

Test report no. 173385

1st copy of 03rd July 2017

Principal: Cembrit Holding A/S
Sohngaardsholmsvej 2
9100 Aalborg

DENMARK

Date of commission: 09.03.2017 / Mr Esben Moss

Subject of commission: Testing of Impact resistance according to ETAG 034

Cembrit Patina 8 mm

The test report contains 7 pages.

The testing material is used up.



The test report shall be published unabridged. Any partial publishing requires written allowance by the testing institute. The test results refer only to the tested material.

1. General

Client assigned MPA HANNOVER to perform tests of Impact resistance according to ETAG 034 on "Cembrit Patina" boards. This report states the results.

2. Delivery of samples

The delivery on 20.03.2017 and 28.03.2017 contains following samples:

5 pieces	Cembrit Patina 8 mm, Size 1200 x 2050 x 8 mm
10 pieces	Wooden batten 45 x 45 mm, length 3600 mm
5 pieces	Wooden batten 45 x 95 mm, length 3600 mm
approx. 30 m	EPDM strips 50 mm, black
1 package	Cembrit Facade Wood Screws 4.5 x 41 mm

3. Scope

Following properties should be tested:

- Resistance to hard body impact according to ETAG 034, clause 5.4.4.1, edition April 2012
- Resistance to soft body impact according to ETAG 034, clause 5.4.4.2, edition April 2012

Table 1 gives an overview about test boundaries according to ETAG 034.

Table 1: Overview test boundaries for impact tests

ETAG 034	Type of impact	Type of ball	Mass	Energy	Height	Position
5.4.4.1	Hard body	Steel ball	0,5 kg	1 Joule	0,20 m	3 locations
		Steel ball	0,5 kg	3 Joule	0,61 m	3 locations
		Steel ball	1,0 kg	10 Joule	1,02 m	3 locations
5.4.4.2	Soft body	Soft ball	3,0 kg	10 Joule	0,34 m	3 locations
		Soft ball	3,0 kg	60 Joule	2,04 m	3 locations
		Soft ball	50,0 kg	300 Joule	0,61 m	At least in the centre point
		Soft ball	50,0 kg	400 Joule	0,82 m	At least in the centre point

4. Test results

Testing of Impact resistance was done according to ETAG 034, clause 5.4.4.1 and 5.4.4.2. The test setup including impact bodies and test equipment is defined in ISO 7892:1988. Drop heights are taken from ETAG 034.

A description of mounting is given in Annex A1. Annex A2 shows the mounted sheet and Annex A3 shows the failure. Table 2 gives the results.

Table 2: Results of Impact tests

Period of testing: 15.05.2017 to 16.06.2017						
Type of impact	Type of ball	Mass	Energy	Height	Position	Observation
Hard body	Steel ball	0,5 kg	1 Joule	0,20 m	3 locations	no damage
	Steel ball	0,5 kg	3 Joule	0,61 m	3 locations	no damage
	Steel ball	1,0 kg	10 Joule	1,02 m	3 locations	no damage
Soft body	Soft ball	3,0 kg	10 Joule	0,34 m	3 locations	no damage
	Soft ball	3,0 kg	60 Joule	2,04 m	3 locations	no damage
	Soft ball	50,0 kg	300 Joule	0,61 m	At least in the centre point	broken, deterioration
	Soft ball	50,0 kg	400 Joule	0,82 m	At least in the centre point	not tested

5. Evaluation

ETAG 034, clause 6.4.4 gives categories regarding Impact resistance. An overview could be seen in Table 3. The requirements for each category are shown in Table 4. At least Table 5 displays the evaluation of test results regarding requirements of ETAG 034.

Table 3: Definition of use categories for Impact resistance (ETAG 034, 6.4.4, Table 4)

Use category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level

Table 4: Requirements regarding Impact categories (ETAG 034, 6.4.4, Table 5)

	Category IV	Category III	Category II	Category I
Test 5.4.4.1 Impact 1 joule	cladding element not cracked ²⁾	-----	-----	-----
Test 5.4.4.1 Impact 3 joule	-----	cladding element not cracked ²⁾	No deterioration ¹⁾	No deterioration ¹⁾
Test 5.4.4.1 Impact 10 joule	-----	-----	Cladding element not cracked ²⁾	No deterioration ¹⁾
Test 5.4.4.2 Impact 10 joule	No deterioration ¹⁾	No deterioration ¹⁾	-----	-----
Test 5.4.4.2 Impact 60 joule	-----	-----	No deterioration ¹⁾	No deterioration ¹⁾
Test 5.4.4.2 Impact 300 joule	-----	-----	No deterioration ¹⁾	-----
Test 5.4.4.2 Impact 400 joule	-----	-----	-----	No deterioration ¹⁾

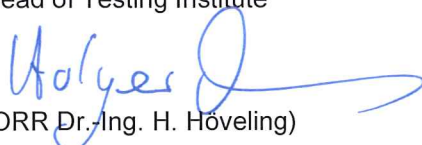
¹⁾ Superficial damage, provided there is no cracking, is considered as showing "no deterioration".

²⁾ The test result is assessed as being "cracked" if circular cracking penetrating is observed.

Table 5: Evaluation of test results regarding requirements of ETAG 034 (Cembrit Patina 8 mm)

Type of impact	Energy	Category IV	Category III	Category II	Category I
Hard body	1 Joule	passed	-----	-----	-----
	3 Joule	-----	passed	passed	passed
	10 Joule	-----	-----	passed	passed
Soft body	10 Joule	passed	passed	-----	-----
	60 Joule	-----	-----	passed	passed
	300 Joule	-----	-----	not passed	-----
	400 Joule	-----	-----	-----	not passed
Evaluation		passed	passed	not passed	not passed

Hanover, 03rd July 2017
Head of Testing Institute

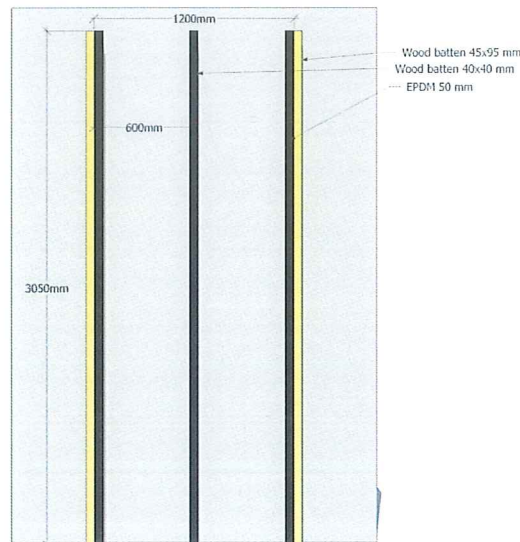
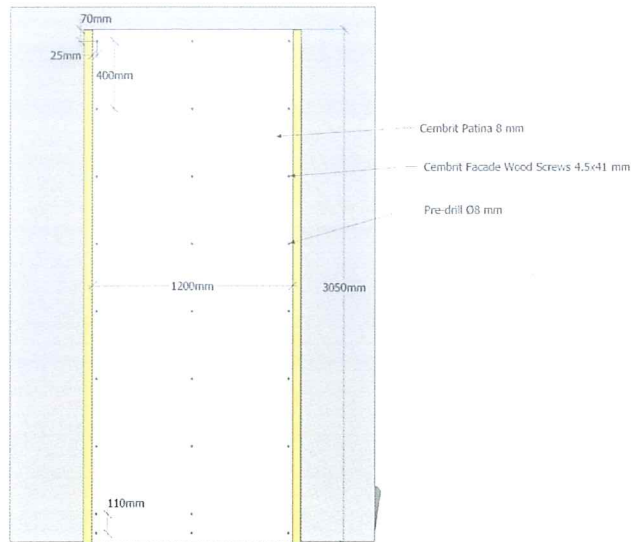

(ORR Dr.-Ing. H. Höveling)



APPENDIX

Appendix A1: Description for mounting

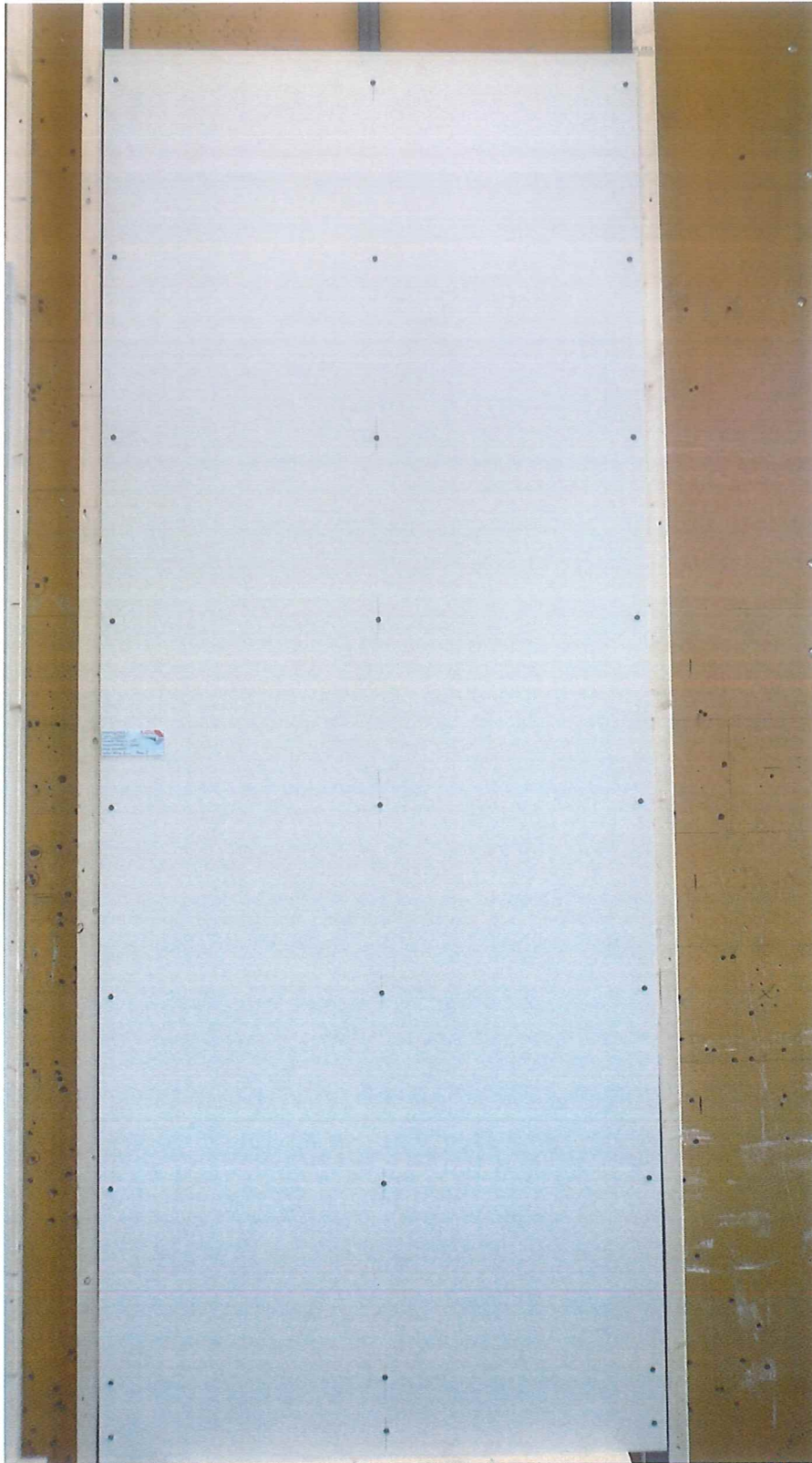
Cembrit Patina 8 mm



<p>Test: Impact test Product: Cembrit Facade board Test place: MPA BAU Hannover</p>	<p>Cembrit Holding A/S Sohngaardsholmsvej 2 DK- 9100 Denmark</p>	<p>Drawing number</p>	<p>03-BAUH.17.029</p>	
<p>CEMBRIT</p> <p>Tel. +45 99372222 Www.cembrit.com</p>		<p>Scale</p>		
		<p>Data</p>	<p>08/03-2017</p>	<p>SLA</p>
		<p>Rev. A.</p>		



Appendix A2: Mounted sheet Patina 8 mm



Appendix A3: Failure, soft ball 50 kg with 300 Joule

