

6. CE MARK AND CERTIFICATES

6.1. CE-CERTIFICATES

THE GREEN BARRIER® AND GB® ECONOMY

Only few institutes in Europe are certified to grant CE-marks according to the comprehensive regulation for sound barriers. Barriers from Pile-Byg are proven to be performing according to the facts listed on the following CE-marks certified by the following accredited institutes :

Structural stability:

BBRI
Belgian Building Research Institute
Notified testing Laboratory no 1136



Verification of the calculation of the structural stability for
CE Marking of Sound Barrier

THE WOVEN ACOUSTIC BARRIER
THE LIVING ACOUSTIC BARRIER

Date: April 29th 2008
Client: PileByg
Villerup Hovedgaard
Vilhelmsvej 78
DK-9800 Hjørring
Redaction: Gustave Zaman, Laboratory Structures (BBRI)
c/o Lombard, 34
25, 3000 Brussels.
Project n°: DE 413X3128 / SC-0083

CE Marking of Sound Barrier

1/7

CSTC-WTCB

Boulevard Poincare
1060 Brussels
Ph (32) 2 502 66 90
VAT BE 407 695 057
Research Centre:
Avenue P Holoffe 21
B-1342 Limelette
Ph: (32) 2655 77 11

Sound Measurement

DELTA
Danish Electronics,
Lights and Acoustics

DELTA is accredited by DANAK, reg no. 100. DELTA is a notified body under the CPD (Constructions Products Directive), Notification no ID 0199

Venlighedsvej 4
2970 Hørsholm

Ph: (45) 72194000
Www.delta.dk



THE GREEN NOISE BARRIERS

PileByg a/s Villerup Hovedgaard DK-9800 Hjørring www.pilebyg.dk +45 98962071 info@pilebyg.dk

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THE GREEN BARRIER® AND GB® ECONOMY

Declaration of Conformity

EC DECLARATION OF CONFORMITY
No. : 0199 1136

The undersigned, representing the following manufacturer

manufacturer : PileByg a/s
address : Villerupvej 78, 9800 Hjørring, Denmark

or representing the manufacturer's authorized representative established within the Community (or the EEA) indicated hereafter (when applicable)

authorized representative :
address :

herewith declares that the product

THE GREEN BARRIER and THE GREEN BARRIER ^{ECONOMY} DET GRØNNE ELEMENT and DET GRØNNE ELEMENT ^{ECONOMY}
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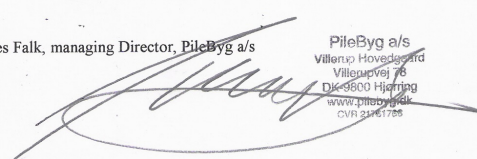
is in conformity with the provisions of the following EC directive(s)
(including all applicable amendments)

reference n °	title
EN14-388:2005	Vejstyr – Støjafskærmning til dæmpning af trafikstøj – specifikationer. DS/EN14388:2006, DS/EN 1794-1:2003 and DS/EN 1794-2:2003.

and that the standards and/or technical specifications referenced overleaf have been applied.

Villerup Hovedgaard, Hjørring **March 2008**

Johannes Falk, managing Director, PileByg a/s


PileByg a/s
Villerup Hovedgaard
Villerupvej 78
DK-9800 Hjørring
www.pilebyg.dk
CVR 24161755


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THE GREEN BARRIER® 240 mm

 0199 1136			
PileByg A/S Villerup Hovedgaard Villerupvej 78 9800 Hjørring Denmark			
DS/EN 14388:2006, DS/EN 1794-1:2003 and DS/EN 1794-2:2003			
Noise barrier for reducing road traffic noise. Type: "DET GRØNNE ELEMENT" Width = 2000 mm, 2500mm and 3000mm; Column material acacia Distance between steeltubes : 583-687,5mm Sides: Living willow and woven willow or woven willow on both sides. Acoustic element with 240 mm isolation type RockDelta Stenuid Dual 200/80 kg/m³			
Dry and reduced wet self weight of an acoustic element:			
	Dry weight		Approximately 65 kg/m²
	Reduced Wet weight		Approximately 89 kg/m²
Material data (Characteristic values):			
	Compressive strenght $f_{c,ak}$	Bending strenght $f_{m,k}$	Modulus of elasticity E_x
Acacia	35 MPa	40 MPa	11600 MPa
Steel S235	$f_{yk} = 235$ MPa		2100 GPa
Resistance to loads (*if characteristic value):			
	Maximum vertical load an element can withstand:		1,0 kN/m*
	Normal (90°) load an acoustic element can withstand (Due to wind and static)		0,94 kN/m²*
	Normal (90°) load a structural element can withstand (Due to wind, selfweight and static):		
Columns:			
Dimension/Maximum uniform load/Maximum bending moment at ground level			
	2,0m between columns	2,5m between columns	3,0m between columns
2,0m high	100x100/4,2kN/m/8,2kNm	100x100mm/4,1kN/m/8,2kNm	100x100mm/4,2kN/m/8,2kNm
2,5m high	100x125/4,2kN/m/13,2kNm	100x125mm/4,2kN/m/13,2kNm	100x125mm/4,2kN/m/13,1kNm
3,0m high	125x125/3,6kN/m/16,1kNm	125x125mm/3,6kN/m/16,1kNm	125x125mm/3,6kN/m/16,1kNm
Steel bars pr.600mm:			
(Dimension)/Maximum uniform load			
	2,0m between columns	2,5m between columns	3,0m between columns
Upper tubes	(1")/0,92 kN/m	(1")/0,59 kN/m	(1 1/4")/0,69 kN/m
Lower tubes	(1" Solid)/1,07 kN/m	(1 1/4" Solid)/1,17 kN/m	(1 1/2" Solid)/1,09 kN/m
Sound Absorption: DL_w		5-11 dB	
Airborne sound insulation: DL_w		32 dB	
Sound reduction index: R_w		37 dB	
Light reflectivity:		NPD	
Risk of falling debris:		Class 0	
Expected Durability of Non Acoustic Characteristics:			
Service Life, Acoustic element:		50 years	
Service Life, Structural element:		Material (Undressed and in contact with the ground)	
	Acacia	years > 36	

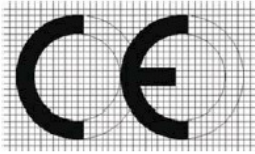
THE GREEN NOISE BARRIERS

PileByg a/s Villerup Hovedgaard DK-9800 Hjørring www.pilebyg.dk +45 98962071 info@pilebyg.dk

6. CE MARK AND CERTIFICATES

6.1. CE-CERTIFICATES

GB: ECONOMY 240 MM

 0199 1136			
PileByg A/S Villerup Hovedgaard Villerupvej 78 9800 Hjørring Denmark			
DS/EN 14388:2006, DS/EN 1794-1:2003 and DS/EN 1794-2:2003			
Noise barrier for reducing road traffic noise. Type: "DET GRØNNE ELEMENT - FACADE flettet pil" Width = 1540 mm; Column material acacia Distance between steeltubes= 600mm Sides optional: Armor plate net; woven willow: Rib oak. Acoustic element with 240 mm isolation type RockDelta Stenuld Dual 200/80 kg/m ³			
Dry and reduced wet self weight of an acoustic element:			
	Dry weight	Approximately 65 kg/m ²	
	Reduced Wet weight	Approximately 89 kg/m ²	
Material data (Characteristic values):			
	Compressive strenght $f_{c,0,k}$	Bending strenght $f_{m,k}$	Modulus of elasticity E_k
Acacia	35 MPa	40 MPa	11600 MPa
Steel S235	$f_{y,k}=235$ MPa		2100 GPa
Resistance to loads (*if characteristic value):			
Maximum vertical load an element can withstand:			1,0 kN/m*
Normal (90°) load an acoustic element can withstand (Due to wind and static)			0,94 kN/m ² *
Normal (90°) load a structural element can withstand (Due to wind, selfweight and static):			
Columns			
Height	Dim.	Maximum uniform load	Maximum bending moment at ground level
1,5m	100x100mm	3,86kN/m	4,31kNm
2,0m	100x100mm	2,15kN/m	4,31kNm
2,5m	100x125mm	2,16 kN/m	6,75kNm
3,0m	100x150mm	2,18 kN/m	9,79kNm
Steel bars	3/4" (Upper)	1,60 kN/m	
	3/4" (Lower)	1,60 kN/m	
Sound Absorption: DL_n			5-11 dB
Airborne sound Insulation: DL_R			32 dB
Sound reduction Index: R_w			37 dB
Light reflectivity:			NPD
Risk of falling debris:			Class 0
Expected Durability of Non Acoustic Characteristics:			
Service Life, Acoustic element:			50 years
Service Life, Structural element: Material (Undressed and in contact with the ground)			
Acacia			years > 36

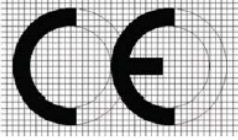
THE GREEN NOISE BARRIERS

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6. CE MARK AND CERTIFICATES

6.1. CE-CERTIFICATES

GB, ECONOMY 120 MM

 <p>0199 1136</p>			
PileByg A/S Villerup Hovedgaard Villerupvej 78 9800 Hjørring Denmark			
DS/EN 14388:2006, DS/EN 1794-1:2003 and DS/EN 1794-2:2003			
Noise barrier for reducing road traffic noise. Type: "DET GRØNNE ELEMENT - FACADE flettet pil" Width = 1540 mm; Column material acacia Distance between steeltubes= 600mm Sides optional: woven willow and armor plate net; woven willow on both sides; woven willow and oak. Acoustic element with 120 mm isolation type RockDelta Stenuld Dual 200/80 kg/m ³			
Dry and reduced wet self weight of an acoustic element:			
	Dry weight		Approximately 32 kg/m ²
	Reduced Wet weight		Approximately 43 kg/m ²
Material data (Characteristic values):			
Acacia	Compressive strength $f_{c0,k}$ 35 MPa	Bending strength $f_{m,k}$ 40 MPa	Modulus of elasticity E_k 11600 MPa
Steel S235	f_{yk} =235 MPa		2100 GPa
Resistance to loads (**if characteristic value):			
Maximum vertical load an element can withstand:			1,0 kN/m*
Normal (90°) load an acoustic element can withstand (Due to wind and static)			0,94 kN/m ² *
Normal (90°) load a structural element can withstand (Due to wind, selfweight and static):			
Columns			
Height	Dim.	Maximum uniform load	Maximum bending moment at ground level
1,5m	100x100mm	3,86kN/m	4,31kNm
2,0m	100x100mm	2,15kN/m	4,31kNm
2,5m	100x125mm	2,16 kN/m	6,75kNm
3,0m	100x150mm	2,18 kN/m	9,79kNm
Steel bars	3/4" (Upper)	1,60 kN/m	
	3/4" (Lower)	1,60 kN/m	
Sound Absorption: DL_w			9 dB
Airborne sound insulation: DL_r			22 dB
Sound reduction Index: R_w			26 dB
Light reflectivity:			NPD
Risk of falling debris:			Class 0
Expected Durability of Non Acoustic Characteristics:			
Service Life, Acoustic element:			50 years
Service Life, Structural element:			Material (Undressed and in contact with the ground)
Acacia			years > 36

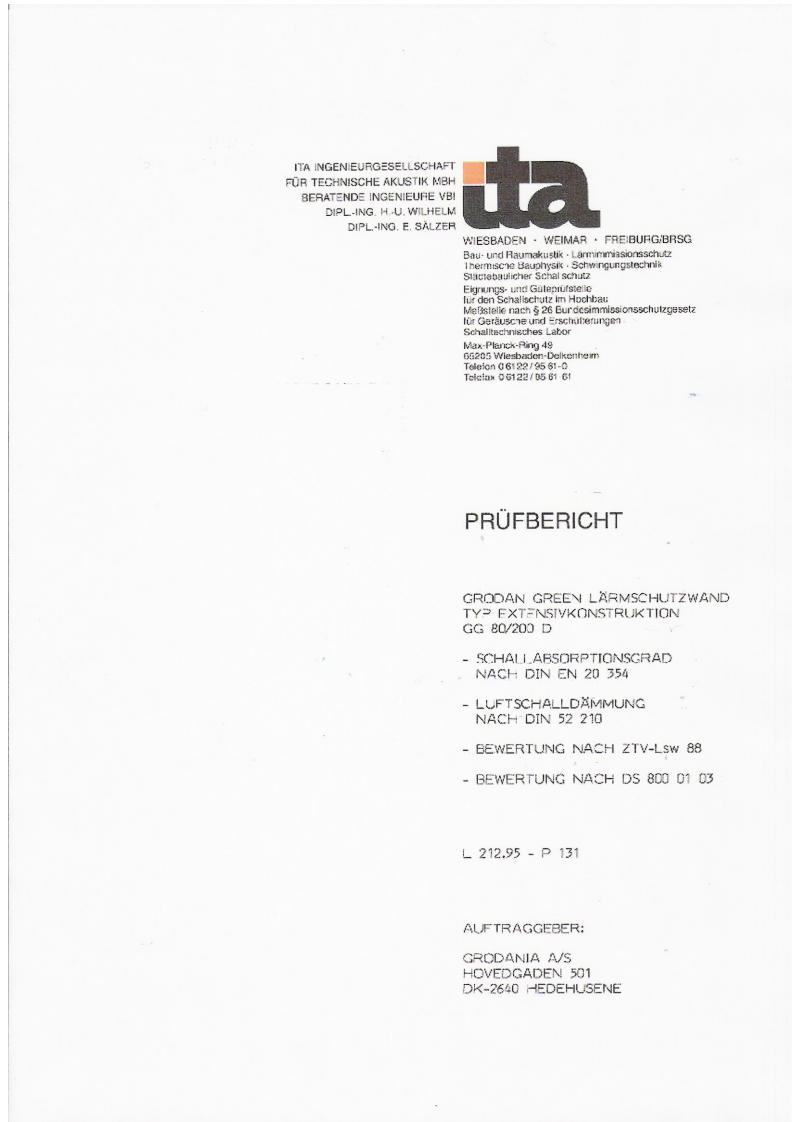
THE GREEN NOISE BARRIERS

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6. CE MARK AND CERTIFICATES

6.2 CE-CERTIFICATES, WOOL

THE GREEN BARRIER® AND GB® ECONOMY



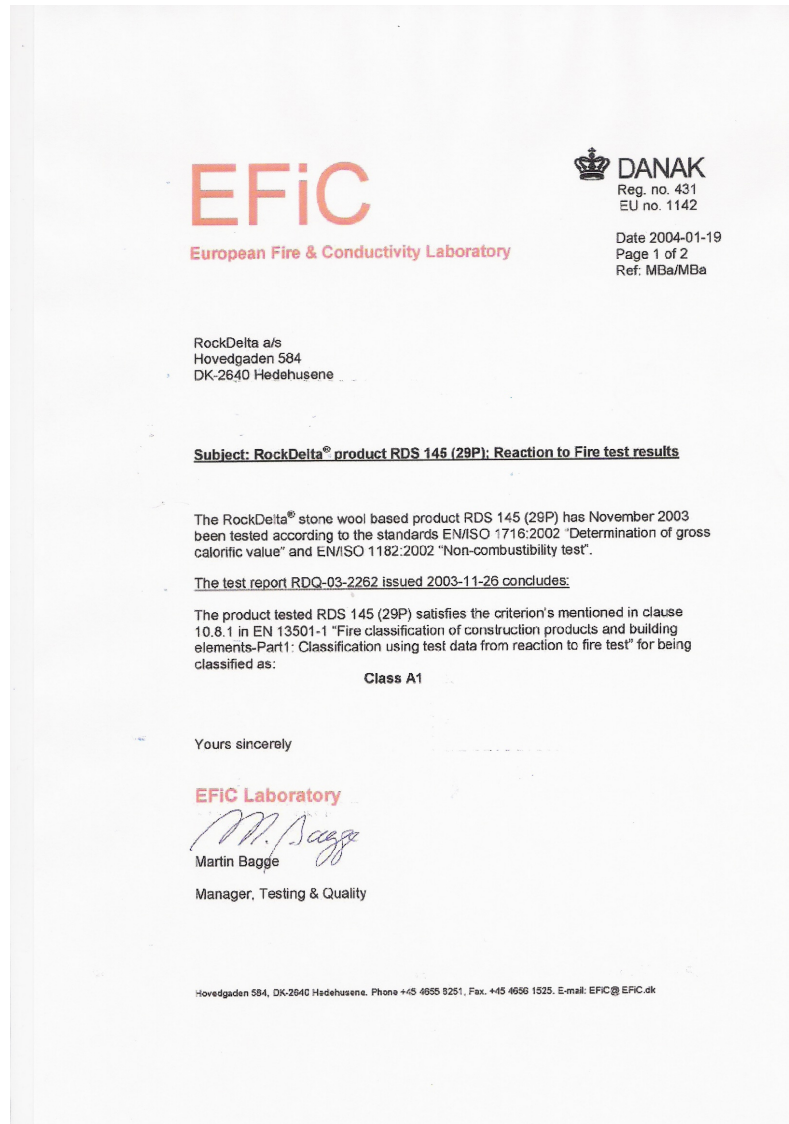
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6. CE MARK AND CERTIFICATES

6.2 CE-CERTIFICATES, WOOL

THE GREEN BARRIER® AND GB® ECONOMY



THE GREEN NOISE BARRIERS

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6. CE MARK AND CERTIFICATES

6.2 CE-CERTIFICATES, GLASS

THE GREEN BARRIER® AND GB® ECONOMY

“Schalldämm-Prüfprogramm” für TROSIFOL Sound Control Plus (SC⁺) » Übersicht Prüfergebnisse «

1. VSG mit TROSIFOL Sound Control Plus

VSG			Messergebnisse	
Floatglas	Folie	Floatglas	Schalldämm- Maß $R_w (C; C_w)$	Prüfinstitut
3mm	SC ⁺ 0,76mm	3mm	36 (-1/-4) dB	IBP Stuttgart
4mm	SC ⁺ 0,76mm	4mm	37 (-1/-4) dB	IBP Stuttgart
5mm	SC ⁺ 0,76mm	5mm	38 (-1/-3) dB	ift Rosenheim
6mm	SC ⁺ 0,76mm	6mm	40 (-1/-3) dB	SWA Aachen
8mm	SC ⁺ 0,76mm	8mm	41 (-1/-3) dB	ift Rosenheim
10mm	SC ⁺ 0,76mm	10mm	42 (-1/-3) dB	ift Rosenheim
12mm	SC ⁺ 0,76mm	12mm	43 (-1/-3) dB	ift Rosenheim

TROSIFOL® SOUND CONTROL

Film type	Thickness [mm]	Water content [%]	Roughness R_z^{**} [µm]	Length of roll PE-interleaved [m]
TROSIFOL® Sound Control	0.76*	0.45	45	200/450

* Other thicknesses available on request

** Value measured in accordance with EN ISO 4287

PHYSICAL DATA* SOUND CONTROL

Properties	Test method	Unit	Typical values
Density	DIN 53479	g/cm ³	1.058
Refractive index	DIN 53491	-	1.478
Thermal conductivity	DIN EN 12939	W/mK	0.14
Thermal expansion coefficient	-	1/K x 10 ⁻⁴	4.14
Specific heat	DIN 52616	J/gK	-
Surface resistivity	DIN 53482	Ω x 10 ¹¹	2.0
Tensile strength	ISO 527	N/mm ²	> 14
Tensile elongation	ISO 527	%	> 300

* All values independent of film thickness

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6. CE MARK AND CERTIFICATES

6.2 CE-CERTIFICATES, GLASS

THE GREEN BARRIER® AND GB® ECONOMY



**TEKNOLOGIS
INSTITUT**

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DK-9800 Hjoerring
Denmark

Order no. 410706
Page 1 of 1
Appendices 1
Initials MJLD/-

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DK-8000 Århus C
Telefon 72 20 10 00
Telefax 72 20 10 19

info@teknologisk.dk
www.teknologisk.dk



Test overview

System: Safety glass – 12 mm glass pane of 2 x 6 mm thermally toughened safety glass, laminated with 0.76 mm foil.

Method: EN 12150-2: Glass in building – Thermally toughened soda lime silicate safety glass – Part 2: Evaluation of conformity / Product standard
EN 12600: Glass in building – Pendulum test – Impact test method and classification for flat glass

Result: Pendulum test: Class 1(C)1

The test result covers the tested thickness and above.

Terms: The test has been performed according to the enclosed conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation Scheme). The testing is only valid for the tested specimen. The test report may only be extracted if the laboratory has approved the extract.

2011-02-09, Danish Technological Institute, Building Technology, Aarhus


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Consultant

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