,70		2608
0 cycle foam side	1	1,13	0,90	4164
	2	0,90		3323
	3	0,97		3590
	4	0,42		1550
	5	1,07		3963
6 cycles foam side	1	0,60	0,88	2221
	2	0,79		2933
	3	1,19		4401
	4	0,97		3588
	5	0,85		3155

Table 1: results

In the following images, the setup of the three points bending test and the type of failure are reported.

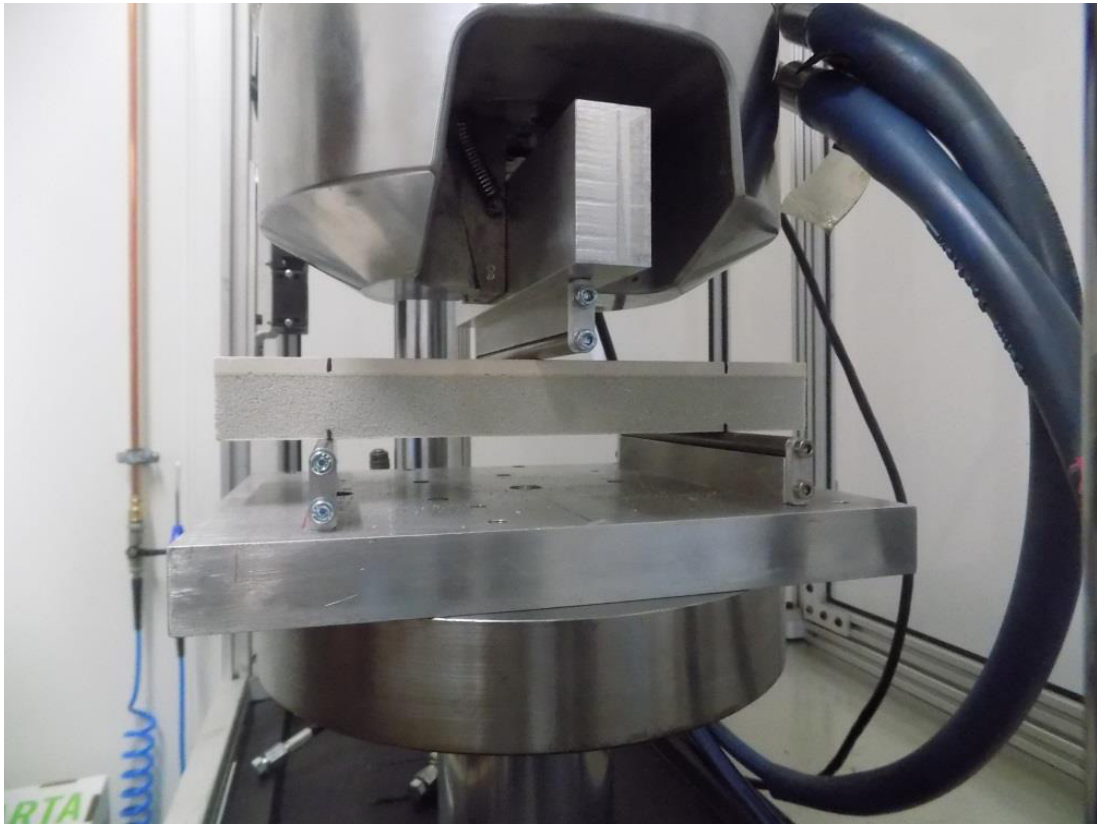


Fig. 4: test setup

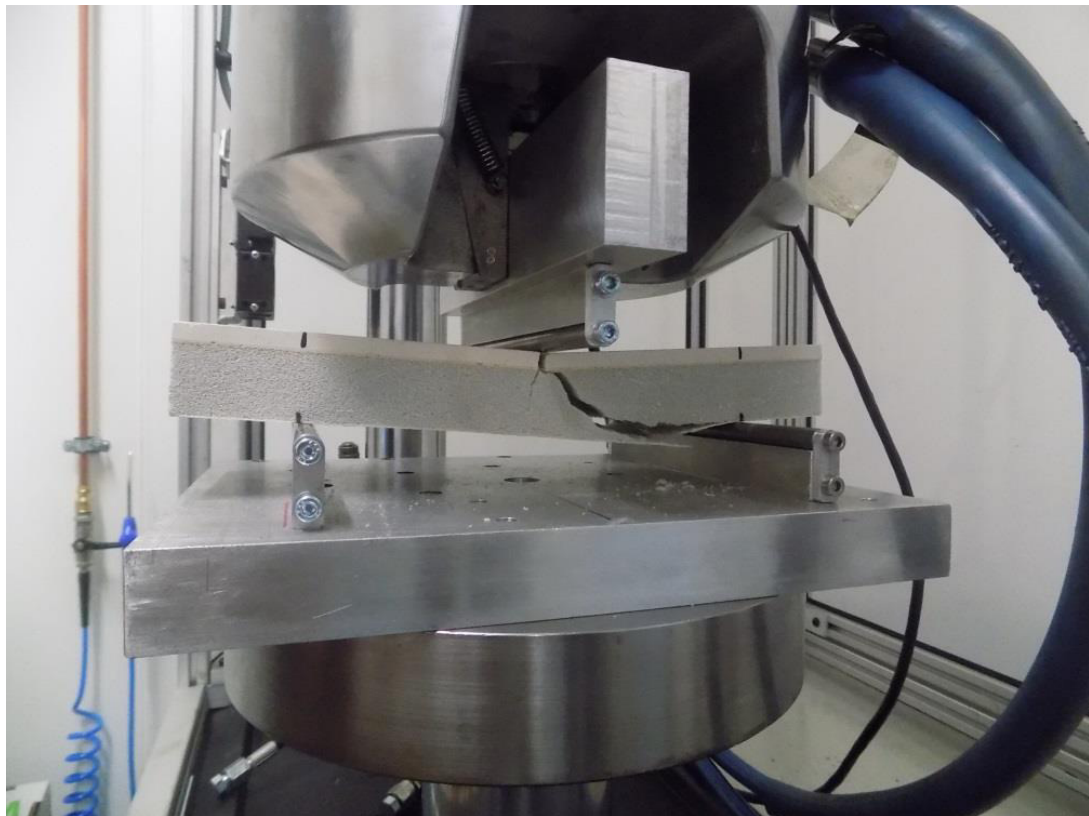


Fig. 5: stone side sample failure

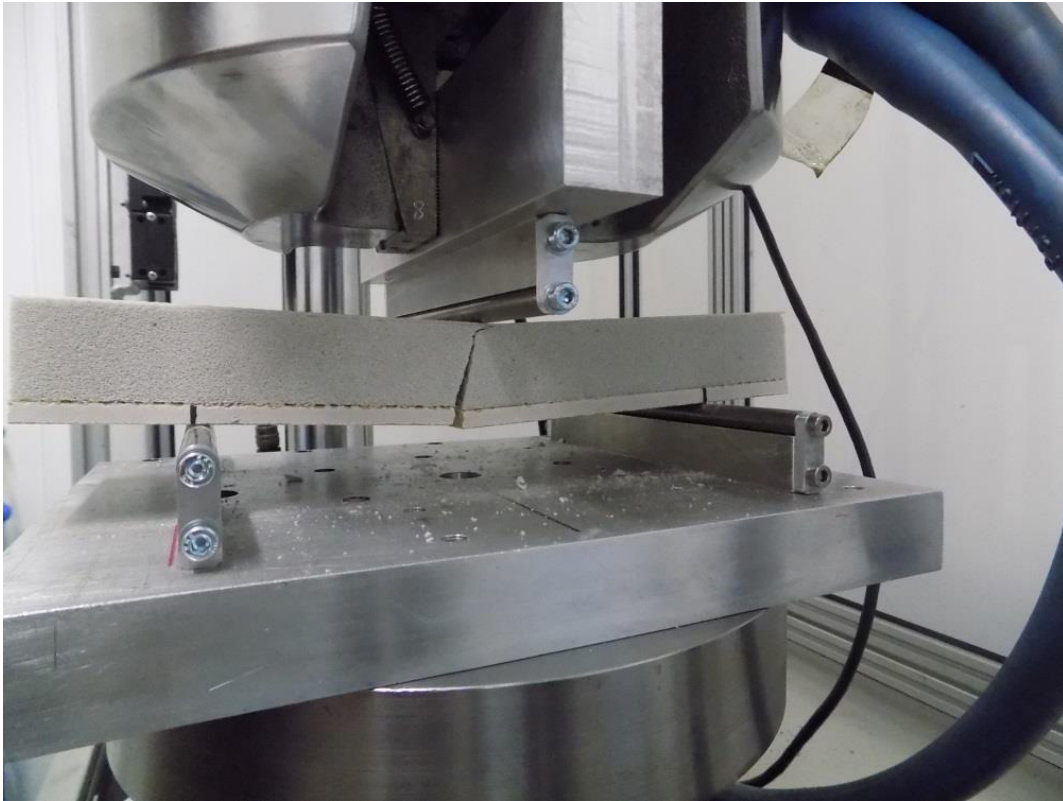


Fig. 6: foam side sample failure

Conclusioni (*Conclusions*)

A slight improvement (+10%) of flexural resistance was detected after 6 ageing cycles for samples tested on stone side.

No significant difference was detected after 6 ageing cycles for samples tested on foam side.

Informazioni aggiuntive (*Additional informations*)

I risultati si riferiscono esclusivamente ai campioni descritti a pag. 2

The results refer exclusively to the standards described on page. 2

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Fine del rapporto (*End of Report*)