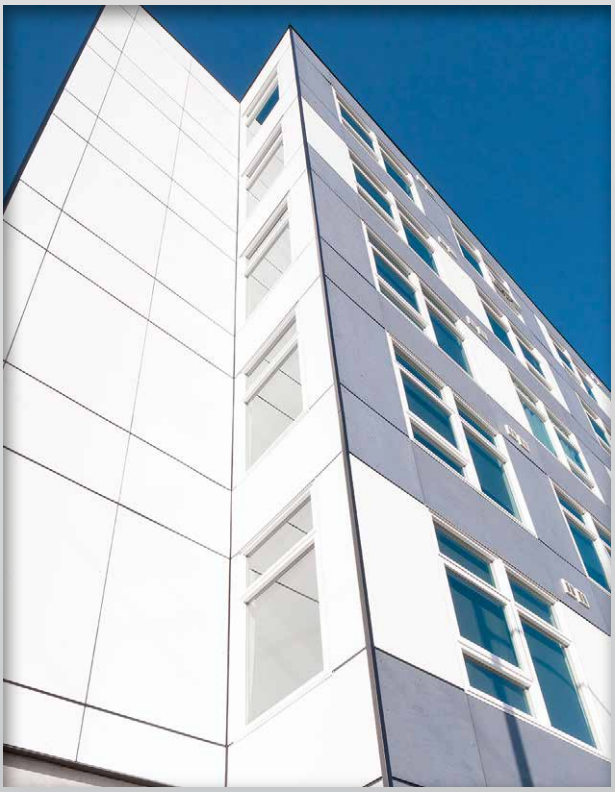
afc cladding

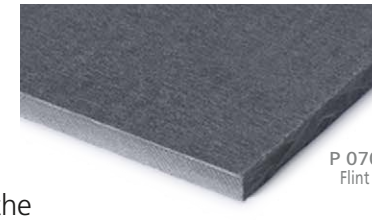
SUSTAINABLE SOLUTIONS



American Fiber
Cement Corporation

Patina

Patina has a natural, textured surface. You can see the fiber and natural characteristics of the raw materials, and you can see and feel the sanding lines on the surface. As the seasons change and the years pass, the natural aging of the fiber cement leaves subtle traces on the surface, and the façade will gradually acquire a distinctive patina.



P 070
Flint

Grays

P 020
Granite

P 050
Graphite

P 070
Flint

Whites

P 222
Pearl

Reds

P 313
Tufa

P 323
Magma

P 333
Adobe

P 343
Ruby

Yellows

P 545
Sand

P 565
Amber

Greens

P 626
Emerald

Printed in USA

Patina Inline

Patina Inline reflects strength and durability. Its milled linear grooves add a 3D effect to a building and make it possible to create custom squares or triangular patterns. When viewed in natural light, its featured lines offer a vibrant look that changes throughout the day. Over time, this material will patinate, enriching its natural look. This material is virtually maintenance-free and is available in five timeless colors.

PI 070
Flint

PI 020
Granite

PI 050
Graphite

PI 070
Flint

Grays

PI 222
Pearl

White

PI 545
Sand

Tan

Patina Rough

Patina Rough has a tough textured surface and stone-like finish which adds character to any building. When combined with other products from the Patina design line, it creates an interesting interplay. This material has an eroded, natural looking surface. It's virtually maintenance-free and is available in five timeless colors.

PR 050
Graphite

PR 020
Granite

PR 050
Graphite

PR 070
Flint

Grays

PR 222
Pearl

White

PR 545
Sand

Tan

Printed in USA

Solid

Solid is a through-colored panel with an acrylic paint surface. It's designed this way so it closely matches the surface's acrylic paint layer. This means if you choose the Solid product line for your façade, every edge of the board will feature the same hue as the surface color, giving the wall an unblemished appearance.

S 353
Mars

Grays

S 030
Mercury

S 071
Orcus

Blacks

S 101
Pluto

S 131
Juno

S 151
Pallas

S 191
Erebus

Whites

S 212
Luna

S 282
Saturn

Reds

S 334
Jupiter

S 353
Mars

Yellows

S 515
Venus

S 525
Triton

Greens

S 606
Rhea

S 616
Ceres

S 656
Terra

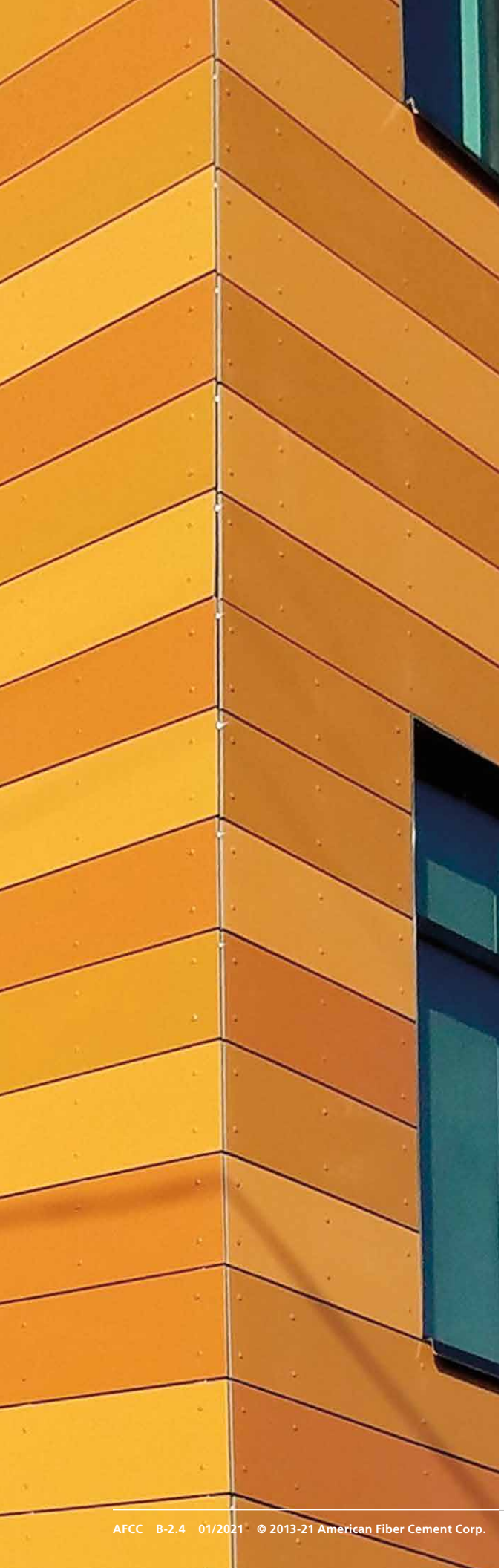
S 676
Callisto

Blues

S 747
Neptune

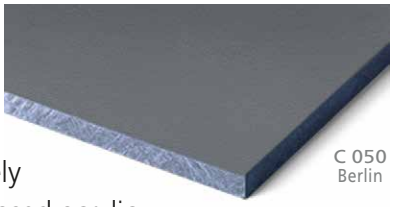
S 757
Mimas

Printed in USA



Cover

Cover is the ideal solution if you prefer the strongest colors and bolder design statements. The natural gray fiber-cement core is completely covered by a layer of water-based acrylic paint, with 26 standard Colors and more than 1,950 NCS® colors to choose from. (Custom colors available.)



C 050
Berlin

Grays

C 010
Stockholm

C 020
Vilnius

C 040
Sofia

C 050
Berlin

C 060
Helsinki

Blacks

C 160
London

C 190
Munich

Whites

C 200
Gothenburg

C 210
Nuuk

Reds

C 350
Brussels

C 360
Copenhagen

C 370
Moscow

C 390
Istanbul

Yellows

C 450
Amsterdam

C 530
Rome

C 540
Kiev

C 550
Athens

C 570
Barcelona

Greens

C 610
Lisbon

C 630
Geneva

C 640
Hamburg

C 650
Madrid

C 670
Dublin

Blues

C 730
Oslo

C 760
Naples

C 770
Riga

Printed in USA

Transparent


T 020
Mediterranean

Transparent combines the textured nuances and natural characteristics of the baseboard with the long-lasting performance of the transparent top coat. The color added to the fiber cement reveals and highlights fibers and other raw materials that provide its strength and character. The durable transparent coating protects the board and ensures a smooth surface with a long service life.

Grays

T 020
Mediterranean

T 030
Olympus

Blacks

T 101
Arabian

T 111
Kilimanjaro

T 161
Denali

T 171
Etna

Whites

T 242
Antarctic

T 252
Blanc

T 262
Sahara

Reds

T 373
Kalahari

T 383
Vesuv

Yellows

T 505
Mojave

T 515
Gobi

Greens

T 626
Sonoran

Blues

T 737
Caribbean

Printed in USA

Deco


D 100
Charcoal

Deco features a rustic coated surface for ventilated facades by combining the characteristics of Solid and Patina. Deco creates a smooth polished look with a natural texture by melding an acrylic paint finish with a directional sanding grain. The combination of the delicate structure and the true nature of the fiber cement boards requires very limited maintenance and provides excellent UV stability.

Grays

D 030
Fossil

Blacks

D 100
Charcoal

D 190
Carbon

Whites

D 212
Cirrus

Reds

D 330
Sienna

D 350
Chestnut

Yellows

D 555
Aspen

D 562
Wheat

Greens

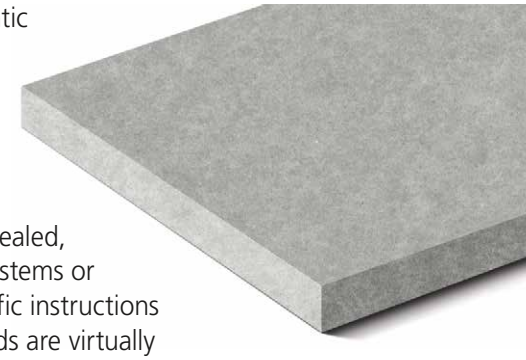
D 600
Sage

Deco	**U.S. Trimmed sizes** in. (mm)		**Weight** (lbs/ft²)
Thickness	5/16 (8 mm)		2.6
Width	46¼ (1,175)		
Length	96 (2,440)	119⅞ (3,045)	

Printed in USA

Minerit **HD** (Raw)

Minerit HD is an uncoated fiber cement board that allows the authentic appearance of the fiber cement to stand out. In application, Minerit HD is a building board that can be installed for certain cladding purposes when a natural expression is desired. It's an unpigmented material, so variations may occur in the individual boards and from board to board, adding a lively expression to the façade.



When used for cladding in a rainscreen system, the boards must be sealed, typically on all sides. They can be painted on-site with acrylic paint systems or transparent stains that are suitable for cement-based materials (Specific instructions for painting/staining are available). After surface treatment, the boards are virtually maintenance free. In industrial applications where the surface appearance is of less importance, the boards do not need to be sealed but efflorescence will likely occur over time depending on the type of exposure and climate conditions.

The color charts displayed in this brochure give an impression of the available colors. Reproduction of the exact colors is restricted by the printing process. For an exact color match, samples are available upon request.

Cover, Patina, Patina Rough, Transparent and Solid				
	U.S. Trimmed sizes in. (mm)		**Weight** (lbs/ft²)	
Thickness	8 mm		Patina and Patina Rough	Cover, Transparent & Solid
Width	48 (1,220)		2.5	2.9
Length	96 (2,440)	120 (3,050)		

Patina Inline			
	U.S. Trimmed sizes in. (mm)		**Weight** (lbs/ft²)
Thickness	9.5 mm (non-grooved areas), 8 mm (grooved areas)		Patina Inline
Width	48 (1,220)		2.9
Length	96 (2,440)	120 (3,050)	

Minerit HD						
	Trimmed sizes — in. nominal (mm)		**Weight** (lbs/ft²)			
Thickness	4 mm, 6 mm 8 mm or 10 mm		4 mm	6 mm	8 mm	10 mm
Width	48 (1,220)		1.6	2.3	3.1	3.9
Length	96 (2,440)	120 (3,050)				

The recommended thickness for Minerit HD in a rainscreen application is 8mm.

Product **Sustainability**

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- Thermal Comfort

Energy and Atmosphere:

- Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rainscreen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Warranty information available upon request.

AFC cladding Panels

Fiber Cement— **Distinct Properties**

Sound and Weather Resistant — AFC's fiber cement boards deliver optimal sound and weather insulation. Noise as well as changing weather conditions such as freeze/thaw, heat and water pose no threat to fiber cement façades. The boards retain their shape at all times.

Low Maintenance — The ability of the boards to resist mold and algae attacks is equally impressive. The result is a long-lived façade that saves you time and effort on inconvenient and costly repairs and repaints.

Non-combustible — The boards are non-combustible, which is your guarantee for a safe building.

Easy Handling — AFC's fiber cement boards are flexible and easy to handle. They can be delivered cut to size, ready for installation. All this makes for lower construction costs, shorter construction times, and lower installed costs.

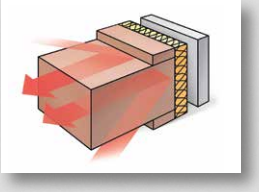
Fiber Cement— **A Unique Composition**

Natural Ingredients — With the strong composition of cement, mineral fillers, cellulose and non-toxic, organic fibers— and not to forget a dash of water— AFC's fiber cement boards are made up of purely natural and environmentally friendly raw materials. This makes for sustainable and fully reusable boards.

Strong Recipe — The secret behind the impressive strength and durability of AFC's fiber cement boards resides in the manufacturing technology. Thin layers of fiber cement are added on top of each other, pressed firmly together under tremendous pressure before completing a slow air curing process. Reinforced by carefully selected fibers, the many thin layers give the fiber cement cladding a strength with few peers in the world of building materials.

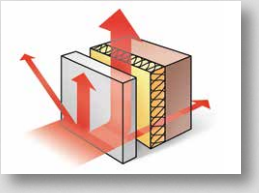
Green Footprints — A comprehensive analysis of the environmental impact of the AFC boards can be made from AFC's EPDs in accordance with EN 15804 on the Sustainability of Construction Works. The EPDs provide a Life-Cycle Assessment, manufacturing process details, and information on the use of any dangerous materials. These EPDs are available online.

Rainscreen Cladding



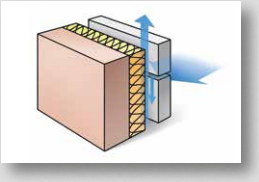
Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.



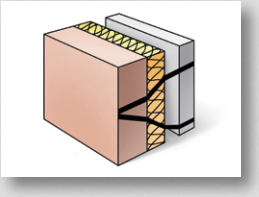
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



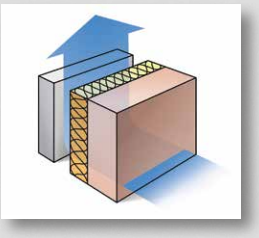
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter in both hot and cold climates.



Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapor pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

Distributed by

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AIA Continuing Education Provider

American Fiber Cement Corporation

Patina Original

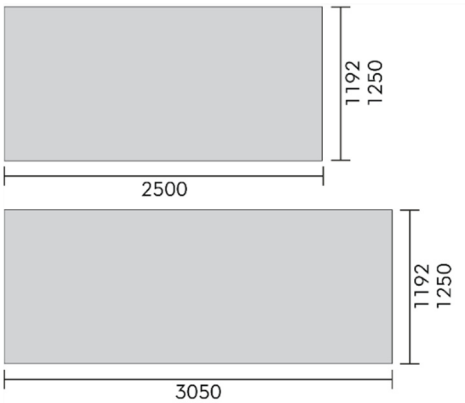
Datasheet - Facade Boards

Patina Original has a natural, textured surface. You can see the fiber and natural characteristics of the raw materials, and you can see and feel the unique sanding lines on the surface. Natural imperfections like dots and spots can be visible but from 3-5 meters distance the surface will appear homogenous. As the seasons change and the years pass, the natural aging of the fiber cement leaves subtle traces on the surface, and the facade will gradually acquire a distinctive patina.

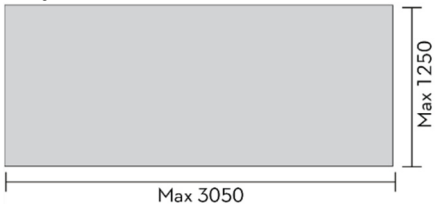
Patina Original is a through-coloured board. Variations in the color of the board are visible and vary depending on the orientation of the sheet, the viewing angle and level of light and humidity. Measuring the board color's small variations in the lightness are accepted. Patina Original facade boards are high quality fiber cement products used as part of a ventilated facade solution in all types of construction.

Dimensions (nominal)		Small Module	Standard size
Thickness	mm	8	6 8
Width	mm	292 592	1192 1250
Length	mm	1192 2392 2992	2500 3050

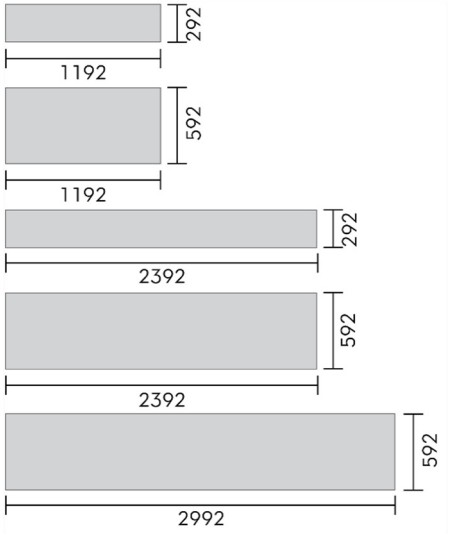
Standard size



Project size



Small Modules



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Patina Original

Dimension tolerance (EN 12467, Level 1)		Patina 6 mm	Patina 8 mm
Thickness (up to 20 mm)	mm	± 0.6	± 0.8
Width (a ≤ 1000 mm)	mm	± 3.0	± 3.0
Width/Length (1000 mm < a ≤ 1600 mm)	mm	± 0,3% a	± 0,3% a
Length (1600 mm < Length)	mm	± 5.0	± 5.0

* a is the nominal width or length

Physical properties			
Density, dry minimum (EN12467)	kg/m³	≥ 1400	≥ 1475
Density, dry avarage (EN12467)	kg/m³	1450	1550
Weight (incl. 10% moisture)*	kg/m²	9.3	12.4
Moisture content (on dispatch ex works)	%	5-10	5-10

* nominal value may vary depending on the conditions

Mechanical properties (EN 12467)			
Flexural modulus			
E-module along grain, ambient	GPa	12	12
E-module across grain, ambient	GPa	13	14
E-module along grain, wet	GPa	9	9
E-module across grain, wet	GPa	11	11

Bending strength (EN 12467)			
Along grain, ambient	MPa	22	22
Across grain, ambient	MPa	35	35
Along grain, wet	MPa	17	18
Across grain, wet	MPa	26	27

Modified Charpy Pendulum Impact test EN ISO 148-1			
Along grain, dry	kJ/m²	2.2	2.7
Across grain, dry	kJ/m²	2.7	3.6

Thermal properties			
Thermal conductivity (ISO 8301, EN 12667), λ_{10}	W/mK	0.32	0.37
Coefficient of thermal expansion	mm/m °C	0.01	0.01
Frost resistance (average along/across)	R_L	≥ 0.75	≥ 0.75

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American Fiber Cement Corporation

Patina Original

Hygrothermal properties			
Water absorption (24 hrs 105°C, 24 hrs in water)	%	28	28
Moisture movement (30/90 % RH, EN 12467)	%	0.08	0.08

Water vapour transmission properties (EN 12572-C)			
Water vapour transmission resistance (Z-value)	GPa m² s/kg	2.4	2.5
Water Vapour transmission resistance (Z-value)	s/m	17700	18500
Water vapour diffusion equivalent air layer thickness, Sd	m	0.5	0.5
Water vapour resistivity	MN s/gm	366	327
Water vapour resistance factor, μ		58	58
Water vapour resistance	MN s/g	2.4	2.5
Water vapour transmission	USPerm	7.2	7.0

Color variation measured on the production line			
CIELAB colour model	ΔL	-2.5/+2.5	-2.5/+2.5

Fire Performance			
Reaction to fire (EN 13501-1)	Rating	NA	A2-s1, d0
Behavior of materials at 750°C (ASTM E136)	Rating	NA	Passed
External thermal insulation for walls (BS 8414-2-2015+A1-2017)*	Rating	NA	Passed

* Tested with special requirements. Contact Product Compliance for further information.

Other properties		
Category, class (EN12467)	NT A4 I	NT A4 I
M1-Classification, VOC emission of building materials	Pass	Pass

Impact resistance test (ETAG 034, ISO 7892), 8 mm					
	Max.	Category IV	Category III	Category II	Category I
Hard body	1 Joule	Passed			
	3 Joules		Passed	Passed	Passed
	10 Joules			Passed	Passed
Soft body	10 Joules	Passed	Passed		
	60 Joules			Passed	Passed
	300 Joules			Not passed	
	400 Joules				Not passed
Evaluation		Passed	Passed	Not passed	Not passed

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Patina Original

Ballwurfsicherheit (DIN 18032-3) - (Impact resistance), Wall and Ceiling, 12 mm

	Angle of Impact	Number of shots	Subconstruction	Distance, subconstruction	Test result
Handball	90	30	Aluminium	315 mm	Passed as "Ballwurfsicher"
	45	12			
	45	12			
Hockeyball	90	4	Aluminium	315 mm	Passed as "Ballwurfsicher"
	45	4			
	45	4			

American Fiber Cement Corporation

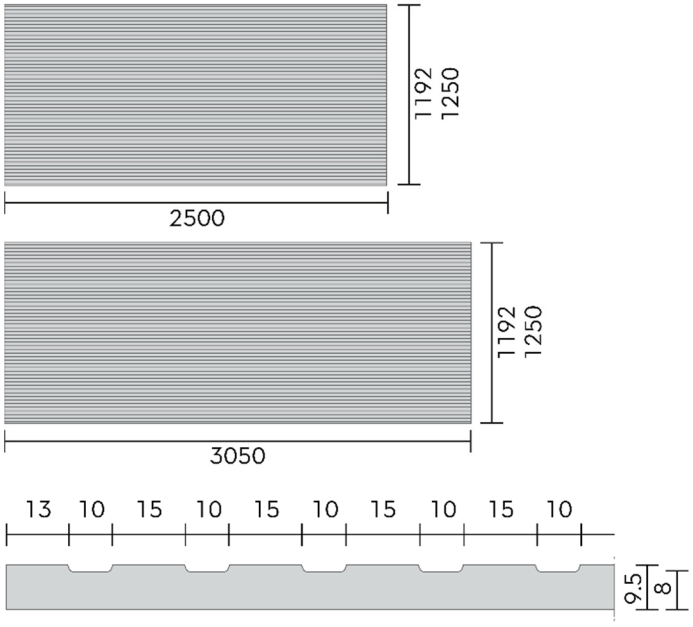
Patina Inline

Datasheet - Facade Boards

Patina Inline introduces a 3D-effect to your building from the milled linear grooves in the board. The featured lines in combination with the natural light and viewing angle gives a lively facade changing its appearance throughout the day. As the seasons change and the years pass, the natural aging of the fiber cement leaves subtle traces on the surface, and the facade will gradually acquire a distinctive patina. As if formed by nature, Patina Inline adds a natural stylish finish to your facade. Patina Inline will patinate over time - enriching its natural appearance.

Dimension (nominal)	
Thickness	9,5 / 8
Width	1192 1250
Length	2500 3050

Standard size



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Patina Inline

Dimension tolerance (EN 12467, Level 1)		
Thickness	mm	+/- 10%
Width (1000mm < a < 1600mm)	mm	± 0,3% a
Length (1600mm < Length)	mm	± 5.0

Physical properties		
Density, dry minimum (EN 12467)	kg/m^3	≥ 1300
Density, dry avarage (EN 12467)	kg/m^3	1430
Weight (incl. 10% moisture)*	kg/m^2	14.2

* Nominal value may vary depending on the conditions

Mechanical properties (EN 12467)		
Flexural modulus		
E-module along grain, ambient	GPa	17
E-module across grain, ambient	GPa	17
E-module along grain, wet	GPa	13
E-module across grain, wet	GPa	14

Bending strength (EN 12467)		
Along grain, ambient	MPa	26
Across grain, ambient	MPa	37
Along grain, wet	MPa	21
Across grain, wet	MPa	32

Impact strength (Pendulum test)		
Along grain, dry	kJ/m^2	2.9
Across grain, dry	kJ/m^2	2.8

Thermal properties		
Thermal conductivity (ISO 8301, EN 12667), λ_{10}	W/mK	0,4
Coefficient of thermal expansion	mm/m °C	0.01
Frost resistance (average along/across)	R_L	≥ 0.75

Hygrothermal properties		
Moisture movement (30/90 % RH, EN 12467)	%	0,07
Water impermeability (EN 12467)	Visual	No drop

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American Fiber Cement Corporation

Patina Inline

Color variation measured on the production line		
CIELAB colour model	ΔL	-2.5/+2.5
Fire Performance		
Reaction to fire (EN 13501-1)	Rating	A2-s1, d0
Other properties		
Category, class (EN 12467)		NT A4 1
M1-Classification, VOC emission of building materials		Pass

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American Fiber Cement Corporation

Patina Rough

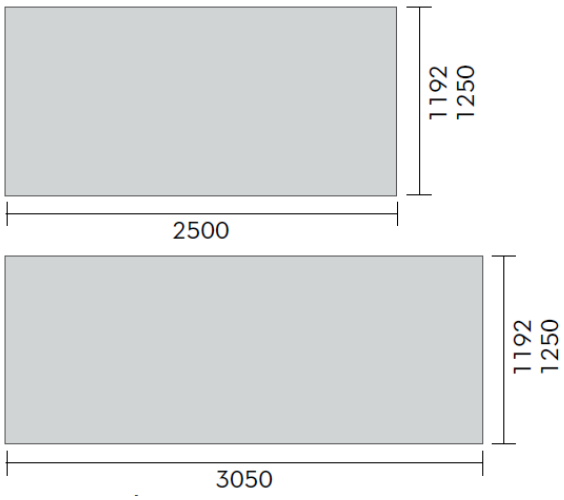
Facade Boards

Patina Rough has a velvety, structured surface – as if formed over time by nature. This appearance will add a mineral, natural and subtly eroded surface finish to your facade. The board texture will give your facade a dynamically changing appearance throughout the day depending on external light and viewing angle. Natural imperfections like dots and spots can be visible but from 3-5 meters distance the imperfections will appear homogenous.

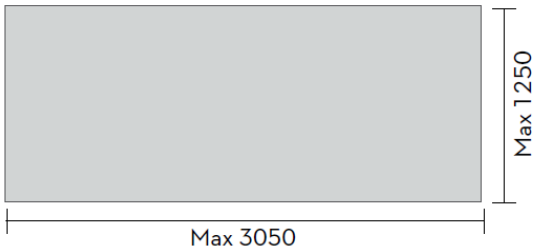
Patina Rough is a through-colored board. Variations in the color of the board are visible – color variations are measured according to a simplified CIELAB color model where only the color lightness is checked. The accepted variation is ΔL = ±2,5 based on five measurements. And as the seasons change and the years pass, the natural aging of the fiber cement leaves subtle traces on the surface, and the facade will gradually acquire a distinctive patina. Patina Rough facade boards are high quality fiber cement products used as part of a ventilated facade solution in all types of construction.

Dimension (nominal)		
Thickness	mm	8
Width	mm	1192 1250
Length	mm	2500 3050

Standard sizes



Project sales



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Patina Rough

Dimension tolerance (EN 12467, Level 1)		
Thickness (up to 20 mm)	mm	± 0.8
Width (a ≤ 1000 mm)	mm	± 3.0
Width/Length (1000 mm < a < 1600 mm)	mm	± 0,3% a
Length (1600 mm < Length)	mm	± 5.0

* a is the nominal width or length

Physical properties		
Density, dry minimum (EN12467)	Kg/m³	≥ 1300
Density, dry avarage (EN12467)	Kg/m³	1460
Weight (incl. 10% moisture)*	Kg/m²	12.4
Moisture content (on dispatch ex works)	%	5-10

* Nominal value may vary depending on the conditions

Mechnical properties (EN 12467)		
Flexural modulus		
E-module along grain, ambient	GPa	13
E-module across grain, ambient	GPa	15
E-module along grain, wet	GPa	11
E-module across grain, wet	GPa	13

Bending strength (EN 12467)		
Along grain, ambient	MPa	25
Across grain, ambient	MPa	36
Along grain, wet	MPa	17
Across grain, wet	MPa	26

Impact strength - Pendulum test		
Along grain, dry	kJ/m²	2.8
Across grain, dry	kJ/m²	2.3

Thermal properties		
Thermal conductivity (ISO 8301, EN 12667), λ_{10}	W/mK	0.4
Coefficient of thermal expansion	mm/m °C	0.01
Frost resistance (average along/across)	R_L	≥ 0.75

Hygrothermal properties		
Water absorption (24 hrs 105°C, 24 hrs in water)	%	25
Moistore movement (30/90 % RH, EN 12467)	%	0.07

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Patina Rough

Water vapour transmission properties (EN 12572-C)		
Water vapour transmission resistance (Z-value)	GPa m² s/kg	2.5
Water Vapour transmission resistance (Z-value)	s/m	18500
Water vapour diffusion equivalent air layer thickness, Sd	m	0.5
Water vapour resistivity	MN s/(gm)	327
Water vapour resistance factor, μ		58
Water vapour resistance	MN s/g	2.5
Water vapour transmission	USPerm	7.0

Fire Performance		
Reaction to fire (EN 13501-1)	Rating	A2-s1, d0

Other properties	
Category, class (EN12467)	NT A4 I
M1-Classification, VOC emission of building materials	Pass

Impact resistance test (ETAG 034, ISO 7892), 8 mm					
	Max.	Category IV	Category III	Category II	Category I
Hard body	1 Joule	Passed			
	3 Joules		Passed	Passed	Passed
	10 Joules			Passed	Passed
Soft body	10 Joules	Passed	Passed		
	60 Joules			Passed	Passed
	300 Joules			Not passed	
	400 Joules				Not passed
Evaluation		Passed	Passed	Not passed	Not passed

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SAFETY DATA SHEET

Section 1. Identification

GHS product identifier: **AFCC Fiber Cement Panels**
Patina

Other means Of identification: Fiber Cement Panels

Product type:

SDS No.: AFC-104

Relevant identified uses of the substance or mixture and uses advised against:

Identified uses: Building Facade

Uses advised against: None known

Supplier:

American Fiber Cement Corporation.
6901 S. Pierce St., Suite 180
Littleton, CO 80128

Technical Support: 800-688-8677
www.americanfibercement.com

Emergency telephone Number: CHEMTREC - 800-424-9300 or 703-741-5970 (Outside USA and Canada – collect calls accepted). 24 Hour service.

Section 2. Hazards Identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Classification of the substance or mixture:
CARCINOGENICITY/Inhalation - Category 1A
SPECIFIC TARGET ORGAN TOXICITY (STOT) REPEATED EXPOSURE – Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] – Category 3
SKIN IRRITATION – Category 2
SKIN SENSITIZATION – Category 1
EYE IRRITATION – Category 2A
Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 0%

GHS label elements
Hazard pictograms:

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Signal word: Danger

Hazard statements: **If dust is present:**
May cause cancer.
May cause damage to lungs
May cause respiratory irritation.
Causes serious eye irritation
Causes skin irritation
May cause allergic skin reaction.

Precautionary statements

Prevention: **If dust is present:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Use only outdoors or in a well-ventilated area.
Do not breathe dust.
Wear eye protection
Wear protective gloves, protective clothing, eye protection, face protection
Do not eat, drink, or smoke when using this product.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.

Response: If inhaled: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation occurs: Get medical attention.
If on skin: Wash with plenty of water
If skin irritation or rash occurs: Get medical attention.
Take off contaminated clothing and wash before reuse.
If exposed, or concerned: Get medical advice/attention if you feel unwell.

Storage: Store locked up.
Store in a well-ventilated place. Keep container tightly closed.

Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplementary Information Use precautions if exposure exceeds the established OSHA limits.
This material does not present a hazard unless dust is generated from cutting, grinding, or other operations.

Hazards not otherwise Classified None known

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Section 3. Composition/Information on Ingredients

Substance or mixture: Mixture

Other means of identification: Fiber Cement Panels

CAS number/other identifiers
CAS number : Mixture
Product code : Fiber Cement Panels

Ingredient name	CAS number	%
Portland Cement	65997-15-1	40 – 85
Limestone	1317-65-3	0 – 15
Crystalline Silica	14808-60-7	20 – 30
Calcium Silicates	13983-17-0	0 – 15
Sodium Silicate (Water Glass)	1344-09-8	0 – 2

Any concentration shown as a range it to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of necessary first aid measures

Inhalation: Remove victim to fresh air.
Drink plenty of water and blow nose to evacuate remaining dust.
If coughing or irritation persist seek medical attention.

Eye contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.
Check for and remove any contact lenses.
Rinse for at least 15 minutes.
If irritation persists seek medical attention.

Skin contact: Gently wash with plenty of soap and water.
If irritation persists seek medical attention.

Ingestion Emergency procedures not normally required.
If prolonged irritation to gastrointestinal tract or mouth persist seek medical attention.

Most important symptoms/effects, acute and delayed
Potential acute health effects

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Inhalation : Respirable airborne particles may cause temporary irritation to the lungs and upper respiratory system.
Skin contact: Prolonged exposure may cause dryness or irritation to the skin.
Eye contact: Will cause mechanical irritation to the eyes. May cause moderate to severe eye irritation and dryness.
Ingestion: May cause irritation to gastrointestinal tract or mouth.

Over-exposure signs/symptoms

Inhalation: Adverse symptoms may include the following:
Irritation
Eye contact: Adverse symptoms may include the following:
Irritation
Dryness
Skin contact: Adverse symptoms may include the following:
Irritation
Dryness
Ingestion: Adverse symptoms may include the following:
Irritation
Stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Medical conditions which may be aggravated by exposure include dry skin, dermatitis, and pre-existing lung conditions such as bronchitis, emphysema, and asthma.
Specific treatments: No specific treatment.

Protection of first-aiders:. No action shall be taken involving any personal risk or without suitable training
Wear a suitable NIOSH-approved dust mask if airborne dust is present.
Wash contaminated clothing before re-use.

Section 5. Firefighting Measures

Specific hazards arising from the chemical: None known other than those represented elsewhere in this SDS.

Hazardous thermal decomposition products Decomposition products may include the following materials:
- Crystalline Silica

Special protective actions for firefighters Material will not burn.
Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.
No action shall be taken involving any personal risk or without suitable training.
No special firefighting equipment is necessary.

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Special protective equipment for fire-fighters Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency Personnel

No action shall be taken involving any personal risk or without suitable training.
Evacuate surrounding areas.
Keep unnecessary and unprotected personnel from entering.
Provide adequate ventilation.
Wear appropriate respirator when ventilation is inadequate.
Put on appropriate personal protective equipment.

For emergency responders

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

This material does not pose a significant threat to the environment.
Avoid dispersion of material and runoff and contact with waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, or air)

Methods and materials for containment and cleaning up

Small spill

Stop source of spill .
Avoid creating airborne dust
Use dust suppressant as necessary
Place material into closed waste disposal container.
Any sweeper or vacuum should be equipped with High Efficiency Particulate (HEPA) filter.
Dispose of using a licensed waste disposal contractor.

Large spill

Stop source of spill.
Avoid creating airborne dust
Use dust suppressant as necessary
Place material into closed waste disposal container.

Any sweeper or vacuum should be equipped with High Efficiency Particulate (HEPA) filter.
Dispose of using a licensed waste disposal contractor.

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and Storage

Protective measures for safe handling

Protective Measures: Minimize dust generation
Use appropriate respiratory protection if dust is present above the established exposure limits.
If dusty conditions exist (such as during cutting, sanding, or milling) use engineering controls and/or respiratory protection (See Section 8).

Advice on general occupational hygiene Eating and smoking should be prohibited in areas where this material is handled, stored and processed.
Workers should wash hands and face before eating and smoking.
Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities Store in accordance with local regulations.
Store in original container in a dry area, away from incompatible materials (see Section 10) and food and drink.

Section 8. Exposure Controls/Personal Protection

Control parameters

Occupational exposure limits:

US Occupational Safety and Health Administration Permissible Exposure Limit (OSHA PEL):

Irritant (Nuisance) Dust:	5 mg/m^3
Crystalline Silica	
Permissible Exposure Limit	50 µg/m^3
Action Level	25 µg/m^3

(See 29 CFR 1910.1053, effective June 23, 2018. Regulation contains additional requirements, including written exposure plan, medical exams, training, and recordkeeping.)

American Conference of Governmental and Industrial Hygienists Threshold Limit Value (ACGIH TLV®):

Irritant (Nuisance) Dust:	3 mg/m^3

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Crystalline Silica	0.025 mg/m^3

Note: TLV® and PEL values are for eight hour exposures, unless noted.

Appropriate Engineering controls: If user operations generate dust, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
Power equipment should be fitted with a properly designed dust collection device.

Environmental Exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.
In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.
Appropriate techniques should be used to remove potentially contaminated clothing.
Wash contaminated clothing before reusing.
Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory Protection: Wear a NIOSH-approved dust mask to limit exposure to product dust.
Higher dust levels may require use of a half or full mask respirator with dust filters.
Use local exhaust if necessary to lower dust levels.
Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Eye/Face Protection: Wear safety glasses with side shields or goggles complying with an approved standard to avoid exposure to dust.

Hand Protection: Protective gloves should be worn when handling and to avoid abrasion or drying of skin.

Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved.

Other Skin Protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved.

Section 9. Physical and Chemical Properties

Appearance
Physical State Solid Blocks of various size

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Color	Various
Odor	None
Odor Threshold	Not Applicable
pH	Not Applicable
Melting Point	N/A
Boiling Point	N/A
Flash Point	None
Burning Time	Not applicable
Specific Gravity	1.7
Burning Rate	Not applicable
Evaporation Rate	0 (butyl acetate = 1)
Flammability (solid, gas)	Not applicable
Lower Explosive (flammable) Limit	Not available
Upper Explosive (flammable) Limit	Not available
Vapor Pressure	Not applicable
Vapor Density	Not applicable
Relative Density	Not available
Solubility	Insoluble
Solubility in Water	Insoluble
Partition coefficient: n-octanol/water	Not available
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
SADT	Not available
Viscosity	Not available

Section 10. Stability and Reactivity

Reactivity: This product is normally not reactive.

Chemical stability: The product is stable.

Possibility of Hazardous Reactions: Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerization will not occur.

Conditions to Avoid: Avoid strong acids and ammonium salts. Contact with strong oxidizing agents (such as fluorine, chlorine trifluroride) may present a fire hazard.

Incompatible Materials: Reactive or incompatible with the following strong oxidizers such as: Hydrofluoric acid, fluorine, chlorine trifluoride, oxygen difluoride

Hazardous Decomposition Products Crystalline silica will dissolve in hydrofluoric acid and produce silicon tetrafluoride, a corrosive gas.

Section 11. Toxicological Information

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
None Known	--	--	--	--
	--	--	--	--

Irritation/Corrosion: Not available

Sensitization Not available

Mutagenicity Not available

Carcinogenicity: Not available

Reproductive toxicity Not available

Teratogenicity Not available

Specific target organ toxicity (single exposure) Not available

Specific target organ toxicity (repeated exposure) This material contains Crystalline Silica, which is known to cause silicosis. Silicosis is a rapidly progressive, non-cancerous lung disease that is often fatal.

Aspiration hazard Not available

Information on the likely routes of exposure Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Inhalation : Respirable airborne particles may cause temporary irritation to the lungs and upper respiratory system.

Skin contact: Prolonged exposure may cause dryness or irritation to the skin.

Eye contact: Will cause mechanical irritation to the eyes. May cause moderate to severe eye irritation and dryness.

Ingestion: May cause irritation to gastrointestinal tract or mouth.

Symptoms related to the physical, chemical and toxicological characteristics

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Inhalation: Adverse symptoms may include the following:
Irritation

Eye contact: Adverse symptoms may include the following:
Irritation
Dryness

Skin contact: Adverse symptoms may include the following:
Irritation
Dryness

Ingestion: Adverse symptoms may include the following:
Irritation
Stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects: Not available.

Potential delayed effects : Not available.

Potential chronic health effects: Not available

General: No other known significant effects or critical hazards.

Carcinogenicity: Crystalline silica – long term overexposure may cause permanent and irreversible lung damage, including silicosis, and increase the risk of lung cancer, kidney, and liver damage. Silicosis is a rapidly progressive, non-cancerous lung disease that is often fatal.

IARC (International Agency for Research on Cancer)	014808-60-7 Silica dust, crystalline, in the form of quartz or cristobalite - Group 1 (Sup 7, 68,100C, 2012)
National Toxicology Program (NTP) Report on Carcinogens	Silica, Crystalline (Respirable Size) - Known To Be Human Carcinogen
OSHA:	Crystalline Silica classified as a Category 1A Carcinogen

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates
Not available.

Section 12. Ecological Information

Toxicity Not available.

Persistence and Degradability: Not available.

Bioaccumulative Potential: Not available.

Mobility in soil

Soil/water partition coefficient (K_{OC}): Not available

Other adverse effects: Most of the ingredients in this product are naturally occurring minerals, and, unless contaminated in service, are not hazardous to the environment.

Section 13. Disposal Considerations

Disposal methods: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
Dispose of surplus and non-recyclable products via a licensed waste disposal contractor.
Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.
Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
This material and its container must be disposed of in a safe way.
Care should be taken when handling emptied containers that have not been cleaned or rinsed out.
Empty containers or liners may retain some product residues.
Avoid dispersal of spilled material and runoff and contact with waterways, drains and sewers.

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Section 14. Transport Information

	DOT Classification	TDG Classification	IMDG	IATA
UN Number	Not Regulated	Not Regulated	Not Regulated	Not Regulated

Special precautions for user:

Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage

Section 15. Regulatory Information

U.S. Federal regulations

TSCA 8(a) CDR Exempt/Partial exemption: Not applicable
United States inventory (TSCA 8b): This material is listed.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs): Not listed

Clean Air Act Section 602 Class I Substances: Not listed

Clean Air Act Section 602 Class II Substances: Not listed

DEA List I Chemicals (Precursor Chemicals): Not listed

DEA List II Chemicals (Essential Chemicals): Not listed

SARA 302/304
Composition/information on ingredients: No products were found.

SARA 304 RQ: Not applicable.

SARA 311/312 Classification :

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

Composition/information on ingredients:

Name	Immediate (acute) Health Hazard	Delayed (chronic) Health Hazard	Fire Hazard	Reactivity Hazard	Sudden Release of Pressure
Portland Cement	Yes	Yes	No	No	No
Limestone	Yes	Yes	No	No	No
Crystalline Silica	Yes	Yes	No	No	No
Calcium Silicates	Yes	No	No	No	No
Sodium Silicate	Yes	No	No	No	No

Section 313 listed: No
Listed material/compound: Not Applicable

State regulations

New York: Crystalline Silica
New Jersey: Crystalline Silica
Pennsylvania: Crystalline Silica
Massachusetts: Crystalline Silica
Rhode Island: Crystalline Silica
California Prop. 65: Crystalline Silica

International Lists

DSL (Canada) All ingredients are listed, or exempt from inclusion, on the Canadian Domestic Substances List (DSL).

WHMIS 2015 (Canada): **See Section 2.**

Australia inventory (AICS): Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals: Not listed
Chemical Weapons Convention List Schedule II Chemicals: Not listed
Chemical Weapons Convention List Schedule III Chemicals: Not listed

DSCL (Europe): R48/20: Harmful – Danger of serious damage to health by prolonged exposure through inhalation.
R36: Irritating to the eyes
R39: Danger of serious irreversible side effects.

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

R45: May cause cancer.

Section 16. Other Information

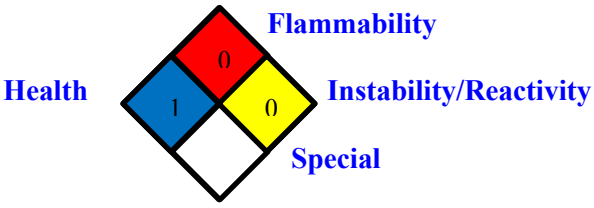
Hazardous Material Information System (U.S.A.)

Health	2
Flammability	0
Physical Hazards	0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

DISCLAIMER – American Fiber Cement Corp., (AFCC) believes the information contained in this Safety Data Sheet (SDS) to be accurate and reliable as of the date of issue, and is provided in good faith as a service to our customers and to comply with applicable laws. This document is intended as a guide for the safe handling, storage, and use of this material under normal conditions of use. No representation, warranty, or

NOTE: These panels are considered to be non-hazardous unless dust is generated by cutting, drilling, breaking, or other means.

guarantee, either express or implied, is intended or given. AFCC does not accept any liability for any loss, injury, or damage resulting from the use of this product.

History

Date of issue/Date of revision:	May 1, 2020
Date of previous issue:	None
Changes :	Not Applicable
Prepared by:	T Square Associates, Inc. **www.tsquare.us**

afc cladding

Architectural Panels

SUSTAINABLE SOLUTIONS

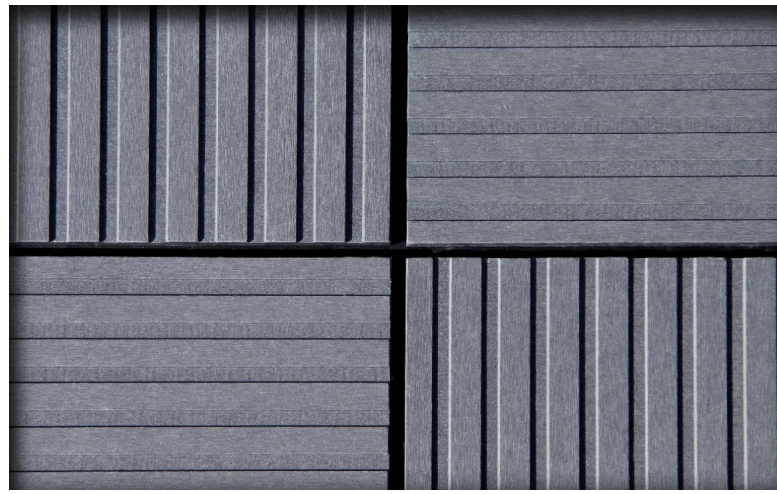
Supplemental Installation Guidelines[1]

Patina Inline

For Steel, Aluminum and Wood Profiles

General Notes

Panel Orientation:
Patina-Inline can be installed in the vertical or horizontal orientation.



Visible Fastener Placement:
Fasteners (screws and rivets) must be placed on the 9.5 mm-thick non-grooved portion of the board.
See page one of the Patina Inline datasheet for thickness specifications.
For corner hole placement, figure C in AFCC's Standard guidelines must be used.

American Fiber Cement Corporation

AIA Continuing Education Provider

1 These guidelines represent a **supplemental illustration** for proper installation of ***Patina Inline*** architectural panels in a ventilated rain screen application, and are supplemental for steel, aluminum and wood applications.

Installation on Steel and Aluminum

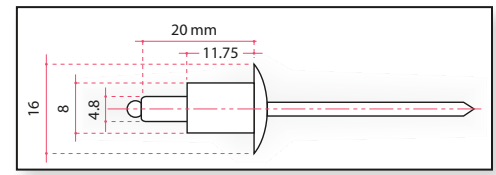
For installation of Patina Inline onto Steel or Aluminum profiles, AFCC's Standard Installation Guidelines must be used.

Standard Installation Guidelines – Steel Profiles with Rivets

Standard Installation Guidelines – Aluminum Profiles with Rivets

The rivet used for Patina Inline is slightly different due to the panel thickness being 9.5 mm versus the standard 8mm. The collar of the rivet used to attach this panel is 11.75 mm long. All other dimensions are the same and the installation of the rivets is also the same. See the figure at right.

Astro Rivet® with fixed cylinder



Patina Inline Rivet Dimensions

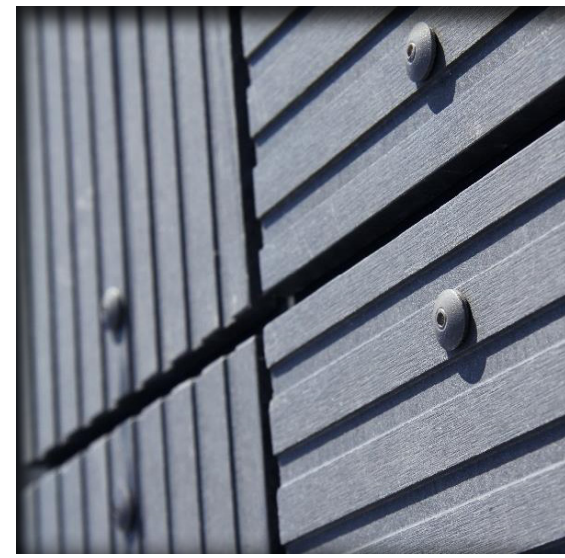
Installation on Wood

For installation of Patina Inline onto Wood profiles, AFCC's Standard Installation Guidelines must be used. The screw shown in these guidelines must also be used.

Standard Installation Guidelines – Wood Profiles with Screws

Dynamic Bond (Hidden Attachment)

For installation of Patina Inline onto Steel or Aluminum profiles, AFCC's Standard Adhesive Bonding Installation Guidelines in conjunction with the Steel, Aluminum, or Wood Standard Installation Guidelines.



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For the nearest authorized fabricator, call 303-972-5107.

afc cladding

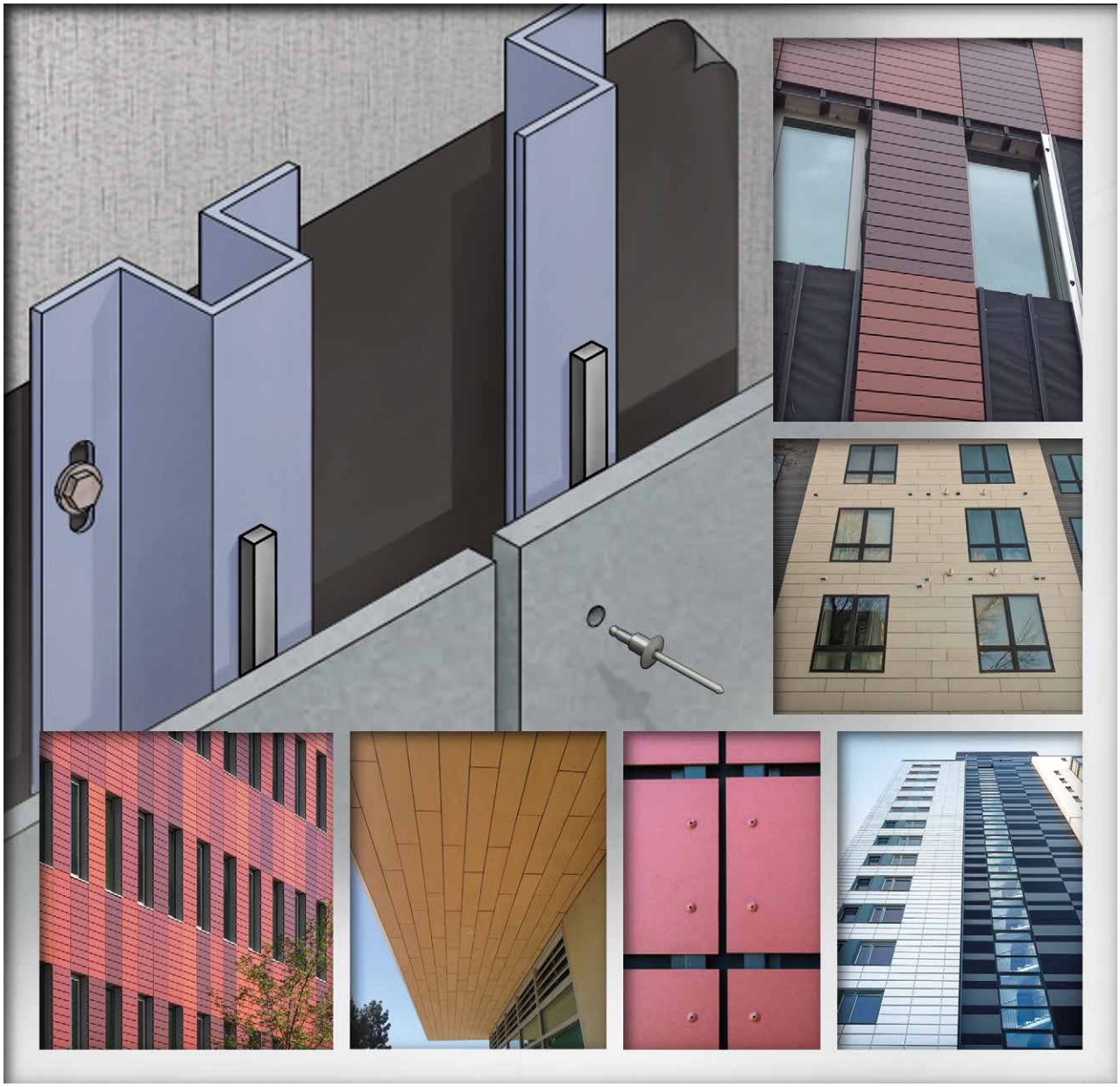
Architectural Panels

SUSTAINABLE SOLUTIONS

Standard Installation Guidelines[1]

Steel Profiles with Rivets

Rainscreen Application — 8 mm Panels



American Fiber Cement Corporation

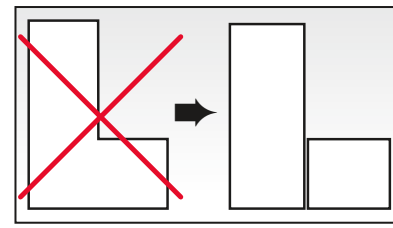
1 These guidelines represent an **abbreviated illustration** for proper installation of Cover, Patina, Solid, Transparent and Deco architectural panels in a ventilated rain screen application. Additional guidelines for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment can be found at www.americanfibercement.com.

AIA Continuing Education Provider

Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.

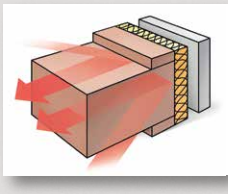
Construction Practices

1. Air space at top and bottom of building or wall termination to be 25 mm (1") to facilitate airflow from out behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow needs to be continuous from bottom to top so there is air movement behind each panel. See item 4 under Building/Structure on page 4 for proper profile depth based on wall height. 1" is required for walls between 15ft and 60ft. Vertical air flow behind the fiber cement panels is a critical necessity in rainscreen constructions.
2. For areas that receive moderate to high snowfall, panels must terminate 6 to 12 inches above grade line based on expected snow build-up.
3. A metal drip edge may be used at window heads, door heads and the panel base, but it must not restrict airflow (¾"; 1" at base openings).
4. Install panels from top of building to bottom.
5. For straight walls, start panel installation in center and work outward.
6. For walls with inside corners, start installation there and work across wall.
7. Jobsite storage: See AFCC Fabrication, Maintenance, and Storage Guidelines
   - Keep material laying flat, under cover, dry and protected with a waterproof tarp.
   - Transport material on edge.
   - Using a microfiber cloth, brush off any material dust generated by drilling or cutting prior to installation.
   - Do not use the shipping crates or pallets containing the fiber cement panels as a work surface. Keep panels dust-free.
8. For field cuts and drilling, use carbide or diamond blades/bits and slower turning/feed rates. AFCC offers saw blades and drill bits.
9. All Cover, Solid and Transparent field-cut edges and field-drilled holes must be sealed with Edge Sealer and Deco edges must be painted. See AFCC's website for application instructions.



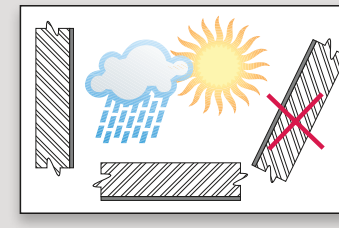
L or C-Shaped panels are not allowed.

Rain Screen Cladding

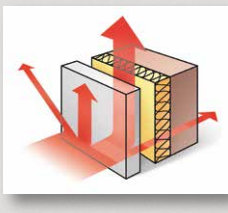


Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.

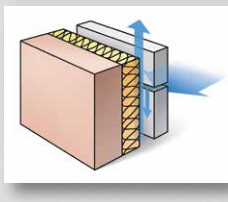


Panels exposed to weather *(rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.*



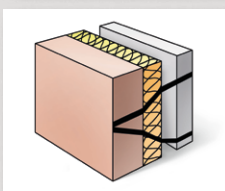
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the air space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



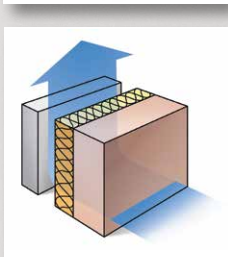
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load-bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter, in both hot and cold climates.



Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapor pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

Profile Attachment — illustrated

For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required. (See *FIG.* ***D-1B***)

Building wrap *per AFCC. Weather and UV resistant. Check local codes for proper placement.*

FIG. ***D-1A*** *— Vertical profiles are typically "Z" channels or "Hat" channels.*

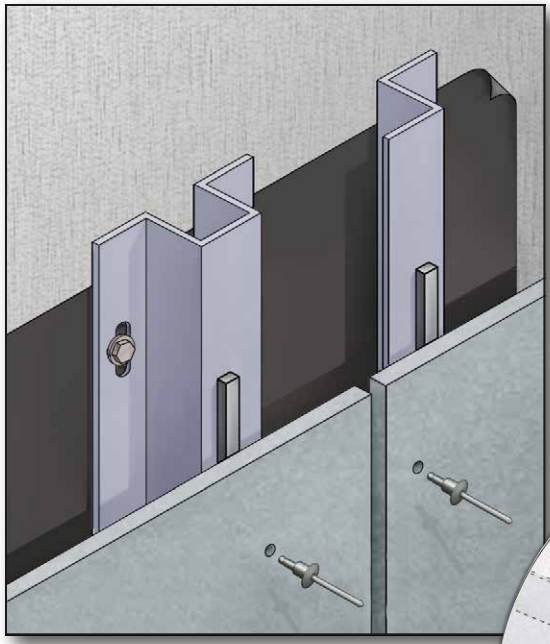
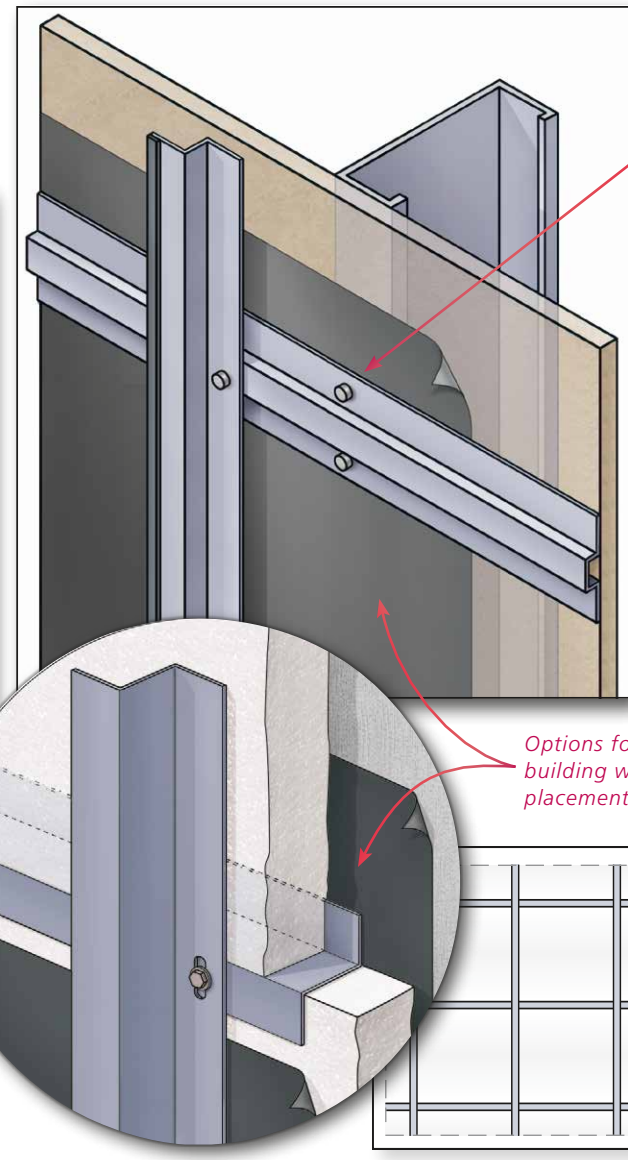


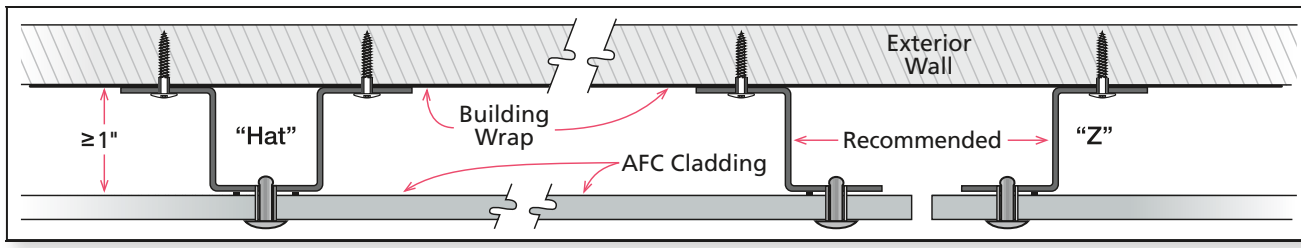
FIG. ***D-1B***



Hat channel can be attached with the crown facing in or out, depending on fastener spacing and the visibility of the profile through the joint.

FIG. ***D-2*** *— Exterior insulation, when vertical profiles are attached to horizontal profiles affixed to wall.*

FIG. J — "Hat" or "Z" channels and vertical joint. (G90 and Powder Coated "Z" channels offered by AFCC.)



Can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (¾" plywood sheathing is recommended).

FIG. ***H*** *— Astro Rivet® with fixed cylinder*

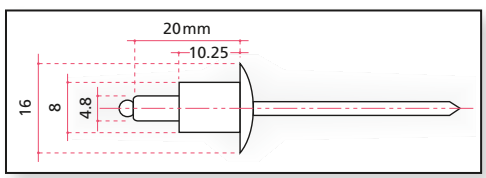
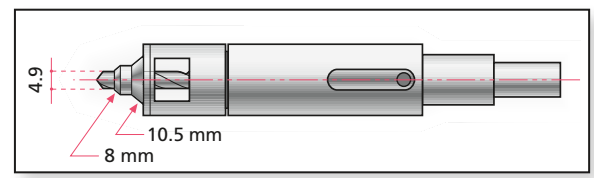


FIG. ***I*** *— Centralizing drill bit*



For centering pilot hole in profile for ***Fixed Points*** *and* ***Gliding Points****.*

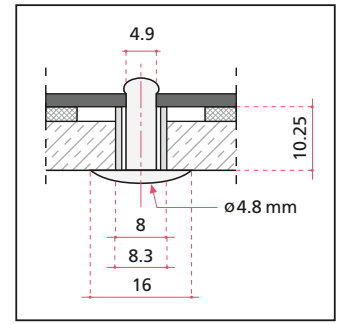
Building/Structure

1. **Architect/Engineer/Contractor to design and build structurally sound, water-tight exterior wall.**
   - Substructure Horizontal Straightness Tolerance: ±3.0 mm per 2 m (± 0.0625" per 42")
   - Substructure Vertical Straightness Tolerance: ±0.5 mm per 600mm (± 0.0625" per 75")

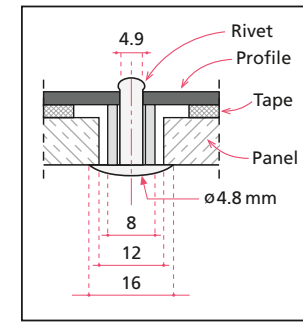
   If the wall is not straight, the profiles should be shimmed to create a flat plane for the panels. Shims should not be used between the profile and the panel.
2. **Attach profiles to exterior walls. *Structural engineer to determine fastening/affixing specification***, i.e. quantity and type of attachment and fasteners, based upon exterior wall construction. Attachment must support 3.2 lbs/ft² (8 mm panel) dead load, plus design wind loads. Fasteners in profile must accommodate thermal expansion/contraction of metal and not interfere with panel application. Shortening the length of the profiles can minimize thermal expansion and contraction. It is also recommended to oversize holes at or near the tops and bottoms of the profiles while having fixed points near the center. This reduces stress in the panels.
3. Profiles for affixing panels to be a minimum of 16 gauge steel or greater, determined by building orientation/location and load factors. Depending on location and climate, a minimum of G90 or greater hot-dipped galvanized coating is recommended. Galvalume® and powder coat finishes may also be used.
4. Vertical profiles for affixing panels must be the following depth to allow for optimal air flow and water drainage:
   - 19 mm (¾") for panel runs 0–15 ft
   - 25 mm (1") for panel runs 15–60 ft
   - 32 mm (1¼") for panel runs 60–100 ft
   - 38 mm (1½") for panel runs 100–150 ft

   For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.
5. Maximum length of steel profile ≤10 feet. Two profiles ("Z" recommended, or "Hat" with ≥ 1¼" legs) are recommended in place of one wide profile at vertical joints. The sides of the panel can be cantilevered 2"–6" over edge profile so vertical joint is open. (See *FIG. C*)
6. Profiles to be straight, plumb, level and aligned correctly on the building. **For installations without exterior insulation, the metal profiles are typically hat-channels or Z-channels affixed directly to the exterior wall, provided the sheathing has adequate screw-holding strength.** (See *FIG. J*)
7. **It is recommended to take field measurements before panels are cut or drilled.** Field measurements verify print dimensions to ensure proper fit.
8. Spacing between vertical profiles to be ≥ 20 mm (¾"). A joint between the vertical profiles must ***always*** coincide with a joint between the panels (*FIG. A*). The joint is preferably continued at the same horizontal height among adjacent profiles. (Reduces stress in panels). If a two layer system is used, the same concept must be applied for the horizontal profiles. 20mm spacing, and coincide a joint between panels with a joint between horizontal profiles.
9. For structures with ***exterior insulation***, follow the insulation manufacturer's installation instructions. Horizontal metal profiles (the same depth as the exterior insulation) can be attached to the exterior wall. Vertical metal profiles are then attached to the horizontal profiles (See *FIG. D-2*).

FIG. E — Fixed and Gliding Points



Fixed Point *— cylinder & rivet*



Gliding Point *— cylinder & rivet*

FIG. A

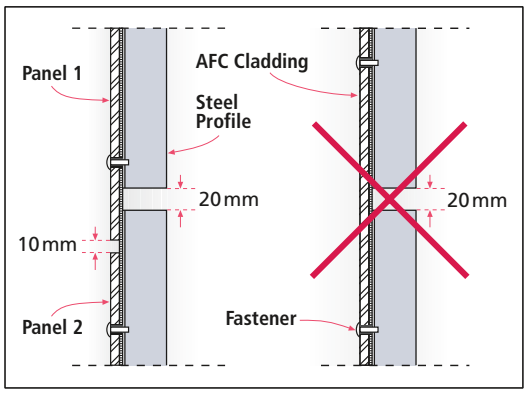


FIG. B —

Standard profile.

*Affix adhesive foam tape to either **or** both sides of rivet. (Foam tape will compress to correct depth when panel is fastened.)*

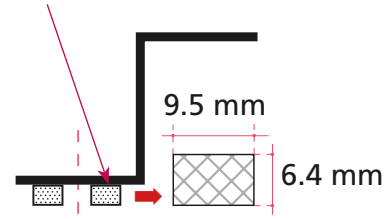
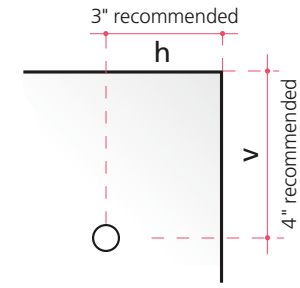


FIG. C



	in.	(mm)
h:	2–6	(50–150)
v:	4–6	(100–150)

Prepare Profile

1. Typical vertical and horizontal joints are left open and have a black background (use a black weather and UV resistant building wrap). Metal profiles visible at joint openings (vertical and horizontal) can be covered with a black UV weather resistant tape or UV weather resistant coating. Other reveal colors are possible if desired.
2. Affix adhesive foam tape (supplied by AFCC) to the profile's full length — 1 strip on either side of the rivet location or 1 strip on each side of the rivet location, no more than ½" from the rivet location. At vertical joints, place 1 strip on the panels center side of the rivet location. (See *FIG. **B***)
3. See page 6 regarding closing horizontal and vertical joints.

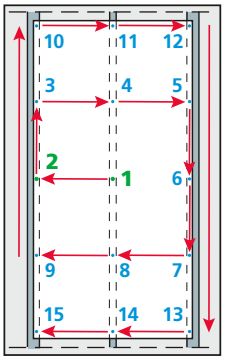
Panels

1. Panels to be Patina, Solid, Transparent, Deco or Cover.
   - Patina and Deco panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
2. Vertical and horizontal joints to be 10 mm (⅜"). This is the minimum distance between the edges of two adjacent panels, or the distance from panel edge to metal trim extrusions or structural members. (See *FIG. **A***)
3. Pre-drill holes in panel so that there are: (See *FIGS. **E, F** & **G***)
   - Two (2) **fixed points** per panel (**F**).
   - The rest of the holes are to be **gliding points** (**G**).
   - See **Fixing** section (and *FIGS. **F** & **G***) for determining location of fixed points in each panel.
4. Diameter of the fixed point hole is to be 8.3 mm.
5. Diameter of the gliding point hole is to be 12 mm.
   - 8.3 mm and 12 mm drill bits supplied by AFCC
6. Joints between profiles must coincide with horizontal joints in the panels. ***Panels cannot bridge a break in the profiles.*** (See *FIG. **A***)
7. **The pilot hole in metal profile** must be in the center of both the fixed point and gliding point holes. Use a drill bit centralizing fixture (supplied by AFCC) to accomplish this geometry. Pilot hole to be 4.9 mm in diameter — use #10 drill bit (4.9 mm). (See *FIG. **I***)
8. After first affixing the two fixed-point rivets, affix the rivets in a manner moving from nearest the center of the panel to the outside ring. (See *FIG. **K***)

Fixing

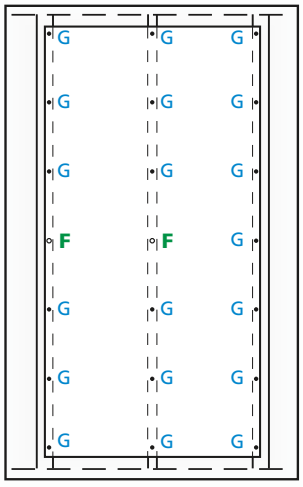
1. Rivets to be Astro Rivet (supplied by AFCC) with colored or stainless steel head with 8 mm x 11.1 mm cylinder. Shank of rivet is 4.8 mm x 20 mm long, with a 16 mm diameter head. (See *FIG. **H***)
2. Fixing pattern is typically either 16" or 24" (max) on center horizontally (based upon vertical profile spacing) and 16" to 24" (max) on center vertically, depending upon building height, building location, design criteria/ specifications, and panel/fastener location on building. Edge areas on facades and high wind load conditions require closer fixing distances. Structural engineer to determine spacings. For soffit applications, the maximum fastener spacing is 16" on center in both directions.
3. Corner rivets to be located at 50 – 150 mm (2"– 6") horizontally and 100 – 150 mm (4"– 6") vertically from every corner of panel. (*FIG. **C***)
4. 10 mm (⅜") clearance is required from the edge of metal profile to pilot hole for rivet.
5. Two **fixed points** are required per panel. (*FIGS. **I** & **J***)

   Fixed points (for attachment to vertical profiles) are:
   - Always the same height in each panel.
   - As close to center of panel as possible, and then either the next adjacent point to the left ***or*** right. Be consistent in panel-to-panel location (center and left ***or*** center and right, so fixed points are at the same level horizontally for attachment to vertical profiles).
   - No two fixed points on one panel can be on the same profile, and no two fixed points on two adjacent panels can be on the same profile when adjacent panels share a profile at a vertical joint.

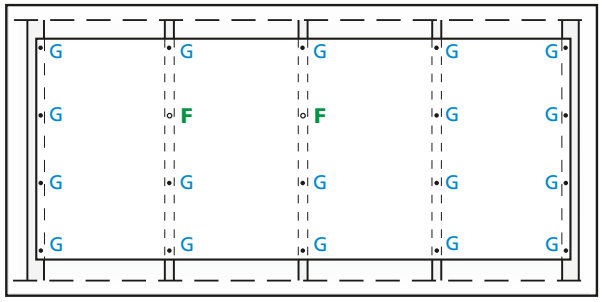


◀ *FIG. **K** — Fixing sequence Attach fixed points first.*

▼ *FIG. **F** — Vertical installation on vertical profiles*



▼ *FIG. **G** — Horizontal installation on vertical profiles*



If there is no perfectly centered row, the Fixed points go one row up, as shown.

Fixing *(continued)*

- For smaller panel sizes with only two rows of fasteners, fixed points to be top center and top left ***or*** top right (horizontal applications on vertical profiles). For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated, *FIG J*).

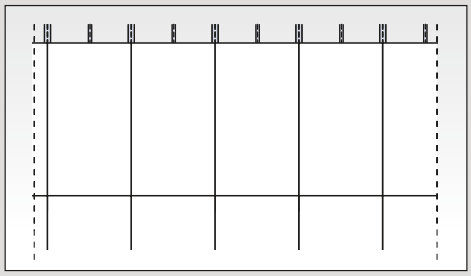
6. Joint closures can be installed (maximum thickness of finishing profile to be .8 mm or 21 gauge). Standard practice is to leave the joints open. If the joints are closed, the base and parapet openings must be increased to a minimum of 1½".
7. Pilot hole for rivet in metal profile to be 4.9 mm diameter. See **Panel** section for drill size. (See *FIGS. E & I*)
8. Remove drill shavings from metal profile holes and panel fixed and gliding holes prior to installing rivets.

Fabrication/Maintenance/Storage

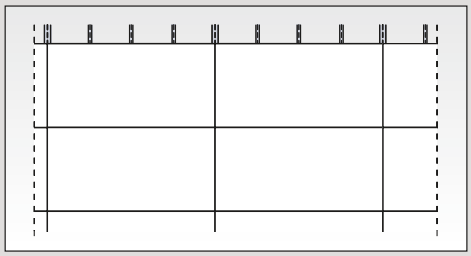
See AFCC Fabrication, Maintenance and Storage Guidelines.

Typical Pattern Layout

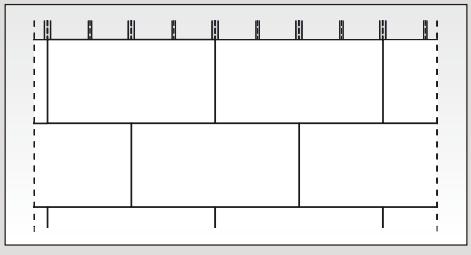
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



Straight pattern with vertical panels



Straight pattern with horizontal panels

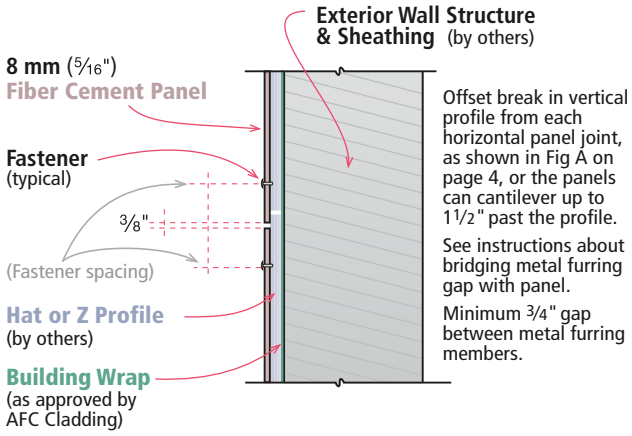


Semi pattern with horizontal panels

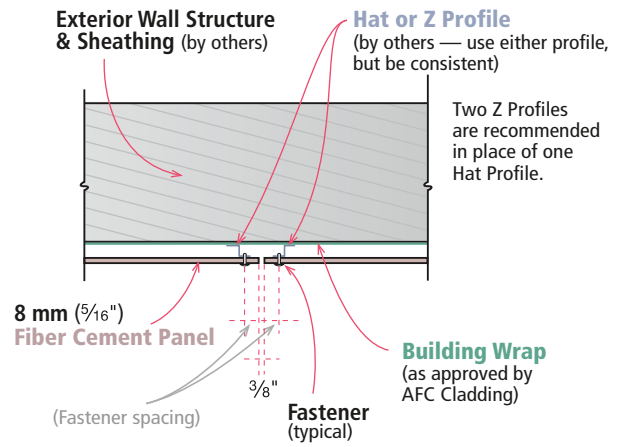
Details

See AFCC Standard Details for detailing requirements in architectural drawing format.

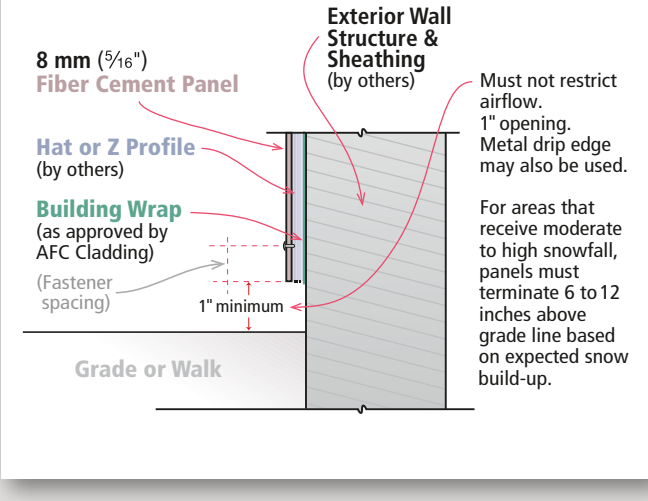
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



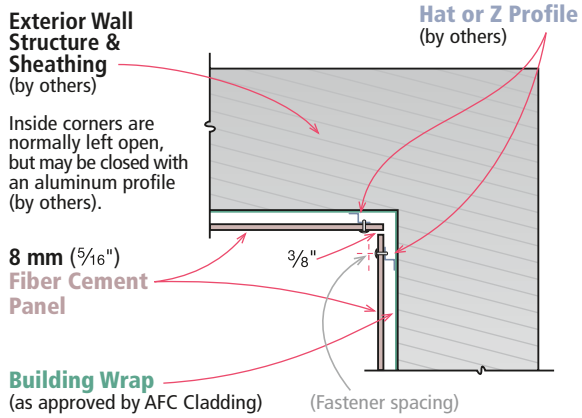
Typical Panel Base



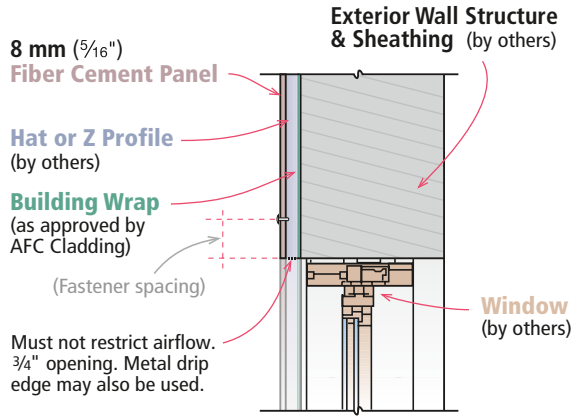
Details *(continued)*

See AFCC Standard Details for detailing requirements in architectural drawing format.

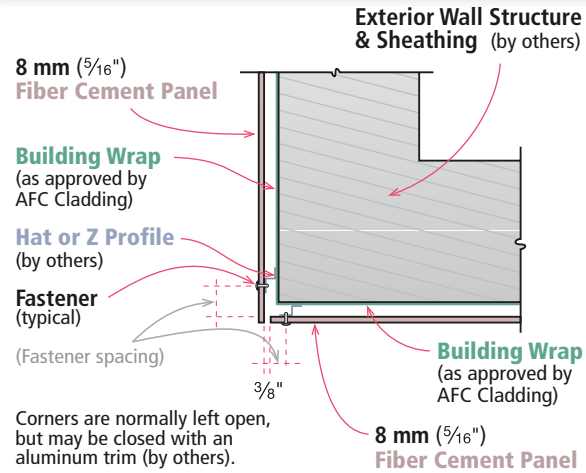
Typical Inside Corner – Plan View



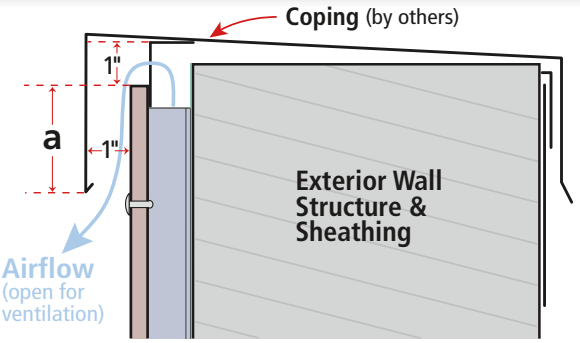
Typical Panel @ Window Head or Door Head



Typical Outside Corner – Plan View

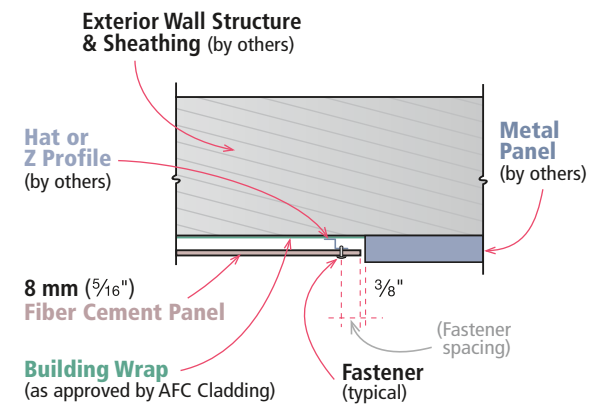


Parapet Coping – Closeup

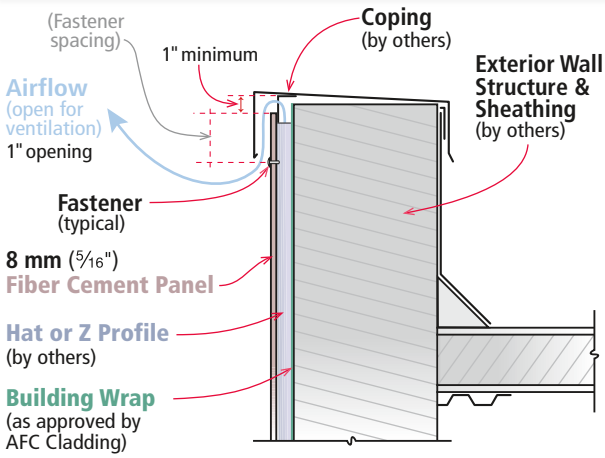


Building Height (ft)	Dimension (a)
0–30	1"
30–50	2"
50–80	3"
80+	4"

Typical Panel End @ Metal Panel



Typical Panel @ Parapet



AFC cladding

Product Sustainability Statement

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- Thermal Comfort

Energy and Atmosphere:

- Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rainscreen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Warranty information available upon request.

Limited Warranty

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afc cladding

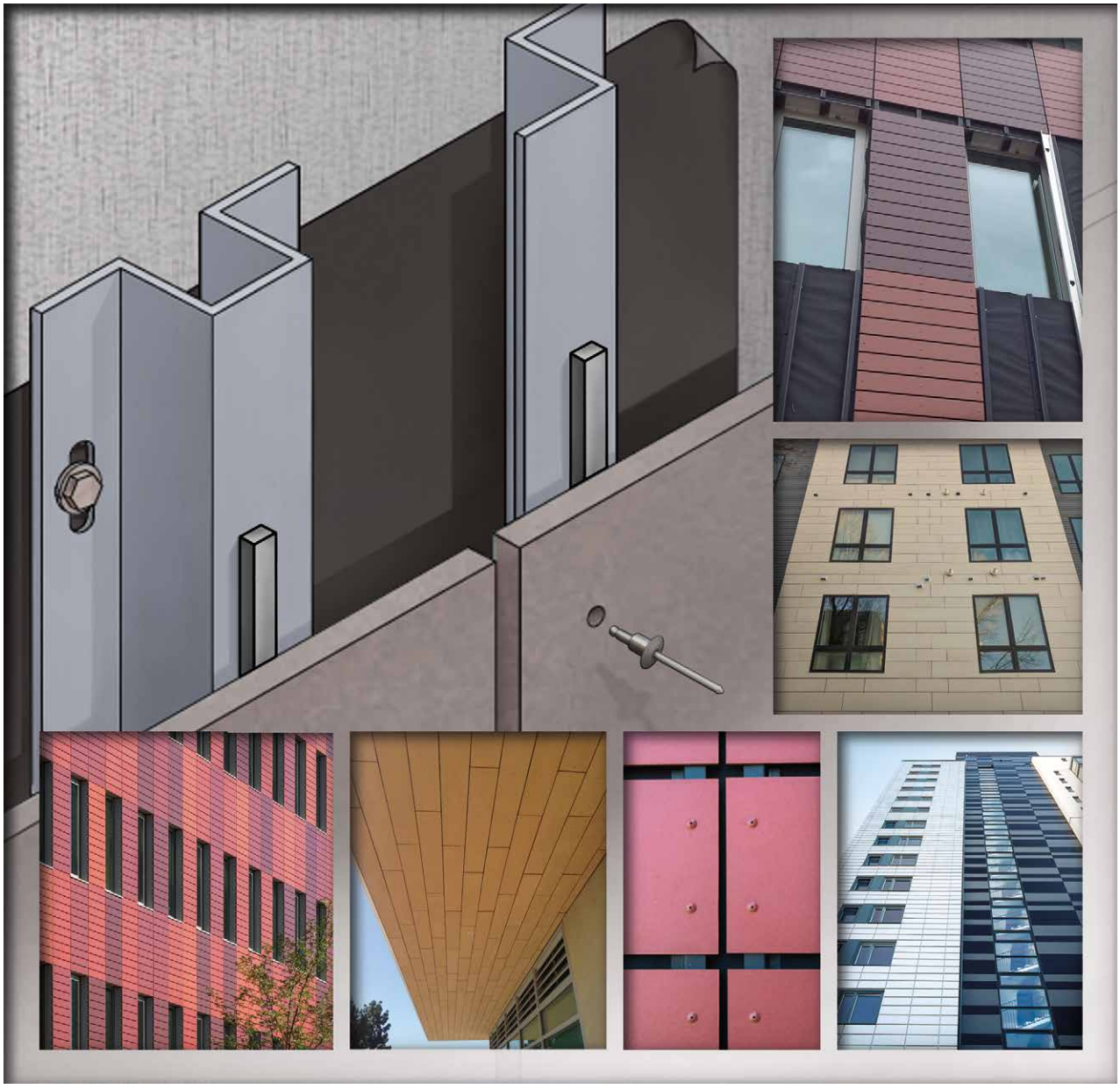
Architectural Panels

SUSTAINABLE SOLUTIONS

Standard Installation Guidelines[1]

Aluminum Profiles with Rivets

Rainscreen Application — 8 mm Panels



American Fiber Cement Corporation

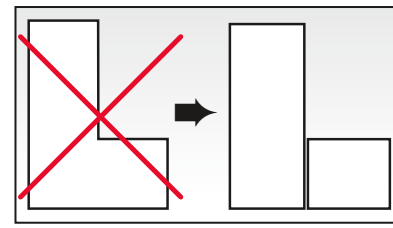
1 These guidelines represent an **abbreviated illustration** for proper installation of Cover, Patina, Solid, Transparent and Deco architectural panels in a ventilated rain screen application. Additional guidelines for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment can be found at www.americanfibercement.com.

AIA Continuing Education Provider

Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.

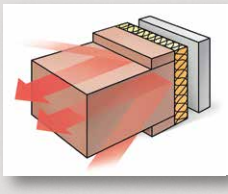
Construction Practices

1. Air space at top and bottom of building or wall termination to be 25 mm (1") to facilitate airflow from out behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow needs to be continuous from bottom to top so there is air movement behind each panel. See item 4 under Building/Structure on page 4 for proper profile depth based on wall height. 1" is required for walls between 15ft and 60ft. Vertical air flow behind the fiber cement panels is a critical necessity in rainscreen constructions.
2. For areas that receive moderate to high snowfall, panels must terminate 6 to 12 inches above grade line based on expected snow build-up.
3. A metal drip edge may be used at window heads, door heads and the panel base, but it must not restrict airflow (¾"; 1" at base openings).
4. Install panels from top of building to bottom.
5. For straight walls, start panel installation in center and work outward.
6. For walls with inside corners, start installation there and work across wall.
7. Jobsite storage: See AFCC Fabrication, Maintenance, and Storage Guidelines
   - Keep material laying flat, under cover, dry and protected with a waterproof tarp.
   - Transport material on edge.
   - Using a microfiber cloth, brush off any material dust generated by drilling or cutting prior to installation.
   - Do not use the shipping crates or pallets containing the fiber cement panels as a work surface. Keep panels dust-free.
8. For field cuts and drilling, use carbide or diamond blades/bits and slower turning/feed rates. AFCC offers saw blades and drill bits.
9. All Cover, Solid and Transparent field-cut edges and field-drilled holes must be sealed with Edge Sealer and Deco edges must be painted. See AFCC's website for application instructions.



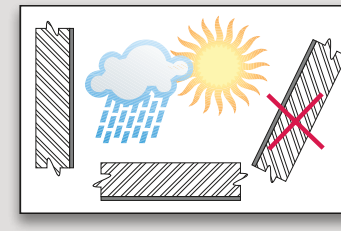
L or C-Shaped panels are not allowed.

Rain Screen Cladding

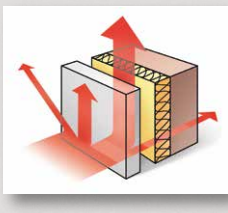


Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.

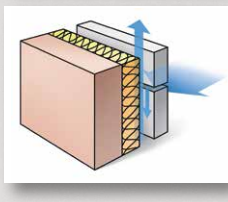


Panels exposed to weather *(rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.*



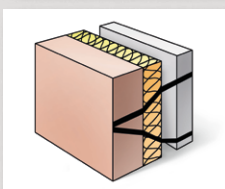
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the air space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



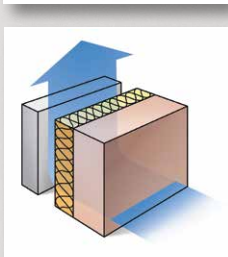
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load-bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter, in both hot and cold climates.



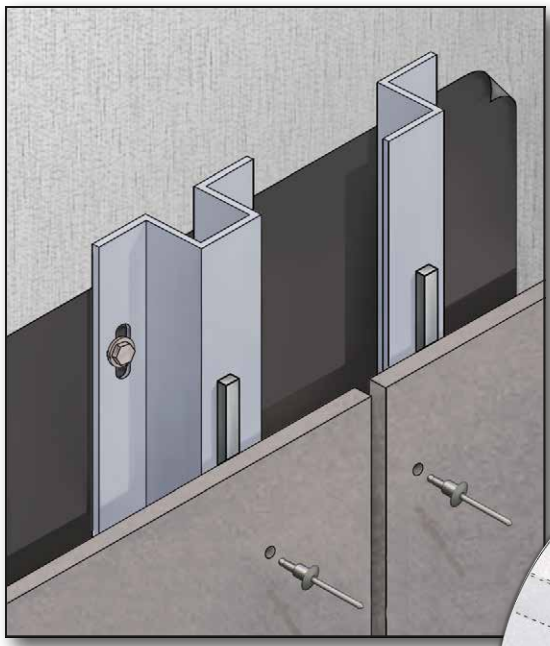
Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapor pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

Profile Attachment — illustrated

For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required. (See *FIG.* ***D-1B***)

FIG. ***D-1A*** —
Vertical profiles are typically "Z" channels or "Hat" channels.



Hat channel can be attached with the crown facing in or out, depending on fastener spacing and the visibility of the profile through the joint.

FIG. ***D-1B***

Building wrap *per AFCC. Weather and UV resistant. Check local codes for proper placement.*

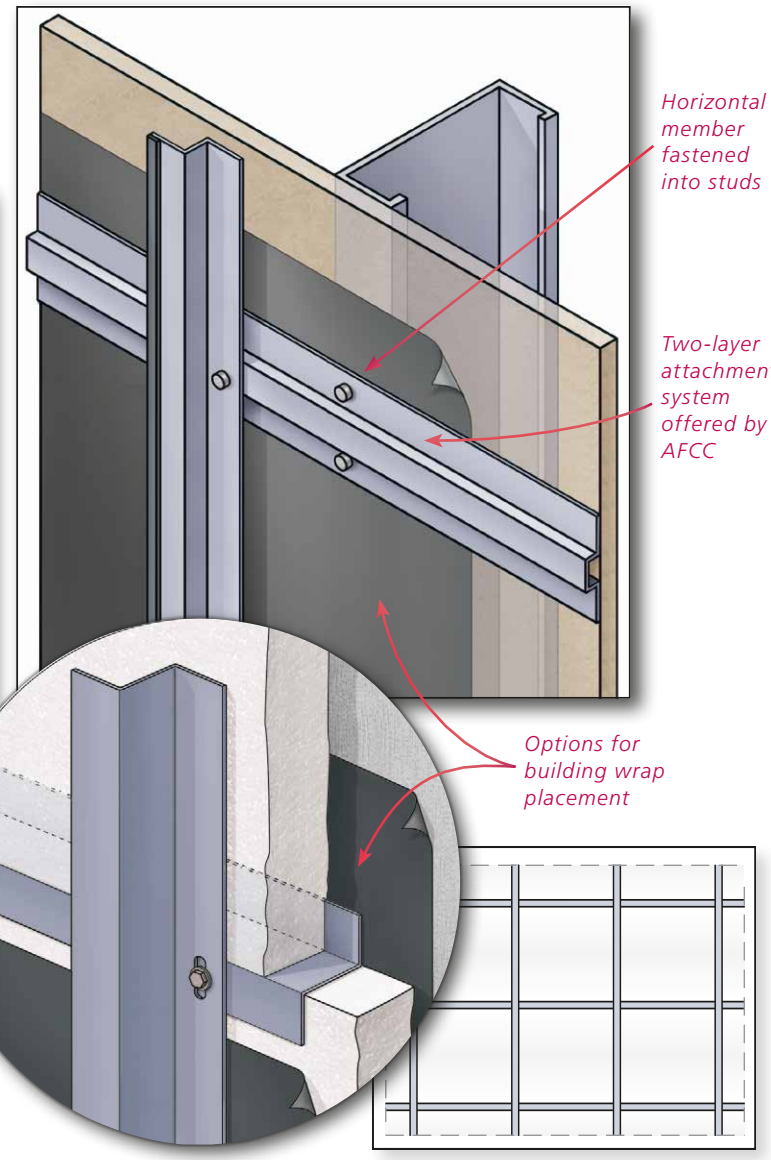
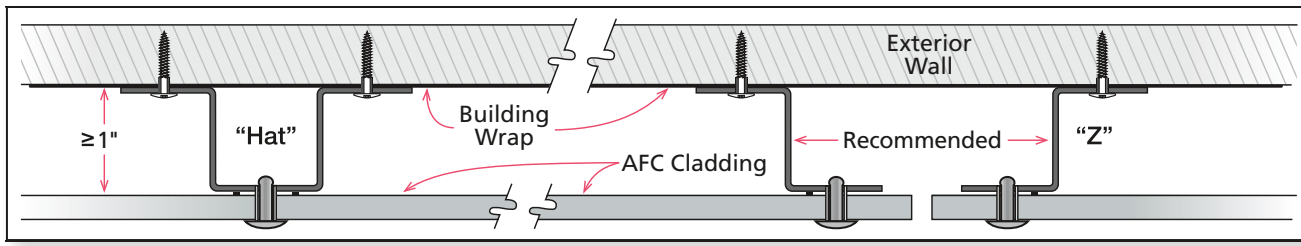


FIG. ***D-2*** —
Exterior insulation, when vertical profiles are attached to horizontal profiles affixed to wall.

FIG. J — "Hat" or "Z" channels and vertical joint. (Black Anodized "Z" channels offered by AFCC.)



Can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (¾" plywood sheathing is recommended).

FIG. ***H*** *— Astro Rivet® with fixed cylinder*

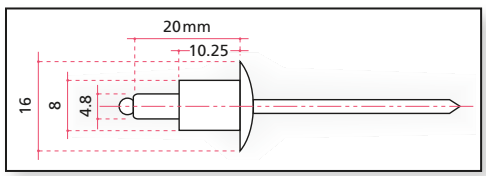
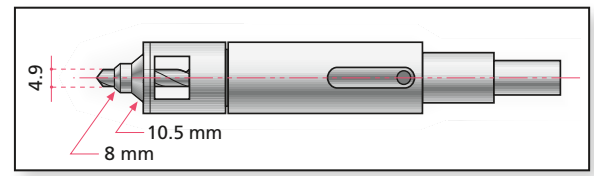


FIG. ***I*** *— Centralizing drill bit*



For centering pilot hole in profile for ***Fixed Points*** *and* ***Gliding Points****.*

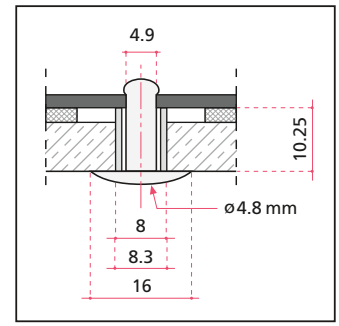
Building/Structure

1. **Architect/Engineer/Contractor to design and build structurally sound, water-tight exterior wall.**
   - Substructure Horizontal Straightness Tolerance: ±3.0 mm per 2 m (± 0.0625" per 42")
   - Substructure Vertical Straightness Tolerance: ±0.5 mm per 600mm (± 0.0625" per 75")

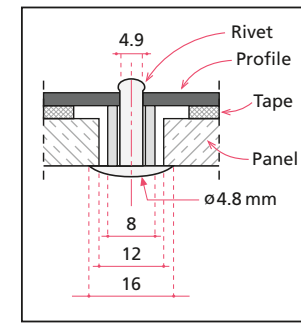
   If the wall is not straight, the profiles should be shimmed to create a flat plane for the panels. Shims should not be used between the profile and the panel.
2. **Attach profiles to exterior walls. *Structural engineer to determine fastening/affixing specification***, i.e. quantity and type of attachment and fasteners, based upon exterior wall construction. Attachment must support 3.2 lbs/ft² (8 mm panel) dead load, plus design wind loads. Fasteners in profile must accommodate thermal expansion/contraction of metal and not interfere with panel application. Shortening the length of the profiles can minimize thermal expansion and contraction. It is also recommended to oversize holes at or near the tops and bottoms of the profiles while having fixed points near the center. This reduces stress in the panels.
3. Profiles for affixing panels to be a minimum of 16 gauge steel or greater, determined by building orientation/location and load factors. Depending on location and climate, a minimum of G90 or greater hot-dipped galvanized coating is recommended. Galvalume® and powder coat finishes may also be used.
4. Vertical profiles for affixing panels must be the following depth to allow for optimal air flow and water drainage:
   - 19 mm (¾") for panel runs 0–15 ft
   - 25 mm (1") for panel runs 15–60 ft
   - 32 mm (1¼") for panel runs 60–100 ft
   - 38 mm (1½") for panel runs 100–150 ft

   For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.
5. Maximum length of steel profile ≤10 feet. Two profiles ("Z" recommended, or "Hat" with ≥ 1¼" legs) are recommended in place of one wide profile at vertical joints. The sides of the panel can be cantilevered 2"–6" over edge profile so vertical joint is open. (See *FIG. C*)
6. Profiles to be straight, plumb, level and aligned correctly on the building. **For installations without exterior insulation, the metal profiles are typically hat-channels or Z-channels affixed directly to the exterior wall, provided the sheathing has adequate screw-holding strength.** (See *FIG. J*)
7. **It is recommended to take field measurements before panels are cut or drilled.** Field measurements verify print dimensions to ensure proper fit.
8. Spacing between vertical profiles to be ≥ 20 mm (¾"). A joint between the vertical profiles must ***always*** coincide with a joint between the panels (*FIG. A*). The joint is preferably continued at the same horizontal height among adjacent profiles. (Reduces stress in panels). If a two layer system is used, the same concept must be applied for the horizontal profiles. 20mm spacing, and coincide a joint between panels with a joint between horizontal profiles.
9. For structures with ***exterior insulation***, follow the insulation manufacturer's installation instructions. Horizontal metal profiles (the same depth as the exterior insulation) can be attached to the exterior wall. Vertical metal profiles are then attached to the horizontal profiles (See *FIG. D-2*).

FIG. E — Fixed and Gliding Points



Fixed Point *— cylinder & rivet*



Gliding Point *— cylinder & rivet*

FIG. A

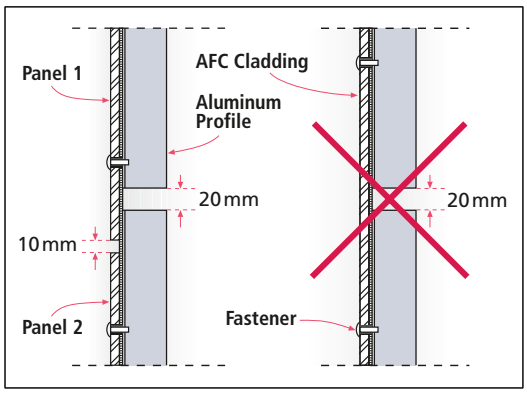


FIG. B —

Standard profile.

*Affix adhesive foam tape to either **or** both sides of rivet. (Foam tape will compress to correct depth when panel is fastened.)*

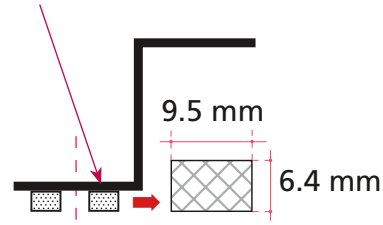
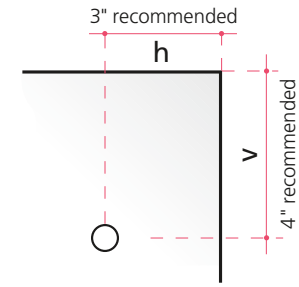


FIG. C



	in.	(mm)
h:	2–6	(50–150)
v:	4–6	(100–150)

Prepare Profile

1. Typical vertical and horizontal joints are left open and have a black background (use a black weather and UV resistant building wrap). Metal profiles visible at joint openings (vertical and horizontal) can be covered with a black UV weather resistant tape or UV weather resistant coating. Other reveal colors are possible if desired.
2. Affix adhesive foam tape (supplied by AFCC) to the profile's full length — 1 strip on either side of the rivet location or 1 strip on each side of the rivet location, no more than ½" from the rivet location. At vertical joints, place 1 strip on the panels center side of the rivet location. (See *FIG. **B***)
3. See page 6 regarding closing horizontal and vertical joints.

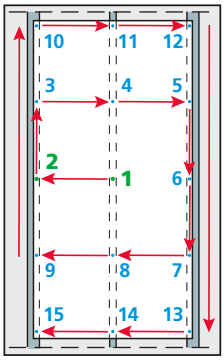
Panels

1. Panels to be Patina, Solid, Transparent or Cover.
   - Patina and Deco panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
2. Vertical and horizontal joints to be 10 mm (⅜"). This is the minimum distance between the edges of two adjacent panels, or the distance from panel edge to metal trim extrusions or structural members. (See *FIG. **A***)
3. Pre-drill holes in panel so that there are: (See *FIGS. **E, F** & **G***)
   - Two (2) **fixed points** per panel (**F**).
   - The rest of the holes are to be **gliding points** (**G**).
   - See **Fixing** section (and *FIGS. **F** & **G***) for determining location of fixed points in each panel.
4. Diameter of the fixed point hole is to be 8.3 mm.
5. Diameter of the gliding point hole is to be 12 mm.
   - 8.3 mm and 12 mm drill bits supplied by AFCC
6. Joints between profiles must coincide with horizontal joints in the panels. ***Panels cannot bridge a break in the profiles.*** (See *FIG. **A***)
7. **The pilot hole in metal profile** must be in the center of both the fixed point and gliding point holes. Use a drill bit centralizing fixture (supplied by AFCC) to accomplish this geometry. Pilot hole to be 4.9 mm in diameter — use #10 drill bit (4.9 mm). (See *FIG. **I***)
8. After first affixing the two fixed-point rivets, affix the rivets in a manner moving from nearest the center of the panel to the outside ring. (See *FIG. **K***)

Fixing

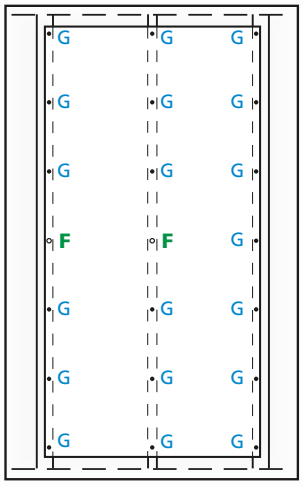
1. Rivets to be Astro Rivet (supplied by AFCC) with colored or stainless steel head with 8 mm x 11.1 mm cylinder. Shank of rivet is 4.8 mm x 20 mm long, with a 16 mm diameter head. (See *FIG. **H***)
2. Fixing pattern is typically either 16" or 24" (max) on center horizontally (based upon vertical profile spacing) and 16" to 24" (max) on center vertically, depending upon building height, building location, design criteria/ specifications, and panel/fastener location on building. Edge areas on facades and high wind load conditions require closer fixing distances. Structural engineer to determine spacings. For soffit applications, the maximum fastener spacing is 16" on center in both directions.
3. Corner rivets to be located at 50 – 150 mm (2"– 6") horizontally and 100 – 150 mm (4"– 6") vertically from every corner of panel. (*FIG. **C***)
4. 10 mm (⅜") clearance is required from the edge of metal profile to pilot hole for rivet.
5. Two **fixed points** are required per panel. (*FIGS. **I** & **J***)

   Fixed points (for attachment to vertical profiles) are:
   - Always the same height in each panel.
   - As close to center of panel as possible, and then either the next adjacent point to the left ***or*** right. Be consistent in panel-to-panel location (center and left ***or*** center and right, so fixed points are at the same level horizontally for attachment to vertical profiles).
   - No two fixed points on one panel can be on the same profile, and no two fixed points on two adjacent panels can be on the same profile when adjacent panels share a profile at a vertical joint.

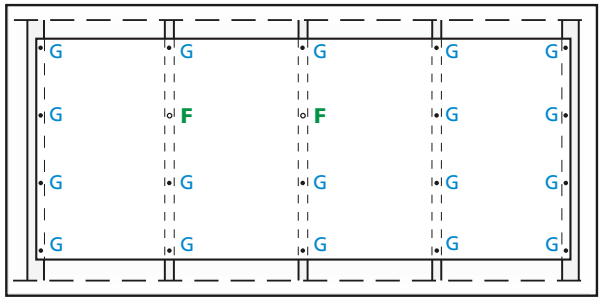


◀ *FIG. **K** — Fixing sequence Attach fixed points first.*

▼ *FIG. **F** — Vertical installation on vertical profiles*



▼ *FIG. **G** — Horizontal installation on vertical profiles*



If there is no perfectly centered row, the Fixed points go one row up, as shown.

Fixing *(continued)*

- For smaller panel sizes with only two rows of fasteners, fixed points to be top center and top left ***or*** top right (horizontal applications on vertical profiles). For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated, *FIG J*).

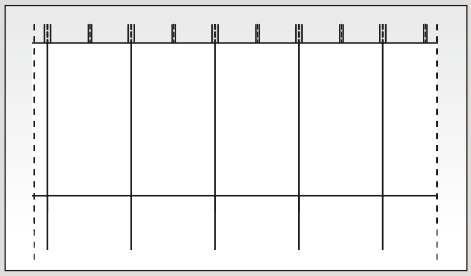
6. Aluminum joint closures can be installed (maximum thickness of finishing profile to be .8 mm or 21 gauge). Standard practice is to leave the joints open. If the joints are closed, the base and parapet openings must be increased to a minimum of 1½".
7. Pilot hole for rivet in metal profile to be 4.9 mm diameter. See **Panel** section for drill size. (See *FIGS. E & I*)
8. Remove drill shavings from metal profile holes and panel fixed and gliding holes prior to installing rivets.

Fabrication/Maintenance/Storage

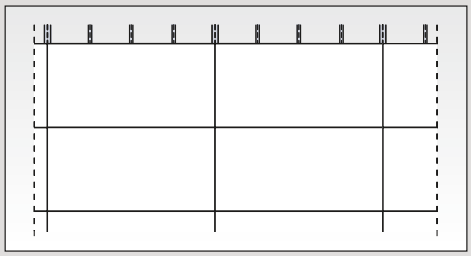
See AFCC Fabrication, Maintenance and Storage Guidelines.

Typical Pattern Layout

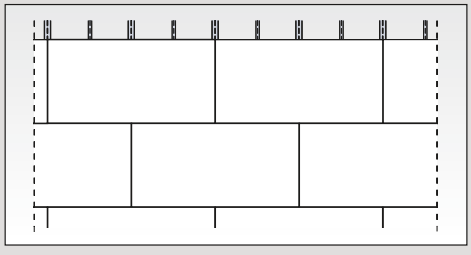
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



Straight pattern with vertical panels



Straight pattern with horizontal panels

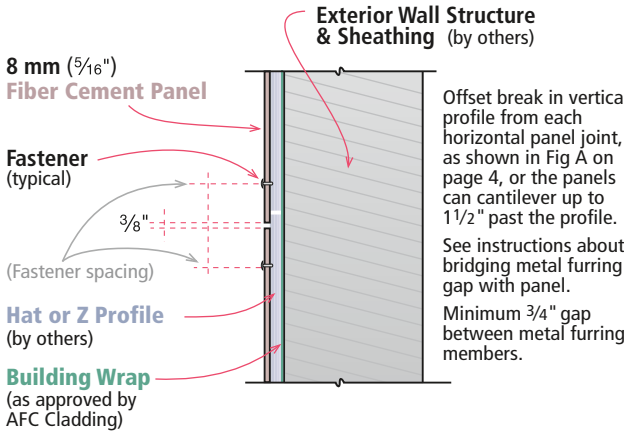


Semi pattern with horizontal panels

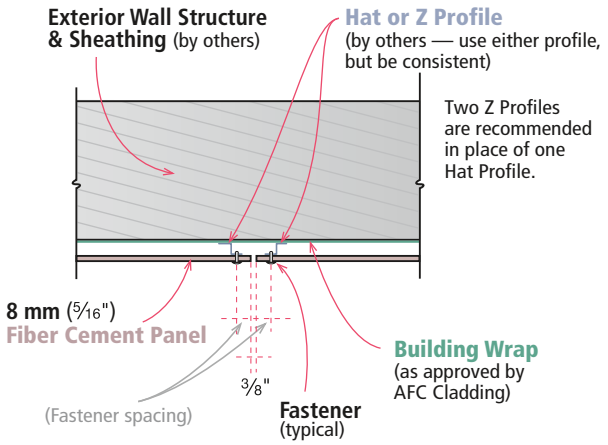
Details

See AFCC Standard Details for detailing requirements in architectural drawing format.

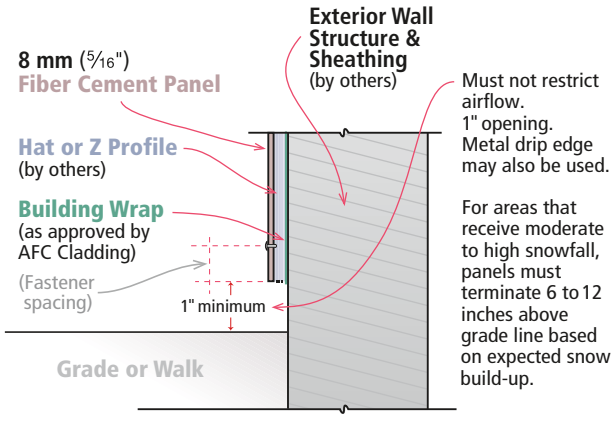
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



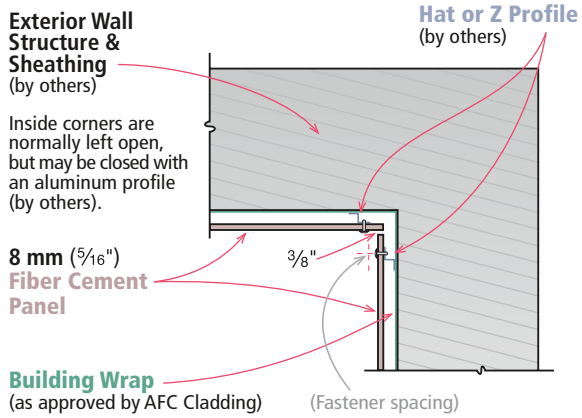
Typical Panel Base



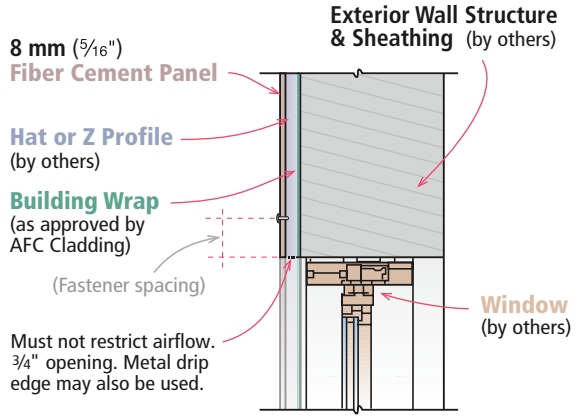
Details *(continued)*

See AFCC Standard Details for detailing requirements in architectural drawing format.

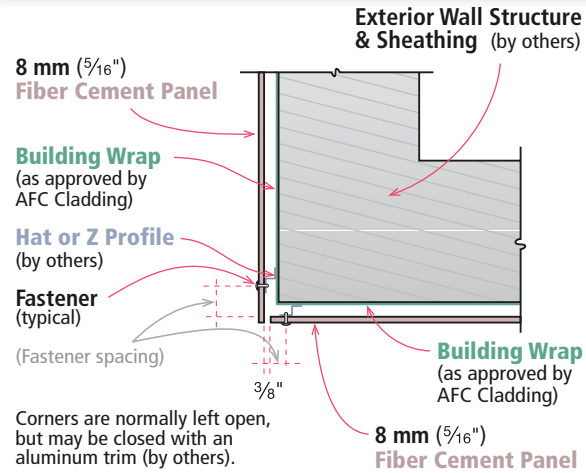
Typical Inside Corner – Plan View



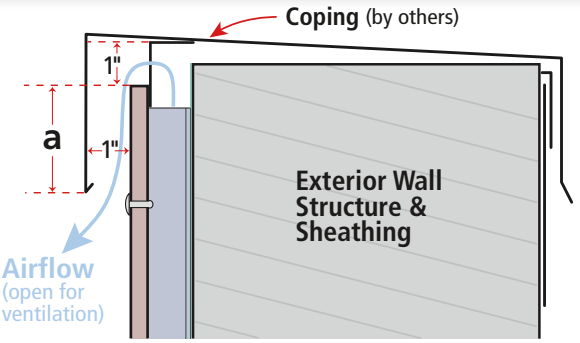
Typical Panel @ Window Head



Typical Outside Corner – Plan View

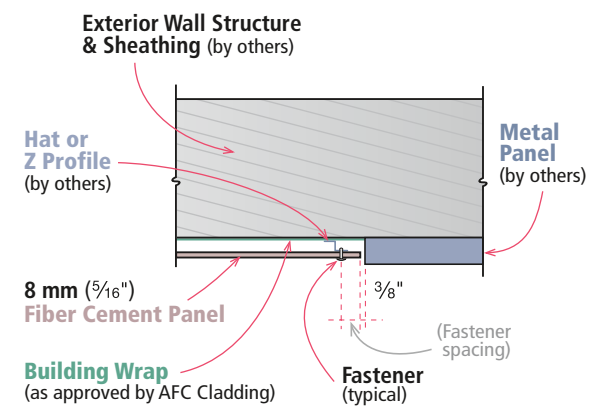


Parapet Coping – Closeup

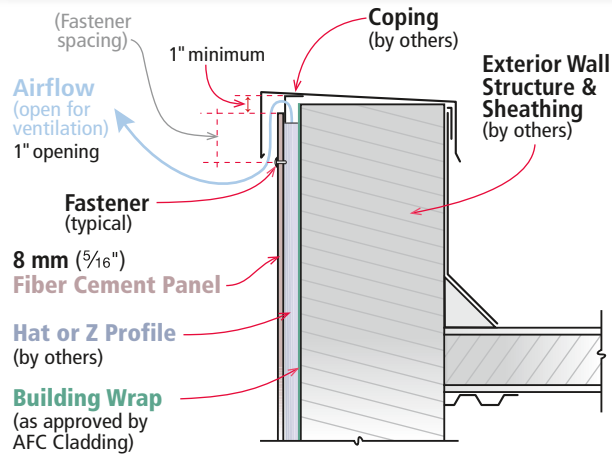


Building Height (ft)	Dimension (a)
0–30	1"
30–50	2"
50–80	3"
80+	4"

Typical Panel End @ Metal Panel



Typical Panel @ Parapet



afc cladding

Product Sustainability Statement

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- Thermal Comfort

Energy and Atmosphere:

- Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rainscreen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Warranty information available upon request.

Limited Warranty

American Fiber Cement Corporation (AFCC) warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship using AFCC's specifications as a standard. Only products which are installed and used in accordance with applicable AFCC instructions and specifications are in any way warranted by AFCC. This warranty is applicable only to claims made in writing and received by AFCC within thirty (30) days after the defect was discovered *and* within ten (10) years after the date of the shipment of the product by AFCC. All other claims are waived. If a claim is made, you must allow reasonable investigation of the product you claim is defective and you must supply samples that adequately demonstrate the problem you claim for testing by AFCC.

AFCC DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THIS LIMITED WARRANTY PROVIDES YOUR EXCLUSIVE REMEDY AS A PURCHASER OF AFCC PRODUCTS. THIS LIMITED WARRANTY MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF AFCC. WITHOUT AN EXPRESS, WRITTEN AUTHORIZATION FROM AFCC, NO RETAILER OR DISTRIBUTOR OF AFCC PRODUCTS HAS THE AUTHORITY TO MODIFY OR AMEND THIS LIMITED WARRANTY.

Limitation of Liability

This limited warranty is your sole and exclusive remedy. It is expressly understood and agreed that the limit of liability will be, at AFCC's option, repair, resupply of a like quantity of non-defective product, or refund of purchase price of the material. All labor and service charges which may be incurred with respect to either the original or replacement product are excluded. AFCC shall have no liability except where the claim results solely from breach of AFCC's limited warranty.

AFCC SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. FURTHERMORE, AFCC SHALL NOT BE LIABLE FOR DAMAGE TO THE PROPERTY TO WHICH THE PRODUCT IS APPLIED OR ITS CONTENTS, LOSS OF TIME, PROFITS, OR ANY INCONVENIENCE ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY OR OBLIGATIONS UNDER THIS LIMITED WARRANTY. AFCC SHALL NOT BE LIABLE FOR ANY DAMAGES WHICH ARE BASED UPON NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY EXCEPT THE LIMITED WARRANTY SET FORTH ABOVE. INCIDENTAL AND CONSEQUENTIAL DAMAGES SHALL NOT BE RECOVERABLE EVEN IF THE REPLACEMENT REMEDY FAILS OF ITS PURPOSE OR FOR ANY OTHER REASON.

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afc cladding

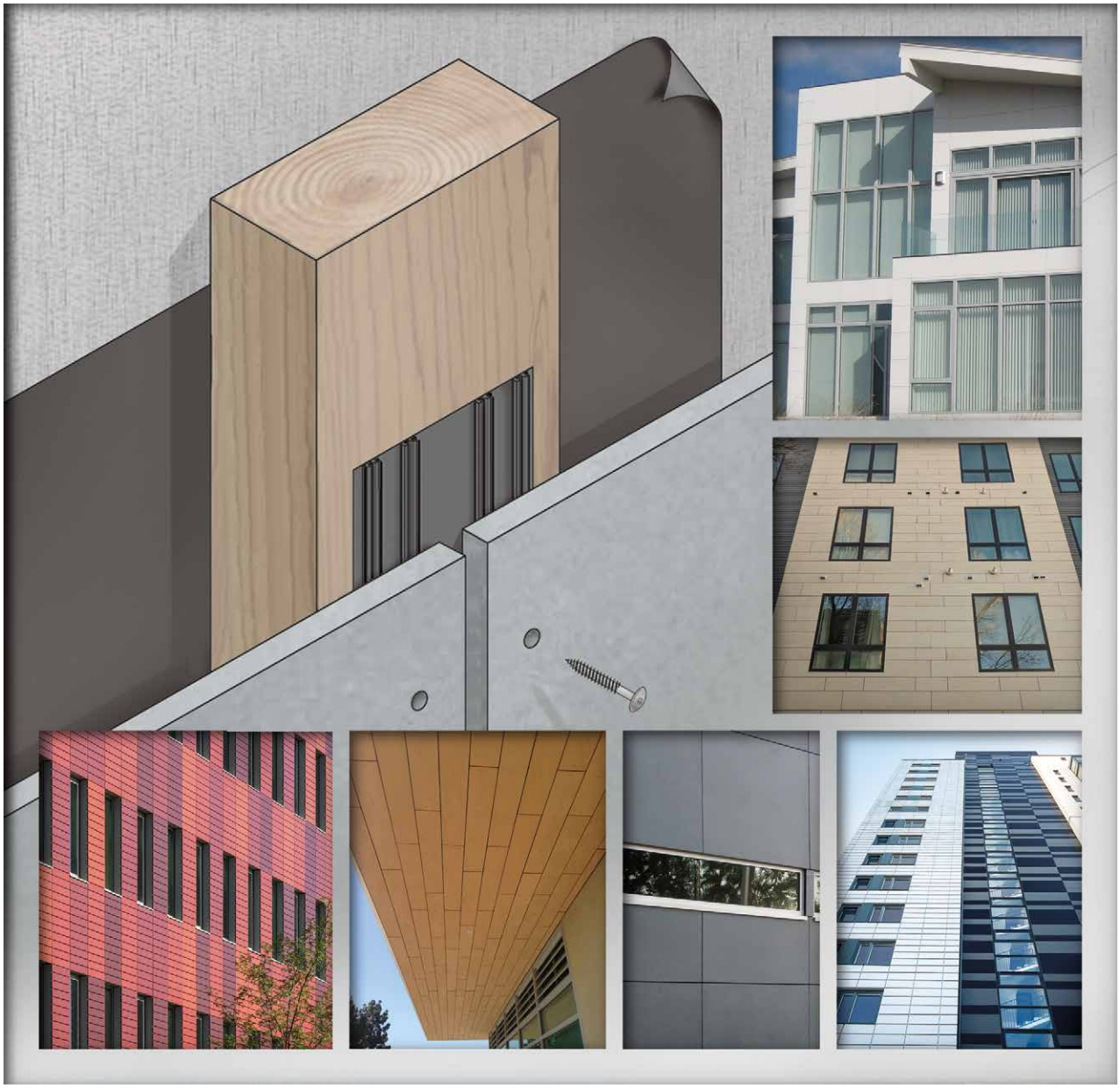
Architectural Panels

SUSTAINABLE SOLUTIONS

Standard Installation Guidelines[1]

Wood Profiles with Screws

Rainscreen Application — 8 mm Panels



American Fiber Cement Corporation

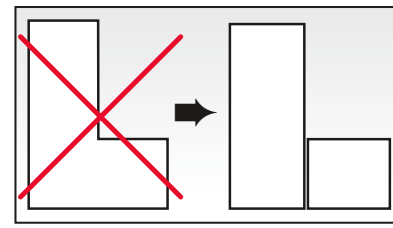
1 These guidelines represent an **abbreviated illustration** for proper installation of Cover, Patina, Solid, Transparent and Deco architectural panels in a ventilated rain screen application. Additional guidelines for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment can be found at www.americanfibercement.com.

AIA Continuing Education Provider

Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.

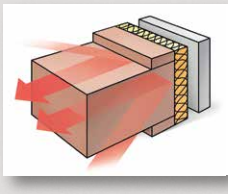
Construction Practices

1. Air space at top and bottom of building or wall termination to be 20 mm (¾") to facilitate airflow from out behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow needs to be continuous from bottom to top so there is air movement behind each panel. For walls over 60 feet high, the ventilated cavity between rear of panels and exterior wall should be increased to 30 mm (1¼"). Air flow behind the fiber cement panels is a critical necessity in rainscreen constructions.
2. For areas that receive moderate to high snowfall, panels must terminate 6 to 12 inches above grade line based on expected snow build-up.
3. A metal drip edge may be used at window heads, door heads and the panel base, but it must not restrict airflow (¾"; 1" at base openings).
4. Install panels from top of building to bottom.
5. For straight walls, start panel installation in center and work outward.
6. For walls with inside corners, start installation there and work across wall.
7. Jobsite storage:
   - Keep material laying flat, under cover, dry and protected with a waterproof tarp.
   - Transport material on edge.
   - Using a microfiber cloth, brush off any material dust generated by drilling or cutting prior to installation.
   - Do not use the shipping crates or pallets containing the fiber cement panels as a work surface. Keep panels dust-free.
8. For field cuts and drilling, use carbide or diamond blades/bits and slower turning/feed rates. AFCC offers saw blades and drill bits.
9. All Cover, Solid and Transparent field-cut edges and field-drilled holes must be sealed with Edge Sealer. See Instructions for the Edge Sealer.on AFCC's website.



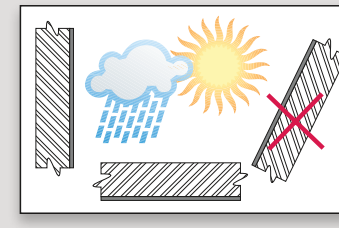
L or C-Shaped panels are not allowed.

Rain Screen Cladding

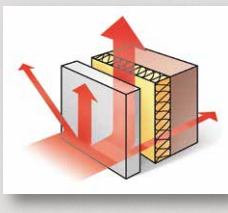


Preventing thermal bridges

As the insulating material is on the outside of the structural wall, it can easily be mounted without interruptions caused by floor slabs. In this way, any thermal bridges that occur at each floor slab can be prevented. These thermal bridges are also the cause of surface condensation that may result in fungus growth.

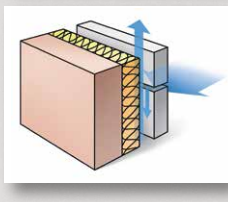


Panels exposed to weather *(rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.*



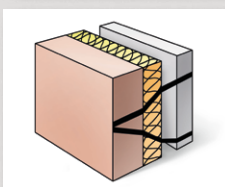
Dissipating heat from the sun

The ventilated rainscreen cladding system has a cooling effect when temperatures outside are high. Most of the sun's rays are reflected away from the building. Heat passing through the exterior wall panel is partially dissipated by the ventilating effect of the air space between the exterior cladding panel and the structural wall. Any residual heat managing to penetrate buildings is very minor.



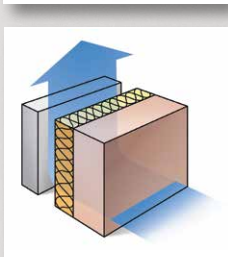
Rainscreen

Architectural wall-cladding panels act as a rainscreen on the outside of the building and keep the structural wall absolutely dry. The air space connected to the outside air evacuates water and humidity that might have penetrated behind the wall-cladding panels through its horizontal or vertical joints. This water will never reach the load-bearing wall and/or the thermal insulation.



Protecting the basic structure and load-bearing wall against temperature variations

In view of the fact that the insulation material is applied to the outside of the building, changes in temperature are very minor compared with those found in conventional constructions where insulation is applied on the interior. This principle works in summer and winter, in both hot and cold climates.



Prevention of internal condensation

Insulation material can be applied to the outside of the structural wall because it is protected effectively by the architectural exterior wall panel. Because of differences in vapor pressure and temperature passing through the wall, condensation has been shown to occur close to the ventilated area and not in the structural wall itself. As a result, the ventilating effect is easily sufficient to dry out the thermal insulating material.

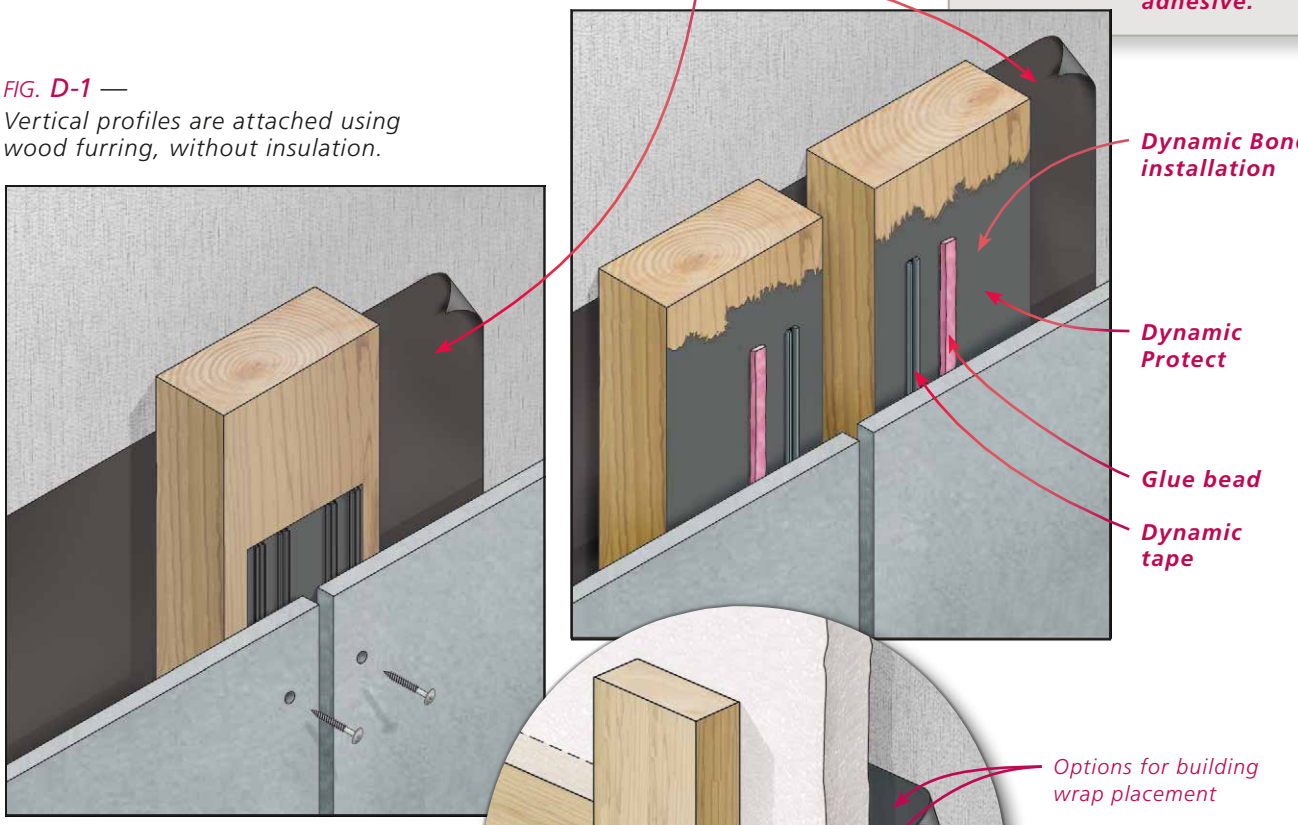
Profile Attachment — illustrated

For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required.

Building wrap *per AFCC. Weather and UV resistant. Check local codes for proper placement.*

Contact your AFCC representative or visit AFCC's website for application instructions utilizing Dynamic Bond adhesive.

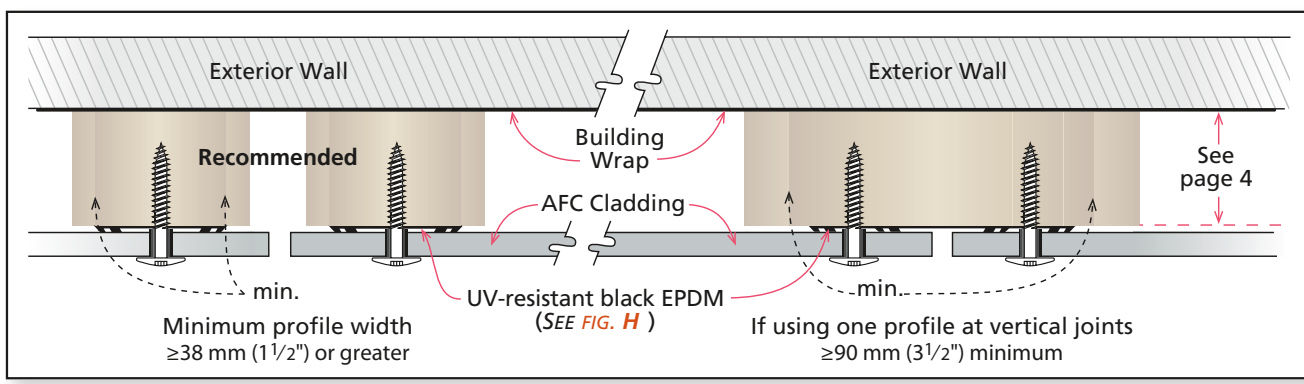
FIG. ***D-1*** *—*
Vertical profiles are attached using wood furring, without insulation.



Options for building wrap placement

FIG. ***D-2*** *—*
Exterior insulation, when vertical profiles are attached to horizontal profiles affixed to wall.

FIG. J — Wood profiles: interior and vertical joint.
Vertical joints may also use two ≥38mm profiles (recommended) in place of one ≥90mm profile.



Wood profiles can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (¾" plywood sheathing is recommended).

Building / Structure

1. **Architect / Engineer / Contractor to design and build structurally sound, water-tight exterior wall.**
   - Substructure Horizontal Straightness Tolerance: ±3.0 mm per 2m (± 0.0625" per 42")
   - Substructure Vertical Straightness Tolerance: ±0.5 mm per 600mm (± 0.0625" per 75")

   If the wall is not straight, the profiles should be shimmed to create a flat plane for the panels. Shims should not be used between the profile and the panel.
2. **Attach wood profiles to exterior walls. *Structural engineer to determine fastening specification***, i.e. quantity and type of attachment and fasteners, as well as the dimensions and species of wood profiles compatible with exterior wall construction (*FIG. **D-1***). Attachment must be sufficient to support 3.2 lbs/ft² (8 mm panel) dead load, plus design wind loads.
3. The quality of the wood must be consistent with prevailing standards in the area. The wood should be pressure treated construction grade lumber with a smooth surface finish. Fungi-resistant woods are required, but must not be treated with agents that are corrosive to stainless steel screws.
4. Vertical profiles for affixing panels must be the following depth to allow for optimal air flow and water drainage:
   - 19 mm (¾") for panel runs 0–15 ft (1x2 or 1x4)
   - 38 mm (1½") for panel runs 15–150 ft (2x2 or 2x4)

   For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.
5. Profile width at vertical joints to be ≥ 90 mm (3 ½") minimum, and interior profile width to be ≥ 38 mm (1½") or greater, to allow tolerances in alignment. Maximum length of wood profile ≤12 feet. Minimum screw depth in wood profile is 19 mm (¾").
6. Profiles to be straight, plumb, level and aligned correctly on the building. For installations without exterior insulation, the wood profiles are typically 2 x 2 or 2 x 4 pressure treated lumber affixed directly to the exterior wall, provided the sheathing has adequate screw-holding strength. (See *FIG. **J***)
7. **It is recommended to take field measurements before panels are cut or drilled.** Field measurements verify print dimensions to ensure proper fit.
8. Joints between vertical wood profiles to be ≥ 10 mm (⅜"). A joint between the vertical profiles must ***always*** coincide with a joint between the panels (*FIG. **A***). The joint is preferably continued at the same horizontal height among adjacent profiles (reduces stress in panel). If a two layer system is used, the same concept must be applied for the horizontal profiles. 20mm spacing, and coincide a joint between panels with a joint between horizontal profiles.
9. For structures with ***exterior insulation***, follow the insulation manufacturer's installation instructions. Horizontal wood profiles (the same depth as the exterior insulation) can be attached to the exterior wall. Vertical wood profiles are then attached to the horizontal profiles (*FIG. **D-2***).

Prepare Profile

1. Typical vertical and horizontal joints are left open and have a black background (use a black weather and UV resistant building wrap). Other reveal colors are possible if desired.
2. At the vertical joints, the wood profile is covered with a 90 mm (3½") UV-resistant black EPDM rubber joint sealing strip with ribs (*FIG. **H***).
3. The joint sealing strip can be applied with a chemically compatible spray adhesive, staples, or double-sided tape until panels are affixed with screws. The screws must be positioned between the ribs to permit penetrated water to run off.
4. At interior wood profiles, a 38 mm (1½") UV-resistant black EPDM rubber sealing strip with ribs is applied. Spray adhesive, staples, or double-sided tape can be employed to hold up the strips until the panels are fastened.

*FIG. **B-1***

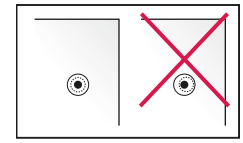
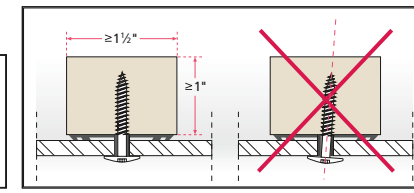
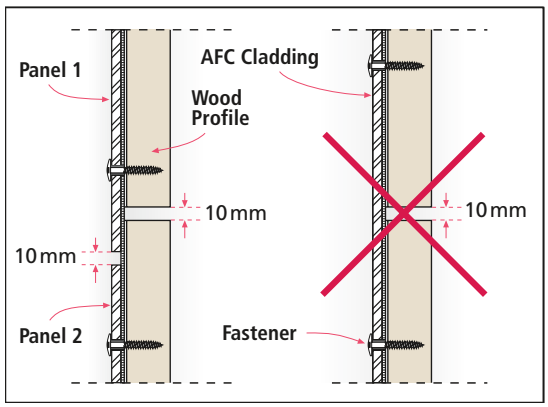


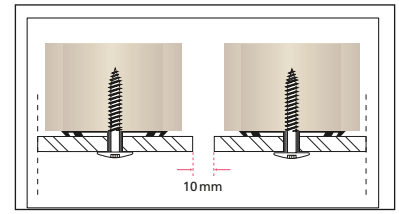
*FIG. **B-2** — Interior profile*



◀ *FIG. **A***

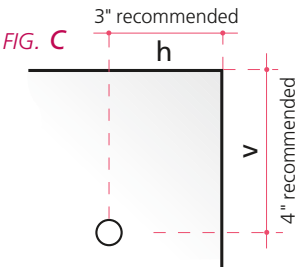


Typical Vertical Panel Joint



Alternative:
Use one 90 mm wide profile

*FIG. **C***



	in.	(mm)
h:	1–4	(25–100)
v:	4–6	(100–150)

Panels

1. Panels to be Patina, Solid, Transparent, Deco or Cover.
2. Vertical and horizontal joints to be 10 mm (3/8"). This is the minimum distance between the edges of two adjacent panels, or the distance from panel edge to metal trim extrusions or structural members. (See *FIG. A*)
3. Pre-drill ***all*** fixed and gliding point holes in panel so that there are: (See *FIG. E* & *F*)
   - Two (2) **fixed points** per panel (**F**).
   - The rest of the holes are to be **gliding points** (**G**). (See *FIG. E* & *F*)
   - See **Fixing** section (and *FIGS. E & F*) for determining location of fixed points in each panel.
4. Diameter of the fixed point hole is to be 5 mm — use #8 drill bit: 5.05 mm (13/64").
5. Diameter of the gliding point hole is to be 8 mm — use #O drill bit: 8.02 mm (5/16").
   - Drill bits supplied by AFCC.
6. Joints between profiles must coincide with joints in the panels. ***Panels cannot bridge a break in the profiles.*** (See *FIG. A*)
7. Patina and Deco panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
8. After first affixing the two fixed point screws, affix the rivets in a manner moving from nearest the center of the panel to the outside ring. (See *FIG. K*)

Fixing

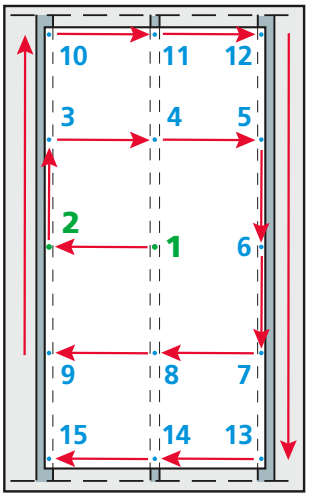
1. The screw specifications for Patina, Solid, Transparent, Deco or Cover must be respected. (See *FIG. G*)
2. Fixing pattern is typically either 16" or 24" (max.) on center horizontally (based upon wood profile spacing) and 16" to 24" on center vertically, depending upon building height, building location, design criteria/ specifications, and panel/fastener location on building.

The screws are inserted using an electric drill with a high quality bit suitable for the type of screw head. AFCC supplied screws have a Torx T20 head. The screws must be inserted perpendicular to the panel surface (FIG. B-2), and must not be over-tightened. Check torque setting frequently during installation of the panels. Overtightening will restrict the panels' freedom of movement that is necessary to accommodate changes in thermal and moisture conditions.

Edge areas on facades and high wind load conditions require closer fixing distances. For soffit applications, the maximum fastener spacing is 16" on center in both directions.

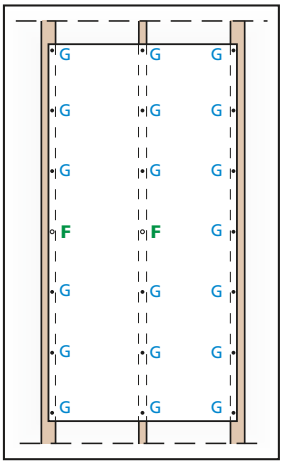
3. Corner rivets to be located at 25 – 100 mm (1" – 4") horizontally and 100 – 150 mm (4" – 6") vertically from each corner of panel. (See *FIG. C*)
4. 15 mm (5/8") clearance is required from the edge of wood profile to screw location.
5. **Screws must be located in the center of each hole in the panel** (*FIG. B-1*). **They must be perpendicular to panel surface** (*FIG. B-2*), **and not be over-tightened, which would prevent the panel's normal movement.**
6. Two **fixed points** are required per panel. (*FIGS. E & F*)

   Fixed points (for attachment to vertical profiles) are:
   - Always the same height in each panel.
   - As close to center of panel as possible, and then either the next adjacent point to the left ***or*** right. Be consistent in panel-to-panel location (center and left ***or*** center and right, so fixed points are at the same level horizontally for attachment to vertical profiles).
   - No two fixed points on one panel can be on the same profile, and no two fixed points on two adjacent panels can be on the same profile.
   - For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated in *DETAILS – TYPICAL VERTICAL PANEL JOINT* on page 4).

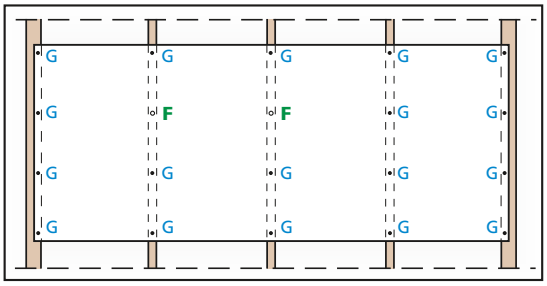


◀ *FIG. K — Fixing sequence Attach fixed points first.*

▼ *FIG. E — Vertical installation on vertical profiles*



▼ *FIG. F — Horizontal installation on vertical profiles*



If there is no perfectly centered row, the Fixed points go one row up, as shown.

Fixing *(continued)*

7. Aluminum joint closures can be installed (maximum thickness of finishing profile to be .8 mm or 21 gauge). Standard practice is to leave the joints open.
8. Remove residue from drilling fixed and gliding holes prior to installing screws.

Fabrication/Maintenance/Storage

See AFCC Fabrication, Maintenance and Storage Guidelines.

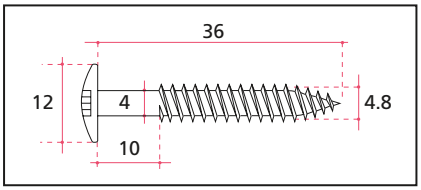


FIG. G — Screw (supplied by AFCC)

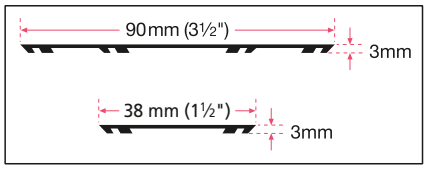
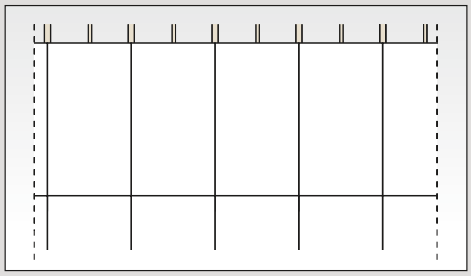


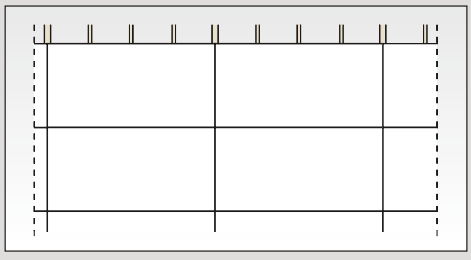
FIG. H — UV-resistant EPDM rubber joint sealing strip with ribs (supplied by AFCC)

Typical Pattern Layout

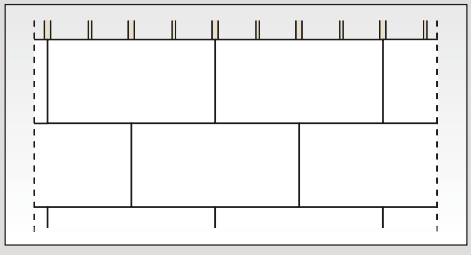
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



Straight pattern with vertical panels



Straight pattern with horizontal panels

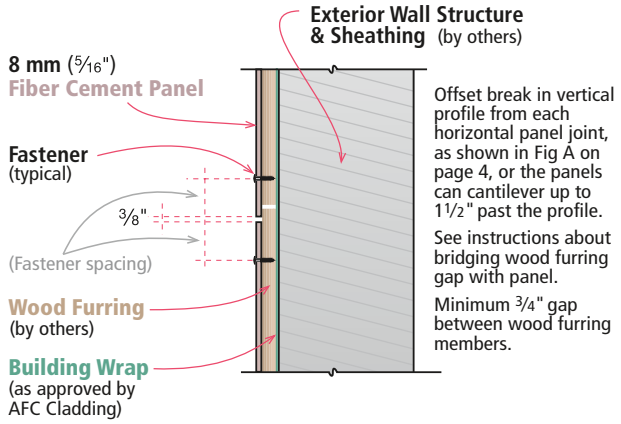


Semi pattern with horizontal panels

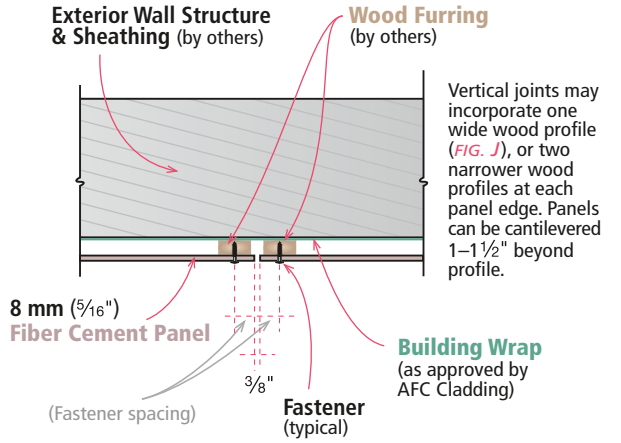
Details

See AFCC Standard Details for detailing requirements in architectural drawing format.

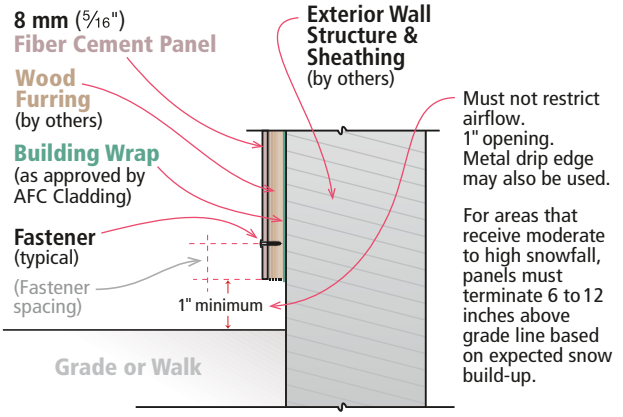
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



Typical Panel Base

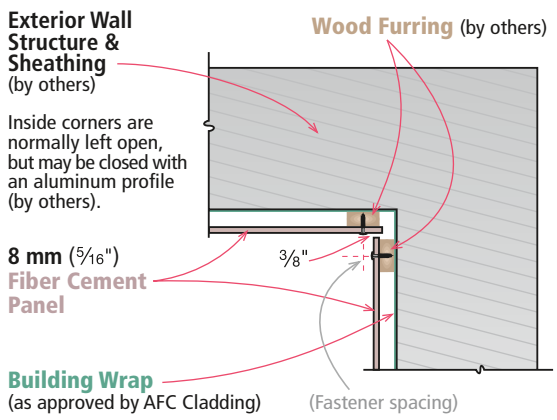


Ventilated Rainscreen Application

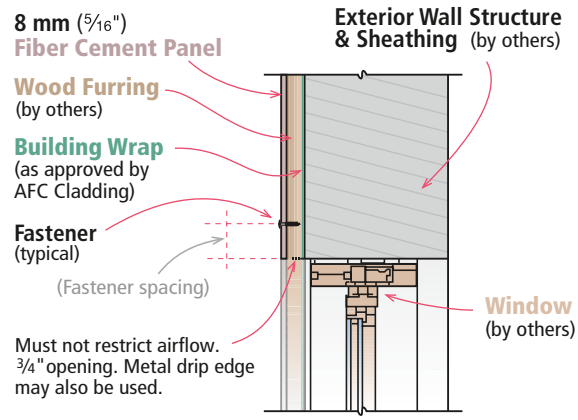
Details *(continued)*

See AFCC Standard Details for detailing requirements in architectural drawing format.

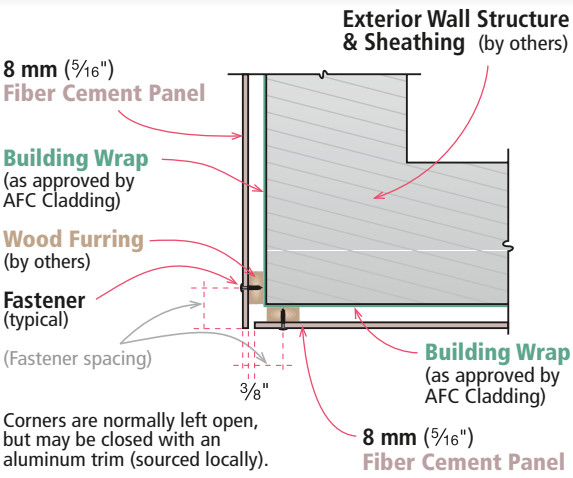
Typical Inside Corner – Plan View



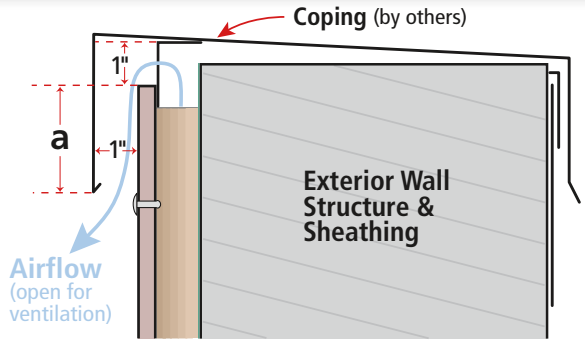
Typical Panel @ Window Head



Typical Outside Corner – Plan View

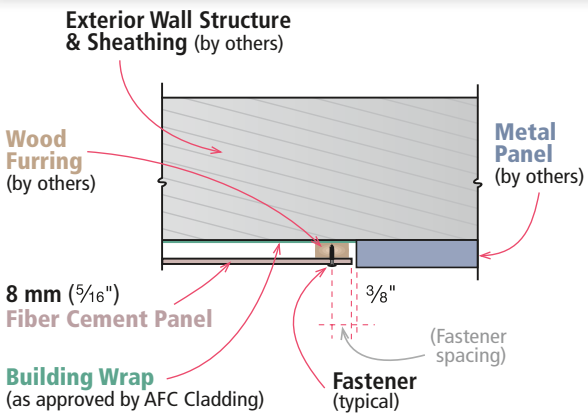


Parapet Coping – Closeup

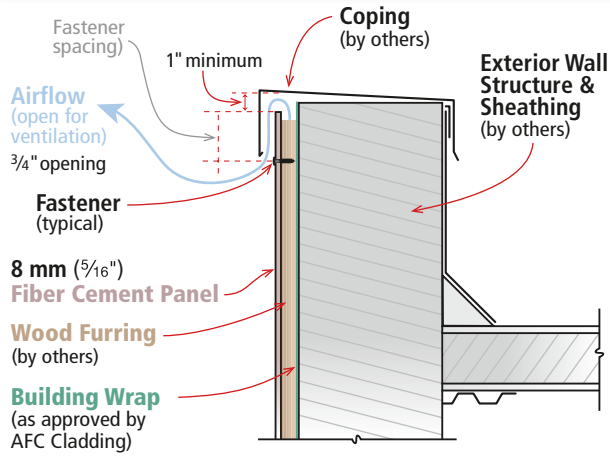


Building Height (ft)	Dimension (a)
0–30	1"
30–50	2"
50–80	3"
80+	4"

Typical Panel End @ Metal Panel



Typical Panel @ Parapet



AFC cladding

Product Sustainability Statement

AFC Cladding is committed to providing the highest quality high density compressed fiber cement panels to the U.S. building markets. In order to do this, we feel it necessary to provide not only high quality products, but sustainable products that can contribute to green (LEED) building projects, which in turn benefit the environment we all live in.

AFC Cladding products currently have a potential contribution to various LEED credits including but not limited to:

Direct Contribution

Materials and Resources:

- BPDO – Environmental Product Declarations

Indirect Contribution

Indoor Environmental Quality:

- Thermal Comfort

Energy and Atmosphere:

- Optimize Energy Performance

One of the most important sustainable attributes is the durability of AFC Cladding panels. With their long lifespan, virtually requiring no refurbishment, AFC Cladding panels can contribute to less replacement of materials and to drastically lower maintenance costs over the useful life of the building.

The Ventilated and Insulated Rainscreen Cladding (VIRSC) system, which is used to affix AFC Cladding panels to the exterior of a structure, offers many benefits and green attributes to the performance of the building envelope. Durability and resistance to moisture and mold build-up are noteworthy benefits. Equally important is its ability to accommodate external insulation.

In addition, AFC Cladding is dedicated to further research and analysis of our products to achieve additional LEED credits, and help further the cause of building sustainable and efficient buildings.

Warranty information available upon request.

Limited Warranty

American Fiber Cement Corporation (AFCC) warrants that its products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship using AFCC's specifications as a standard. Only products which are installed and used in accordance with applicable AFCC instructions and specifications are in any way warranted by AFCC. This warranty is applicable only to claims made in writing and received by AFCC within thirty (30) days after the defect was discovered *and* within ten (10) years after the date of the shipment of the product by AFCC. All other claims are waived. If a claim is made, you must allow reasonable investigation of the product you claim is defective and you must supply samples that adequately demonstrate the problem you claim for testing by AFCC.

AFCC DISCLAIMS ALL IMPLIED WARRANTIES INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THIS LIMITED WARRANTY PROVIDES YOUR EXCLUSIVE REMEDY AS A PURCHASER OF AFCC PRODUCTS. THIS LIMITED WARRANTY MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF AFCC. WITHOUT AN EXPRESS, WRITTEN AUTHORIZATION FROM AFCC, NO RETAILER OR DISTRIBUTOR OF AFCC PRODUCTS HAS THE AUTHORITY TO MODIFY OR AMEND THIS LIMITED WARRANTY.

Limitation of Liability

This limited warranty is your sole and exclusive remedy. It is expressly understood and agreed that the limit of liability will be, at AFCC's option, repair, resupply of a like quantity of non-defective product, or refund of purchase price of the material. All labor and service charges which may be incurred with respect to either the original or replacement product are excluded. AFCC shall have no liability except where the claim results solely from breach of AFCC's limited warranty.

AFCC SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. FURTHERMORE, AFCC SHALL NOT BE LIABLE FOR DAMAGE TO THE PROPERTY TO WHICH THE PRODUCT IS APPLIED OR ITS CONTENTS, LOSS OF TIME, PROFITS, OR ANY INCONVENIENCE ARISING OUT OF ANY BREACH OF THIS LIMITED WARRANTY OR OBLIGATIONS UNDER THIS LIMITED WARRANTY. AFCC SHALL NOT BE LIABLE FOR ANY DAMAGES WHICH ARE BASED UPON NEGLIGENCE, BREACH OF WARRANTY, STRICT LIABILITY, OR ANY OTHER THEORY EXCEPT THE LIMITED WARRANTY SET FORTH ABOVE. INCIDENTAL AND CONSEQUENTIAL DAMAGES SHALL NOT BE RECOVERABLE EVEN IF THE REPLACEMENT REMEDY FAILS OF ITS PURPOSE OR FOR ANY OTHER REASON.

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afc cladding

Architectural Panels

SUSTAINABLE SOLUTIONS

Fabrication, Maintenance & Jobsite Storage Guidelines[1]

American Fiber Cement Corporation

1 These guidelines show how to manage Cover, Deco, Minerit HD, Patina, Solid and Transparent on-site. This includes proper storage, handling, fabrication, edge sealing and edge painting. Installation guidelines for these product lines can be found at www.americanfibercement.com.

AIA Continuing Education Provider

Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.

After installation

Annual Inspection

Normally, façade boards do not require any maintenance. Weathering, however, may influence the appearance of the façade. Therefore, an annual inspection of the ventilation gaps, joints and fixings is a good idea. Detection and repair of possible damage ensures a prolonged lifespan for the façade.

Cleaning

AFCC façade boards can be cleaned with cold or lukewarm water with the addition, if necessary, of a mild household cleaning agent not containing solvents. Rinse with plenty of clean water until the façade boards are perfectly clean. Before cleaning full scale, it is recommended to test the chosen cleaning method on a smaller area, to ensure it works and does not damage the surface of the boards.

High-Pressure Cleaning

Warning! High-pressure cleaning is a severe treatment for a fiber cement façade. Exaggerated or incorrect use of a high-pressure cleaner may damage the surface.

Moss and Algae

Moss and algae growth can be removed with common agents available on the market. Care should be taken to ensure that the cleaning agent does not cause damage to the surface of the AFCC façade boards.

Confirm the compatibility of your cleaning agent with your cleaning agent supplier, and ensure it is applied according to the supplier's instructions. It is advised that before conducting a large-scale application, a test is carried out on a small, inconspicuous area to ensure that the cleaning agent has no effect on the color of AFCC façade boards.

Efflorescence

Efflorescence is a naturally occurring, white, powdery deposit that can appear on cement-based building materials (including bricks, cement walls, grout, and fiber cement). It is the result of a process in which moisture draws salt crystals to the surface, evaporates, and leaves a chalky substance behind. Efflorescence occurs when all three of the following conditions exist:

1. Water-soluble salts are present in the building material.
2. There is enough moisture in the wall to turn the salts into a soluble solution.
3. There is a path for the soluble salts to get to the surface.

Efflorescence may also be a sign of water ingress behind the façade. Make certain that all openings are properly covered and there is no water intrusion due to over-driven nails.

While some efflorescence may weather away naturally on its own, it is best to take steps to treat it. Efflorescence can be removed with household white vinegar and water. For most cases of efflorescence, Step 1 – 3 works well. But for substantial deposits of efflorescence go to Step 4.

For best results, follow these cleaning instructions:

1. Protect areas that are not to be cleaned. Rinse all plants and vegetation around the façade with water before and after application of the vinegar.
2. Generously coat the entire surface area with vinegar. Allow the solution to sit on the surface for 10 minutes.
3. Rinse the treated area thoroughly with water from the top down and allow the area to air dry.
4. For extra tough efflorescence: Use a 10% acetic acid solution and apply to the affected area with a cotton cloth. A light scrubbing with the cotton cloth may be required. After about 20 seconds rinse with water.

On-site

Cleaning of boards after cutting and drilling

It is important to immediately remove dust caused by cutting and drilling from the front and rear of the boards with a soft brush/duster or a vacuum cleaner, as it otherwise might damage the boards. Ensure that the boards are properly cleaned before installation, and if necessary use clean water or water with a mild detergent and a soft sponge or brush to remove dirt and dust from the surface. Thereafter, wipe the boards with a damp cloth. It may also be necessary to wash the surface after installation if the building site conditions have been unfavorable. This is done with lots of clean water or water with a mild detergent and a soft sponge or brush and finally wiping the boards with a damp cloth.

Removal of calcium-based residues

Calcium carbonate residue may occasionally be seen on the board surface. This can be difficult to remove with water or even with detergents because it does not dissolve in water. For cleaning purposes 10% acetic acid (CH_3COOH) solution is used to dissolve the calcium compounds.

Note! Carefully observe safety precautions (MSDS) when working with acetic acid. R-phrase R36/R38 is valid: "Irritating to eyes, respiratory system and skin". Use proper clothing, nitrile rubber gloves, eye protection goggles and approved respirator (filter A, E or A/E).

Carry out the mixing outdoors.

Apply the diluted 10% acetic acid solution evenly with a spray can to the surface of the stained board. Leave it to react for a few minutes. Do not allow the solution to dry, but rinse with lots of clean water. Repeat the process if necessary and rinse with water afterwards.

Note! Do not execute the cleaning process with acetic acid in direct sunlight or on hot surfaces. This might create permanent stains. Neighboring areas such as windows and glass must also be cleaned.

Cleaning of neighboring areas

Windows and glass in particular, but also other adjacent areas, must be kept clean during the façade board installation and, if necessary, protected with plastic film. Alkaline leaching from cement bonded materials (dust from cutting or drilling holes in structural concrete, etc.) is prone to damaging glass and other materials. Therefore, frequent cleaning during and after the construction period is needed.

Surface damages and scratches

Damages and scratches should be avoided by lifting the boards off the pallet and handling them carefully during installation. Scratches might leave white streaks on the surface which will turn dark when exposed to rain, because the board absorbs water through the scratch. Repair paint is not available. The only way to prevent dark stripes or spots is to carefully apply clear AFCC Edge Sealer onto the scratch with a thin brush (does not apply to Patina design line boards). In any case the dark area will diminish after 6 to 12 months, because of the carbonation reactions in the cement matrix of the board.

Behavior in wet conditions

Since the boards are made of Portland cement, their color may turn darker when exposed to rain if the board absorbs moisture through holes, scratches or insufficiently sealed edges. This is natural behavior for any cement-based product and it does not affect the integrity or long-term durability of the board. The original color is restored as soon as the boards dry out. The darkening will show after heavy rainfall for the first months after installation. It will gradually reduce within 6 to 12 months, because the cement based matrix reacts with carbon dioxide from the atmosphere — carbonation — and thereby reduces water penetration.

Cutting instructions for using a circular saw for a straight cut

Summary

When making 'straight' cuts on AFCC boards, a circular diamond blade saw should be used in order to achieve excellent results. AFCC offers 7¼" Diamond Saw blades for purchase.

Equipment

1. Wide diameter, Circular Diamond Saw Blade
2. Solid and stable cutting surface (dust free) with several pieces of 1½" framing lumber used to elevate AFCC boards above the table height. Clamping the framing lumber supports and the board to the work surface will help reduce vibration of the piece being cut. Be careful not to damage the board surface with the clamp.
3. Sand paper: 60–100 grit

Set-up

1. Use several pieces of framing lumber to provide support of the board on both sides of the cut line sufficient to keep the board from binding as the cut is made (for cuts in the center section of the panel).
2. Place the board, face side *DOWN* on top of the framing lumber with pieces of the framing lumber on either side of the cut line, no more than 2" on either side of cut. For cuts at either end of the panel, do not extend panel more than 2" beyond the supporting lumber. Make sure the panel is gently placed onto the surface with no sliding. Once placed, carefully clamp the panel.
3. Make provisions for capturing dust that will be generated by the saw kerf.

Cutting

1. When cutting with the diamond blade, turn down the turn rate of the saw and lower the feed rate to reduce heat (heat can cause non-linear cuts and can burn the fiber cement).
2. Set saw blade to be perpendicular to the cut surface.
3. Be certain that the framing lumber completely supports the drop piece to prevent break-off at the end of the cut.
4. After the cut is complete, use sanding block along the edge to remove any burrs that may have lifted during cutting. Angle the sanding block away from the front face of the panel.
5. Once complete, wipe off any dust seen on the backside of the panel with a microfiber cloth. Then flip the panel face side up and remove any dust that may be on the surface of the panel.
6. For Cover, Solid, and Transparent, Edge Sealer must be applied to the field cut edge. See page 6.
   For Deco, the field cut edge must be painted. See page 7.

Drilling

- Fixed Point Hole Size = 21/64" (rivets) or 13/64" (screws)
- Gliding Point Hole Size = 7/16" (rivets) or 5/16" (screws)
- AFCC offers long lasting carbide drill bits.
- See AFCC Installation Guidelines for correct fixed/gliding point hole placement, edge distance restrictions, and maximum on center spacing.

1. Place fiber cement panel face up on top of the framing lumber.
2. Measure and mark hole locations.
3. Drill holes with the correct sized drill bit.
4. Remove excess dust with a microfiber cloth or blow the dust off.

Once done cutting, drilling, and sealing (if necessary), store the panels laying flat in a waterproof environment until being installed on the wall.

AFCC Offered Saw Blade

Recommended Turn Rate: 3200-3300 rpm

Cutting instructions for when a straight cut using a circular saw is not possible.

Summary

When making 'non-straight' cuts on boards (for example, cutting a scribed line to match an irregular floor or window ledge) readily available tools can be used to achieve excellent results by using some special techniques.

Equipment

1. Construction grade jig (sabre) saw such as Bosch JS 365 with speed control settings and variable speed trigger
2. Carbide grit blade (30 grit) similar to Vermont American item #30004
3. Painter's masking tape similar to 3M Blue
4. Solid and stable cutting surface (dust free) with several pieces of 1½" framing lumber used to elevate boards above the table height. Clamping the framing lumber supports and the board to the work surface will help reduce vibration of the piece being cut. Be careful not to damage the surface with the clamp.
5. Sand paper: 60–100 grit

Set-up

1. Use several pieces of framing lumber to provide support of the board on both sides of the cut line sufficient to keep the board from binding as the cut is made (for cuts in the center section of the panel).
2. Place the board, face side UP on top of the framing lumber with pieces of the framing lumber on either side of the cut line, no more than 2" on either side of cut. For cuts at either end of the panel, do not extend panel more than 2" beyond the supporting lumber.
3. Make provision for capturing dust that will be generated by the 3/16" saw kerf.
4. Apply strips of painter's masking tape along both sides of the cut line (one strip for end cuts) sufficiently wide to protect the board's face from the jig saw's table/foot. Do not cover the cut line, as the tape will interfere with the cutting action of the blade.

Cutting

1. Set the jig saw speed control to slow/medium #3 on the Bosch JS 365 (higher speeds will tend to cause tearing of the top surface).
2. Set saw blade to be perpendicular to the cut surface.
3. Cut with even, forward pressure at a rate of approximately 3 feet per minute.
4. Be certain that the framing lumber completely supports the drop piece to prevent break off at the end of the cut.

AFCC Fabrication

AFCC does not recommend fabricating the entire project on-site. AFCC offers state-of-the-art fabrication using numerical control saws for cutting and numerical control routers for drilling. The precision and finish cannot be matched fabricating on-site. With the use of shop drawings, the panels can then be delivered to the jobsite sorted by elevation with panel ID tags on the back, marking their exact location on the wall.

AFCC Fabrication Equipment

Finishing of edges with Universal Edge Sealer

Product type

Solvent based clear Edge Sealer for Solid, Transparent and Cover.

Usage

Universal Edge Sealer must always be used to protect all jobsite cut EDGES of Solid, Transparent and Cover fiber cement boards.

Factory-cut edges are always sealed. Only Universal Edge Sealer should be used to protect the edges of facade boards.

Surface preparation

After cutting, edges must be treated immediately with Universal Edge Sealer. Board must be dry. Edges should be beveled with fine grade sand paper and must be thoroughly cleaned from dust and dirt before applying the Edge Sealer.

Application conditions

Board temperature and ambient temperature should be 40° to 85° F (+5° to +30°C) and relative humidity < 85%. Process temperature must be minimum 40°F (+5°C).

Application

1. Shake the Edge Sealer can well before filling the applicator with Edge Sealer. Shake the filled applicator also before use if applicator unused for a while.
2. Remove the protective cap.
3. Position the applicator horizontally.
4. Place the sponge parallel to the board edge and run twice along the edge with a moderate pressure.

   Note! Carefully prevent the Edge Sealer from flowing onto the front side of the board. Excess Edge Sealer on front side of the board must be wiped off immediately with a clean cloth.
5. Check that the liquid has been applied over the entire edge surface.
6. Close the applicator with the cap when interrupting the job.
7. Replace the sponge when necessary. The boards can be handled 2 minutes after application of the Edge Sealer.

Cleaning

No cleaning of equipment necessary. Unintended spillage can be cleaned with white spirit.

Storage

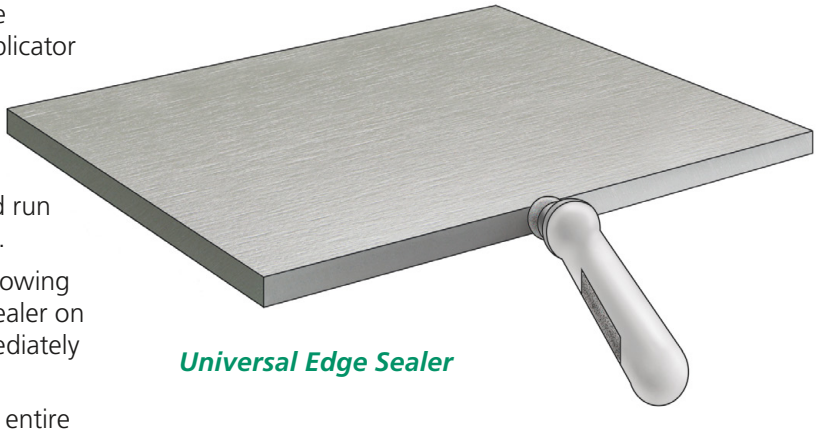
Always keep the containers tightly closed and avoid direct exposure to sunlight. Store in a dry, cool and well-ventilated place. Keep away from sources of ignition. No smoking. Shelf life is 6 months in unopened original packaging at cool temperatures. Can be stored at temperatures from -5° to 85°F (-20° to +30°C).

Disposal

Disposal of the Edge Sealer must be in compliance with local and national regulations. Please refer to Material Safety Data Sheet.

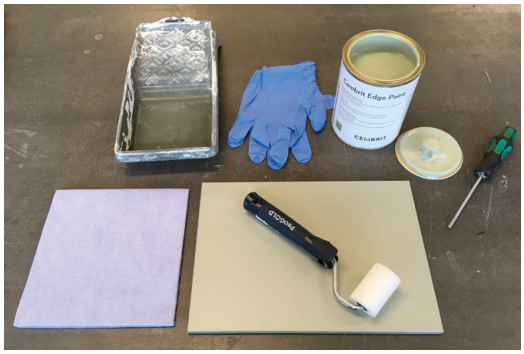
Safety measures

Please refer to Material Safety Data Sheet.

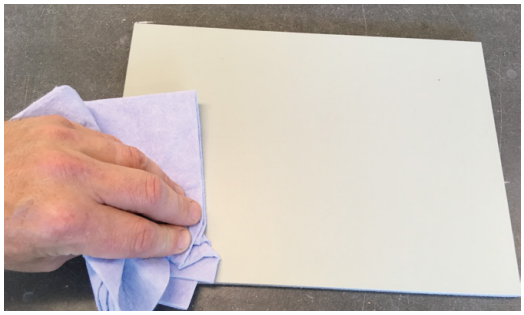


Universal Edge Sealer

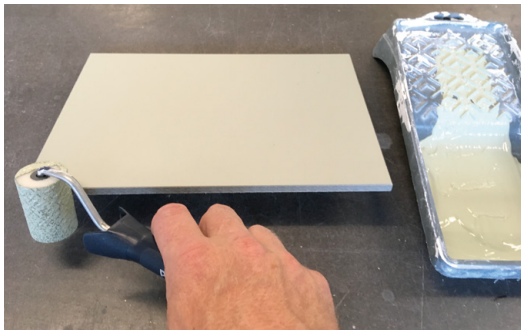
Edge Paint — Deco



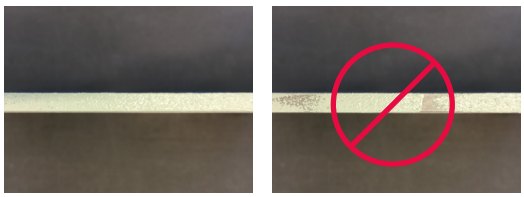
Before you start edge painting Deco, be sure you have all necessary things to perform the task and make sure to cover the area before painting.



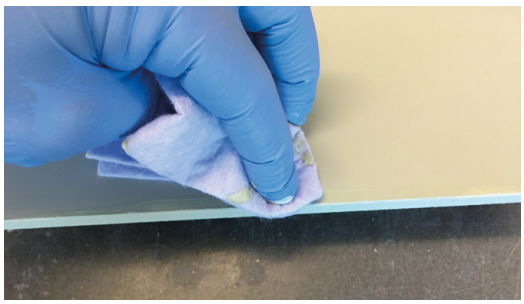
Before you start, the edge and the board surfaces must be wiped off to remove any dirt or dust.



Apply an appropriate amount of paint on the roller so that the sponge is saturated. Apply the paint without pressing too hard and ensure to do it slowly.

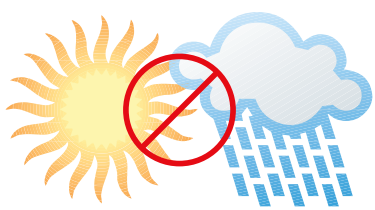


Make sure that the entire edge is covered with Edge Paint.



Excess Edge Paint must be removed with a clean cloth immediately after the edge is painted. If this is not done, it will be difficult to remove and leave visible marks. Never stack Deco boards that have just been edge painted.

The Edge Paint typically drys in 5 to 10 minutes.



Do not edge paint in direct sunlight or rain. Board and air temperature should be between 40° and 85°F (+5° and +30°C), optimal 70°F (+20°C). Relative humidity below 80%.

Storage and Handling of Flat Sheets

Flat Sheets

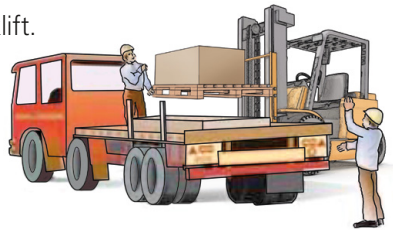
The following flat sheets are covered by these handling and working instructions:

Cover, Deco, Solid, Patina, Patina Design Line, Minerit HD, Transparent

For product data of the various panels, please refer to the product information leaflets.

Storage and Handling

Remove panels using a forklift.

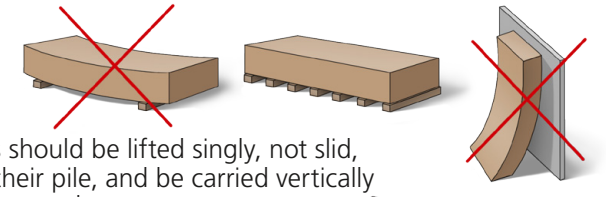


Note! The crating and plastic wrapping that the panels are shipped in are not sufficient protection from weather. **Additional protection is required.**

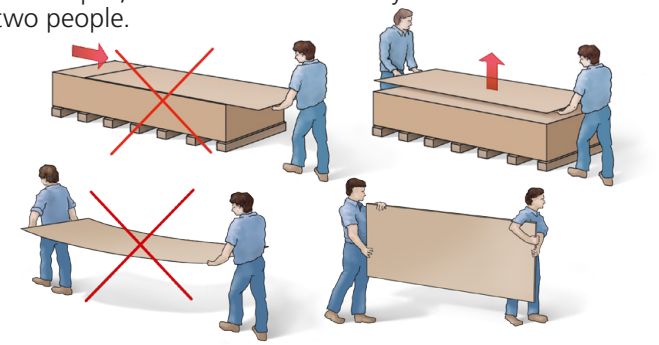
The sheets must be stored in a **dry, ventilated space**. If the pallets are stored outside when they arrive at the building site, the plastic cover should be removed and replaced with a tarpaulin. It is very important that there is ventilation all around the tarpaulin and also on top of the pallet under the tarpaulin. This reduces condensation. If the sheets do become wet in the packing, all packaging must be removed and the sheets must be wiped dry and placed in a way that they can totally dry.

If the facade boards are stored more than 2-3 weeks on site, the pallets should be kept under a roof to ensure dry and ventilated conditions.

The sheets must be stacked horizontally on a flat surface. The sheets must always be sufficiently supported so that they don't sag. Only two pallets can be stacked on top of one another. Make sure they are positioned so they stand securely and stable.



Panels should be lifted singly, not slid, from their pile, and be carried vertically by two people.



Limited Warranty

American Fiber Cement Corporation warrants that the products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship using AFCC specifications as the standard. Only products which are stored, installed, and used for purposes in accordance with applicable AFCC instructions and specifications are in any way warranted by AFCC. Prior to installation, purchaser shall inspect all panels for any visible faults or deviations from AFCC product specifications. This warranty is applicable only to claims made in writing and received by AFCC with in sixty (60) days after the defect was discovered and within ten (10) years after the date of shipment of the product by AFCC. All other claims are waived. If a claim is made, you must allow reasonable investigation of the product you claim is defective and you must supply samples that adequately demonstrate the problem you claim for testing by AFCC.

AFCC DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THIS LIMITED WARRANTY PROVIDES YOUR EXCLUSIVE REMEDY AS A PURCHASER AND/OR OWNER OF AFCC PRODUCTS. THIS LIMITED WARRANTY MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF AFCC. WITHOUT AN EXPRESS, WRITTEN AUTHORIZATION FROM AFCC, NO RETAILER OR DISTRIBUTOR OF AFCC PRODUCTS HAS THE AUTHORITY TO MODIFY OR AMEND THIS LIMITED WARRANTY.

Limitation of Liability

This limited warranty is your sole and exclusive remedy. It is expressly understood and agreed that the limit of liability will be, at AFCC option, repair, re-supply of a like quantity of non-defective product, or refund of the purchase price of the material. All labor and service charges which may be incurred with respect to either the original or replacement product are excluded. AFCC shall not be liable for incidental or consequential damages, for damage to the property to which the product is applied or its contents, loss of time, profits, or any inconvenience arising out of any breach of this limited warranty or obligations under this limited warranty. AFCC shall not be liable for any damages which are based upon negligence, breach of warranty, strict liability, or any other theory except as provided in the limited warranty set forth above. This limitation of liability shall apply to any replacement product or remedy if it fails of its purpose or for any other reason.

AFCC SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES. FURTHERMORE, AFCC THIS LIMITED WARRANTY COVERS THE STRUCTURAL OR PHYSICAL DEFECTS OF THE BASE MATERIAL ONLY. ALTERATIONS OF THE SURFACE OR DAMAGE DUE TO EXTERNAL INFLUENCES SUCH AS MECHANICAL LOADS AND DEFECTS FROM USE OF IMPROPER ACCESSORIES ARE EXPRESSLY EXCLUDED FROM THIS WARRANTY. MINERIT HD/RAW IS A NON-COATED, NON-PIGMENTED BOARD. COLOR VARIATION FROM BOARD TO BOARD IS NORMAL AND TO BE EXPECTED AND IS EXPRESSLY EXCLUDED FROM THIS WARRANTY. CHANGES IN COLOR/EFFLORESCENCE ON THE BOARDS (E.G. FADING) DUE TO NORMAL WEATHERING ARE PART OF THE AGING PROCESS OF CEMENT BASED MATERIALS AND ARE ALSO EXPRESSLY EXCLUDED FROM THIS WARRANTY.

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ICC-ES Evaluation Report
ESR-3863

Reissued July 2022

This report is subject to renewal July 2023.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

CEMBRIT HOLDINGS A/S

EVALUATION SUBJECT:

CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012, and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-3863 LABC and LARC Supplement.

Properties evaluated:

- Structural
- Surface burning Characteristics
- Non-combustibility
- Physical characteristics

1.1 Evaluation to the following green code(s) and/or standards:

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

The Cembrit Fiber-Cement Façade Panel System is used as an exterior wall covering system. The façade panel system is also used for interior applications as part of a Class A interior wall finish. The façade panel system may be installed on buildings of all construction types under the IBC and on buildings constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

The Cembrit Fiber-Cement Façade Panel system is an open-jointed veneer wall covering system that allows air to circulate between the panels and the exterior face of the approved water-resistive barrier. The fiber cement panels are mounted with visible fasteners onto extruded aluminum members. When used as an exterior wall covering, the façade panel system must be installed over a water-resistive barrier. The Cembrit Fiber-Cement Façade Panel System is shown in Figure 1.

The attributes of the Cembrit Fiber-Cement Façade Panel System have been verified as conforming to the provisions of (i) CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) ICC 700-2020 Sections 601.7 and 11.601.7, ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Section 601.7 (site-applied finishing materials). Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. The code may provide supplemental information as guidance.

3.2 Materials:

3.2.1 Cembrit Panels: The Cembrit fiber cement panels are manufactured from Portland cement, additives, reinforcing fibers, and comply with ASTM C1186 as Type A, minimum Grade IV. The panels have a Class A index when tested in accordance with ASTM E84 and are classified as non-combustible when tested in accordance with ASTM E136. The panels are available in lengths of approximately 98 inches and 120 inches, (the actual lengths are 2500 mm and 3050 mm), a width of approximately 49.2 inches (actually 1250 mm) and thicknesses of approximately 0.31 inch (actually 8 mm). Both faces of the panels are coated with either an opaque or translucent material having an acrylic base. The panels are available under the trade names of Cembrit Patina Original, Cembrit Patina Inline,

Cembrit Patina Rough, Cembrit Patina Signature, and Cembrit Deco.

3.2.2 Fasteners:

The visible fastening system is used with the 0.31-inch-thick (8 mm) panels and consists of BB-LF 4.8 x 20 x 16 stainless steel rivets supplied with the system. The aluminum Hat-shaped structural profiles are fastened to steel studs with two EJOT JT3-6-5.5 x 35-millimeter (1.378 inches) long E16 self-drilling stainless steel screws per steel stud intersection. The aluminum Z-shaped structural profiles are fastened to the aluminum hat-profiles with one EJOT JT4-6-5.5 x 22-millimeter (0.866 inch) long stainless steel screws per intersection. The maximum installed weight for the 0.31-inch-thick (8 mm) Patina Original and Patina Rough panels with visible fastening system is 3.3 psf (16.1 kg/m^2). Connection of the visible fastening system to the underlying wall assembly must be designed in accordance with Section 4.2.

3.2.3 Attachment Systems: The Cembrit fiber-cement façade panels are supported by an attachment system composed of extruded Z-shaped and Hat-shaped structural profiles made of ASTM B221, 6005a-T61, alloy aluminum manufactured in accordance with the specifications for the Cembrit Fiber-Cement Façade Panel System contained in the approved manufacturer's quality control manual. The Z-shaped structural profiles are 0.098 inch (2.5 mm) in thickness, 0.882 inch (22.4 mm) in depth, and have $1^1/_4$-inch-long (31.75 mm) legs. The Hat-shaped structural profiles are 0.098 inch (2.5 mm) in thickness, $^1/_2$ inch (12.7 mm) in depth, and have $1^1/_2$-inch-long (38.1 mm) legs with 1-inch-long (25.4 mm) hat.

3.2.4 Water-resistive Barrier: Water-resistive barriers used with the Cembrit façade panel system must comply with 2021 and 2018 IBC Section 1403.2 [2015, 2012, 2009 and 2006 IBC Section 1404.2] or IRC Section R703.2, as applicable, or be recognized in an ICC-ES evaluation report under the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).

4.0 DESIGN AND INSTALLATION

4.1 General:

The Cembrit Fiber-Cement Façade Panel System (panels and attachment system) must be installed over existing wall assemblies capable of supporting the imposed loads including, but not limited to, transverse wind loads. The system must be securely connected to the supporting wall with fasteners that are compatible with the wall assembly substrate.

4.2 Design:

The allowable loads for the Cembrit Fiber-Cement Façade Panel System, given in Table 1, and the wind-load capacity of the underlying wall and substrate must be equal to or exceed the design uniform transverse wind loads determined in accordance with Chapter 16 of the IBC or Section R301.2.1 of the IRC, as applicable. The attachment system connections used to connect the Cembrit panel attachment system to the underlying wall or substrate must be designed by a design professional, and the details must be submitted to the code official for approval. The allowable loads must be reduced to the capacity of the attachment system connections if these are less than the values in Table 1. All fasteners used to connect the attachment system to exterior walls must be corrosion-resistant.

4.3 Installation:

4.3.1 General: The Cembrit Fiber-cement Façade Panel System must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the manufacturer's published installation instructions must be available on the jobsite at all times during construction.

The Cembrit Façade Panel System must be installed over wall assemblies complying with 2021 and 2018 IBC Section 1402.3 and 2015 and 2012 IBC Section 1403.3, using the attachment systems described in Section 3.2.2. Exterior wall assemblies, on which the Cembrit Façade System is to be installed, must include flashing, a water-resistive barrier, a means of draining water, and protection against condensation in accordance with 2021 and 2018 IBC Section 1402.2 and 2015 and 2012 IBC Section 1403.2. The panels may be cut to accommodate various architectural designs. The system boundaries at the top, bottom, and around building openings must be finished in accordance with the manufacturer's published installation instructions. A ventilation path must be maintained to allow air to flow into, out of, and within the cavity between the water-resistive barrier and the Cembrit panels.

4.3.2 Visible Fastening System: The Hat-shaped structural profiles, spaced at a maximum on-center spacing of $22^1/_2$ inches (571.5 mm), must be installed horizontally by using two EJOT JT3-6-5.5 by 35-millimeter (1.378 inches) long E16 self-drilling stainless steel screws per steel stud intersection, which is attached to the underlying wall or substrate complying with Section 4.2 of this evaluation report. The Z-shaped structural profiles, spaced at a maximum on-center spacing of 14 inches (355.6 mm), must be installed perpendicular to the Hat-shaped profiles by using one EJOT JT4-6-5.5 by 22-millimeter (0.866 inch) long self-drilling stainless steel screws per intersection. The panels must be fastened at a maximum horizontal on-center spacing of 14 inches (355.6 mm) and a maximum vertical on-center spacing of 18 inches (457.2 mm) onto the Z-shaped profiles with a minimum of one fastener per 1.75 square feet of panel (0.163 m^2) of panel, using the $^3/_{16}$-inch-diameter (4.76 mm), 4-by-19/K15 cladding rivets, provided. The maximum panel overhang for the visible fastening system is 3 inches (76.2 mm) and the maximum spacing between panels is $^3/_8$ inch (9.5 mm). The panels must be installed with a minimum rivet edge distance of 3 inches (76.2 mm).

4.3.3 Type I, II, II or IV (Noncombustible) Construction: When installed as in accordance with Section 5.7 and Section 5.8 of this evaluation report, the nominally 8-millimeter (0.315 inch) Cembrit Patina Original, Cembrit Patina Inline, Cembrit Patina Rough, Cembrit Patina Signature or Cembrit Deco panels may be used on the exterior face of exterior walls of buildings required to be of Type I, II, III, or IV construction.

5.0 CONDITIONS OF USE

The Cembrit fiber-cement wall cladding described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.

5.2 The Cembrit Fiber-Cement Façade Panel System must be installed by qualified installers recognized by Cembrit Holdings A/S.

5.3 The allowable wind pressures for the Cembrit Fiber-Cement Façade Panel System shown in Table 1,

the capacity of the supporting wall or substrate, and the capacity of the connections used to attach the system to the wall must be equal to, or exceed, the design wind pressure.

5.4 Drawings, design details, and calculations verifying the adequacy of the fastening to connect the Cembrit panel attachment system to the supporting wall must be submitted to the code official for approval. These must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the system is to be installed.

5.5 When installed on exterior walls, the Cembrit Fiber-Cement Façade Panel System must be installed only on exterior walls incorporating sheathing capable of resisting positive and negative design wind pressures. The sheathing must be covered with a water-resistive barrier, as required by the applicable code, and a ventilation path must be maintained between the water-resistive barrier and the panels.

5.6 When installed with spaces between adjacent panels, on interior walls required to have a Class A finish, the Cembrit Fiber-Cement Façade Panels and System must be installed over a substrate having a Class A finish.

5.7 When installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Section 1403.5 of the 2012 IBC, the fiber cement panel system is limited to 40 feet (12 192 mm) or less in height above the grade plane.

5.8 When installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Exception 2 to Section 1402.5 of the 2018 IBC and Section 1403.5 of the 2015 IBC, the fiber cement panel system is not limited to 40 feet (12 192 mm) in height above the grade plane.

5.9 The Cembrit Fiber-Cement Façade Panel System is manufactured in Nyergesújfalu, Hungary, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Siding Used as Exterior Wall Siding (AC90), dated October 2020 (Editorially revised December 2020).

6.2 Reports of testing in accordance with ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.

6.3 Reports of testing in accordance with ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C

7.0 IDENTIFICATION

7.1 Product labeling shall include, the name of the report holder or listee, and the ICC-ES mark of conformity. The listing or evaluation report number (ICC-ES ESR-3863) may be used in lieu of the mark of conformity. The Cembrit panels and accessory components are labeled with the name of the manufacturer (Cembrit Holding A/S), the product name (Cemrit Patina Original, Cembrit Patina Inline, Cembrit Patina Rough, Cembrit Patina Signature or Cembrit Deco), the color code and the thickness of the boards, the evaluation report number (ESR-3863), and the statement "conforms to ASTM C1186."

7.2 CEMBRIT HOLDINGS A/S
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TABLE 1—ALLOWABLE TRANSVERSE WIND LOAD FOR USE OF THE CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

SYSTEM TYPE, NOMINAL PANEL THICKNESS	ACTUAL THICKNESS	ALLOWABLE TRANSVERSE WIND LOAD[1]	
		Positive	Negative
Visible fastener attachment system, 8-millimeter ($^5/_{16}$-inch) panel	8 mm	70 psf	65 psf

For **SI:** 1 inch = 25.4 mm, 1 psf = 0.0479 kPa.

[1]Maximum allowable positive and negative transverse wind loads for use of the panels fastened to the Cembrit panel attachment system. Allowable loads must be reduced to the capacity of the fastening, determined in accordance with Section 4.2, used to connect the Cembrit panel attachment system to the underlying wall or substrate.

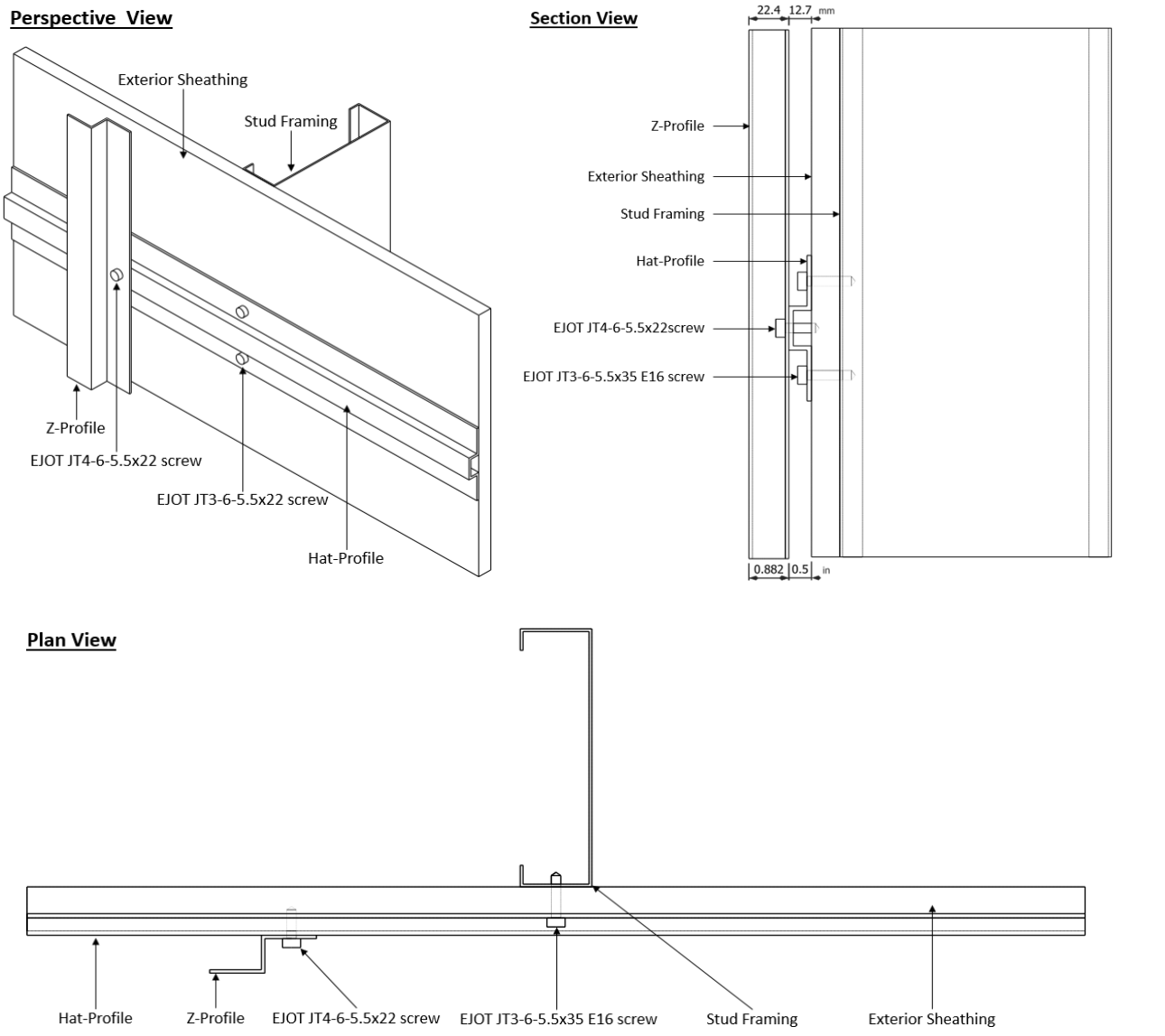

FIGURE 1—CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

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ICC-ES Evaluation Report
ESR-3863

Reissued July 2022

This report is subject to renewal July 2023.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

CEMBRIT HOLDINGS A/S

EVALUATION SUBJECT:

CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, 2012, and 2009 *International Building Code*® (IBC)
- 2021, 2018, 2015, 2012, and 2009 *International Residential Code*® (IRC)
- 2013 *Abu Dhabi International Building Code* (ADIBC)†

†The ADIBC is based on the 2009 IBC. 2009 IBC code sections referenced in this report are the same sections in the ADIBC.

For evaluation for compliance with codes adopted by the Los Angeles Department of Building and Safety (LADBS), see ESR-3863 LABC and LARC Supplement.

Properties evaluated:

- Structural
- Surface burning Characteristics
- Non-combustibility
- Physical characteristics

1.1 Evaluation to the following green code(s) and/or standards:

- 2019 California Green Building Standards Code (CALGreen), Title 24, Part 11
- 2020, 2015, 2012 and 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2015, ICC 700-2012 and ICC 700-2008)

Attributes verified:

See Section 3.1

2.0 USES

The Cembrit Fiber-Cement Façade Panel System is used as an exterior wall covering system. The façade panel system is also used for interior applications as part of a Class A interior wall finish. The façade panel system may be installed on buildings of all construction types under the IBC and on buildings constructed in accordance with the IRC.

3.0 DESCRIPTION

3.1 General:

The Cembrit Fiber-Cement Façade Panel system is an open-jointed veneer wall covering system that allows air to circulate between the panels and the exterior face of the approved water-resistive barrier. The fiber cement panels are mounted with visible fasteners onto extruded aluminum members. When used as an exterior wall covering, the façade panel system must be installed over a water-resistive barrier. The Cembrit Fiber-Cement Façade Panel System is shown in Figure 1.

The attributes of the Cembrit Fiber-Cement Façade Panel System have been verified as conforming to the provisions of (i) CALGreen Sections A4.405.1.3 (prefinished materials) and A5.406.1.2 (reduced maintenance); (ii) ICC 700-2020 Sections 601.7 and 11.601.7, ICC 700-2015 and ICC 700-2012 Sections 601.7, 11.601.7, and 12.1(A).601.7 (site-applied finishing materials); and (iii) ICC 700-2008 Section 601.7 (site-applied finishing materials). Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. The code may provide supplemental information as guidance.

3.2 Materials:

3.2.1 Cembrit Panels: The Cembrit fiber cement panels are manufactured from Portland cement, additives, reinforcing fibers, and comply with ASTM C1186 as Type A, minimum Grade IV. The panels have a Class A index when tested in accordance with ASTM E84 and are classified as non-combustible when tested in accordance with ASTM E136. The panels are available in lengths of approximately 98 inches and 120 inches, (the actual lengths are 2500 mm and 3050 mm), a width of approximately 49.2 inches (actually 1250 mm) and thicknesses of approximately 0.31 inch (actually 8 mm). Both faces of the panels are coated with either an opaque or translucent material having an acrylic base. The panels are available under the trade names of Cembrit Patina Original, Cembrit Patina Inline,

Cembrit Patina Rough, Cembrit Patina Signature, and Cembrit Deco.

3.2.2 Fasteners:

The visible fastening system is used with the 0.31-inch-thick (8 mm) panels and consists of BB-LF 4.8 x 20 x 16 stainless steel rivets supplied with the system. The aluminum Hat-shaped structural profiles are fastened to steel studs with two EJOT JT3-6-5.5 x 35-millimeter (1.378 inches) long E16 self-drilling stainless steel screws per steel stud intersection. The aluminum Z-shaped structural profiles are fastened to the aluminum hat-profiles with one EJOT JT4-6-5.5 x 22-millimeter (0.866 inch) long stainless steel screws per intersection. The maximum installed weight for the 0.31-inch-thick (8 mm) Patina Original and Patina Rough panels with visible fastening system is 3.3 psf (16.1 kg/m^2). Connection of the visible fastening system to the underlying wall assembly must be designed in accordance with Section 4.2.

3.2.3 Attachment Systems: The Cembrit fiber-cement façade panels are supported by an attachment system composed of extruded Z-shaped and Hat-shaped structural profiles made of ASTM B221, 6005a-T61, alloy aluminum manufactured in accordance with the specifications for the Cembrit Fiber-Cement Façade Panel System contained in the approved manufacturer's quality control manual. The Z-shaped structural profiles are 0.098 inch (2.5 mm) in thickness, 0.882 inch (22.4 mm) in depth, and have $1^1/_4$-inch-long (31.75 mm) legs. The Hat-shaped structural profiles are 0.098 inch (2.5 mm) in thickness, $^1/_2$ inch (12.7 mm) in depth, and have $1^1/_2$-inch-long (38.1 mm) legs with 1-inch-long (25.4 mm) hat.

3.2.4 Water-resistive Barrier: Water-resistive barriers used with the Cembrit façade panel system must comply with 2021 and 2018 IBC Section 1403.2 [2015, 2012, 2009 and 2006 IBC Section 1404.2] or IRC Section R703.2, as applicable, or be recognized in an ICC-ES evaluation report under the ICC-ES Acceptance Criteria for Water-resistive Barriers (AC38).

4.0 DESIGN AND INSTALLATION

4.1 General:

The Cembrit Fiber-Cement Façade Panel System (panels and attachment system) must be installed over existing wall assemblies capable of supporting the imposed loads including, but not limited to, transverse wind loads. The system must be securely connected to the supporting wall with fasteners that are compatible with the wall assembly substrate.

4.2 Design:

The allowable loads for the Cembrit Fiber-Cement Façade Panel System, given in Table 1, and the wind-load capacity of the underlying wall and substrate must be equal to or exceed the design uniform transverse wind loads determined in accordance with Chapter 16 of the IBC or Section R301.2.1 of the IRC, as applicable. The attachment system connections used to connect the Cembrit panel attachment system to the underlying wall or substrate must be designed by a design professional, and the details must be submitted to the code official for approval. The allowable loads must be reduced to the capacity of the attachment system connections if these are less than the values in Table 1. All fasteners used to connect the attachment system to exterior walls must be corrosion-resistant.

4.3 Installation:

4.3.1 General: The Cembrit Fiber-cement Façade Panel System must be installed in accordance with the manufacturer's published installation instructions and this report. A copy of the manufacturer's published installation instructions must be available on the jobsite at all times during construction.

The Cembrit Façade Panel System must be installed over wall assemblies complying with 2021 and 2018 IBC Section 1402.3 and 2015 and 2012 IBC Section 1403.3, using the attachment systems described in Section 3.2.2. Exterior wall assemblies, on which the Cembrit Façade System is to be installed, must include flashing, a water-resistive barrier, a means of draining water, and protection against condensation in accordance with 2021 and 2018 IBC Section 1402.2 and 2015 and 2012 IBC Section 1403.2. The panels may be cut to accommodate various architectural designs. The system boundaries at the top, bottom, and around building openings must be finished in accordance with the manufacturer's published installation instructions. A ventilation path must be maintained to allow air to flow into, out of, and within the cavity between the water-resistive barrier and the Cembrit panels.

4.3.2 Visible Fastening System: The Hat-shaped structural profiles, spaced at a maximum on-center spacing of $22^1/_2$ inches (571.5 mm), must be installed horizontally by using two EJOT JT3-6-5.5 by 35-millimeter (1.378 inches) long E16 self-drilling stainless steel screws per steel stud intersection, which is attached to the underlying wall or substrate complying with Section 4.2 of this evaluation report. The Z-shaped structural profiles, spaced at a maximum on-center spacing of 14 inches (355.6 mm), must be installed perpendicular to the Hat-shaped profiles by using one EJOT JT4-6-5.5 by 22-millimeter (0.866 inch) long self-drilling stainless steel screws per intersection. The panels must be fastened at a maximum horizontal on-center spacing of 14 inches (355.6 mm) and a maximum vertical on-center spacing of 18 inches (457.2 mm) onto the Z-shaped profiles with a minimum of one fastener per 1.75 square feet of panel (0.163 m^2) of panel, using the $^3/_{16}$-inch-diameter (4.76 mm), 4-by-19/K15 cladding rivets, provided. The maximum panel overhang for the visible fastening system is 3 inches (76.2 mm) and the maximum spacing between panels is $^3/_8$ inch (9.5 mm). The panels must be installed with a minimum rivet edge distance of 3 inches (76.2 mm).

4.3.3 Type I, II, II or IV (Noncombustible) Construction: When installed as in accordance with Section 5.7 and Section 5.8 of this evaluation report, the nominally 8-millimeter (0.315 inch) Cembrit Patina Original, Cembrit Patina Inline, Cembrit Patina Rough, Cembrit Patina Signature or Cembrit Deco panels may be used on the exterior face of exterior walls of buildings required to be of Type I, II, III, or IV construction.

5.0 CONDITIONS OF USE

The Cembrit fiber-cement wall cladding described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 Installation must comply with this report, the manufacturer's published installation instructions and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.

5.2 The Cembrit Fiber-Cement Façade Panel System must be installed by qualified installers recognized by Cembrit Holdings A/S.

5.3 The allowable wind pressures for the Cembrit Fiber-Cement Façade Panel System shown in Table 1,

the capacity of the supporting wall or substrate, and the capacity of the connections used to attach the system to the wall must be equal to, or exceed, the design wind pressure.

5.4 Drawings, design details, and calculations verifying the adequacy of the fastening to connect the Cembrit panel attachment system to the supporting wall must be submitted to the code official for approval. These must be prepared by a registered design professional when required by the statutes of the jurisdiction in which the system is to be installed.

5.5 When installed on exterior walls, the Cembrit Fiber-Cement Façade Panel System must be installed only on exterior walls incorporating sheathing capable of resisting positive and negative design wind pressures. The sheathing must be covered with a water-resistive barrier, as required by the applicable code, and a ventilation path must be maintained between the water-resistive barrier and the panels.

5.6 When installed with spaces between adjacent panels, on interior walls required to have a Class A finish, the Cembrit Fiber-Cement Façade Panels and System must be installed over a substrate having a Class A finish.

5.7 When installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Section 1403.5 of the 2012 IBC, the fiber cement panel system is limited to 40 feet (12 192 mm) or less in height above the grade plane.

5.8 When installed over exterior walls on buildings of Types I, II III and IV construction in accordance with Exception 2 to Section 1402.5 of the 2018 IBC and Section 1403.5 of the 2015 IBC, the fiber cement panel system is not limited to 40 feet (12 192 mm) in height above the grade plane.

5.9 The Cembrit Fiber-Cement Façade Panel System is manufactured in Nyergesújfalu, Hungary, under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Fiber Cement Siding Used as Exterior Wall Siding (AC90), dated October 2020 (Editorially revised December 2020).

6.2 Reports of testing in accordance with ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.

6.3 Reports of testing in accordance with ASTM E136, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C

7.0 IDENTIFICATION

7.1 Product labeling shall include, the name of the report holder or listee, and the ICC-ES mark of conformity. The listing or evaluation report number (ICC-ES ESR-3863) may be used in lieu of the mark of conformity. The Cembrit panels and accessory components are labeled with the name of the manufacturer (Cembrit Holding A/S), the product name (Cemrit Patina Original, Cembrit Patina Inline, Cembrit Patina Rough, Cembrit Patina Signature or Cembrit Deco), the color code and the thickness of the boards, the evaluation report number (ESR-3863), and the statement "conforms to ASTM C1186."

7.2 CEMBRIT HOLDINGS A/S
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TABLE 1—ALLOWABLE TRANSVERSE WIND LOAD FOR USE OF THE CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

SYSTEM TYPE, NOMINAL PANEL THICKNESS	ACTUAL THICKNESS	ALLOWABLE TRANSVERSE WIND LOAD[1]	
		Positive	Negative
Visible fastener attachment system, 8-millimeter ($^5/_{16}$-inch) panel	8 mm	70 psf	65 psf

For **SI:** 1 inch = 25.4 mm, 1 psf = 0.0479 kPa.

[1]Maximum allowable positive and negative transverse wind loads for use of the panels fastened to the Cembrit panel attachment system. Allowable loads must be reduced to the capacity of the fastening, determined in accordance with Section 4.2, used to connect the Cembrit panel attachment system to the underlying wall or substrate.

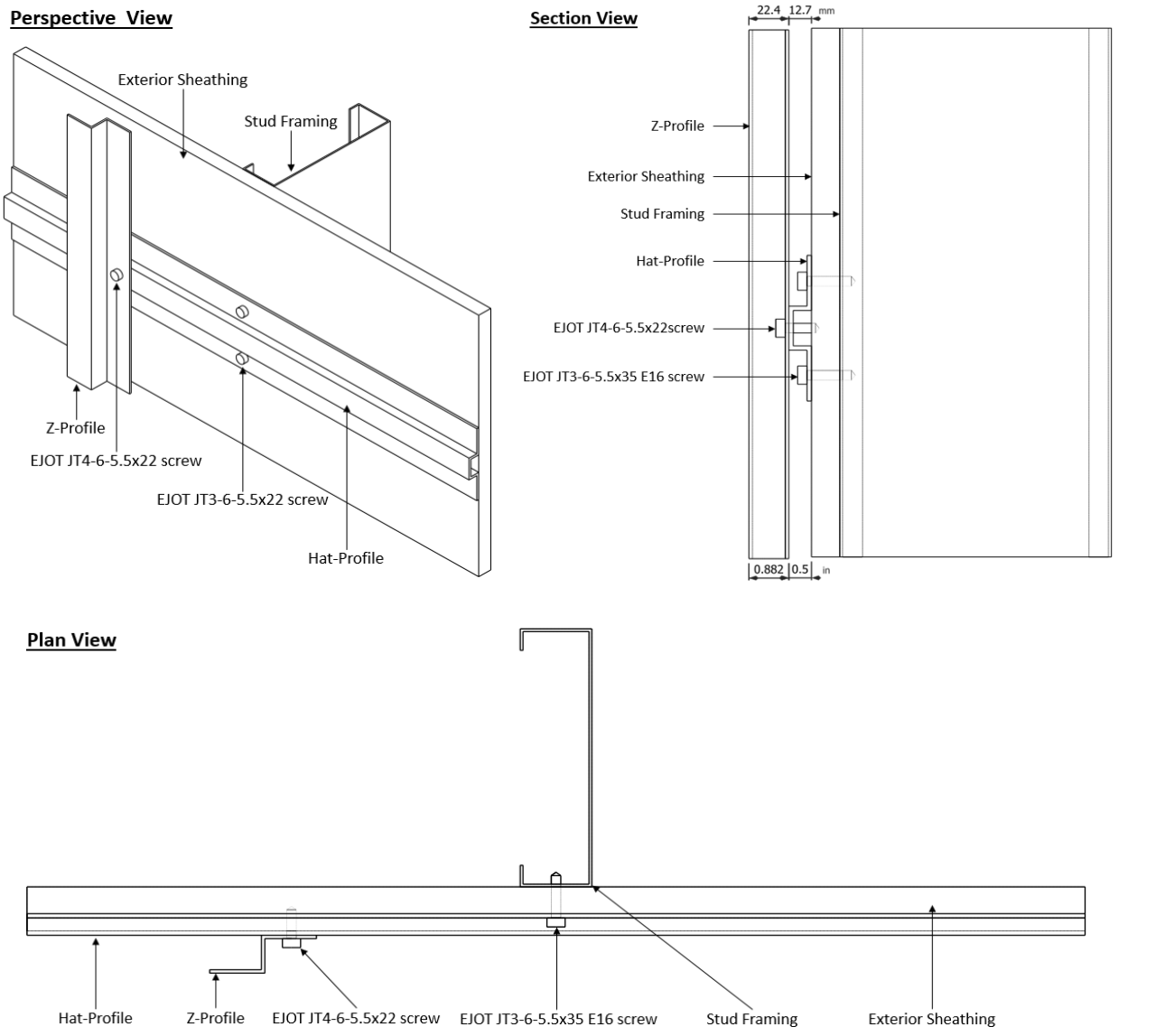


FIGURE 1—CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

CEMBRIT HOLDINGS A/S

EVALUATION SUBJECT:

CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Cembrit Holdings A/S Fiber-Cement Façade Panel Systems, described in ICC-ES evaluation report ESR-3863, have also been evaluated for compliance with the codes noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code editions:

- 2020 *City of Los Angeles Building Code* (LABC)
- 2020 *City of Los Angeles Residential Code* (LARC)

2.0 CONCLUSIONS

The Cembrit Holdings A/S Fiber-Cement Façade Panel Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3863, comply with the LABC Chapters 7, 8 and 14, and the LARC Chapter 7, and are subjected to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Cembrit Holdings A/S Fiber-Cement Façade Panel Systems described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report ESR-3863.
- The design, installation, conditions of use and identification are in accordance with the 2018 *International Building Code*® (IBC) and 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report ESR-3863.
- The design, installation and inspection are in accordance with additional requirements of the LABC Chapters 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report ESR-3863, reissued July 2022.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

CEMBRIT HOLDINGS A/S

EVALUATION SUBJECT:

CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Cembrit Holdings A/S Fiber-Cement Façade Panel Systems, described in ICC-ES evaluation report ESR-3863, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2019 *California Building Code*® (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

- 2019 *California Residential Code*® (CRC)

2.0 CONCLUSIONS

2.1 CBC:

The Cembrit Holdings A/S Fiber-Cement Façade Panel Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3863, comply with CBC Chapters 7, 8 and 14, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 16 and 17, as applicable.

2.1.1 OSHPD:

OSHPD requirements as indicated in the CBC are beyond the scope of this supplement.

2.1.2 DSA:

DSA requirements as indicated in the CBC are beyond the scope of this supplement.

2.2 CRC:

The Cembrit Holdings A/S Fiber-Cement Façade Panel Systems, described in Sections 2.0 through 7.0 of the evaluation report ESR-3863, comply with CRC Chapter 7, provided the design and installation are in accordance with the 2018 *International Residential Code*® (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report ESR-3863, reissued July 2022.

ICC-ES Evaluation Report

ESR-3863 FBC Supplement

Reissued July 2022

This report is subject to renewal July 2023.

www.icc-es.org | (800) 423-6587 | (562) 699-0543 *A Subsidiary of the International Code Council®*

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 46 46—Fiber-Cement Siding

REPORT HOLDER:

CEMBRIT HOLDINGS A/S

EVALUATION SUBJECT:

CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the Cembrit Holdings A/S Fiber-Cement Façade Panel System, descrided in ICC-ES evaluation report ESR-3863, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 *Florida Building Code—Residential*
- 2020 *Florida Building Code—Building*

2.0 CONCLUSIONS

The Cembrit Holdings A/S Fiber-Cement Façade Panel System, described in Sections 2.0 through 7.0 of the evaluation report ESR-3863, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential,* provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential,* as applicable. The installation requirements noted in the ICC-ES evaluation report ESR-3863 for the 2018 *International Building Code®* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the Cembrit Holdings A/S Fiber-Cement Façade Panel System for compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential* has not been evaluated, and is outside the scope of this supplemental report.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official, when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report ESR-3863, reissued July 2022.

epddanmark

ECO PLATFORM EPD EN 15804 VERIFIED

Owner:	Cembrit Holding A/S
No.:	MD-20045-EN_rev2
Revision	Rev2
Issued first time	11-01-2021
Issued:	28-06-2021
Valid to:	11-01-2026

3rd PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
Cembrit Holding A/S
Gasværksvej 24
9000 Aalborg
CVR-nr. 58711713

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared products
Cembrit Solid
Cembrit Cover
Cembrit Patina Original
Cembrit Patina Inline
Cembrit Patina Rough
Cembrit Deco

Number of declared datasets/product variations: 6

Production site
Bécsi út 7
2536 Nyergesújfalu
Hungary

Products use
Cembrit fibre cement decorative rain screen claddings for mounting on facades or roofs on wooden or metal substructures with the principle of back-ventilated curtain facades.

Declared unit
1 m² facade board with a thickness of 8mm

Year of data
2019

Issued: 28-06-2021
Valid to: 11-01-2026

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804:2012+A2:2019.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804:2019+A2. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804:2012+A2:2019 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐Cradle-to-gate with modules C1-C4 and D
☐Cradle-to-gate with options, modules C1-C4 and D
☒Cradle-to-grave and module D
☐Cradle-to-gate
☐Cradle-to-gate with options

CEN standard EN 15804:2012+A2:2019 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

☐ internal ☒ external

Third party verifier:

Kim Christiansen

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MND = module not declared)																
Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below. Values are given as intervals covering the six declared product variations with a thickness of 8 mm. Specific recipes and some input materials (0-2 mass-%) are not shown in this table due to reasons of confidentiality.

Material	Weight-% of declared product
Cement	40-83%
Filler	0-21%
Sand	0-34%
Cellulose/fibres	0-15%
Paint/pigments	1-5%

Representativity

This declaration including data collection and the modelled foreground system, represents the production of 1 m² of Cembrit facade board on the production site located in Hungary. Product specific data are based on average values collected in 2019. Background data are mainly based on GaBi and are less than 10 years old. For a few exceptions, GaBi data was supplemented with data from Ecoinvent. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old, which meets the requirements in EN 15804:2012+A2:2019.

Hazardous substances

Cembrit facade boards do not contain substances listed in the ”Candidate List of Substances of Very High Concern for authorisation”.

(http://echa.europa.eu/candidate-list-table)

Essential characteristics (CE)

Cembrit facade boards are covered by the harmonised technical specification EN 12467. Declaration of performance according to EU regulation 305/2011 is available for all declared product variations.

Further technical information can be obtained by contacting the manufacturer or on the manufacturer's website:

https://www.cembrit.com/

Reference Service Life (RSL)

Cembrit's facade boards have an expected average lifetime of 50 years when installed and used correctly and a guaranteed lifetime of 15 years.

Picture of products

Cembrit Colourful design line

Cembrit Solid

Cembrit Cover

Cembrit Patina design line

Cembrit Patina Original

Cembrit Patina Inline

Cembrit Patina Rough

Cembrit Deco

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 m² of Cembrit facade boards with a thickness of 8 mm for types: Cembrit Solid, Cembrit Cover, Cembrit Patina Original, Cembrit Patina Inline, Cembrit Patina Rough and Cembrit Deco.

Cembrit also produces Cembrit Patina Original in 6 mm. Cembrit Patina Inline is produced with a thickness of 8/9.5 mm and a calculated average thickness of 8.9 mm. In this EPD a conversion was made so that the area weight and results are calculated and shown for 8 mm boards for the sake of comparison.

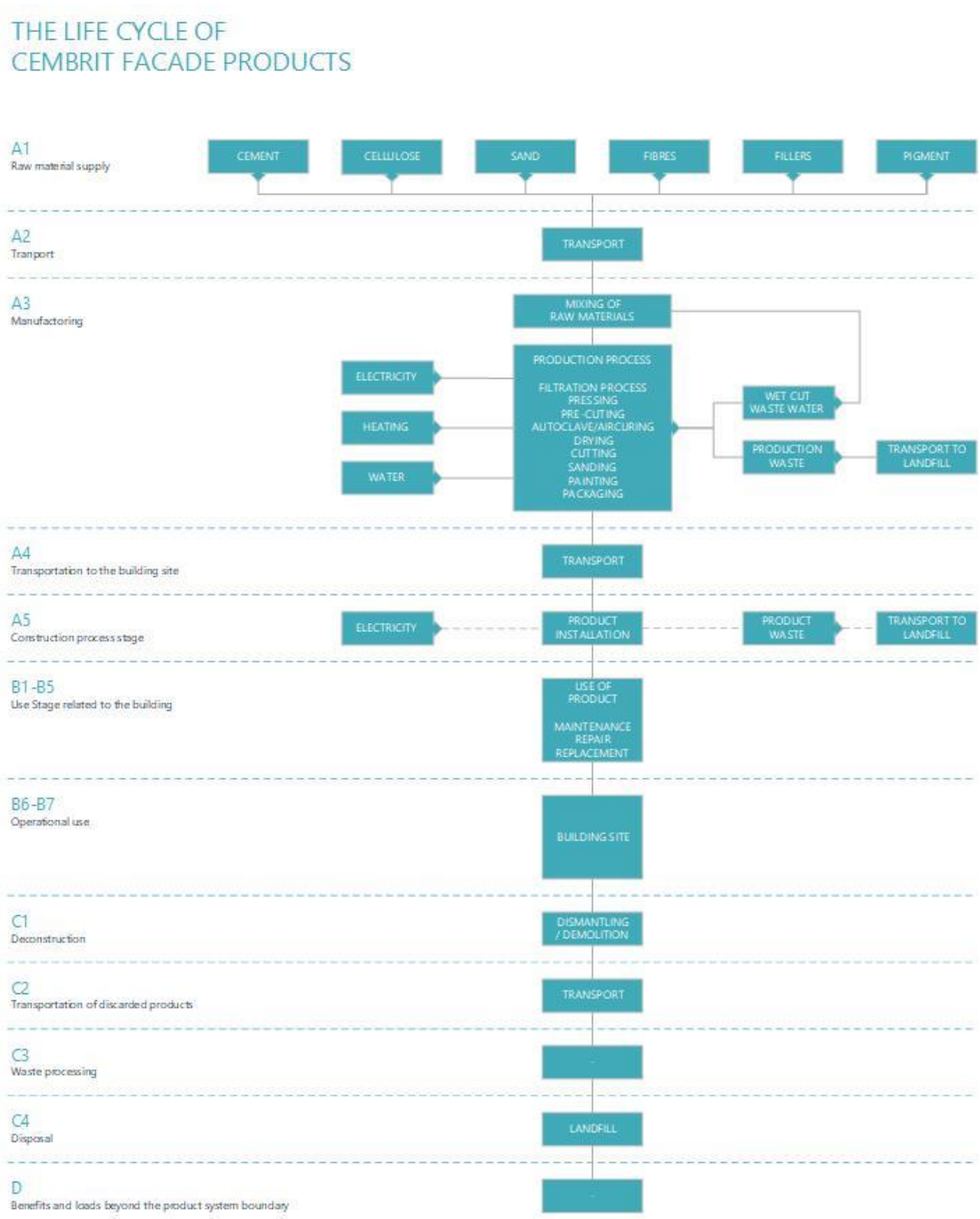
Results for these two variations; Cembrit Patina Original and Cembrit Patina Inline, can be converted to 6 mm board and 8/9.5 mm board respectively using the conversion factor described in the results.

Name	Value	Unit	Conversion factor to 1 kg.
Declared unit	1	m²	
Average production area weight			
Cembrit Solid	14.1	kg/m²	0.0707
Cembrit Cover	14.2	kg/m²	0.0705
Cembrit Patina Original	11.9	kg/m²	0.084
Cembrit Patina Rough	11.9	kg/m²	0.084
Cembrit Patina inline	11.7	kg/m²	0.086
Cembrit Deco	11.9	kg/m²	0.084

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804:2012+A2:2019.

Flow chart


THE LIFE CYCLE OF
CEMBRIT FACADE PRODUCTS
A1
Raw material supply
CEMENT
CELLULOSE
SAND
FIBRES
FILLERS
PIGMENT
A2
Tranport
TRANSPORT
A3
Manufactoring
MIXING OF RAW MATERIALS
ELECTRICITY
HEATING
WATER
PRODUCTION PROCESS
FILTRATION PROCESS
PRESSING
PRE -CUTING
AUTOCLAVE/AIRCURING
DRYING
CUTTING
SANDING
PAINTING
PACKAGING
WET CUT WASTE WATER
PRODUCTION WASTE
TRANSPORT TO LANDFILL
A4
Transportation to the building site
TRANSPORT
A5
Construction process stage
ELECTRICITY
PRODUCT INSTALLATION
PRODUCT WASTE
TRANSPORT TO LANDFILL
B1-B5
Use Stage related to the building
USE OF PRODUCT
MAINTENANCE
REPAIR
REPLACEMENT
B6-B7
Operational use
BUILDING SITE
C1
Deconstruction
DISMANTLING / DEMOLITION
C2
Transportation of discarded products
TRANSPORT
C3
Waste processing
C4
Disposal
LANDFILL
D
Benefits and loads beyond the product system boundary

System boundary

This EPD is based on a cradle-to-grave + module D, in which >99 weight-% has been accounted for.

The general rules for the exclusion of inputs and outputs follows the requirements in EN 15804:2012+A2:2019, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes.

Data collection and measurements includes all processes, materials or emissions that are known to make a significant contribution to the environmental impact of producing facade boards at Cembrit A/S. All these emissions were considered in the model. Therefore, there has been no exclusion of inputs and outputs above these limits.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site, packaging and waste processing up to the "end-of-waste" state or final disposal. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2 and A3 are declared as one module: A1-A3.

Cembrit facade boards are produced by the use of the Hatschek method: the base materials (binder, fibres, etc) are processed into a homogeneous mixture with water and transferred to the vats of the Hatschek machine. Rotating sieve cylinders in the vats collects a thin layer of solid material and transfer the layer to a rotating felt for dewatering and further on to the accumulating format roller. The format roller is gradually covered by layers of fibre cement. Once the required thickness of the boards is reached, the fibre cement layer, still moist and mouldable, is unwound and taken from the roll. Further information on the Hatschek method may be found here:

http://www.fibrecementconsulting.com/publications/011011.hatschekfilmsummary.pdf

After the pre-curing period, the autoclaved Patina boards are dried in an autoclave, which runs on natural gas. The AirCured board types (Solid and Cover) are air-dried. After the drying process the products are ready to be sanded, trimming edges, cutting to customised size, painted, edge-sealed, hydrophobated (only autoclaved products), ending with quality controls and packing processes.

Construction process stage (A4-A5) includes:

A4 – Transportation simulating transportation to a construction site in Europe. This scenario uses an average truck, transporting goods at a distance of 2,300 km. This distance is Cembrit's longest route of delivery, hence the distance covers all routes. Transportation of the packaging waste from the construction site to the municipal waste incinerator are also included in this module.

A5 – Accounts for the environmental impacts associated with the disposal of packaging handled at the construction site. It is assumed incinerated at an incineration plant which is assumed to be the most likely and realistic situation. Disposal of product waste is assumed to be landfilled. Furthermore, environmental impacts associated with trucks and fuel for the construction installation. The mounting of facade boards is done by using smaller electrical tools e.g. screwdriver. It is estimated that the energy for the hand tool is very low and below the cut-off criteria of 1% and is therefore excluded.

Use stage (B1-B7) includes:

Modules are not relevant for this product.

End of Life (C1-C4) includes:

C1 – Accounts for the environmental impacts associated with dismantling and demolition of the facade boards. Fuel used for demolition equipment and transport on site vehicles.

C2 – Transportation of the discarded products from the construction site to a landfilling site. The transport is estimated to be 100 km in an average truck.

C3 – The facade boards are sent to landfill and therefore there is no environmental impacts associated with waste processing of materials flows intended for reuse, recycling or energy recovery.

C4 – Environmental impacts associated with the processes at the landfill.

Re-use, recovery and recycling potential (D) includes:

D - The facade boards are sent to landfill after use. The product has therefore no impact during this stage and no associated environmental impacts. The Cembrit facade boards are expected to be reusable over time, but this is not included in the actual LCA calculation.

LCA results

Cembrit Solid

ENVIRONMENTAL IMPACTS PER m² CEMBRIT SOLID										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.62E+01	2.03E+00	6.27E-02	0.00E+00	8.82E-03	1.09E-01	0.00E+00	1.99E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.65E+01	1.99E+00	4.75E-02	0.00E+00	9.15E-03	1.07E-01	0.00E+00	2.15E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-3.38E-01	2.17E-02	1.51E-02	0.00E+00	-4.02E-04	1.16E-03	0.00E+00	-1.71E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	1.70E-02	1.63E-02	2.04E-05	0.00E+00	7.11E-05	8.74E-04	0.00E+00	6.19E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.78E-08	3.70E-16	-3.81E-16	0.00E+00	1.61E-18	1.98E-17	0.00E+00	7.98E-16	0.00E+00
AP	[mol H^+ eq.]	3.87E-02	2.25E-03	-2.98E-05	0.00E+00	4.49E-05	1.25E-04	0.00E+00	1.54E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	1.89E-04	6.15E-06	-1.23E-07	0.00E+00	2.68E-08	3.29E-07	0.00E+00	3.70E-07	0.00E+00
EP-marine	[kg N eq.]	1.04E-02	6.74E-04	1.38E-06	0.00E+00	2.08E-05	3.84E-05	0.00E+00	3.97E-04	0.00E+00
EP-terrestrial	[mol N eq.]	1.12E-01	8.03E-03	6.38E-05	0.00E+00	2.30E-04	4.55E-04	0.00E+00	4.37E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.93E-02	1.85E-03	5.90E-06	0.00E+00	5.82E-05	1.03E-04	0.00E+00	1.20E-03	0.00E+00
ADPm[1]	[kg Sb eq.]	2.95E-05	1.63E-07	-5.61E-09	0.00E+00	7.10E-10	8.73E-09	0.00E+00	1.93E-08	0.00E+00
ADPf[1]	[MJ]	1.54E+02	2.69E+01	-4.72E-01	0.00E+00	1.17E-01	1.44E+00	0.00E+00	2.82E+00	0.00E+00
WDP[1]	[m^3]	2.04E+01	1.97E-02	3.99E-03	0.00E+00	8.57E-05	1.05E-03	0.00E+00	2.26E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT SOLID										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.44E-07	1.52E-08	-4.99E-11	0.00E+00	5.05E-10	8.28E-10	0.00E+00	1.91E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	9.85E-01	7.35E-03	-8.22E-03	0.00E+00	3.20E-05	3.93E-04	0.00E+00	3.31E-03	0.00E+00
ETP-fw[1]	[CTUe]	8.46E+01	2.01E+01	-1.11E-01	0.00E+00	8.77E-02	1.08E+00	0.00E+00	1.61E+00	0.00E+00
HTP-c[1]	[CTUh]	2.94E-09	4.16E-10	-4.15E-12	0.00E+00	1.81E-12	2.23E-11	0.00E+00	2.39E-10	0.00E+00
HTP-nc[1]	[CTUh]	2.69E-07	2.11E-08	-1.08E-10	0.00E+00	1.06E-10	1.13E-09	0.00E+00	2.63E-08	0.00E+00
SQP[1]	-	7.90E+01	9.45E+00	-5.13E-01	0.00E+00	4.11E-02	5.06E-01	0.00E+00	5.89E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT SOLID										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.29E+01	1.56E+00	-2.32E-01	0.00E+00	6.78E-03	8.33E-02	0.00E+00	3.70E-01	0.00E+00
PERM	[MJ]	5.58E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.29E+01	1.56E+00	-2.32E-01	0.00E+00	6.78E-03	8.33E-02	0.00E+00	3.70E-01	0.00E+00
PENRE	[MJ]	1.54E+02	2.70E+01	-4.71E-01	0.00E+00	1.18E-01	1.45E+00	0.00E+00	2.82E+00	0.00E+00
PENRM	[MJ]	2.12E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.54E+02	2.70E+01	-4.71E-01	0.00E+00	1.18E-01	1.45E+00	0.00E+00	2.82E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	5.03E-01	1.81E-03	1.88E-05	0.00E+00	7.90E-06	9.71E-05	0.00E+00	7.12E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT SOLID										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	2.15E-07	1.25E-06	5.09E-09	0.00E+00	5.44E-09	6.69E-08	0.00E+00	4.30E-08	0.00E+00
NHWD	[kg]	4.50E+00	4.28E-03	7.82E-03	0.00E+00	1.87E-05	2.29E-04	0.00E+00	1.42E+01	0.00E+00
RWD	[kg]	1.11E-02	4.98E-05	-4.96E-05	0.00E+00	2.17E-07	2.67E-06	0.00E+00	3.21E-05	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	1.19E+00	0.00E+00	4.40E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.9
Biogenic carbon content in accompanying packaging	kg C	0.4

Cembrit Cover

ENVIRONMENTAL IMPACTS PER m² CEMBRIT COVER										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.61E+01	2.02E+00	6.34E-02	0.00E+00	8.79E-03	1.08E-01	0.00E+00	1.98E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.65E+01	1.98E+00	4.69E-02	0.00E+00	9.12E-03	1.06E-01	0.00E+00	2.14E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-3.71E-01	2.16E-02	1.64E-02	0.00E+00	-4.01E-04	1.16E-03	0.00E+00	-1.70E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	1.70E-02	1.63E-02	1.97E-05	0.00E+00	7.09E-05	8.71E-04	0.00E+00	6.17E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.77E-08	3.69E-16	-3.85E-16	0.00E+00	1.61E-18	1.98E-17	0.00E+00	7.95E-16	0.00E+00
AP	[mol H^+ eq.]	3.88E-02	2.24E-03	-3.03E-05	0.00E+00	4.47E-05	1.24E-04	0.00E+00	1.54E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	1.90E-04	6.13E-06	-1.24E-07	0.00E+00	2.67E-08	3.28E-07	0.00E+00	3.68E-07	0.00E+00
EP-marine	[kg N eq.]	1.04E-02	6.72E-04	1.26E-06	0.00E+00	2.07E-05	3.82E-05	0.00E+00	3.96E-04	0.00E+00

EP-terrestrial	[mol N eq.]	1.12E-01	8.00E-03	6.26E-05	0.00E+00	2.29E-04	4.54E-04	0.00E+00	4.35E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.93E-02	1.84E-03	5.56E-06	0.00E+00	5.80E-05	1.03E-04	0.00E+00	1.20E-03	0.00E+00
ADPm[1]	[kg Sb eq.]	2.94E-05	1.63E-07	-5.67E-09	0.00E+00	7.08E-10	8.70E-09	0.00E+00	1.93E-08	0.00E+00
ADPf[1]	[MJ]	1.55E+02	2.68E+01	-4.76E-01	0.00E+00	1.17E-01	1.44E+00	0.00E+00	2.81E+00	0.00E+00
WDP[1]	[m³]	2.31E+01	1.96E-02	4.07E-03	0.00E+00	8.54E-05	1.05E-03	0.00E+00	2.25E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT COVER										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	4.49E-07	1.52E-08	-5.59E-11	0.00E+00	5.03E-10	8.25E-10	0.00E+00	1.90E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	9.90E-01	7.33E-03	-8.29E-03	0.00E+00	3.19E-05	3.92E-04	0.00E+00	3.30E-03	0.00E+00
ETP-fw[1]	[CTUe]	8.51E+01	2.01E+01	-1.12E-01	0.00E+00	8.74E-02	1.07E+00	0.00E+00	1.61E+00	0.00E+00
HTP-c[1]	[CTUh]	2.96E-09	4.15E-10	-4.21E-12	0.00E+00	1.81E-12	2.22E-11	0.00E+00	2.38E-10	0.00E+00
HTP-nc[1]	[CTUh]	2.70E-07	2.10E-08	-1.11E-10	0.00E+00	1.06E-10	1.13E-09	0.00E+00	2.62E-08	0.00E+00
SQP[1]	-	8.56E+01	9.42E+00	-5.17E-01	0.00E+00	4.10E-02	5.04E-01	0.00E+00	5.87E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT COVER										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.34E+01	1.55E+00	-2.34E-01	0.00E+00	6.75E-03	8.30E-02	0.00E+00	3.69E-01	0.00E+00
PERM	[MJ]	8.36E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.34E+01	1.55E+00	-2.34E-01	0.00E+00	6.75E-03	8.30E-02	0.00E+00	3.69E-01	0.00E+00
PENRE	[MJ]	1.55E+02	2.69E+01	-4.76E-01	0.00E+00	1.17E-01	1.44E+00	0.00E+00	2.81E+00	0.00E+00
PENRM	[MJ]	2.21E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.55E+02	2.69E+01	-4.76E-01	0.00E+00	1.17E-01	1.44E+00	0.00E+00	2.81E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m³]	5.67E-01	1.81E-03	2.01E-05	0.00E+00	7.87E-06	9.68E-05	0.00E+00	7.10E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT COVER									
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	2.13E-07	1.25E-06	5.07E-09	0.00E+00	5.42E-09	6.67E-08	0.00E+00	4.29E-08	0.00E+00

NHWD	[kg]	4.51E+00	4.27E-03	7.82E-03	0.00E+00	1.86E-05	2.29E-04	0.00E+00	1.41E+01	0.00E+00
RWD	[kg]	1.12E-02	4.97E-05	-5.00E-05	0.00E+00	2.16E-07	2.66E-06	0.00E+00	3.20E-05	0.00E+00

CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	1.11E+00	0.00E+00	4.48E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.9
Biogenic carbon content in accompanying packaging	kg C	0.5

Cembrit Patina Original

The declared unit is for 1 m² of Cembrit Patina Original with a thickness of 8 mm. A conversion factor 0.75 must be applied, when calculating results LCIA results for Cembrit Patina Original with a thickness of 6 mm.

ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA ORIGINAL										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.18E+01	1.73E+00	8.29E-02	0.00E+00	7.52E-03	9.26E-02	0.00E+00	1.69E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.21E+01	1.70E+00	6.26E-02	0.00E+00	7.80E-03	9.09E-02	0.00E+00	1.83E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-2.68E-01	1.85E-02	2.03E-02	0.00E+00	-3.42E-04	9.89E-04	0.00E+00	-1.45E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	1.12E-02	1.39E-02	-1.08E-05	0.00E+00	6.06E-05	7.45E-04	0.00E+00	5.28E-04	0.00E+00
ODP	[kg CFC 11 eq.]	7.84E-08	3.16E-16	-5.37E-16	0.00E+00	1.37E-18	1.69E-17	0.00E+00	6.80E-16	0.00E+00
AP	[mol H^+ eq.]	3.43E-02	1.92E-03	-6.70E-05	0.00E+00	3.82E-05	1.06E-04	0.00E+00	1.32E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	3.18E-04	5.24E-06	-1.87E-07	0.00E+00	2.28E-08	2.80E-07	0.00E+00	3.15E-07	0.00E+00
EP-marine	[kg N eq.]	8.15E-03	5.74E-04	-9.68E-06	0.00E+00	1.77E-05	3.27E-05	0.00E+00	3.39E-04	0.00E+00
EP-terrestrial	[mol N eq.]	8.77E-02	6.84E-03	-3.88E-05	0.00E+00	1.96E-04	3.88E-04	0.00E+00	3.72E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.36E-02	1.58E-03	-2.42E-05	0.00E+00	4.96E-05	8.81E-05	0.00E+00	1.03E-03	0.00E+00
ADPm[1]	[kg Sb eq.]	9.31E-05	1.39E-07	-8.28E-09	0.00E+00	6.05E-10	7.44E-09	0.00E+00	1.65E-08	0.00E+00
ADPf[1]	[MJ]	1.38E+02	2.29E+01	-7.29E-01	0.00E+00	9.99E-02	1.23E+00	0.00E+00	2.41E+00	0.00E+00
WDP[1]	[m^3]	1.53E+01	1.68E-02	5.50E-03	0.00E+00	7.30E-05	8.97E-04	0.00E+00	1.92E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA ORIGINAL										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	3.93E-07	1.30E-08	-3.51E-10	0.00E+00	4.30E-10	7.05E-10	0.00E+00	1.63E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	9.31E-01	6.26E-03	-1.16E-02	0.00E+00	2.73E-05	3.35E-04	0.00E+00	2.82E-03	0.00E+00
ETP-fw[1]	[CTUe]	9.73E+01	1.72E+01	-2.04E-01	0.00E+00	7.48E-02	9.19E-01	0.00E+00	1.37E+00	0.00E+00
HTP-c[1]	[CTUh]	7.67E-09	3.55E-10	-6.85E-12	0.00E+00	1.54E-12	1.90E-11	0.00E+00	2.04E-10	0.00E+00
HTP-nc[1]	[CTUh]	7.76E-07	1.80E-08	-2.11E-10	0.00E+00	9.05E-11	9.64E-10	0.00E+00	2.24E-08	0.00E+00
SQP[1]	-	1.05E+02	8.05E+00	-7.45E-01	0.00E+00	3.51E-02	4.31E-01	0.00E+00	5.02E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT PATINA ORIGINAL										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.46E+01	1.33E+00	-3.30E-01	0.00E+00	5.78E-03	7.10E-02	0.00E+00	3.15E-01	0.00E+00
PERM	[MJ]	1.91E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.46E+01	1.33E+00	-3.30E-01	0.00E+00	5.78E-03	7.10E-02	0.00E+00	3.15E-01	0.00E+00
PENRE	[MJ]	1.38E+02	2.30E+01	-7.28E-01	0.00E+00	1.00E-01	1.23E+00	0.00E+00	2.41E+00	0.00E+00
PENRM	[MJ]	3.58E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.38E+02	2.30E+01	-7.28E-01	0.00E+00	1.00E-01	1.23E+00	0.00E+00	2.41E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m³]	3.71E-01	1.55E-03	2.08E-05	0.00E+00	6.73E-06	8.27E-05	0.00E+00	6.07E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT PATINA ORIGINAL										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	6.25E-07	1.07E-06	4.15E-09	0.00E+00	4.64E-09	5.70E-08	0.00E+00	3.67E-08	0.00E+00
NHWD	[kg]	4.17E+00	3.65E-03	1.10E-02	0.00E+00	1.59E-05	1.95E-04	0.00E+00	1.21E+01	0.00E+00
RWD	[kg]	1.07E-02	4.25E-05	-6.99E-05	0.00E+00	1.85E-07	2.27E-06	0.00E+00	2.74E-05	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	8.02E-01	0.00E+00	6.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.4
Biogenic carbon content in accompanying packaging	kg C	0.5

Cembrit Patina Inline

The declared unit is for 1 m² of Cembrit Patina Inline with a thickness of 8 mm. A conversion factor 1.11 must be applied, when calculating results LCIA results for Cembrit Patina Inline with a thickness of 8/9.5 mm. The conversion factor is based on a calculated average thickness of 8.9 mm.

ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA INLINE										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.07E+01	1.68E+00	8.07E-02	0.00E+00	7.31E-03	9.01E-02	0.00E+00	1.65E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.10E+01	1.65E+00	6.09E-02	0.00E+00	7.59E-03	8.84E-02	0.00E+00	1.78E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-2.44E-01	1.80E-02	1.98E-02	0.00E+00	-3.33E-04	9.62E-04	0.00E+00	-1.41E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	9.87E-03	1.35E-02	-1.05E-05	0.00E+00	5.89E-05	7.25E-04	0.00E+00	5.13E-04	0.00E+00
ODP	[kg CFC 11 eq.]	7.21E-08	3.07E-16	-5.22E-16	0.00E+00	1.34E-18	1.64E-17	0.00E+00	6.61E-16	0.00E+00
AP	[mol H^+ eq.]	3.05E-02	1.86E-03	-6.51E-05	0.00E+00	3.72E-05	1.03E-04	0.00E+00	1.28E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	2.90E-04	5.10E-06	-1.82E-07	0.00E+00	2.22E-08	2.73E-07	0.00E+00	3.06E-07	0.00E+00
EP-marine	[kg N eq.]	7.38E-03	5.59E-04	-9.42E-06	0.00E+00	1.72E-05	3.18E-05	0.00E+00	3.29E-04	0.00E+00
EP-terrestrial	[mol N eq.]	7.95E-02	6.66E-03	-3.77E-05	0.00E+00	1.91E-04	3.77E-04	0.00E+00	3.62E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.13E-02	1.53E-03	-2.36E-05	0.00E+00	4.82E-05	8.57E-05	0.00E+00	9.97E-04	0.00E+00
ADPm[1]	[kg Sb eq.]	8.23E-05	1.35E-07	-8.06E-09	0.00E+00	5.89E-10	7.24E-09	0.00E+00	1.60E-08	0.00E+00
ADPf[1]	[MJ]	1.19E+02	2.23E+01	-7.09E-01	0.00E+00	9.72E-02	1.19E+00	0.00E+00	2.34E+00	0.00E+00
WDP[1]	[m^3]	1.28E+01	1.63E-02	5.35E-03	0.00E+00	7.10E-05	8.73E-04	0.00E+00	1.87E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA INLINE										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	3.51E-07	1.26E-08	-3.41E-10	0.00E+00	4.19E-10	6.86E-10	0.00E+00	1.58E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	7.91E-01	6.09E-03	-1.13E-02	0.00E+00	2.65E-05	3.26E-04	0.00E+00	2.74E-03	0.00E+00
ETP-fw[1]	[CTUe]	8.67E+01	1.67E+01	-1.99E-01	0.00E+00	7.27E-02	8.94E-01	0.00E+00	1.34E+00	0.00E+00
HTP-c[1]	[CTUh]	6.27E-09	3.45E-10	-6.66E-12	0.00E+00	1.50E-12	1.85E-11	0.00E+00	1.98E-10	0.00E+00
HTP-nc[1]	[CTUh]	6.25E-07	1.75E-08	-2.05E-10	0.00E+00	8.80E-11	9.37E-10	0.00E+00	2.18E-08	0.00E+00
SQP[1]	-	8.83E+01	7.83E+00	-7.24E-01	0.00E+00	3.41E-02	4.19E-01	0.00E+00	4.88E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

RESOURCE USE PER m² CEMBRIT PATINA INLINE										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	2.09E+01	1.29E+00	-3.21E-01	0.00E+00	5.62E-03	6.91E-02	0.00E+00	3.06E-01	0.00E+00
PERM	[MJ]	1.88E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	2.09E+01	1.29E+00	-3.21E-01	0.00E+00	5.62E-03	6.91E-02	0.00E+00	3.06E-01	0.00E+00
PENRE	[MJ]	1.19E+02	2.24E+01	-7.08E-01	0.00E+00	9.76E-02	1.20E+00	0.00E+00	2.34E+00	0.00E+00
PENRM	[MJ]	6.34E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.19E+02	2.24E+01	-7.08E-01	0.00E+00	9.76E-02	1.20E+00	0.00E+00	2.34E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	3.10E-01	1.50E-03	2.02E-05	0.00E+00	6.55E-06	8.05E-05	0.00E+00	5.90E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT PATINA INLINE										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	5.54E-07	1.04E-06	4.03E-09	0.00E+00	4.51E-09	5.55E-08	0.00E+00	3.57E-08	0.00E+00
NHWD	[kg]	4.02E+00	3.55E-03	1.07E-02	0.00E+00	1.55E-05	1.90E-04	0.00E+00	1.18E+01	0.00E+00
RWD	[kg]	8.93E-03	4.13E-05	-6.80E-05	0.00E+00	1.80E-07	2.21E-06	0.00E+00	2.66E-05	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	7.86E-01	0.00E+00	5.97E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.4
Biogenic carbon content in accompanying packaging	kg C	0.5

Cembrit Patina Rough

ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA ROUGH										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.02E+01	1.72E+00	8.26E-02	0.00E+00	7.48E-03	9.22E-02	0.00E+00	1.69E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.04E+01	1.69E+00	6.24E-02	0.00E+00	7.76E-03	9.05E-02	0.00E+00	1.82E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-2.44E-01	1.84E-02	2.02E-02	0.00E+00	-3.41E-04	9.85E-04	0.00E+00	-1.45E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	9.89E-03	1.39E-02	-1.07E-05	0.00E+00	6.03E-05	7.42E-04	0.00E+00	5.25E-04	0.00E+00

ODP	[kg CFC 11 eq.]	7.28E-08	3.14E-16	-5.35E-16	0.00E+00	1.37E-18	1.68E-17	0.00E+00	6.77E-16	0.00E+00
AP	[mol H^+ eq.]	3.07E-02	1.91E-03	-6.67E-05	0.00E+00	3.80E-05	1.06E-04	0.00E+00	1.31E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	2.97E-04	5.21E-06	-1.86E-07	0.00E+00	2.27E-08	2.79E-07	0.00E+00	3.13E-07	0.00E+00
EP-marine	[kg N eq.]	7.22E-03	5.72E-04	-9.64E-06	0.00E+00	1.76E-05	3.25E-05	0.00E+00	3.37E-04	0.00E+00
EP-terrestrial	[mol N eq.]	7.77E-02	6.81E-03	-3.86E-05	0.00E+00	1.95E-04	3.86E-04	0.00E+00	3.70E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.05E-02	1.57E-03	-2.41E-05	0.00E+00	4.93E-05	8.77E-05	0.00E+00	1.02E-03	0.00E+00
ADPm[1]	[kg Sb eq.]	6.88E-05	1.38E-07	-8.24E-09	0.00E+00	6.03E-10	7.41E-09	0.00E+00	1.64E-08	0.00E+00
ADPf[1]	[MJ]	1.20E+02	2.28E+01	-7.25E-01	0.00E+00	9.94E-02	1.22E+00	0.00E+00	2.39E+00	0.00E+00
WDP[1]	[m^3]	1.49E+01	1.67E-02	5.48E-03	0.00E+00	7.27E-05	8.93E-04	0.00E+00	1.91E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT PATINA ROUGH										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PM	[Disease incidence]	3.57E-07	1.29E-08	-3.49E-10	0.00E+00	4.28E-10	7.02E-10	0.00E+00	1.62E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	8.26E-01	6.24E-03	-1.15E-02	0.00E+00	2.71E-05	3.34E-04	0.00E+00	2.80E-03	0.00E+00
ETP-fw[1]	[CTUe]	8.54E+01	1.71E+01	-2.03E-01	0.00E+00	7.44E-02	9.14E-01	0.00E+00	1.37E+00	0.00E+00
HTP-c[1]	[CTUh]	2.14E-09	3.53E-10	-6.82E-12	0.00E+00	1.54E-12	1.89E-11	0.00E+00	2.03E-10	0.00E+00
HTP-nc[1]	[CTUh]	1.41E-07	1.79E-08	-2.10E-10	0.00E+00	9.01E-11	9.59E-10	0.00E+00	2.23E-08	0.00E+00
SQP[1]	-	6.90E+01	8.02E+00	-7.41E-01	0.00E+00	3.49E-02	4.29E-01	0.00E+00	4.99E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT PATINA ROUGH										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	[MJ]	1.73E+01	1.32E+00	-3.29E-01	0.00E+00	5.75E-03	7.07E-02	0.00E+00	3.14E-01	0.00E+00
PERM	[MJ]	1.96E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.73E+01	1.32E+00	-3.29E-01	0.00E+00	5.75E-03	7.07E-02	0.00E+00	3.14E-01	0.00E+00
PENRE	[MJ]	1.20E+02	2.29E+01	-7.25E-01	0.00E+00	9.98E-02	1.23E+00	0.00E+00	2.40E+00	0.00E+00
PENRM	[MJ]	1.46E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.20E+02	2.29E+01	-7.25E-01	0.00E+00	9.98E-02	1.23E+00	0.00E+00	2.40E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m^3]	3.58E-01	1.54E-03	2.07E-05	0.00E+00	6.70E-06	8.24E-05	0.00E+00	6.04E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT PATINA ROUGH										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
HWD	[kg]	4.62E-07	1.06E-06	4.13E-09	0.00E+00	4.62E-09	5.67E-08	0.00E+00	3.65E-08	0.00E+00
NHWD	[kg]	3.76E+00	3.63E-03	1.10E-02	0.00E+00	1.58E-05	1.94E-04	0.00E+00	1.20E+01	0.00E+00
RWD	[kg]	1.03E-02	4.23E-05	-6.95E-05	0.00E+00	1.84E-07	2.26E-06	0.00E+00	2.73E-05	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	1.39E-01	0.00E+00	6.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	**Unit**	**At the factory gate**
Biogenic carbon content in product	kg C	0.4
Biogenic carbon content in accompanying packaging	kg C	0.5

Cembrit Deco

ENVIRONMENTAL IMPACTS PER m² CEMBRIT DECO										
Parameter	**Unit**	**A1-A3**	**A4**	**A5**	**B1 – B7**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	[kg CO_2 eq.]	1.00E+01	1.73E+00	8.49E-02	0.00E+00	7.51E-03	9.26E-02	0.00E+00	1.69E-01	0.00E+00
GWP-fossil	[kg CO_2 eq.]	1.03E+01	1.70E+00	6.41E-02	0.00E+00	7.79E-03	9.08E-02	0.00E+00	1.83E-01	0.00E+00
GWP-biogenic	[kg CO_2 eq.]	-2.58E-01	1.85E-02	2.08E-02	0.00E+00	-3.42E-04	9.88E-04	0.00E+00	-1.45E-02	0.00E+00
GWP-luluc	[kg CO_2 eq.]	1.01E-02	1.39E-02	-1.27E-05	0.00E+00	6.05E-05	7.44E-04	0.00E+00	5.27E-04	0.00E+00
ODP	[kg CFC 11 eq.]	7.51E-08	3.15E-16	-5.51E-16	0.00E+00	1.37E-18	1.69E-17	0.00E+00	6.79E-16	0.00E+00
AP	[mol H^+ eq.]	3.05E-02	1.92E-03	-6.97E-05	0.00E+00	3.82E-05	1.06E-04	0.00E+00	1.31E-03	0.00E+00
EP-freshwater	[kg PO_4 eq.]	3.02E-04	5.23E-06	-1.93E-07	0.00E+00	2.28E-08	2.80E-07	0.00E+00	3.15E-07	0.00E+00
EP-marine	[kg N eq.]	7.19E-03	5.74E-04	-1.04E-05	0.00E+00	1.77E-05	3.27E-05	0.00E+00	3.38E-04	0.00E+00
EP-terrestrial	[mol N eq.]	7.74E-02	6.84E-03	-4.50E-05	0.00E+00	1.96E-04	3.87E-04	0.00E+00	3.72E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.03E-02	1.57E-03	-2.62E-05	0.00E+00	4.95E-05	8.81E-05	0.00E+00	1.02E-03	0.00E+00
ADPm[1]	[kg Sb eq.]	6.90E-05	1.39E-07	-8.51E-09	0.00E+00	6.05E-10	7.44E-09	0.00E+00	1.65E-08	0.00E+00
ADPf[1]	[MJ]	1.07E+02	2.29E+01	-7.50E-01	0.00E+00	9.98E-02	1.23E+00	0.00E+00	2.40E+00	0.00E+00
WDP[1]	[m^3]	1.48E+01	1.68E-02	5.65E-03	0.00E+00	7.29E-05	8.97E-04	0.00E+00	1.92E-02	0.00E+00
Caption	GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, may be declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER m² CEMBRIT DECO

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	3.52E-07	1.34E-08	-3.71E-10	0.00E+00	4.30E-10	7.05E-10	0.00E+00	1.63E-08	0.00E+00
IRP[2]	[kBq U235 eq.]	8.10E-01	6.36E-03	-1.19E-02	0.00E+00	2.72E-05	3.35E-04	0.00E+00	2.82E-03	0.00E+00
ETP-fw[1]	[CTUe]	8.89E+01	1.74E+01	-2.11E-01	0.00E+00	7.47E-02	9.18E-01	0.00E+00	1.37E+00	0.00E+00
HTP-c[1]	[CTUh]	2.07E-09	3.61E-10	-7.07E-12	0.00E+00	1.54E-12	1.90E-11	0.00E+00	2.03E-10	0.00E+00
HTP-nc[1]	[CTUh]	1.35E-07	1.83E-08	-2.18E-10	0.00E+00	9.04E-11	9.63E-10	0.00E+00	2.24E-08	0.00E+00
SQP[1]	-	6.53E+01	8.18E+00	-7.65E-01	0.00E+00	3.50E-02	4.31E-01	0.00E+00	5.01E-01	0.00E+00
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.									

RESOURCE USE PER m² CEMBRIT DECO										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.74E+01	1.33E+00	-3.39E-01	0.00E+00	5.77E-03	7.09E-02	0.00E+00	3.15E-01	0.00E+00
PERM	[MJ]	1.90E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	1.74E+01	1.33E+00	-3.39E-01	0.00E+00	5.77E-03	7.09E-02	0.00E+00	3.15E-01	0.00E+00
PENRE	[MJ]	1.07E+02	2.30E+01	-7.50E-01	0.00E+00	1.00E-01	1.23E+00	0.00E+00	2.40E+00	0.00E+00
PENRM	[MJ]	2.19E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.07E+02	2.30E+01	-7.50E-01	0.00E+00	1.00E-01	1.23E+00	0.00E+00	2.40E+00	0.00E+00
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m³]	3.58E-01	1.54E-03	2.12E-05	0.00E+00	6.72E-06	8.27E-05	0.00E+00	6.06E-04	0.00E+00
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER m² CEMBRIT DECO										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	4.70E-07	1.06E-06	4.13E-09	0.00E+00	4.63E-09	5.70E-08	0.00E+00	3.66E-08	0.00E+00
NHWD	[kg]	3.84E+00	3.65E-03	1.13E-02	0.00E+00	1.59E-05	1.95E-04	0.00E+00	1.21E+01	0.00E+00
RWD	[kg]	9.94E-02	4.24E-05	-7.17E-05	0.00E+00	1.85E-07	2.27E-06	0.00E+00	2.74E-05	0.00E+00
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	7.84E-01	0.00E+00	6.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 m2)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.4
Biogenic carbon content in accompanying packaging	kg C	0.5

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type and consumption	0.57-0.68	L diesel
Transport distance	2,300	km
Capacity utilisation (including empty runs)	80	%
Gross density of products transported	11.90 – 14.18	kg/m²
Capacity utilisation volume factor	0.55	-

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	0	kg
Water use	0	m^3
Other resource use	0	kg
Fuel consumption	0.002 – 0.003	kg
Waste materials	0.98 – 0.13	kg
Output materials	0	kg
Direct emissions to air, soil or water	0	kg

Reference service life

RSL information	Unit
Reference service Life	40-60 Years

Use (B1-B7)

Modules not relevant

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	0	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	0	kg
For energy recovery	0	kg
For final disposal	11.90 – 14.18	kg

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

Cembrit has performed horizontal dynamic surface leaching test on the facade boards (Cembrit Deco excluded), to determine the release of dangerous substances according to CEN/TS 16637-2:2014. This Technical Specification specifies a dynamic surface leaching test for determination of surface dependent release of substances from monolithic or plate-like or sheet-like construction products or granular construction products with low hydraulic conductivity under standardised conditions. To learn more about the performed leaching test, contact Cembrit Holding A/S.

References

Publisher	epddanmark www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA-practitioner	Julie Rønholt and Linda Høibye COWI A/S www.cowi.com
LCA software /background data	GaBi Professional 2020 and EcoInvent 3.6 2019
3rd party verifier	Kim Christiansen – kimconsult.dk

General programme instructions
Version 2.0
www.epddanmark.dk

EN 15804
DS/EN 15804:2012 + A2:2019 - ”Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”

EN 15942
DS/EN 15942:2011 – ” Sustainability of construction works – Environmental product declarations – Communication format business-to-business”

ISO 14025
DS/EN ISO 14025:2010 – ” Environmental labels and declarations – Type III environmental declarations – Principles and procedures”

ISO 14040
DS/EN ISO 14040:2008 – ” Environmental management – Life cycle assessment – Principles and framework”

ISO 14044
DS/EN ISO 14044:2008 – ” Environmental management – Life cycle assessment – Requirements and guidelines”

Patina
by American Fiber Cement Corporation

Health Product Declaration v2.3
created via: HPDC Online Builder

HPD UNIQUE IDENTIFIER: 29456
CLASSIFICATION: 07 44 53 Glass-Fiber-Reinforced Cementitious Panels
PRODUCT DESCRIPTION: Cement Board

Section 1: Summary

Nested Method / Product Threshold

CONTENT INVENTORY

Inventory Reporting Format
- (•) Nested Materials Method
- ( ) Basic Method

Threshold Disclosed Per
- ( ) Material
- (•) Product

Threshold Level
- (•) 100 ppm
- ( ) 1,000 ppm
- ( ) Per GHS SDS
- ( ) Other

Residuals/Impurities Evaluation
- ( ) Completed
- (•) Not Completed

Explanation(s) provided for Residuals/Impurities?
- (•) Yes ( ) No

For all contents above the threshold, the manufacturer has:

Characterized (•) Yes ( ) No
Provided weight and role.

Screened (•) Yes ( ) No
Provided screening results using HPDC-approved methods.

Identified (•) Yes ( ) No
Provided name and CAS RN or other identifier.

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

NESTED MATERIAL | MATERIAL OR SUBSTANCE | *RESIDUAL OR IMPURITY*
GREENSCREEN SCORE | HAZARD TYPE

PATINA CEMENT BOARD [PORTLAND CEMENT (PORTLAND CEMENT) LT-P1 | CAN | END QUARTZ BM-1 | CAN CELLULOSE, MICROCRYSTALLINE LT-UNK | RES WOLLASTONITE LT-UNK]

Number of Greenscreen BM-4/BM3 contents ... 0

Contents highest-concern GreenScreen score(s) (BM-1, LT-1, LT-P1) ... LT-P1, BM-1

Nanomaterial ... No

INVENTORY AND SCREENING NOTES:

Paints and pigments were excluded from the screening.

VOLATILE ORGANIC COMPOUND (VOC) CONTENT

VOC Content data is not applicable for this product category.

CERTIFICATIONS AND COMPLIANCE *See Section 3 for additional listings.*

VOC emissions: N/A
VOC content: N/A
Other: EPD

CONSISTENCY WITH OTHER PROGRAMS

Pre-checked for LEED v4 Option 1.
Pre-checked for LEED v4.1 Option 1.

Third Party Verified?
- ( ) Yes
- (•) No

PREPARER: Self-Prepared
VERIFIER:
VERIFICATION #:

SCREENING DATE: 2022-03-16
PUBLISHED DATE: 2022-08-01
EXPIRY DATE: 2025-03-16

Section 2: Content in Descending Order of Quantity

This section lists contents in a product based on specific threshold(s) and reports detailed health information including hazards. This HPD uses the inventory method indicated above, which is one of three possible methods:

- *Basic Inventory method with Product-level threshold.*
- *Nested Material Inventory method with Product-level threshold*
- *Nested Material Inventory method with individual Material-level thresholds*

Definitions and requirements for the three inventory methods and requirements for each data field can be found in the HPD Open Standard version 2.3, available on the HPDC website at: www.hpd-collaborative.org/hpd-2-3-standard

PATINA CEMENT BOARD **%: 100.0000 - 100.0000**

PRODUCT THRESHOLD: 100 ppm | RESIDUALS AND IMPURITIES EVALUATION COMPLETED: No | MATERIAL TYPE: Other: MINERAL-FIBER-REINFORCED CEMENTITIOUS PANELS

RESIDUALS AND IMPURITIES NOTES: Residuals and Impurities are considered.

OTHER MATERIAL NOTES: None.

PORTLAND CEMENT (PORTLAND CEMENT) ID: 65997-15-1

HAZARD DATA SOURCE: **Pharos Chemical and Materials Library** HAZARD SCREENING DATE: **2022-03-16 14:48:32**

%: **40.0000 - 50.0000** GreenScreen: **LT-P1** RC: **UNK** NANO: **No** SUBSTANCE ROLE: **Filler**

HAZARD TYPE	AGENCY AND LIST TITLES	WARNINGS
CAN	MAK	Carcinogen Group 3B - Evidence of carcinogenic effects but not sufficient for classification
END	TEDX - Potential Endocrine Disruptors	Potential Endocrine Disruptor

ADDITIONAL LISTINGS	AGENCY	NOTIFICATION
None found		No listings found on Additional Hazard Lists

SUBSTANCE NOTES: White or grey

QUARTZ ID: 14808-60-7

HAZARD DATA SOURCE: **Pharos Chemical and Materials Library** HAZARD SCREENING DATE: **2022-03-16 14:48:33**

%: **25.0000 - 45.0000** GreenScreen: **BM-1** RC: **UNK** NANO: **No** SUBSTANCE ROLE: **Filler**

HAZARD TYPE	AGENCY AND LIST TITLES	WARNINGS
CAN	US CDC - Occupational Carcinogens	Occupational Carcinogen
CAN	CA EPA - Prop 65	Carcinogen - specific to chemical form or exposure route
CAN	US NIH - Report on Carcinogens	Known to be Human Carcinogen (respirable size - occupational setting)
CAN	MAK	Carcinogen Group 1 - Substances that cause cancer in man
CAN	IARC	Group 1 - Agent is carcinogenic to humans - inhaled from occupational sources
CAN	IARC	Group 1 - Agent is Carcinogenic to humans
CAN	GHS - New Zealand	6.7A - Known or presumed human carcinogens
CAN	GHS - Japan	H350 - May cause cancer [Carcinogenicity - Category 1A]
CAN	GHS - Australia	H350i - May cause cancer by inhalation [Carcinogenicity - Category 1A or 1B]

ADDITIONAL LISTINGS	AGENCY	NOTIFICATION
None found		No listings found on Additional Hazard Lists

SUBSTANCE NOTES:

CELLULOSE, MICROCRYSTALLINE

ID: **9004-34-6**

HAZARD DATA SOURCE: **Pharos Chemical and Materials Library** HAZARD SCREENING DATE: **2022-03-16 14:48:33**

%: **5.0000 - 15.0000** GreenScreen: **LT-UNK** RC: **UNK** NANO: **No** SUBSTANCE ROLE: **Filler**

HAZARD TYPE	AGENCY AND LIST TITLES	WARNINGS
RES	AOEC - Asthmagens	Asthmagen (Rs) - sensitizer-induced

ADDITIONAL LISTINGS	AGENCY	NOTIFICATION
None found		No listings found on Additional Hazard Lists

SUBSTANCE NOTES:

WOLLASTONITE

ID: **13983-17-0**

HAZARD DATA SOURCE: **Pharos Chemical and Materials Library** HAZARD SCREENING DATE: **2022-03-16 14:48:34**

%: **5.0000 - 15.0000** GreenScreen: **LT-UNK** RC: **UNK** NANO: **No** SUBSTANCE ROLE: **Filler**

HAZARD TYPE	AGENCY AND LIST TITLES	WARNINGS
None found		No warnings found on HPD Priority Hazard Lists

ADDITIONAL LISTINGS	AGENCY	NOTIFICATION
None found		No listings found on Additional Hazard Lists

SUBSTANCE NOTES:

Section 3: Certifications and Compliance

This section lists applicable certification and standards compliance information for VOC emissions and VOC content. Other types of health or environmental performance testing or certifications completed for the product may be provided.

VOC EMISSIONS — **N/A**

CERTIFYING PARTY: Self-declared
APPLICABLE FACILITIES: N/A
CERTIFICATE URL:

ISSUE DATE: 2022-03-16
EXPIRY DATE:

CERTIFIER OR LAB: N/A

CERTIFICATION AND COMPLIANCE NOTES:

VOC CONTENT — **N/A**

CERTIFYING PARTY: Self-declared
APPLICABLE FACILITIES: N/A
CERTIFICATE URL:

ISSUE DATE: 2022-03-16
EXPIRY DATE:

CERTIFIER OR LAB: N/A

CERTIFICATION AND COMPLIANCE NOTES: N/A

OTHER — **EPD**

CERTIFYING PARTY: Third Party
APPLICABLE FACILITIES: Single-site, Hungary.
CERTIFICATE URL: https://www.cembrit.nl/download/SNL/EPD-Patina-Solid-Cover-Deco

ISSUE DATE: 2021-02-15
EXPIRY DATE: 2026-01-11

CERTIFIER OR LAB: EPDDanmark

CERTIFICATION AND COMPLIANCE NOTES: Third-party certified, EPD Type 3.

Section 4: Accessories

This section lists related products or materials that the manufacturer requires or recommends for installation (such as adhesives or fasteners), maintenance, cleaning, or operations. For information relating to the contents of these related products, refer to their applicable Health Product Declarations, if available.

No accessories are required for this product.

Section 5: General Notes

Required entry - explanation of variations among different products listed in a single HPD [See 3.1], if not addressed in Material or Product Notes [See 2.2.1.7] or Substance Notes [See 2.2.2.11]; and definition of the scope of the HPD when products are composed of combinations of parts [See 3.4].

Safety data sheet available. The product does not have to be classified.

Section 6: References

MANUFACTURER INFORMATION

MANUFACTURER: **American Fiber Cement Corporation**
ADDRESS: **http://www.americanfibercement.com**
Littleton CO 80128, United States
WEBSITE: **http://www.americanfibercement.com**

CONTACT NAME: **Spencer Anderson**
TITLE: **Technical Director**
PHONE: **303-972-5107**
EMAIL: **sanderson@afccladding.com**

The listed contact is responsible for the validity of this HPD and attests that it is accurate and complete to the best of his or her knowledge.

KEY

Hazard Types

AQU Aquatic toxicity
CAN Cancer
DEV Developmental toxicity
END Endocrine activity
EYE Eye irritation/corrosivity
GEN Gene mutation
GLO Global warming
LAN Land toxicity
MAM Mammalian/systemic/organ toxicity
MUL Multiple
NEU Neurotoxicity
NF Not found on Priority Hazard Lists
OZO Ozone depletion
PBT Persistent, bioaccumulative, and toxic
PHY Physical hazard (flammable or reactive)
REP Reproductive
RES Respiratory sensitization
SKI Skin sensitization/irritation/corrosivity
UNK Unknown

GreenScreen (GS)

BM-4 Benchmark 4 (prefer-safer chemical)
BM-3 Benchmark 3 (use but still opportunity for improvement)
BM-2 Benchmark 2 (use but search for safer substitutes)
BM-1 Benchmark 1 (avoid - chemical of high concern)
BM-U Benchmark Unspecified (due to insufficient data)
LT-P1 List Translator Possible 1 (Possible Benchmark-1)
LT-1 List Translator 1 (Likely Benchmark-1)
LT-UNK List Translator Benchmark Unknown
NoGS No GreenScreen.

GreenScreen Benchmark scores sometimes also carry subscripts, which provide more context for how the score was determined. These are DG (data gap), TP (transformation product), and CoHC (chemical of high concern). For more information, see 2.2.2.4 GreenScreen® for Safer Chemicals, www.greenscreenchemicals.org, and Best Practices for Hazard Screening on the HPDC website (hpd-collaborative.org).

Recycled Types

PreC Pre-consumer recycled content
PostC Post-consumer recycled content
UNK Inclusion of recycled content is unknown
None Does not include recycled content

Other Terms:

GHS SDS Globally Harmonized System of Classification and Labeling of Chemicals Safety Data Sheet

Inventory Methods:

Nested Method / Material Threshold Substances listed within each material per threshold indicated per material
Nested Method / Product Threshold Substances listed within each material per threshold indicated per product
Basic Method / Product Threshold Substances listed individually per threshold indicated per product

Nano Composed of nano scale particles or nanotechnology
Third Party Verified Verification by independent certifier approved by HPDC
Preparer Third party preparer, if not self-prepared by manufacturer
Applicable facilities Manufacturing sites to which testing applies

The Health Product Declaration (HPD) Open Standard provides for the disclosure of product contents and potential associated human and environmental health hazards. Hazard associations are based on the HPD Priority Hazard Lists, the GreenScreen List Translator™, and when available, full GreenScreen® assessments. The HPD Open Standard v2.1 is not:

- *a method for the assessment of exposure or risk associated with product handling or use,*
- *a method for assessing potential health impacts of: (i) substances used or created during the manufacturing process or (ii) substances created after the product is delivered for end use.*

Information about life cycle, exposure and/or risk assessments performed on the product may be reported by the manufacturer in appropriate Notes sections, and/or, where applicable, in the Certifications section.

The HPD Open Standard was created and is supported by the Health Product Declaration Collaborative (the HPD Collaborative), a customer-led organization composed of stakeholders throughout the building industry that is committed to the continuous improvement of building products through transparency, openness, and innovation throughout the product supply chain.

The product manufacturer and any applicable independent verifier are solely responsible for the accuracy of statements and claims made in this HPD and for compliance with the HPD standard noted.

RAKENNUSTIETO

29.10.2021 - 3576

EMISSION CLASSIFICATION OF BUILDING MATERIALS

Cembrit Holding A/S

The classification working group set up by The Building Information Foundation RTS has approved the following product:

Cembrit Patina Original
Cembrit Patina Sky
Cembrit Patina Rough
Cembrit Patina Inline
Cembrit Patina Signature

as belonging to emission class M1 for building materials.

The classification is valid until 19.3.2024.

Cembrit Holding A/S has the right to equip its classified products with the classification mark and to use this classification mark when marketing these products.

The decision is in line with the requirements laid down in the Classification of Indoor Climate 2018 and the Classification of Building Materials: General Rules.

BUILDING INFORMATION LTD

Laura Apilo
Managing Director

Katri Leino
Secretary of the Classification Working Group

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CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

CSI Section:
07 46 46 Fiber-Cement Siding

1.0 RECOGNITION

Cembrit Fiber-Cement Façade Panel System described in this report has been evaluated for use as an exterior and interior wall covering. The physical, mechanical, durability, weather resistance, wind-load resistance, non-combustibility, and surface burning characteristics of the panel system were evaluated for compliance with the following codes and regulations:

- 2018, 2015, and 2012 International Building Code® (IBC)
- 2018, 2015, and 2012 International Residential Code® (IRC)
- 2017 Florida Building Code, Building and 2017 Florida Building Code, Residential (FBC) – Supplement attached

2.0 LIMITATIONS

Use of the Cembrit Fiber-Cement Façade Panel System described in this report is subject to the following limitations:

2.1 Installation of the Cembrit Fiber-Cement Façade Panel System shall be in accordance with this report, the project details, installation instructions, and the applicable code. Where conflicts occur between the manufacturer's published installation instructions and this report, the more restrictive shall govern.

2.2 The maximum allowable wind pressure for the Cembrit Fiber-Cement Façade Panel System is provided in Table 1 of this report. The capacities of the supporting wall, framing members, and connections shall be equal to or greater than the allowable wind pressure.

2.3 Where installed as exterior cladding only on buildings of Type I, II, III, or IV Construction, the Cembrit Fiber-Cement Façade Panel System shall be constructed in accordance with Section 3.4 of this report.

2.4 When use is as an interior wall covering, with spaces between adjacent panels, the Cembrit Fiber-Cement Façade Panel System shall be installed over a substrate having a Class A finish, complying with the 2018 IBC Section 803.1.2 or 2015 and 2012 IBC Section 803.1.1.

2.5 Maximum panel fastener spacings and fastener contributory area shall be in accordance with Section 3.2 of this report

3.0 PRODUCT USE

3.1 General: Cembrit Fiber-Cement Façade Panel System is used as exterior or interior wall covering on buildings of all construction types under the IBC and on buildings constructed under the IRC. The panel system shall be installed in accordance with the applicable code, the manufacturer's installation instructions, and this report. A copy of the installation documents shall be available on the job site at all times during construction.

The Cembrit Fiber-Cement Façade Panel System may be used as a non-load-bearing exterior wall covering in accordance with Chapter 14 of the IBC and Chapter 7 of the IRC. The fiber-cement panels may also be used for interior applications as part of a Class A interior wall finish. The panels may be installed on buildings of Types I, II, III, or IV construction when installed in accordance with Section 3.4 of this report.

3.2 Design: Table 1 of this report provides the allowable wind load for the Cembrit Fiber-Cement Façade Panel System when used as an exterior wall covering.

TABLE 1 – ALLOWABLE TRANSVERSE (WIND) LOAD

Panel Thickness Installation Method	POSITIVE (psf)	NEGATIVE (psf)
8-mm Visible Attachment System	49	48
12-mm Concealed Attachment System	42	40

SI: 1-inch = 25.4 mm; 1 psf = 0.0479 kPa

The supporting walls, framing members, and connections shall be designed to meet the loads prescribed by IBC Chapter 16 or IRC Section R301.2, as applicable. The allowable transverse loads for the Cembrit Fiber-Cement Façade Panel System shall equal or exceed the design loads. The attachment of the façade panel system to walls or substrates shall be designed by a registered design professional in accordance with the limitations described in Sections 3.2.1 and 3.2.2 of this report, and submitted to the building official for approval.

3.2.1 8-mm Visible Attachment System: The 8-mm Visible Attachment System shall have brackets spaced a maximum of 24 inches (610 mm) on-center horizontally or vertically. Each bracket shall be connected to supporting framing, spaced a maximum of 16 inches (406 mm) on-center, with two self-tapping screws, complying with Section 4.1.2 of this report. Horizontal L-Profiles, as described in Section 4.1.3 of this report, shall be secured to each bracket with two self-tapping screws, complying with Section 4.1.2 of this report. Vertical Z-Profiles or Hat-Channels, used behind intersecting panel joints shall be secured to intersecting L-Profiles with one self-drilling screw, complying with Section 4.1.2 of this report. The 8-mm Cembrit Fiber-Cement Panels are fastened to the Z- or Hat-Channel profiles with rivets, complying with Section 4.1.2 of this report, supporting a maximum of 2.5 square feet (0.23 m^2) of contributory panel area per rivet. Panel rivets shall be spaced a maximum of 24 inches (610 mm) on-center horizontally or vertically. Rivets shall be a maximum of 4 inches (102 mm) from panel edges.

3.2.2 12-mm Concealed Attachment System: The 12-mm Concealed Attachment System shall have brackets spaced a maximum of 16 inches (406 mm) on-center horizontally and 30 inches (762 mm) on-center vertically. Each bracket shall be connected to supporting framing, with self-tapping screws, complying with Section 4.1.2 of this report. Vertical L-Profiles, as described in Section 4.1.3 of this report, shall be secured to each bracket with two self-tapping screws, complying with Section 4.1.2 of this report. Horizontal C-Profiles, spaced a maximum of $17^1/_{16}$ inches (433 mm) on center, shall be secured to intersecting L-Profiles with one self-drilling screw, complying with Section 4.1.2 of this report. The 12-mm Cembrit Fiber-Cement Panels are fastened to C-Hangers, complying with Section 4.1.3 of this report, with undercut anchors, complying with Section 4.1.2 of this report. The 12-mm Panels are connected to C-Hangers with undercut anchors supporting a maximum of 2.1 square feet (0.195 m^2) of contributory panel area per anchor. Undercut anchors shall be spaced a maximum of 18.1 inches (460 mm) on-center horizontally or vertically. Anchors shall be a maximum of $5^7/_8$-inches (149 mm) from panel edges.

3.3 Installation General: The Cembrit Fiber-Cement Façade Panel System shall be installed in accordance with the design documents, the manufacturer's published installation instructions, and this evaluation report.

Exterior wall assemblies shall include a water-resistive barrier, flashing, a means for draining water that enters the assembly to the exterior and protection against condensation in accordance with IBC Section 1403.2 or IRC Section R703.2, as applicable. The Cembrit Fiber-Cement Panels may be cut and trimmed in accordance with the design documents and this report. A nominal gap of $^3/_8$ inch (9.5 mm) shall be maintained at panel-to-panel and panel-to-penetration joints, except that horizontal joints and corners may be closed with joint closures and corner closures as decorative elements when specified by the building designer. The panels may be used for interior applications as part of a Class A interior wall finish.

3.4 Types I, II, III, and IV Construction:

3.4.1 8-mm Thick Panels: The Cembrit 8-mm thick panels using the Visible Attachment System as described in this report may be installed on buildings of Types I, II, III, or IV construction under the IBC. The base wall framing shall be minimum 18 gage by $3^5/_8$-inch (92.1 mm) cold-formed C-channel steel studs spaced 16 inches (406 mm) on-center. The interior side of the studs shall be covered with a minimum of one layer of $^5/_8$-inch-thick (15.9 mm) Type X gypsum wallboard, complying with ASTM C1396. The exterior side of the studs shall be covered with a minimum of one layer of ½-inch-thick (12.7 mm) glass mat gypsum substrate, Type X, complying with ASTM C1177. The gypsum boards shall be fastened to the studs with 1¼-inch-long (31.7 mm) corrosion-resistant self-tapping screws spaced 12 inches (305 mm) on-center in the field and 8 inches (203 mm) on-center at the perimeters. Stud cavities shall be filled with minimum 4-inch-thick (102 mm) minimum 4 pcf density (64 kg/m^3) mineral wool secured with Z-clips at floor lines. Vertical Z-Profiles shall be installed at 16 inches (406 mm) on-center. Hat-Channels shall be installed at panel joints and fastened to the steel studs with 1¼-inch-long (31.7 mm) corrosion-resistant self-tapping screws. Window and door openings shall be flashed with minimum 18 gage steel flashing.

3.4.2 12-mm Thick Panels: The Cembrit 12-mm thick panels using the Concealed Attachment System as described in this report may be installed on buildings of Types I, II, III, or IV construction under the IBC. Installation on exterior walls is limited to heights not greater than 40 feet (12.2 m) above grade plane when the wall assembly includes a combustible water-resistive barrier. For use with combustible water-resistive barriers at heights greater than 40 feet (12.2 m) above grade plane, the wall constructions shall be tested in accordance with and comply with the acceptance criteria of NFPA 285, in accordance with Section 1403.5 of the IBC.

4.0 PRODUCT DESCRIPTION

4.1 General: The Cembrit Fiber-Cement Façade Panel System consists of Cembrit Fiber-Cement Panels attached with concealed or visible fasteners to metal brackets that are connected to aluminum or steel track.

4.1.1 Cembrit Fiber-Cement Panels: Cembrit Fiber-Cement Panels comply with ASTM C1186 as Type A Grade IV fiber-cement boards, in accordance with Sections 1404.10 and 1405.16 of the IBC. The Cembrit Fiber-Cement Panels are nominally 8 mm or 12 mm (0.31 or 0.47 inch) thick, available in widths up to 1250 mm (49.2 inches) and lengths up to 3070 mm (121 inches). Cembrit Fiber-Cement Panels have a flame spread index of 0 and a smoke-developed index

of not more than 5 when tested in accordance with ASTM E84 and comply as a Class A interior finish in accordance with IBC Section 803.1.1. The boards are classified as noncombustible when tested in accordance with ASTM E136.

4.1.2 Fasteners: Fasteners used with the Cembrit Fiber-Cement Façade Panel Systems are shown in Table 2 of this report. Where installed as exterior cladding, fasteners shall be corrosion-resistant.

TABLE 2 - FASTENERS

Attachment	8-mm Panel Visible Attachment System	12-mm Panel Concealed Attachment System
Bracket to Framing	¼-20 by 2-inch long self-tapping hex head screws	¼-20 by 2-inch long self-tapping hex head screws
L-Profile to Bracket (8-mm Visible System); or L-Profile to C-Profile (12-mm Concealed System)	No. 10 by 1-inch-long self-tapping hex head screws	No.10 by 1-inch-long self-tapping hex head screws
Z- or Hat-Channel to horizontal L-Profile; or Horizontal C-Profile to Vertical L-Profile	M5.5 by 25 mm self-drilling galvanized screw with sealing washer [1]	M5.5 by 25 mm self-drilling galvanized screw with sealing washer [1]
Panel to C-Hanger	NA	Stainless Steel, threaded, undercut anchors [1]
Panel to vertical Z- or Hat-Profile	Rivets - Stainless steel 3/16-inch-diameter 4-by-19/K15 [1]	NA

SI: 1-inch = 25.4 mm
[1] provided with the Cembrit Fiber-Cement Façade Panel System.

4.1.3 Brackets and Profile Descriptions: Descriptions of the attachment systems elements are shown in Table 3 of this report. The 8-mm thick Cembrit panels use the Visible Attachment System. The 12-mm thick Cembrit panels use the Concealed Attachment System. Figure 1 of this report provides typical bracket profiles and installation illustrations.

TABLE 3 – ATTACHMENT SYSTEM ELEMENTS

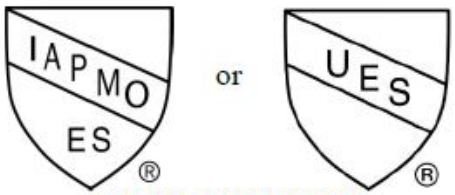
Element	8-mm Panel Visible Attachment System (inch)	12-mm Panel Concealed Attachment System (inch)
Brackets [1]	5¼ x 3½ x 1¾	3½ x 2½ x 2 [2] or 6 7/8 x 2½ x 2 [3]
C-Hangers [1]	NA	Proprietary [1]
L-Profiles	1½ x 2 3/8 x 5/64	1½ x 2 3/8 x 5/64
Z-Profiles	16 Ga. 1 9/16 x 1½ x 1 9/16	NA
Hat-Channels	16 Ga. 2 x 1½ x 2	NA
C-Profiles [1]	NA	Proprietary [1]

SI: 1 inch = 25.4 mm
[1] provided with Cembrit Fiber-Cement Façade Panel System.
[2] Attached with one fastener per bracket.
[3] Attached with two fasteners per bracket.

4.1.4 Metal Tracks and Profiles: Metal framing shall be made of 6063-T6 alloy extruded aluminum complying with ASTM B317, or better.

5.0 IDENTIFICATION

The Cembrit Fiber-Cement Panels shall be labeled with the manufacturer's name and address, product name, thickness, color, finish, and batch number. The label shall identify the fiber-cement panels as conforming to the requirements of ASTM C1186, Type A, and the name of the approved inspection agency, Quality Control Consultants (QCC). The label shall include the IAPMO Uniform ES Mark of Conformity and the Evaluation Report Number (ER-553). Either Mark of Conformity may be used as shown below:



IAPMO UES ER-553

6.0 SUBSTANTIATING DATA

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Fiber-cement Siding (AC90), dated June 2012 (editorially revised September 2015).

6.2 Reports of non-combustibility testing in accordance with ASTM E136.

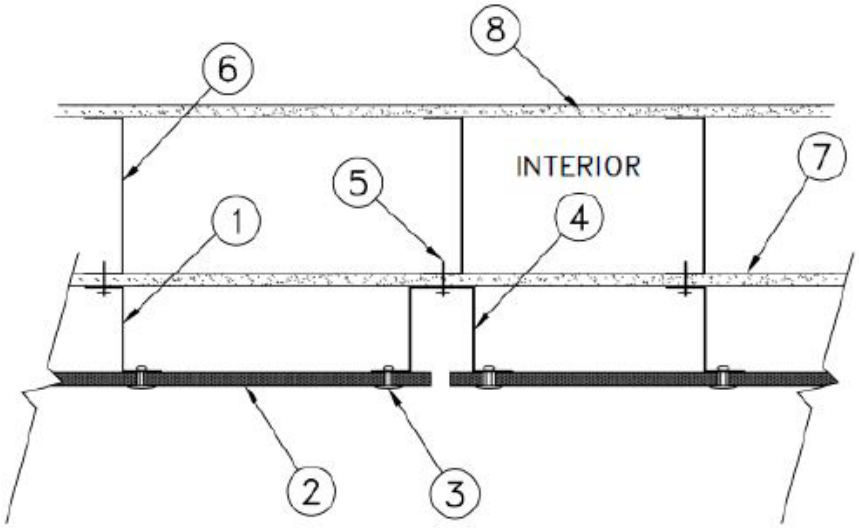
6.3 Reports of Surface Burning Characteristics testing in accordance with ASTM E84.

6.4 Reports of Fire Propagation Characteristics testing in accordance with NFPA 285.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research carried out by IAPMO Uniform Evaluation Service on the Cembrit Fiber-Cement Façade Panel System manufactured in Vocklabruck, Austria under a quality control program with inspections by Quality Control Consultants (QCC) to assess its conformance to the codes and standards shown in Section 1.0 of this report and documents the product's certification.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org



① – 1 3/16" X 1 1/2" X 1 3/16 16 GA. 'Z' CHANNEL
② – CEMBRIT PANEL
③ – POP RIVETS
④ – 2" X 1 1/2" X 2" X 1 1/2" DEEP 16 GA. HAT CHANNEL
⑤ – 1–1/4" FASTENER (APPROPRIATE FOR STRUCTURAL MEMBER)
⑥ – 3–5/8" 18ga. STEEL STUD FRAMING
⑦ – 1/2" TYPE "X" SHEATHING
⑧ – 5/8" TYPE "X" SHEATHING

FIGURE 1
CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

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CEMBRIT FIBER-CEMENT FAÇADE PANEL SYSTEM

CSI Section:
07 46 46 Fiber-Cement Siding

1.0 RECOGNITION

The Cembrit Fiber-Cement Façade Panel System evaluated in IAPMO UES Evaluation Report ER-553 is a satisfactory alternative to the following codes and regulations:

- 2017 Florida Building Code, Building (FBC, Building)
- 2017 Florida Building Code, Residential (FBC, Residential)

2.0 LIMITATIONS

Use of the Cembrit Fiber-Cement Façade Panel System described in this report supplement is subject to the following limitations:

2.1 Load combinations shall be in accordance with Sections 1605.2 or 1605.3 of the FBC-Building, as applicable.

2.2 For installations in accordance with FBC-Building Section 1403.8, the Cembrit Fiber-Cement Façade Panel System shall provide clearance between the façade panel and final earth grade on the exterior of a building of not less than 6 inches (152 mm) in order to provide for inspection for termite infestation, or in accordance with the exceptions to Section 1403.8 of the FBC, Building, as applicable.

2.3 Use of the Cembrit Fiber-Cement Façade Panel System for compliance with the high-velocity hurricane zone provisions of the FBC-Building and FBC, Residential has not been evaluated and is outside the scope of this evaluation report.

2.4 The design and installation of the Cembrit Fiber-Cement Façade Panel System shall be in accordance with the 2015 International Building Code for the 2017 FBC-Building; or the 2015 International Residential Code for the 2017 FBC-Residential, as noted in ER-553.

2.5 For products falling under Section (5)(d) of Florida Rule 61G20-3.001, verification that the report holder's quality assurance program is audited by a quality assurance entity, approved by the Florida Building Commission (or the building official when the report holder does not possess an approval by the Commission), to provide oversight and determine that the products are being manufactured as described in this evaluation report to establish continual product performance.

2.6 This supplement expires concurrently with ER-553.

American Fiber Cement Corporation

10-year Limited Warranty

Products: Cover, Minerit HD, Patina, Patina Rough, Patina Inline, Solid, Transparent

American Fiber Cement Corporation warrants that the products are manufactured in accordance with its applicable material specifications and are free from defects in materials and workmanship using AFCC specifications as the standard. Only products which are stored, installed, and used for purposes in accordance with applicable AFCC instructions and specifications are in any way warranted by AFCC. Prior to installation, purchaser shall inspect all panels for any visible faults or deviations from AFCC product specifications. This warranty is applicable only to claims made in writing and received by AFCC within sixty (60) days after the defect was discovered and within ten (10) years after the date of shipment of the product by AFCC. All other claims are waived. If a claim is made, you must allow reasonable investigation of the product you claim is defective and you must supply samples that adequately demonstrate the problem you claim for testing by AFCC.

AFCC DISCLAIMS ALL IMPLIED WARRANTIES, INCLUDING THE WARRANTY OF MERCHANTABILITY AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THIS LIMITED WARRANTY PROVIDES YOUR EXCLUSIVE REMEDY AS A PURCHASER AND/OR OWNER OF AFCC PRODUCTS. THIS LIMITED WARRANTY MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED REPRESENTATIVE OF AFCC. WITHOUT AN EXPRESS, WRITTEN AUTHORIZATION FROM AFCC, NO RETAILER OR DISTRIBUTOR OF AFCC PRODUCTS HAS THE AUTHORITY TO MODIFY OR AMEND THIS LIMITED WARRANTY.

This limited warranty is your sole and exclusive remedy. It is expressly understood and agreed that the limit of liability will be, at AFCC option, repair, re-supply of a like quantity of non-defective product, or refund of the purchase price of the material. All labor and service charges which may be incurred with respect to either the original or replacement product are excluded. AFCC shall not be liable for incidental or consequential damages, for damage to the property to which the product is applied or its contents, loss of time, profits, or any inconvenience arising out of any breach of this limited warranty or obligations under this limited warranty. AFCC shall not be liable for any damages which are based upon negligence, breach of warranty, strict liability, or any other theory except as provided in the limited warranty set forth above. This limitation of liability shall apply to any replacement product or remedy if it fails of its purpose or for any other reason.

This limited warranty covers the structural or physical defects of the base material only. Alterations of the surface or damage due to external influences such as mechanical loads and defects from use of improper accessories are EXPRESSLY EXCLUDED from this warranty. Minerit HD/Raw is a non-coated, non-pigmented board. Color variation from board to board is normal and to be expected and is expressly excluded from this warranty. Changes in color/efflorescence on the boards (e.g. fading) due to normal weathering are part of the aging process of cement based materials and are also EXPRESSLY EXCLUDED from this warranty.

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