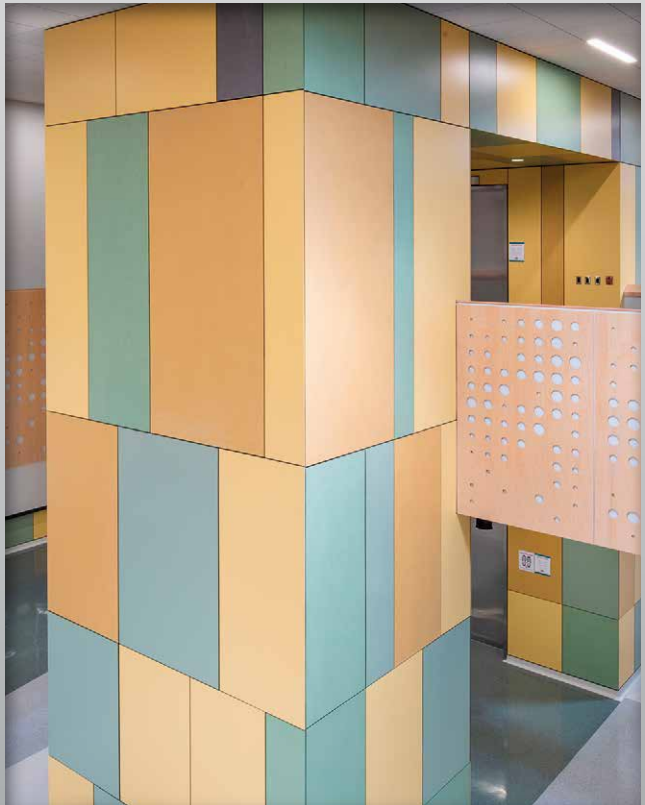


aFC *cladding*

SUSTAINABLE SOLUTIONS

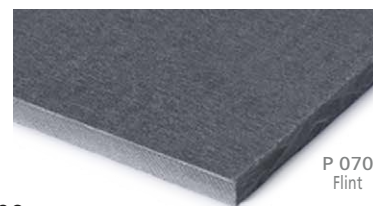


**American Fiber
Cement Corporation**



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



P 020
Granite



P 050
Graphite



P 070
Flint

Grays



P 222
Pearl

Whites



P 313
Tufa



P 323
Magma



P 333
Adobe



P 343
Ruby

Reds



P 545
Sand



P 565
Amber

Yellows



P 626
Emerald

Greens



Patina Inline

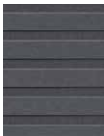
Patina Inline reflects strength and durability. Its milled linear grooves add a 3D effect to a building and make it possible to create custom squares or triangular patterns. When viewed in natural light, its featured lines offer a vibrant look that changes throughout the day. Over time, this material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



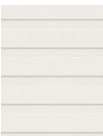
PI 020
Granite



PI 050
Graphite



PI 070
Flint



PI 222
Pearl



PI 545
Sand

Grays

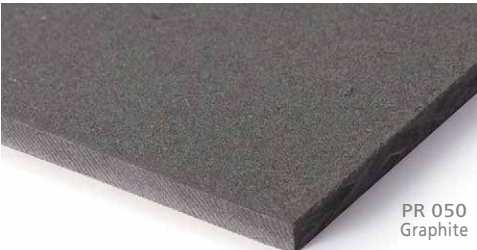
White

Tan



Patina Rough

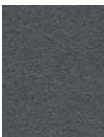
Patina Rough has a tough textured surface and stone-like finish which adds character to any building. When combined with other products from the Patina design line, it creates an interesting interplay. This material has an eroded, natural looking surface. It's virtually maintenance-free and is available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



PR 020
Granite



PR 050
Graphite



PR 070
Flint



PR 222
Pearl



PR 545
Sand

Grays

White

Tan



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 030
Mercury



S 071
Orcus

Grays



S 101
Pluto



S 131
Juno

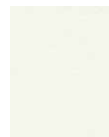


S 151
Pallas



S 191
Erebus

Blacks



S 212
Luna



S 282
Saturn

Whites



S 334
Jupiter



S 353
Mars

Reds



S 515
Venus



S 525
Triton

Yellows



S 606
Rhea



S 616
Ceres



S 656
Terra



S 676
Callisto

Greens



S 747
Neptune

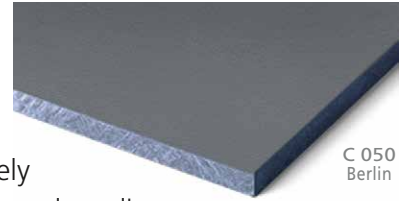


S 757
Mimas








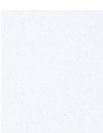



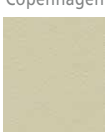





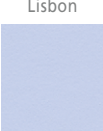
Blues

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.)



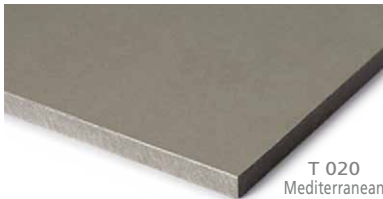
C 050
Berlin




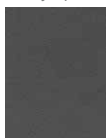








					Grays	
C 010 Stockholm	C 020 Vilnius	C 040 Sofia	C 050 Berlin	C 060 Helsinki		
					Blacks	
C 160 London	C 190 Munich					
					Whites	
C 200 Gothenburg	C 210 Nuuk					
					Reds	
C 350 Brussels	C 360 Copenhagen	C 370 Moscow	C 390 Istanbul			
					Yellows	
C 450 Amsterdam	C 530 Rome	C 540 Kiev	C 550 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				



Transparent

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				



Deco

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.



D 100
Charcoal



D 030
Fossil

Grays



D 100
Charcoal



D 190
Carbon

Blacks



D 212
Cirrus

Whites



D 330
Sienna



D 350
Chestnut

Reds



D 555
Aspen



D 562
Wheat

Yellows



D 600
Sage

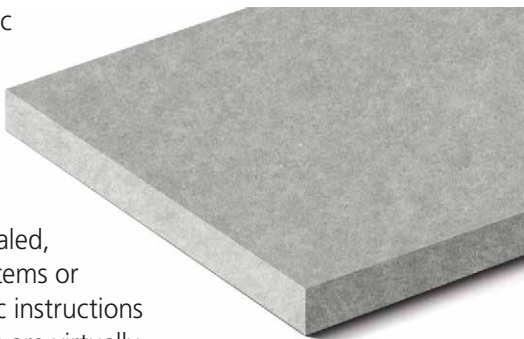
Greens

Deco	U.S. Trimmed sizes in. (mm)	Weight (lbs/ft ²)
Thickness	5/16 (8mm)	2.6
Width	46 1/4 (1,175)	
Length	96 (2,440) 119 7/8 (3,045)	

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.

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.

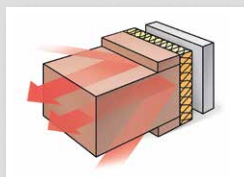
Fiber Cement — A Unique Composition

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.

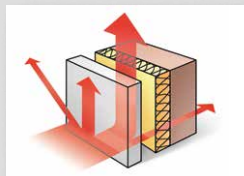
Green Footprints — A comprehensive analysis of the environmental impact of the AFC boards can be made from AFC's EPDs in accordance with EN 15804 on the Sustainability of Construction Works. The EPDs provide a Life-Cycle Assessment, manufacturing process details, and information on the use of any dangerous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

Rainscreen Cladding



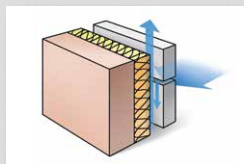
Preventing thermal bridges

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.



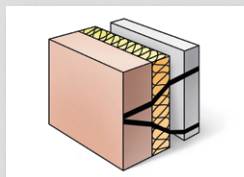
Dissipating heat from the sun

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.



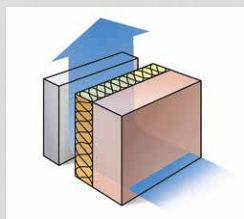
Rainscreen

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



6901 South Pierce Street, Suite 180
Littleton, CO 80128 U.S.A.

Phone: 303-972-5107
Fax: 303-978-0308

www.americanfibercement.com



ATA
Continuing
Education
Provider



Construction

Datasheet

Construction is an untreated fiber cement board that allows the authentic appearance of the rough fiber-cement to stand out. In nature, Construction is a building board which can be installed for cladding purposes, when a natural and rough expression is desired.

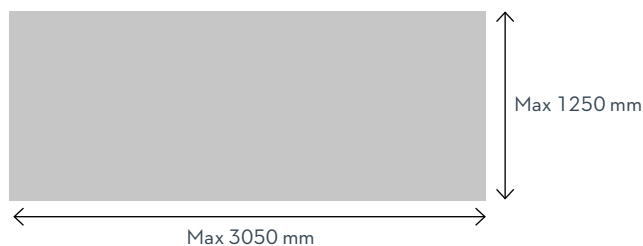
Construction is a natural material and variations may occur in the individual boards and from board to board, adding a lively expression to your facade. Construction is a high quality fiber cement building board that is used as a building board and as part of a ventilated facade solution.

Dimensions	Thickness	Width mm	Length mm
Size	6 mm	1200 1250	2500
Size	8 mm	1192 1200 1250	2500/3050 2500/3050 2500
Size	10 mm	1192 1200	3050

Standard sizes



Project sales



www.americanfibercement.com

Please visit our website for contact details and further information.



Construction

Dimension						
Thickness	mm	3.2	4.0	6.0	8.0	10.0
Tolerances (ref. EN 12467)						
Thickness	mm	±0.6	±0.6	±0.6	±0.8	±1.0
Length	mm	±3	±3	±3	±3	±3
Width	mm	±2	±2	±2	±2	±2
Physical properties						
Density, dry, average (EN 12467)	Kg/m ³	1800	1800	1800	1800	1800
Density, dry, minimum (EN 12467)	Kg/m ³	1550	1550	1550	1550	1550
Weight (Average incl. 5% moisture)	Kg/m ²	6.1	7.6	11.3	15.1	18.9
Mechanical properties (EN 12467)						
Bending modulus of elasticity						
Ambient E-module with grain	GPa	21	21	21	21	21
Ambient E-module across grain	GPa	20	20	20	20	20
Wet E-module with grain	GPa	13	13	13	13	13
Wet E-module across grain	GPa	9	9	9	9	9
Bending strength (EN 12467)						
Ambient with grain	MPa	26	26	26	26	26
Ambient across grain	MPa	22	22	22	22	22
Wet with grain	MPa	20	20	20	20	20
Wet across grain	MPa	15	15	15	15	15
Interlaminar bond						
Dry	MPa	-	-	min. 0.5	min. 0.5	min. 0.5
Impacts strength (Charpy)						
Ambient with grain	kJ/m ²	-	-	2.7	2.7	2.7
Ambient across grain	kJ/m ²	-	-	2.0	2.0	2.0
Thermal properties						
Coefficient of thermal expansion	mm/m °C	0.008	0.008	0.008	0.008	0.008
Temperature range	°C	max. 105	max. 105	max. 105	max. 105	max. 105
Frost resistance (EN 12467)	Cycles	>100	>100	>100	>100	>100
Thermal conductivity (ISO 8301, EN 12667)	λ ₁₀ W/(mK)	-	-	-	0.48	-



Construction

Hygrothermal properties						
Water absorption (wet over dry)	%	12.0	12.0	12.0	12.0	12.0
Wet-dry-wet (max)	mm/m	3	3	3	3	3
Water vapour transmission properties (EN 12572-C)						
Vapour transmission resistance (Z-value)	Gpa • m ² • s/kg	1.93	2.2	4.23	5.21	3.15
Vapour transmission resistance	s/m	14146	16130	31023	38185	23106
Vapour diffusion equivalent air layer thickness	Sd (m)	0.37	0.43	0.82	1.01	0.61
Vapour resistivity	MNs/(g • m)	596	522	653	651	307
Vapour resistance factor	μ	116	102	127	127	59.4
Vapour resistance	MNs/g	1.9	2.2	4.2	5.2	3.2
Vapour transmission	USPerm	9.1	8	4.1	3.4	5.6
Fire performance						
Reaction to fire	EN 13501	-	-	A2-s2, d0	A2-s1, d0	A2-s1, d0
ASTM E136	Flaming test	Pass	Pass	Pass	Pass	Pass
ASTM E84	Flame spread index	-	-	-	0	-
	Smoke development index	-	-	-	10	-
	Flame spread rating	-	-	-	0	-
CAN/ULC-S102-10	Smoke development classification	-	-	-	5	-
Other properties						
pH surface		11	11	11	11	11
Category, Class	EN 12467	NT A3 I	NT A3 I	NT A3 I	NT A3 I	NT A3 I



Construction

Soft and hard body impact resistance (ETAG 034, ISO 7892), 8 mm

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

Soft- and hard body impact resistance (ETAG 034, ISO 7892), 10 mm

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

SAFETY DATA SHEET

Section 1.

Identification

GHS product identifier: AFCC Fiber Cement Panels
Minerit HD

**Other means
Of identification:** Fiber Cement Panels

Product type:

SDS No.: AFC-103

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: 800-866-8677
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
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

Section 3.	Composition/Information on Ingredients
-------------------	---

Substance or mixture: Mixture

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

Other means of: Fiber Cement Panels
identification

CAS number/other identifiers

CAS number : Mixture
Product code : Fiber Cement Panels

<u>Ingredient name</u>	<u>CAS number</u>	<u>%</u>
Portland Cement	65997-15-1	35 – 60
Limestone Meal	1317-65-3	32 – 61
Crystalline Silica	14808-60-7	2 – 4

Any concentration shown as a range is 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

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.

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

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.

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.

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

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

Section 7.

Handling and Storage

Protective measures for safe handling

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

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
Crystalline Silica	0.025 mg/m ³

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

Appropriate

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

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

Color

Various

Odor

None

Odor Threshold

Not Applicable

pH

Not Applicable

Melting Point

N/A

Boiling Point

N/A

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

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 trifluoride) 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

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
--------------------------------	---------------	----------------	-------------	-----------------

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

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

Inhalation: Adverse symptoms may include the following:
Irritation

Eye contact: Adverse symptoms may include the following:
Irritation

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

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

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.

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

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.

Section 14.

Transport Information

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

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

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 :

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 Meal	Yes	Yes	No	No	No
Crystalline Silica	Yes	Yes	No	No	No

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

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.
R45: May cause cancer.

Section 16.

Other Information

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

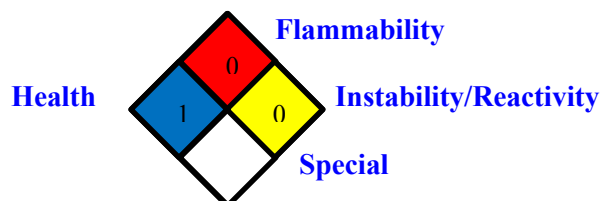
Health	2
Flammability	0
Physical Hazards	0

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

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.

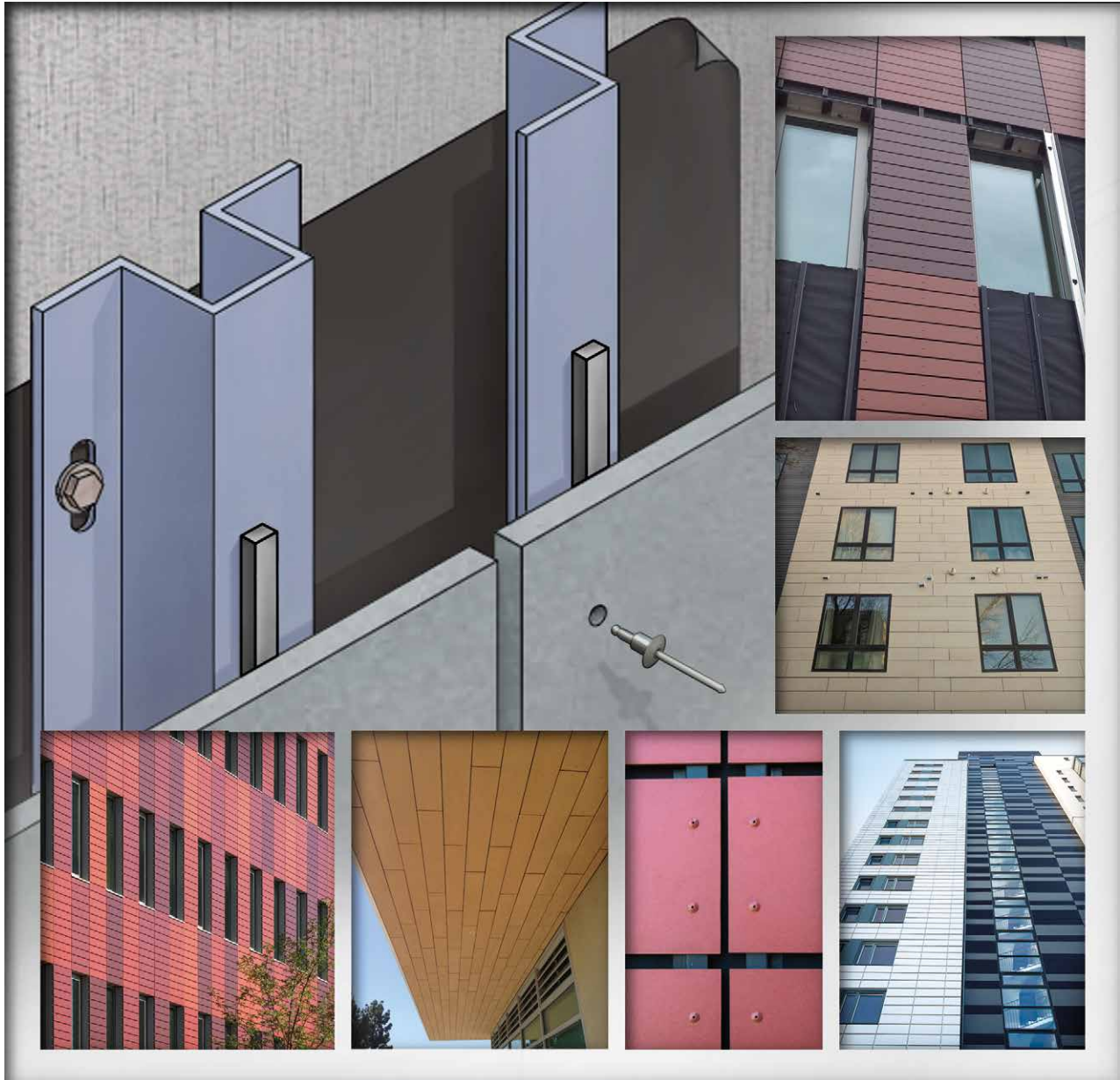
DISCLAIMER – American Fiber Cement Corp., (AFCC) believes the information contained in this Safety Data Sheet (SDS) to be accurate and reliable as of the date of issue, and is provided in good faith as a service to our customers and to comply with applicable laws. This document is intended as a guide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

Steel Profiles with Rivets

Rainscreen Application — 8mm Panels

**American Fiber
Cement Corporation**

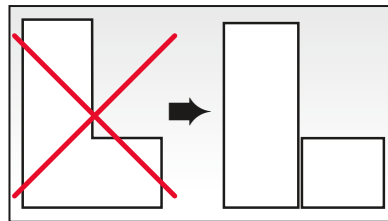
¹ These guidelines represent an **abbreviated illustration** for proper installation of Cover, Patina, Solid, Transparent and Deco architectural panels in a ventilated rain screen application. Additional guidelines for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment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

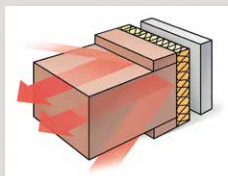
Construction Practices

1. Air space at top and bottom of building or wall termination to be 25mm (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 ($\frac{3}{4}$ "; 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.



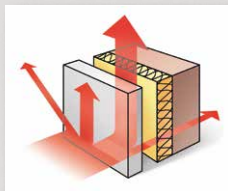
L or C-Shaped panels are not allowed.

Rain Screen Cladding



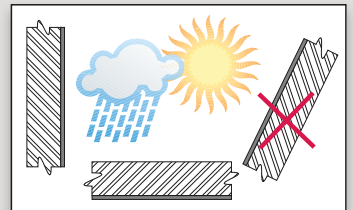
Preventing thermal bridges

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.

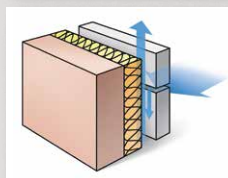


Dissipating heat from the sun

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.

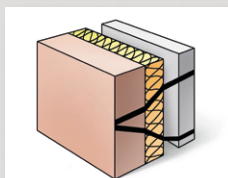


Panels exposed to weather (rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.



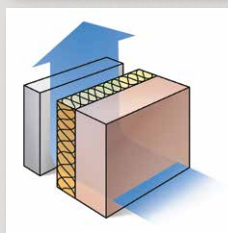
Rainscreen

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.



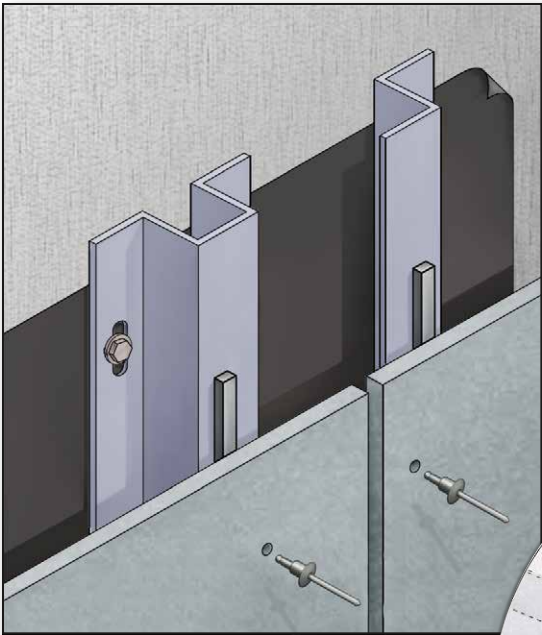
Prevention of internal condensation

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

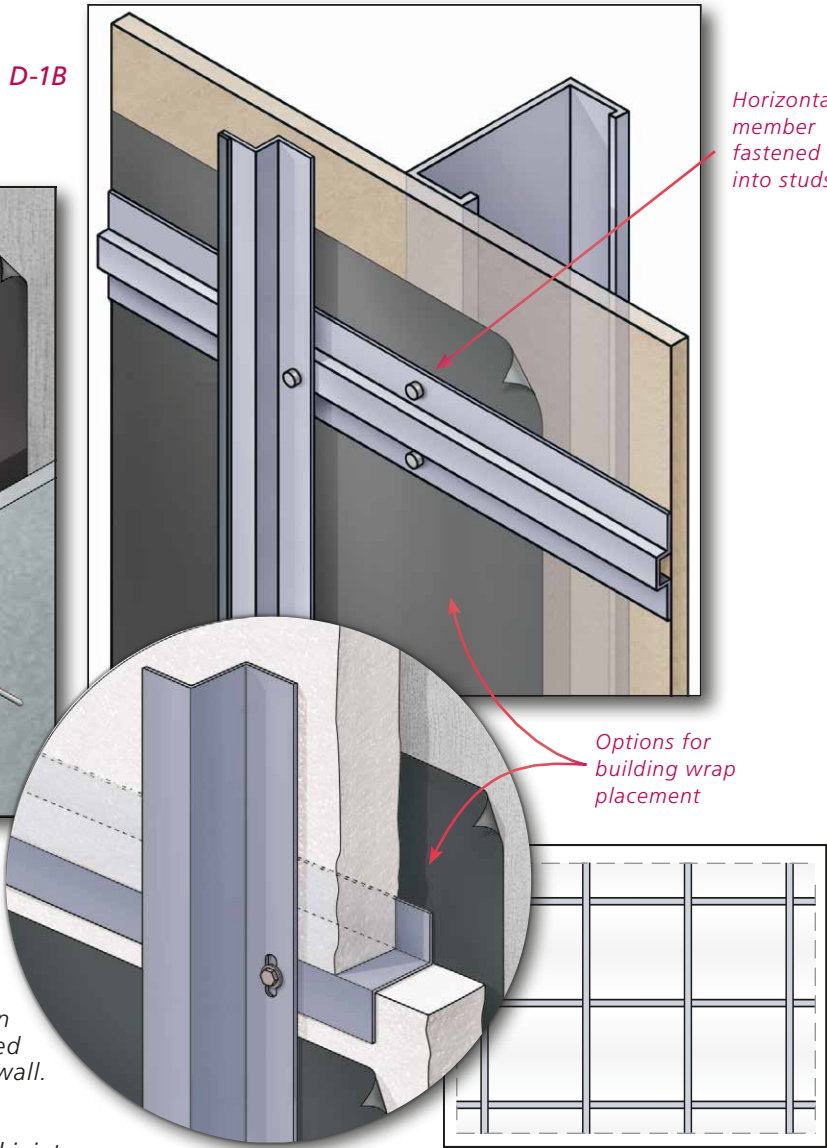
For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required. (See FIG. D-1B)

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

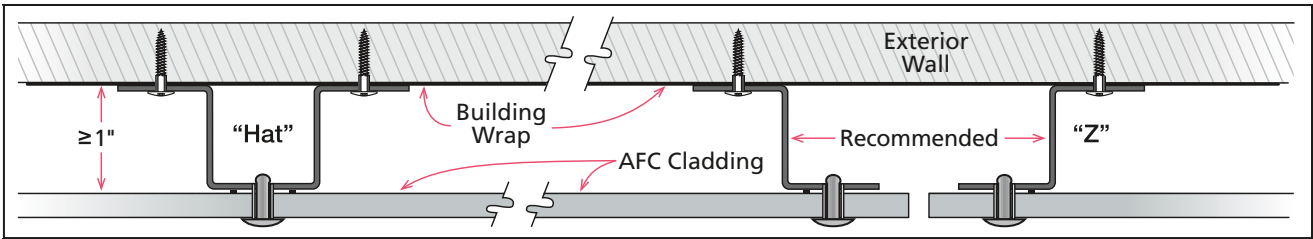


Building wrap per AFCC. Weather and UV resistant.
Check local codes for proper placement.

Horizontal
member
fastened
into studs

Options for
building wrap
placement

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

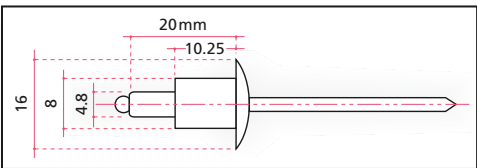
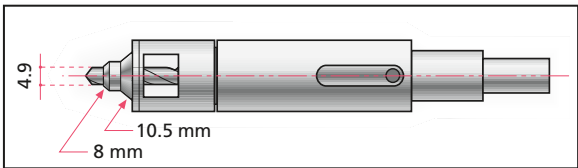


FIG. I — Centralizing drill bit



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: $\pm 3.0 \text{ mm per } 2 \text{ m } (\pm 0.0625" \text{ per } 42")$
- Substructure Vertical Straightness Tolerance: $\pm 0.5 \text{ mm per } 600 \text{ mm } (\pm 0.0625" \text{ per } 75")$

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

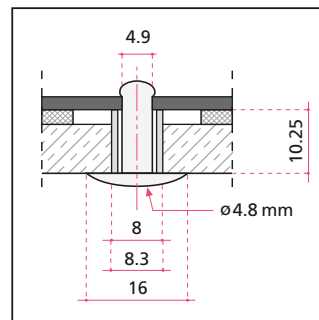
For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.

5. Maximum length of steel profile ≤10 feet. Two profiles ("Z" recommended, or "Hat" with ≥ 1¼"

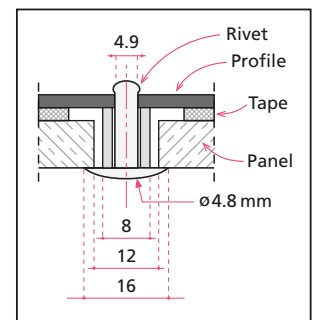
legs) are recommended in place of one wide profile at vertical joints. The sides of the panel can be cantilevered 2"–6" over edge profile so vertical joint is open. (See FIG. C)

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 $\geq 20 \text{ mm } (\frac{3}{4}")$. 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

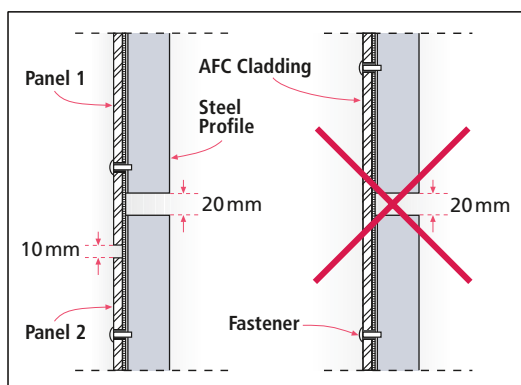


FIG. B —

Standard profile.

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

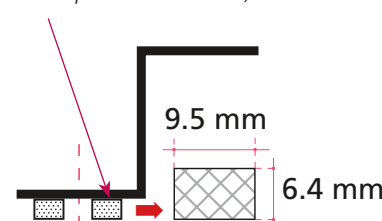
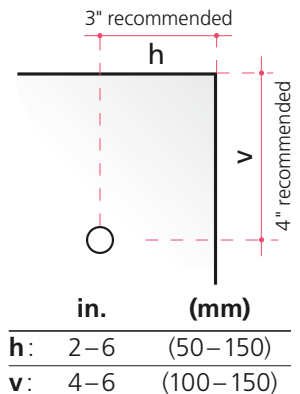


FIG. C



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 1/2" 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

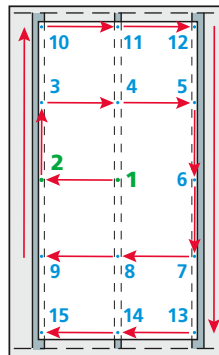
1. Panels to be Patina, Solid, Transparent, Deco or Cover.
 - Patina and Deco panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
2. Vertical and horizontal joints to be 10 mm (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 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 (3/8") 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)

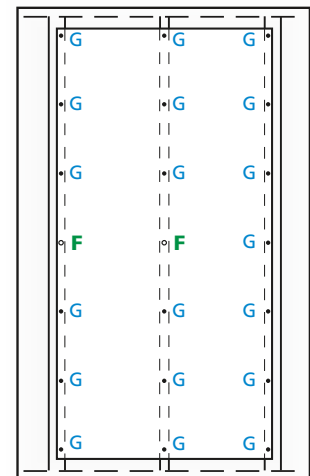
Fixed points (for attachment to vertical profiles) are:

- 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.

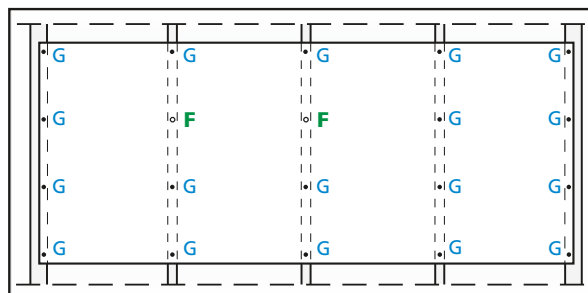


◀ FIG. K — Fixing sequence
Attach fixed points first.

▼ 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.

Ventilated Rainscreen Application

Fixing (continued)

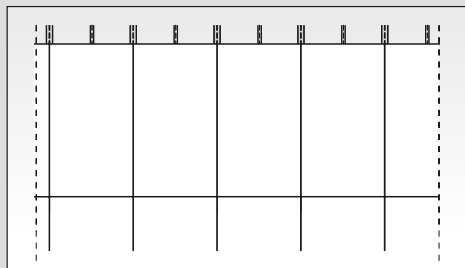
- For smaller panel sizes with only two rows of fasteners, fixed points to be top center and top left **or** top right (horizontal applications on vertical profiles). For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated, **FIG J**).
- 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".
 - Pilot hole for rivet in metal profile to be 4.9 mm diameter. See **Panel** section for drill size. (See **FIGS. E & I**)
 - Remove drill shavings from metal profile holes and panel fixed and gliding holes prior to installing rivets.

Fabrication/Maintenance/Storage

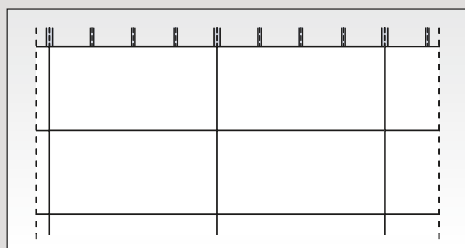
See AFCC Fabrication, Maintenance and Storage Guidelines.

Typical Pattern Layout

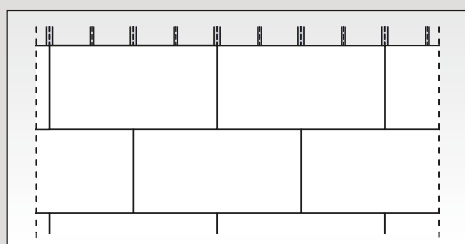
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



Straight pattern with vertical panels



Straight pattern with horizontal panels

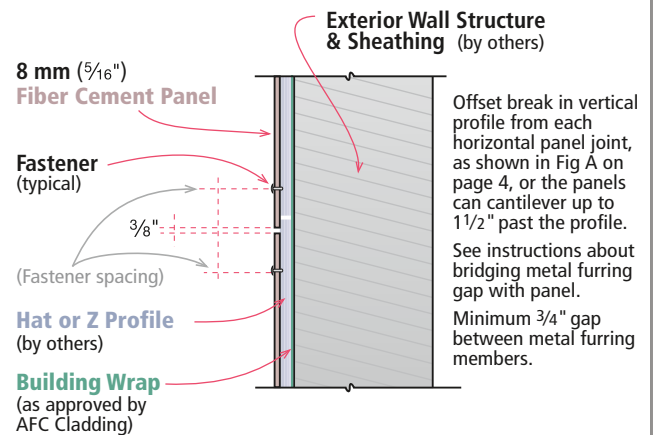


Semi pattern with horizontal panels

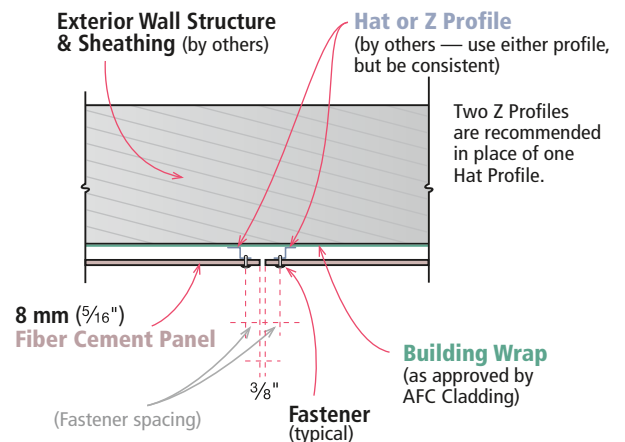
Details

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

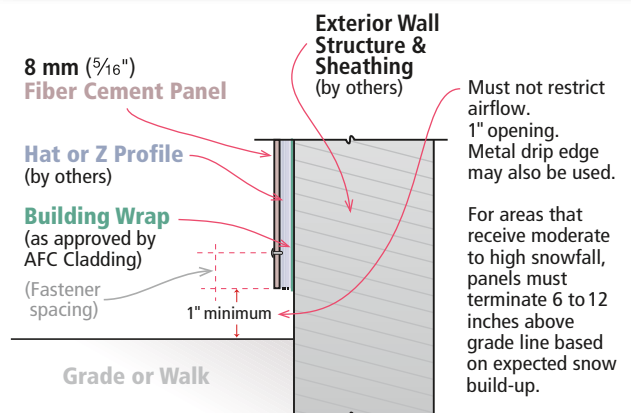
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



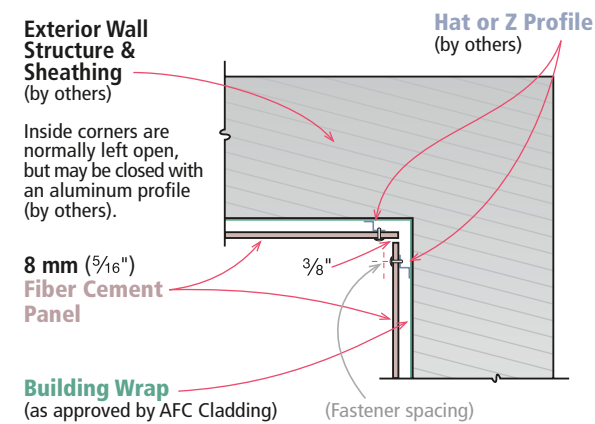
Typical Panel Base



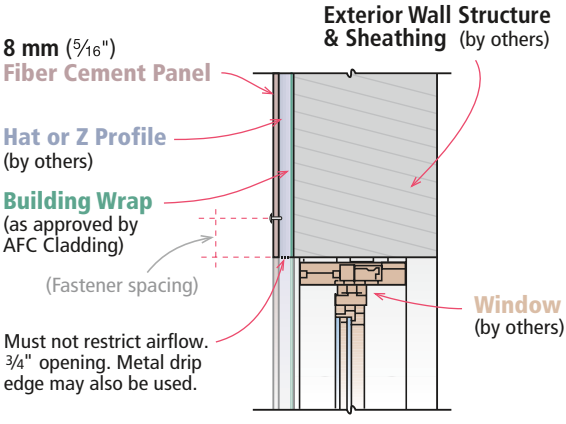
Ventilated Rainscreen Application

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

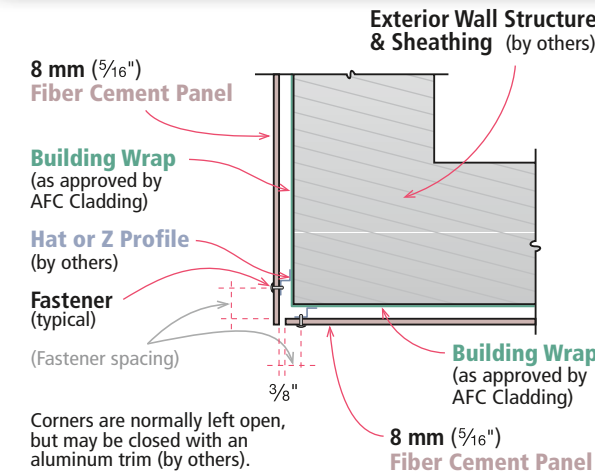
Typical Inside Corner – Plan View



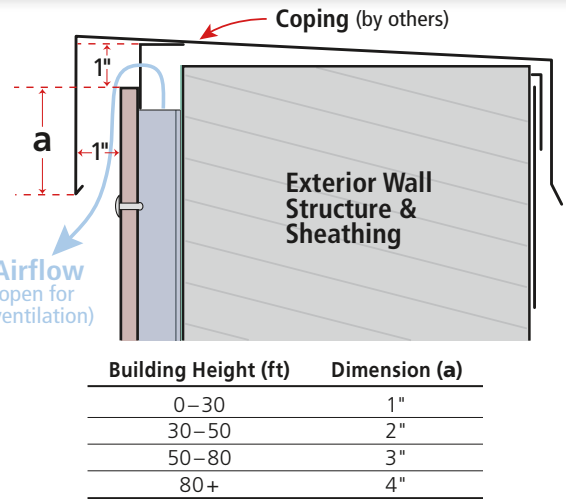
Typical Panel @ Window Head or Door Head



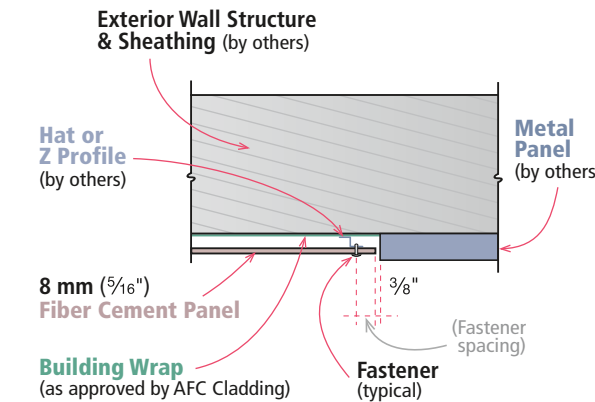
Typical Outside Corner – Plan View



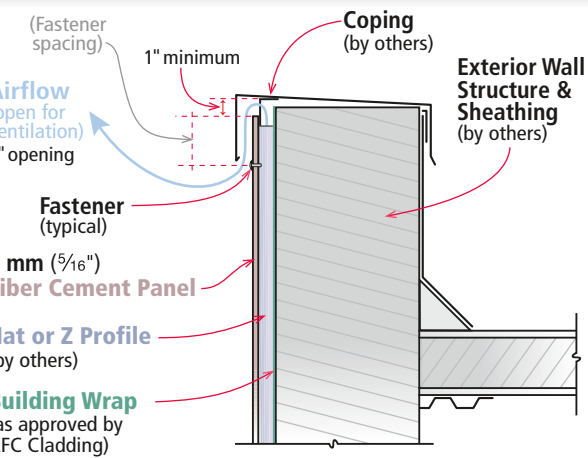
Parapet Coping – Closeup



Typical Panel End @ Metal Panel



Typical Panel @ Parapet



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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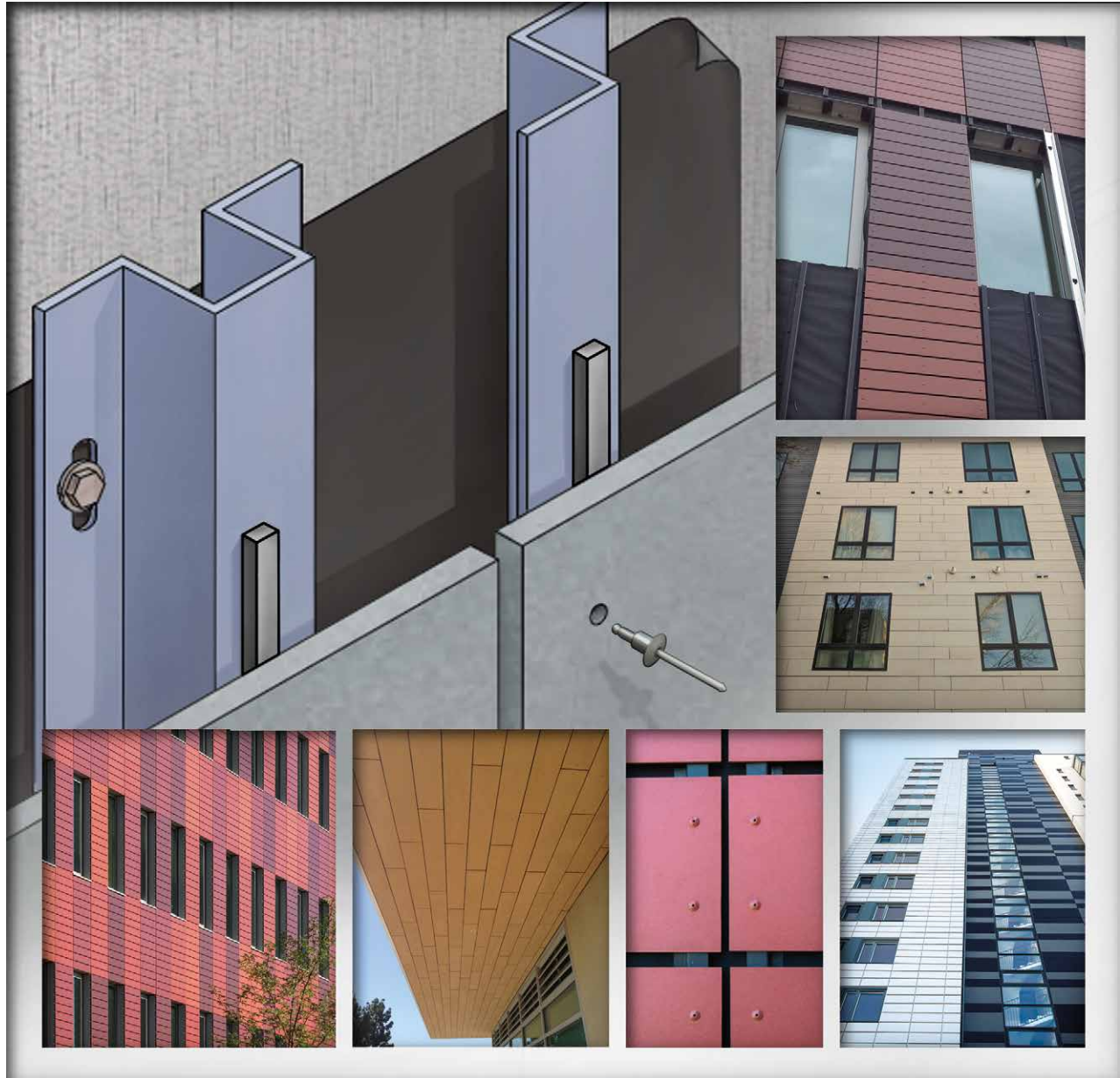
Phone: 303-972-5107

800-688-8677

Fax: 303-978-0308

www.americanfibercement.com

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



**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.

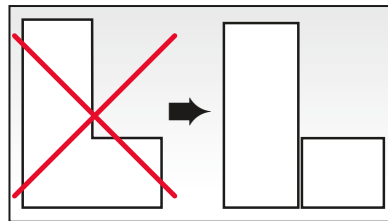
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Note: The online copy of the Installation Guidelines obtained at www.americanfibercement.com supersedes any printed copy.

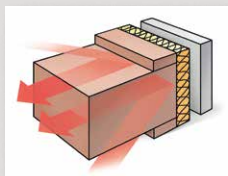
Construction Practices

1. Air space at top and bottom of building or wall termination to be 25mm (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 ($\frac{3}{4}$ "; 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.



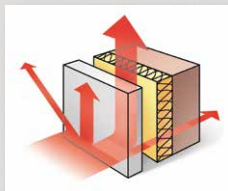
L or C-Shaped panels are not allowed.

Rain Screen Cladding



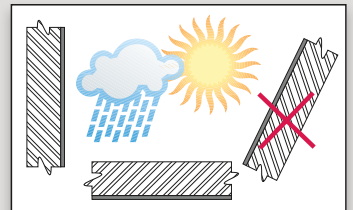
Preventing thermal bridges

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.

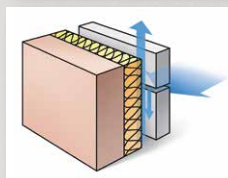


Dissipating heat from the sun

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.

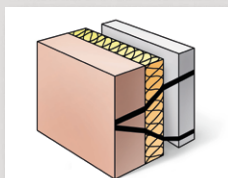


Panels exposed to weather (rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.



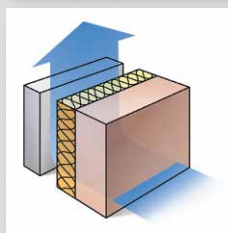
Rainscreen

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.



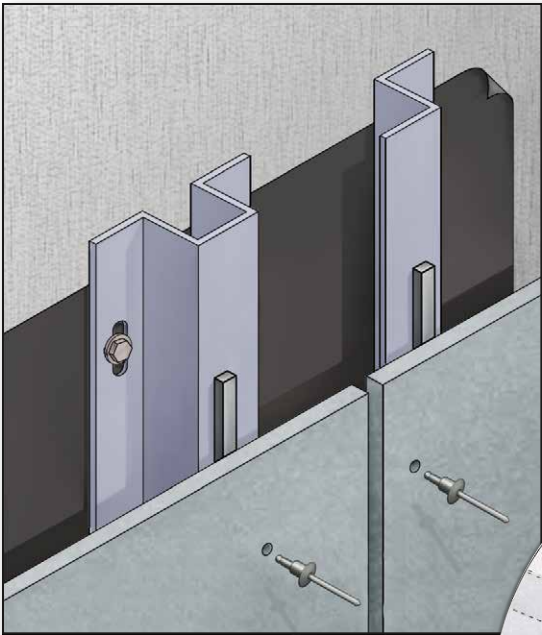
Prevention of internal condensation

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

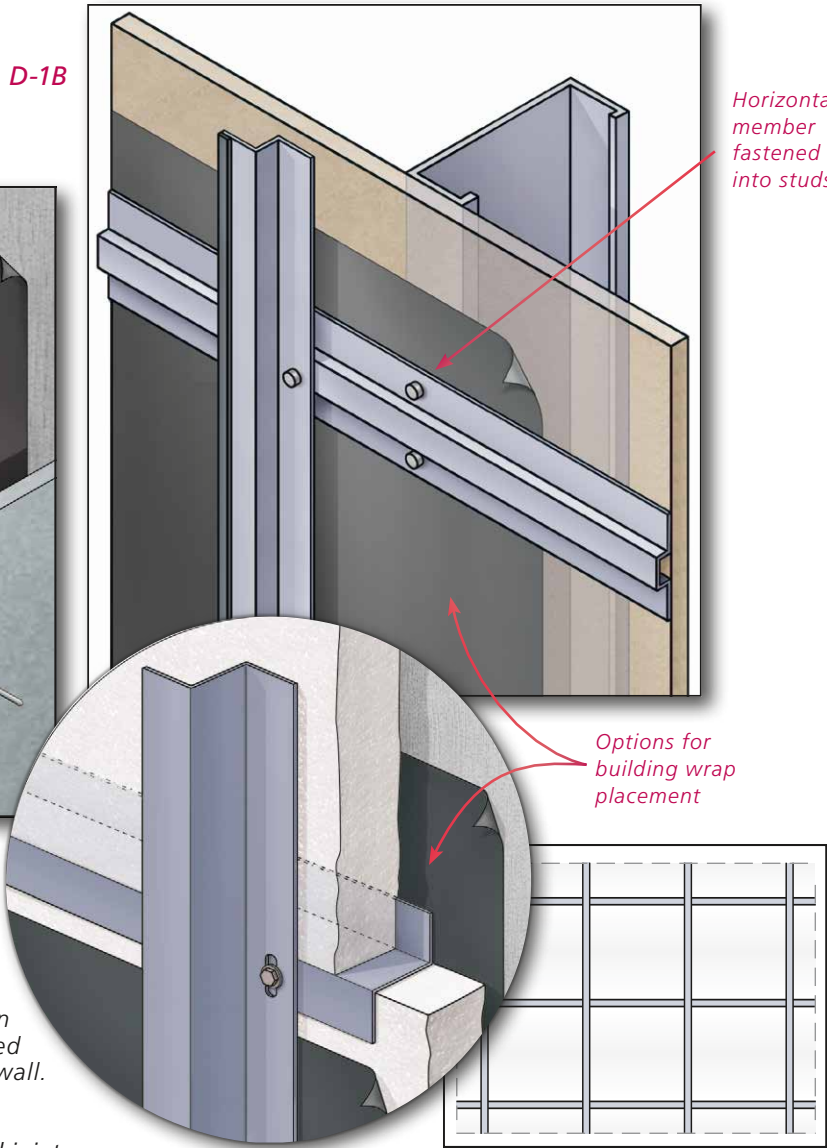
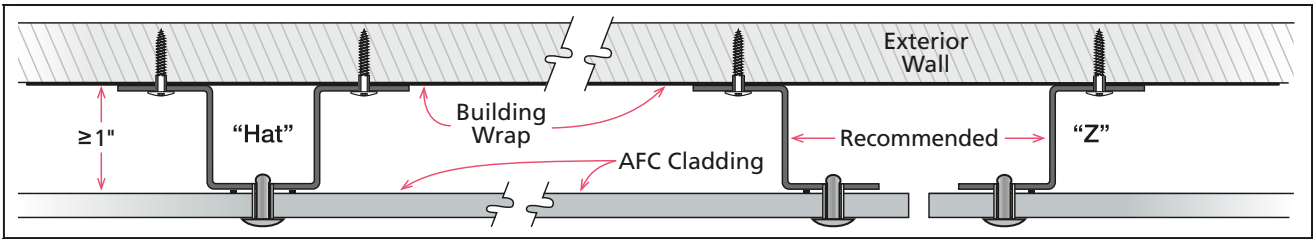


FIG. J — “Hat” or “Z” channels and vertical joint. (G90 and Powder Coated “Z” channels offered by AFCC.)



Can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (3/4" plywood sheathing is recommended).

FIG. H — Astro Rivet® with fixed cylinder

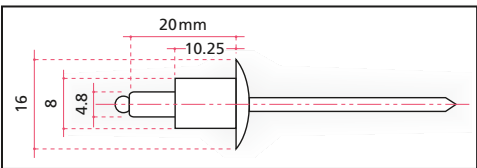
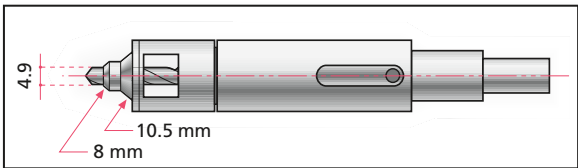


FIG. I — Centralizing drill bit



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: $\pm 3.0 \text{ mm per } 2 \text{ m } (\pm 0.0625" \text{ per } 42")$
- Substructure Vertical Straightness Tolerance: $\pm 0.5 \text{ mm per } 600 \text{ mm } (\pm 0.0625" \text{ per } 75")$

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

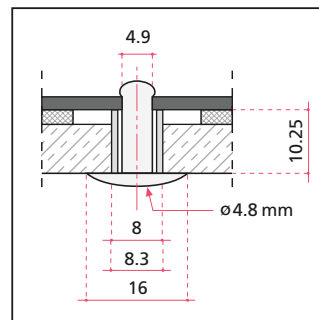
For buildings over 150 feet high, special provisions are required; check with your AFC Cladding representative.

5. Maximum length of steel profile ≤10 feet. Two profiles ("Z" recommended, or "Hat" with ≥ 1¼"

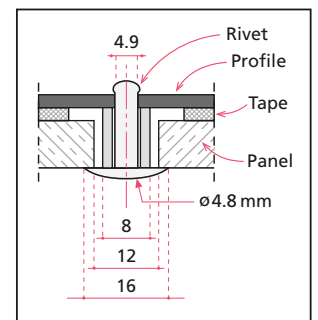
legs) are recommended in place of one wide profile at vertical joints. The sides of the panel can be cantilevered 2"–6" over edge profile so vertical joint is open. (See FIG. C)

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 $\geq 20 \text{ mm } (\frac{3}{4}")$. 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

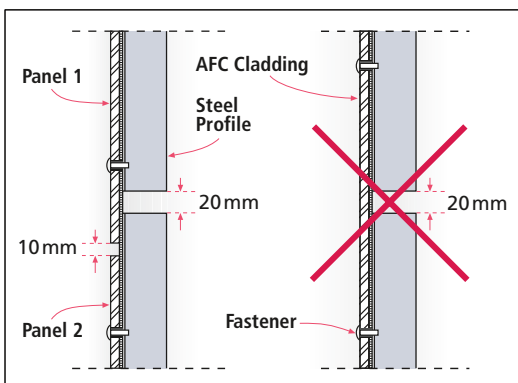


FIG. B —

Standard profile.

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

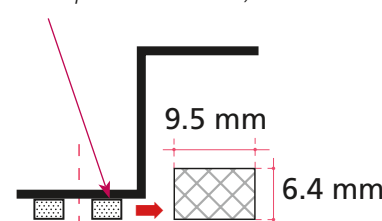
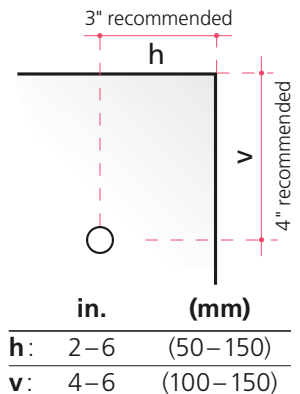


FIG. C



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 1/2" 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

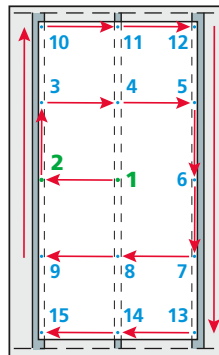
1. Panels to be Patina, Solid, Transparent, Deco or Cover.
 - Patina and Deco panels have a sanding grain that must be accounted for when positioning panels. Rotating some panels 90° from the orientation of adjacent panels can result in the appearance of color shading.
2. Vertical and horizontal joints to be 10 mm (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 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 (3/8") 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)

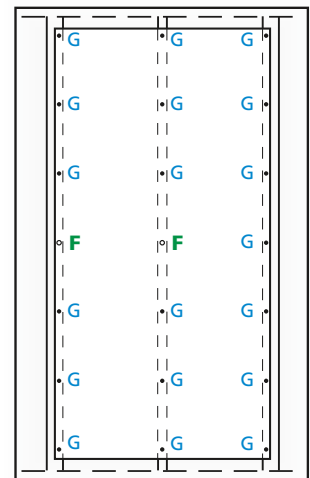
Fixed points (for attachment to vertical profiles) are:

- 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.

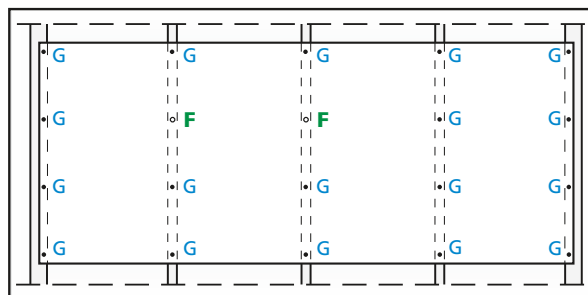


◀ FIG. K — Fixing sequence
Attach fixed points first.

▼ 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.

Ventilated Rainscreen Application

Fixing (continued)

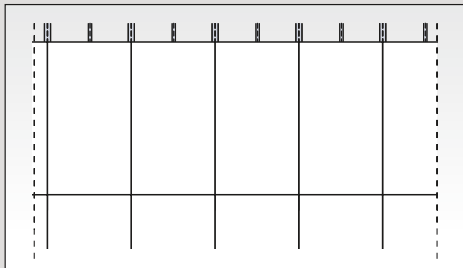
- For smaller panel sizes with only two rows of fasteners, fixed points to be top center and top left **or** top right (horizontal applications on vertical profiles). For vertical narrow panel applications on vertical profiles, vertical joints must incorporate two separate profiles (as illustrated, **FIG J**).
- 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".
 - Pilot hole for rivet in metal profile to be 4.9 mm diameter. See **Panel** section for drill size. (See **FIGS. E & I**)
 - Remove drill shavings from metal profile holes and panel fixed and gliding holes prior to installing rivets.

Fabrication/Maintenance/Storage

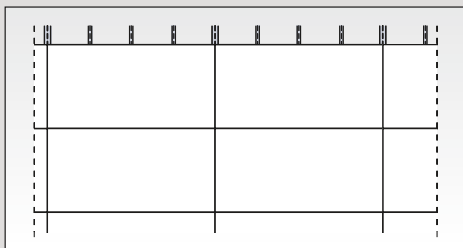
See AFCC Fabrication, Maintenance and Storage Guidelines.

Typical Pattern Layout

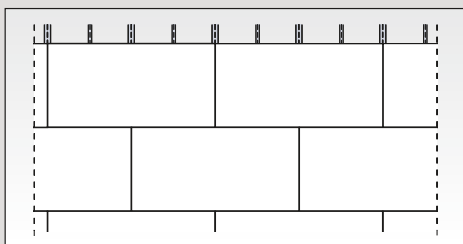
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



Straight pattern with vertical panels



Straight pattern with horizontal panels

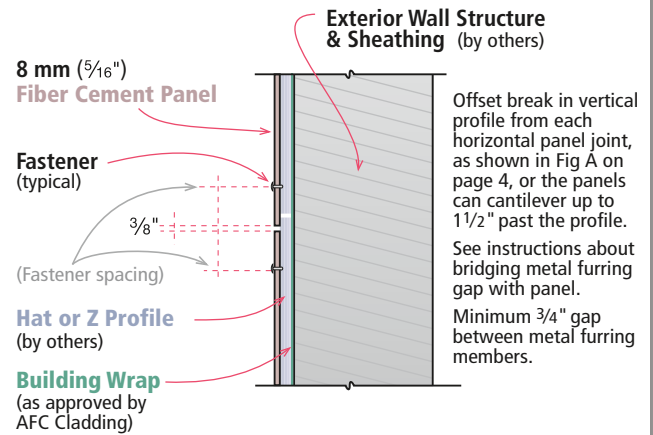


Semi pattern with horizontal panels

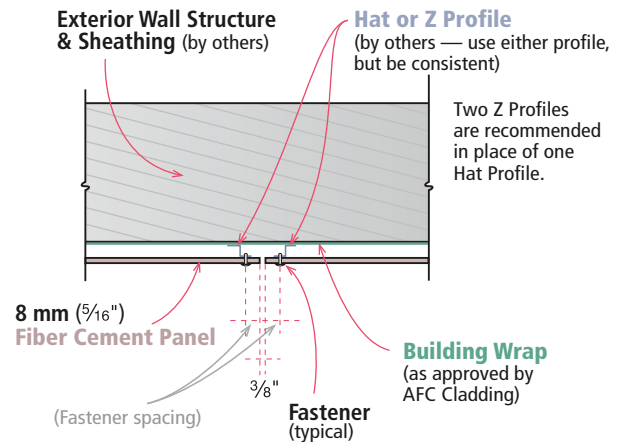
Details

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

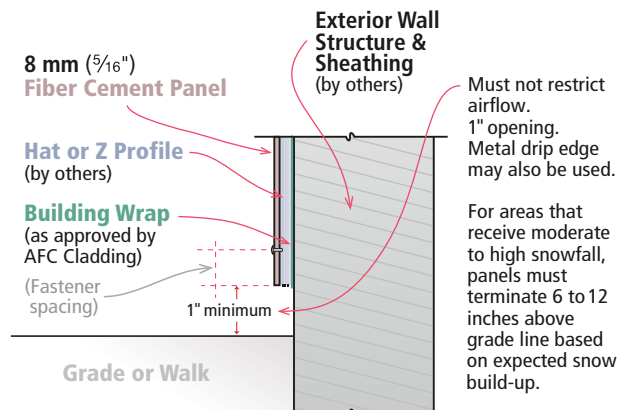
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



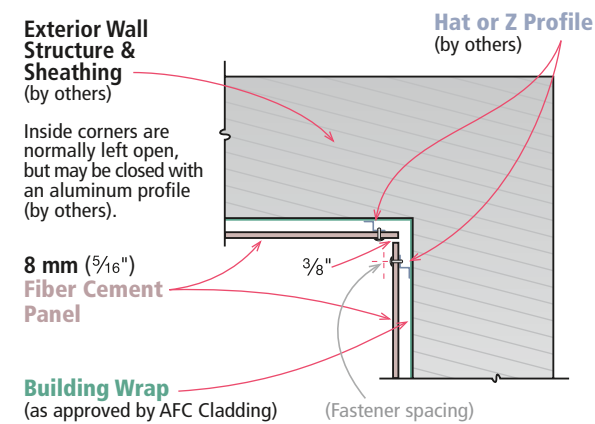
Typical Panel Base



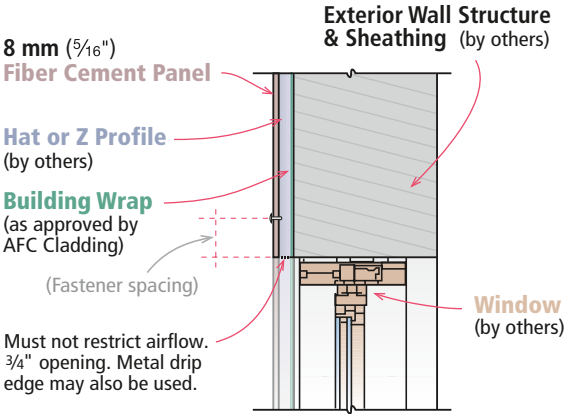
Ventilated Rainscreen Application

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

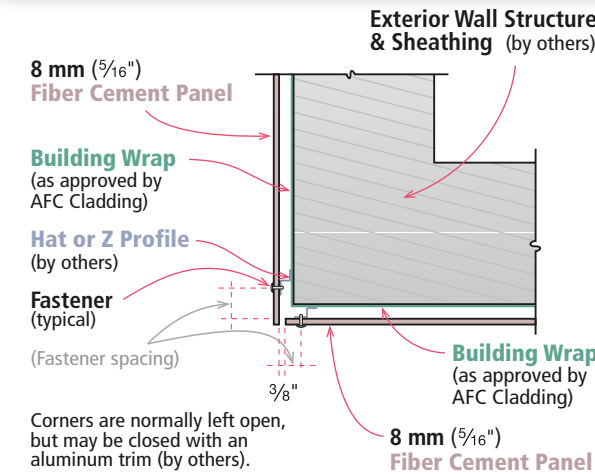
Typical Inside Corner – Plan View



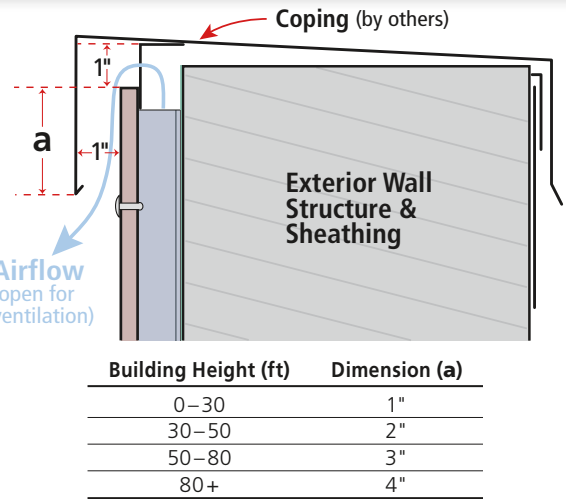
Typical Panel @ Window Head or Door Head



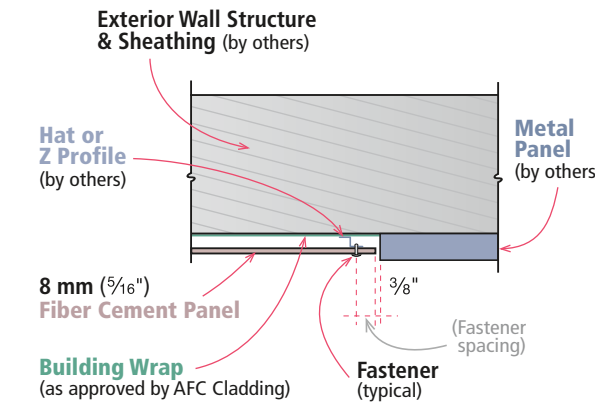
Typical Outside Corner – Plan View



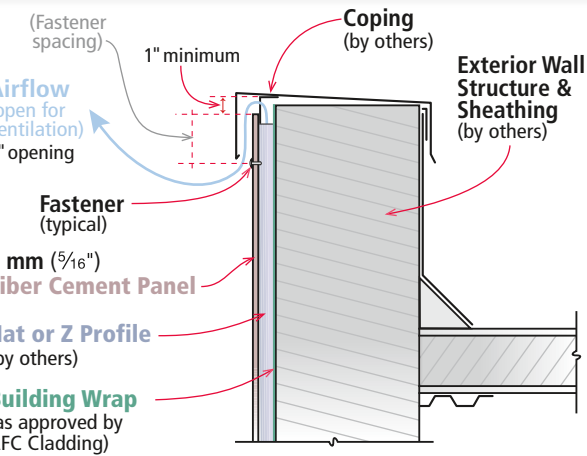
Parapet Coping – Closeup



Typical Panel End @ Metal Panel



Typical Panel @ Parapet



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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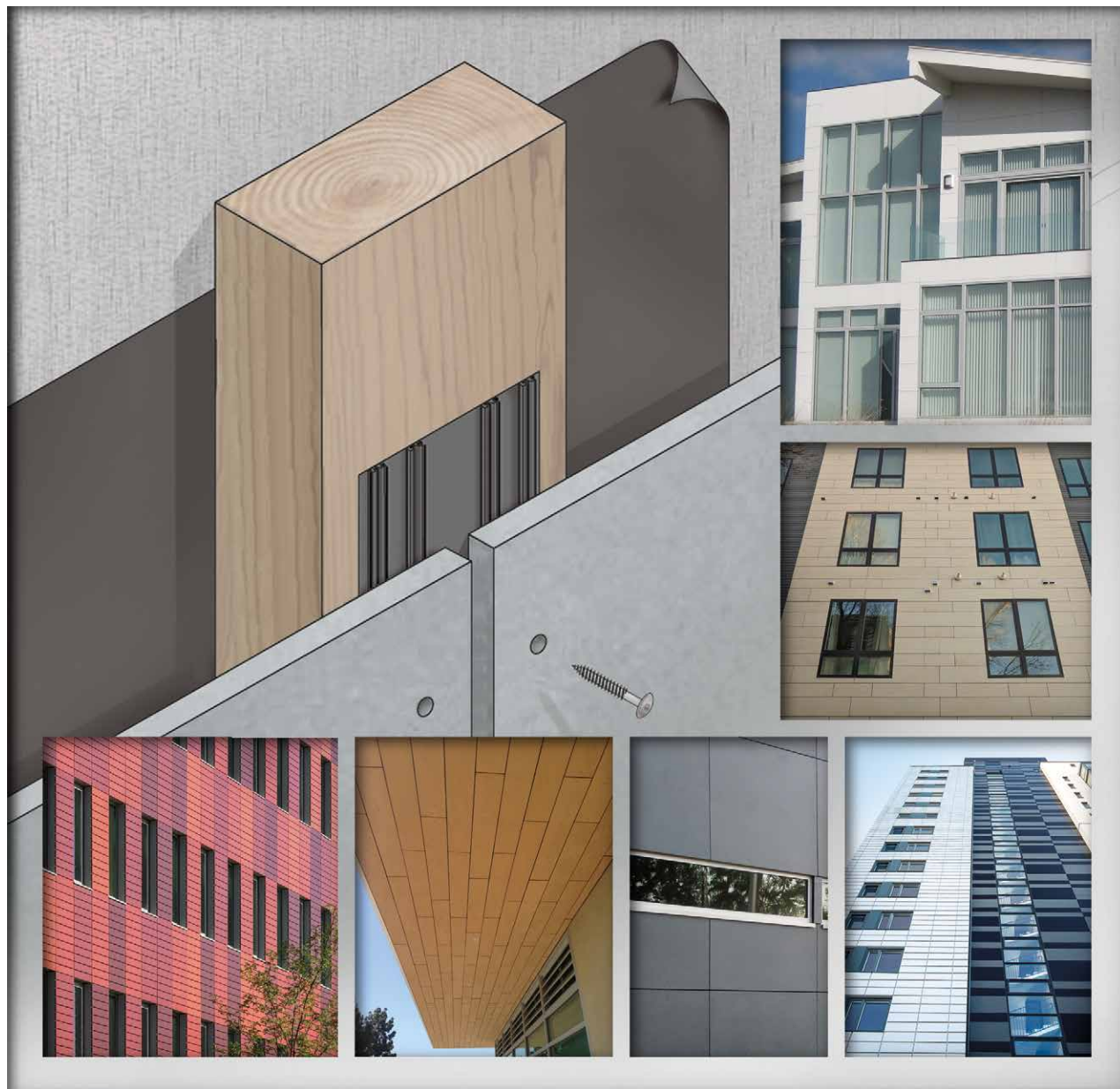
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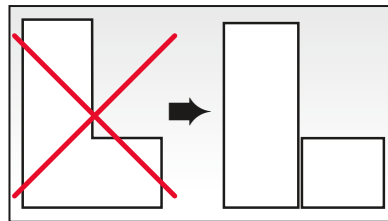


¹ These guidelines represent an **abbreviated illustration** for proper installation of Cover, Patina, Solid, Transparent and Deco architectural panels in a ventilated rain screen application. Additional guidelines for interior applications, hidden adhesive attachment, sealing, and weather barrier attachment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

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

Construction Practices

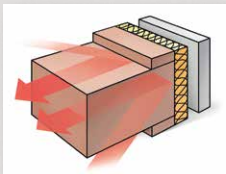
1. Air space at top and bottom of building or wall termination to be 20 mm ($\frac{3}{4}$ ") to facilitate airflow from out behind the panels. Do not block vertical airflow at windows, doors, eaves, or at the base of the building. Airflow needs to be continuous from bottom to top so there is air movement 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 ($1\frac{1}{4}$ "). 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 ($\frac{3}{4}$ " ; 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.

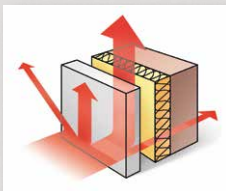
L or C-Shaped panels are not allowed.

Rain Screen Cladding



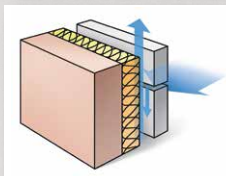
Preventing thermal bridges

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.



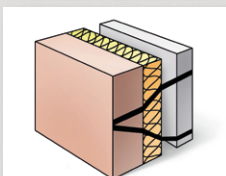
Dissipating heat from the sun

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.



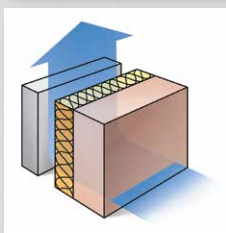
Rainscreen

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.



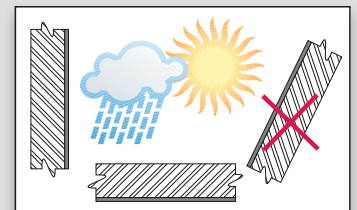
Protecting the basic structure and load-bearing wall against temperature variations

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.

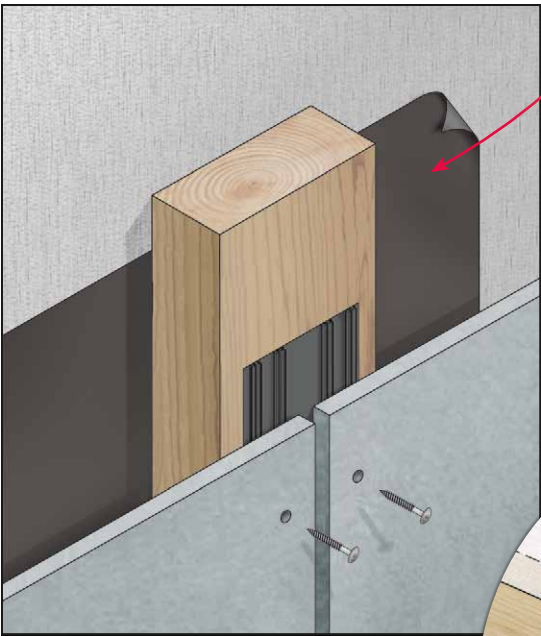


Panels exposed to weather (rain, sun) may only be assembled vertically. Soffit applications not exposed to weather are allowed.

Profile Attachment — illustrated

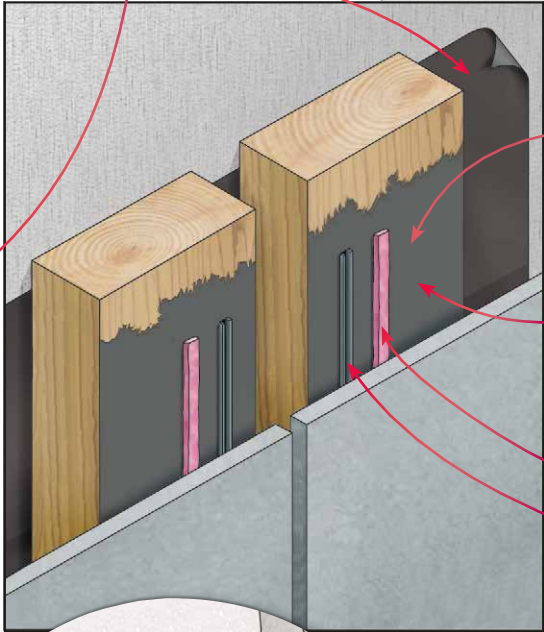
For wall assemblies utilizing exterior sheathing with low screw-holding strength, a two-layer attachment system may be required.

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



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.

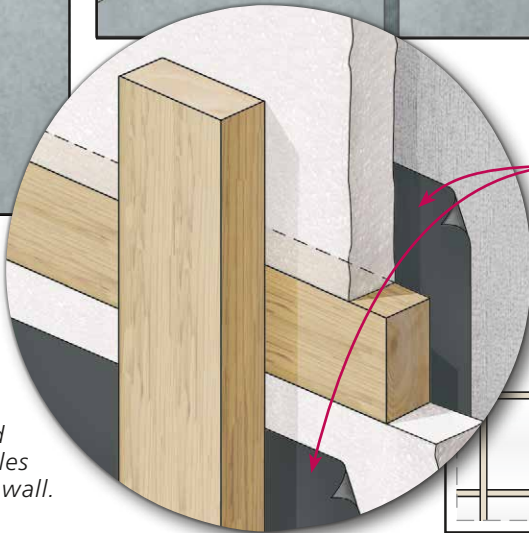


Dynamic Bond installation

Dynamic Protect

Glue bead

Dynamic tape



Options for building wrap placement

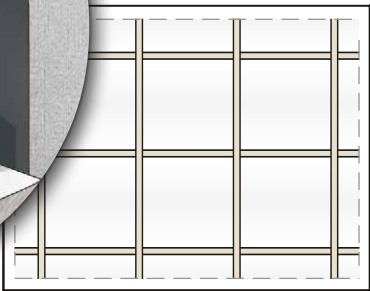
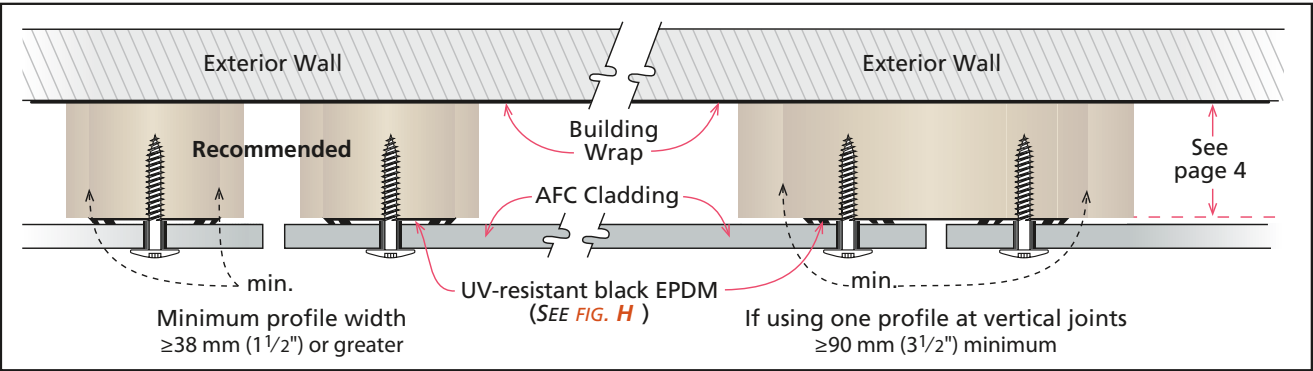


FIG. D-2 — Exterior insulation, when vertical profiles are attached to horizontal profiles affixed to wall.

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



Minimum profile width $\geq 38\text{ mm}$ (1 1/2") or greater

If using one profile at vertical joints $\geq 90\text{ mm}$ (3 1/2") minimum

Wood profiles can be vertically affixed directly to wall if there is no exterior insulation, provided sheathing has adequate screw-holding strength; (3/4" plywood sheathing is recommended).

Building/Structure

1. Architect/Engineer/Contractor to design and build structurally sound, water-tight exterior wall.

- Substructure Horizontal Straightness Tolerance: $\pm 3.0 \text{ mm per } 2 \text{ m } (\pm 0.0625" \text{ per } 42")$
- Substructure Vertical Straightness Tolerance: $\pm 0.5 \text{ mm per } 600 \text{ mm } (\pm 0.0625" \text{ per } 75")$

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.

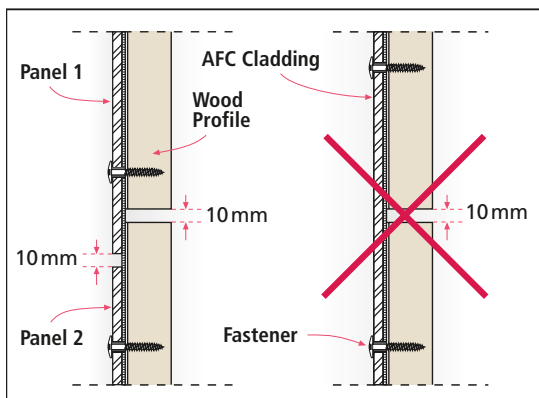
4. Vertical profiles for affixing panels must be the following depth to allow for optimal air flow and water drainage:

- 19 mm ($\frac{3}{4}"$) for panel runs 0–15 ft (1x2 or 1x4)
- 38 mm ($1\frac{1}{2}"$) 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.

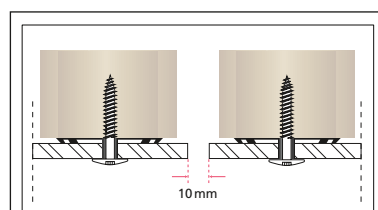
5. Profile width at vertical joints to be $\geq 90 \text{ mm } (3\frac{1}{2}"$) minimum, and interior profile width to be $\geq 38 \text{ mm } (1\frac{1}{2}"$) or greater, to allow tolerances in alignment. Maximum length of wood profile ≤ 12 feet. Minimum screw depth in wood profile is 19 mm ($\frac{3}{4}"$).

6. Profiles to be straight, plumb, level and aligned correctly on the building. For installations without exterior insulation, the wood profiles are typically 2x2 or 2x4 pressure treated lumber affixed directly to the exterior wall, provided the sheathing has adequate screw-holding strength. (See FIG. J)



◀ FIG. A

Typical Vertical Panel Joint



Alternative:
Use one 90 mm wide profile

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 $\geq 10 \text{ mm } (\frac{3}{8}"$). 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 ($3\frac{1}{2}"$) 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 ($1\frac{1}{2}"$) 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-2 — Interior profile

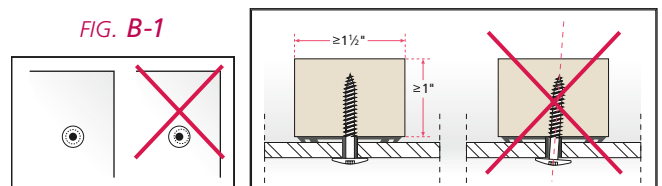


FIG. C

	3" recommended	
	h	
		v
		4" recommended
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 ($\frac{3}{8}$ "). 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 ($\frac{13}{64}$ ").
5. Diameter of the gliding point hole is to be 8 mm — use #0 drill bit: 8.02 mm ($\frac{5}{16}$ ").
 - 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 ($\frac{5}{8}$ ") 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).

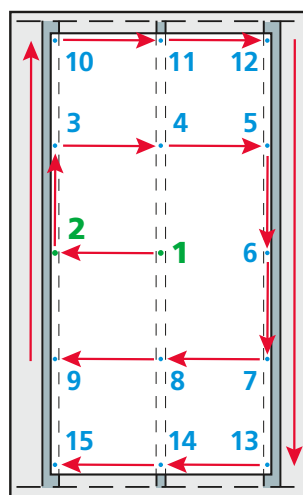


FIG. K —
Fixing sequence
Attach fixed points first.

FIG. E —
Vertical installation
on vertical profiles

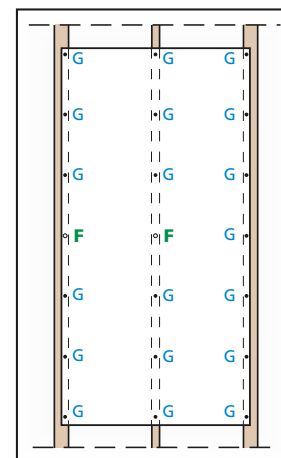
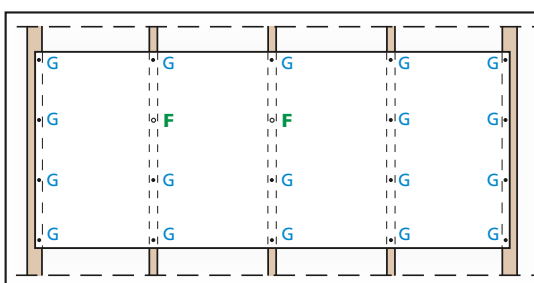


FIG. F — Horizontal installation
on vertical profiles



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

Ventilated Rainscreen Application

Fixing (continued)

- 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.
- Remove residue from drilling fixed and gliding holes prior to installing screws.

Fabrication/Maintenance/Storage

See AFCC Fabrication, Maintenance and Storage Guidelines.

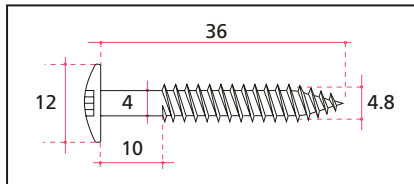


FIG. G —
Screw (supplied
by AFCC)

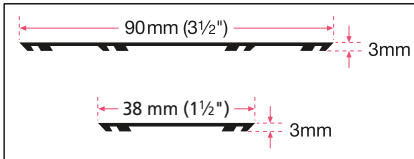
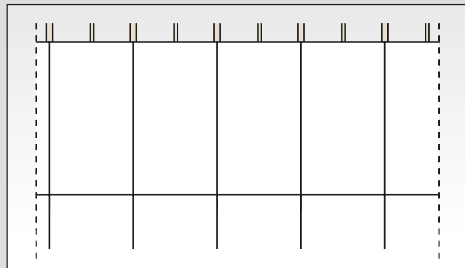


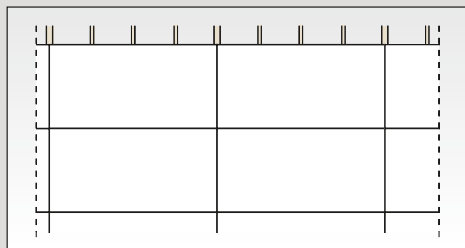
FIG. H —
UV-resistant EPDM
rubber joint sealing
strip with ribs
(supplied by AFCC)

Typical Pattern Layout

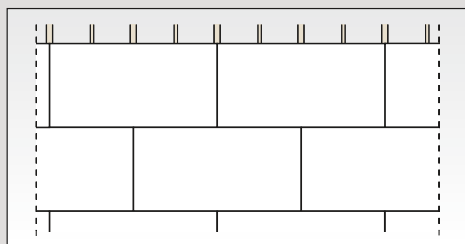
Panels can be used full size (4' x 8' or 4' x 10'), or fabricated to smaller dimensions.



*Straight
pattern
with
vertical
panels*



*Straight
pattern
with
horizontal
panels*

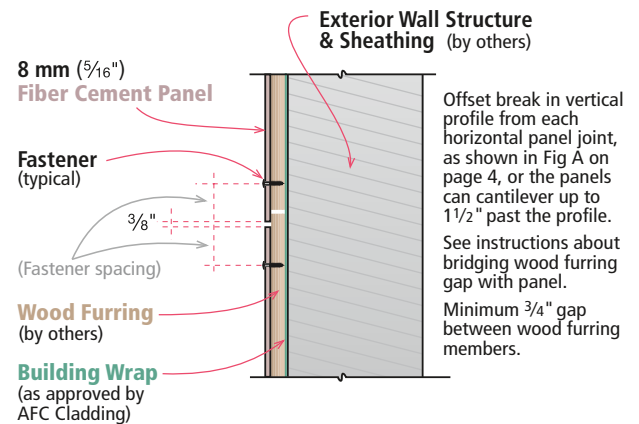


*Semi
pattern
with
horizontal
panels*

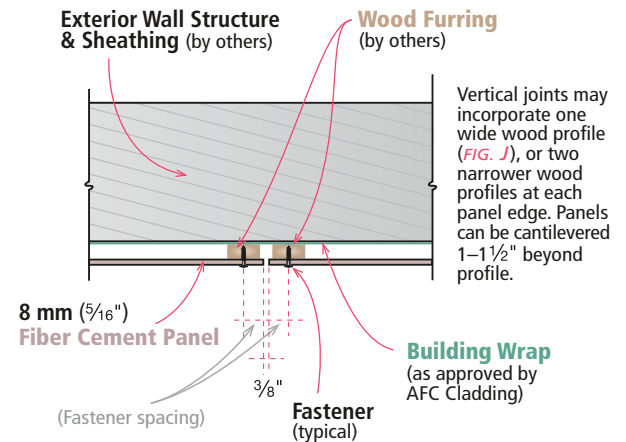
Details

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

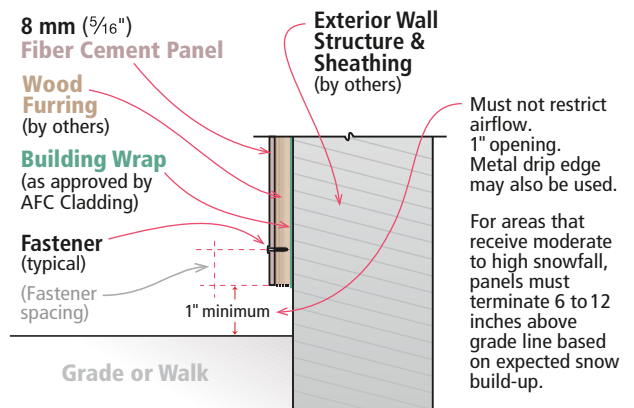
Typical Horizontal Panel Joint



Typical Vertical Panel Joint



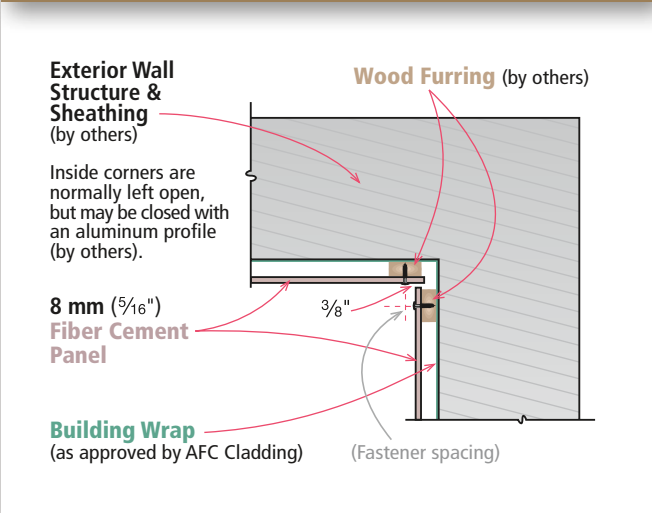
Typical Panel Base



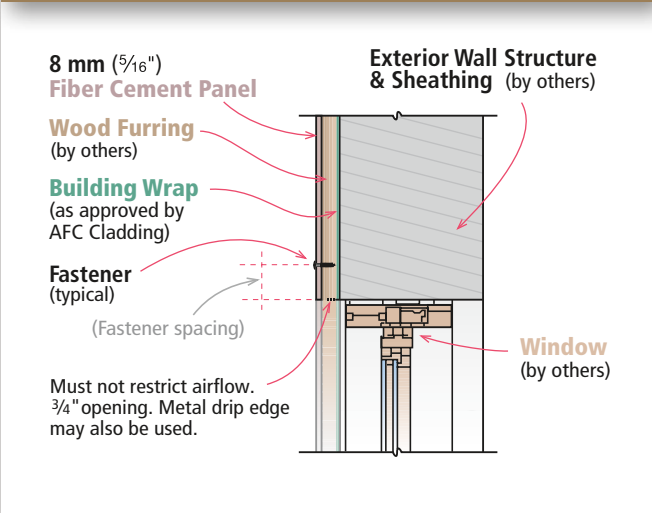
Ventilated Rainscreen Application

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

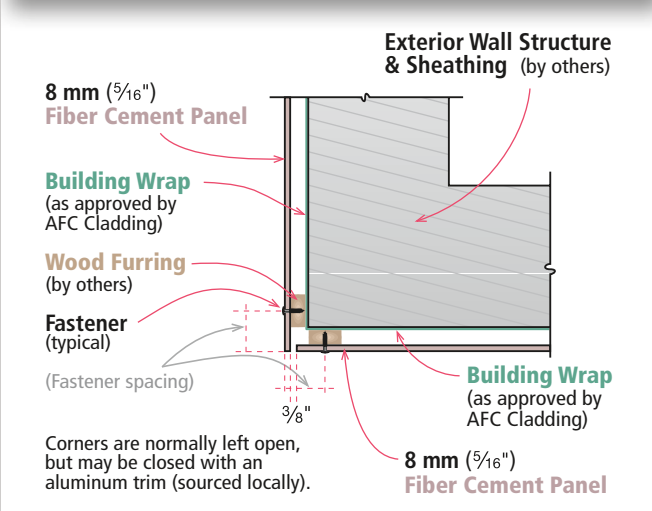
Typical Inside Corner – Plan View



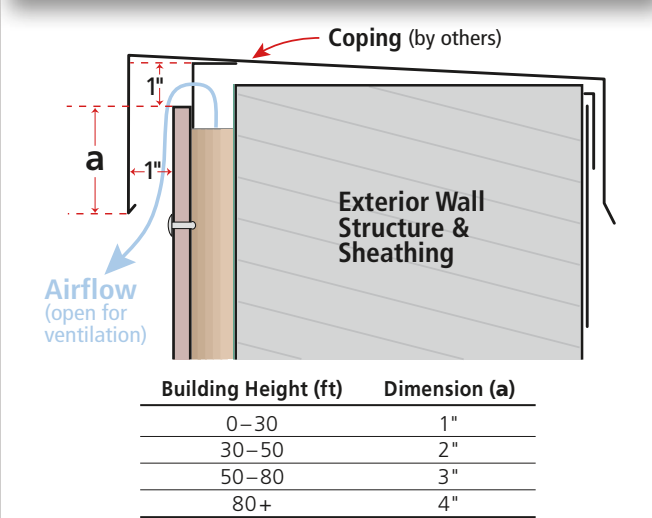
Typical Panel @ Window Head



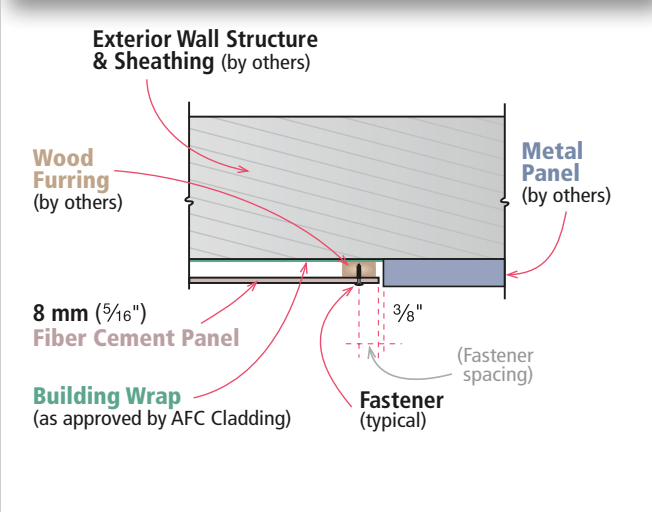
Typical Outside Corner – Plan View



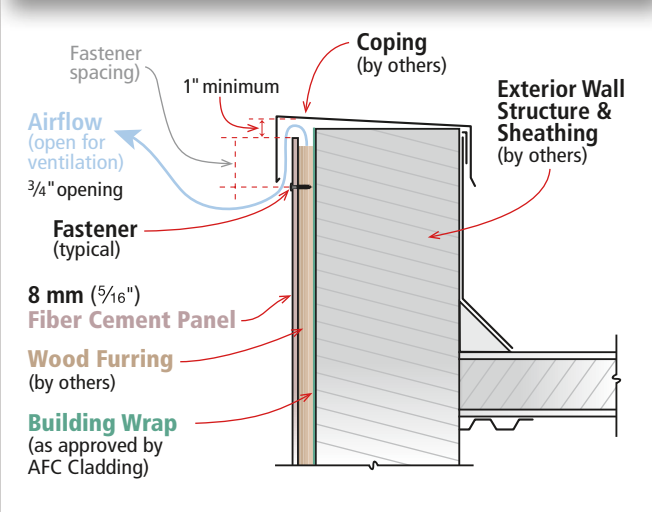
Parapet Coping – Closeup



Typical Panel End @ Metal Panel



Typical Panel @ Parapet



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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Owner: Cembrit Holding A/S
No.: MD-21010-EN
Issued: 18-10-2021
Valid to: 18-10-2026

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. 18336774

CEMBRIT

**Programme**

EPD Danmark
www.epddanmark.dk

- ☐ Industry EPD
☒ Product EPD

Declared products

Cembrit Windstopper Extreme (Natural & Dark grey)
Cembrit Windstopper Extreme (Anthracite)
Cembrit Windstopper Basic
Cembrit Construction
Cembrit Construction (Anthracite)
Cembrit Multi Force

Number of declared datasets/product variations: 6

Production site

Mineraalintie 1
08680 Lohja
Finland

Products use

The Cembrit fibre cement boards; Windstopper Extreme, Windstopper Extreme (Anthracite) and Windstopper Basic are wind barrier boards in exterior wall constructions. Cembrit Construction and Construction (Anthracite) are untreated fibre cement building board which can be installed for facade purpose. Cembrit Multi Force is an indoor interior cladding panel. The material inputs are shown in table 2.

Declared unit

1 m² fibre cement board with a thickness of 9 mm

Year of data

2019

Issued:

18-10-2021

Valid to:

18-10-2026

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:



Ninkie Bendtsen



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 9 mm.

Material	Weight-% of declared product
Cement	35-59%
Limestone	14-60%
Cellulose ¹ /fibres	0-7%
Pigment	0-6%
Filler	0-15%
Perlite	0-14%
Packaging material	kg per declared unit
Pallets	0.028-0.04
Plastic foil - top	0.0044-0.007
Stretch foil	0.0036-0.005

Representativity

This declaration including data collection and the modelled foreground system, represents the production of 1 m² of Cembrit fibre cement board on the production site located in Finland. Product specific data are based on average 2019 production values collected in 2020. 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 version 3.7.1 (2020). 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 fibre cement 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 fibre cement boards have an estimated service life in excess of 30 years when installed and used correctly.

¹ The Cellulose used in production of the declared cembrit boards is FSC Certified.

Picture of products

Cembrit build products

Cembrit Windstopper Extreme (Natural grey)



Cembrit Windstopper Extreme (Dark grey)



Cembrit Windstopper Extreme (Anthracite)



Cembrit Windstopper Basic



Cembrit Construction



Cembrit Construction (Anthracite)



Cembrit indoor products

Cembrit Multi Force



LCA background

Declared unit

The LCI and LCIA results in this EPD relates to 1 m² of Cembrit fibre cement boards with a thickness of 9 mm for types: Cembrit Windstopper Extreme, Cembrit Windstopper Extreme (Anthracite), Cembrit Windstopper Basic, Cembrit Construction, Cembrit Construction (Anthracite) and Cembrit Multi Force.

Cembrit produces Cembrit Windstopper Extreme and Cembrit Windstopper Extreme (Anthracite) in 4.5 mm and 9 mm. Cembrit Construction is produced with a thickness of 6 mm, 8 mm and 10 mm. Cembrit Construction (Anthracite) is produced with a thickness of 8 mm. Cembrit Multi Force is produced with a thickness of both 9mm and 12 mm. In this EPD a conversion was made so that the density and results are calculated and shown for 9 mm boards for the sake of comparison.

Cembrit Windstopper Extreme is produced both in a natural grey colour and a dark grey colour, the production and materials are the same, except in the dark grey module there is a small amount of pigment. In this EPD the two colour variants are modelled as one product, where an average of the

production between the two colour variants has been applied to calculate the amount of pigment.

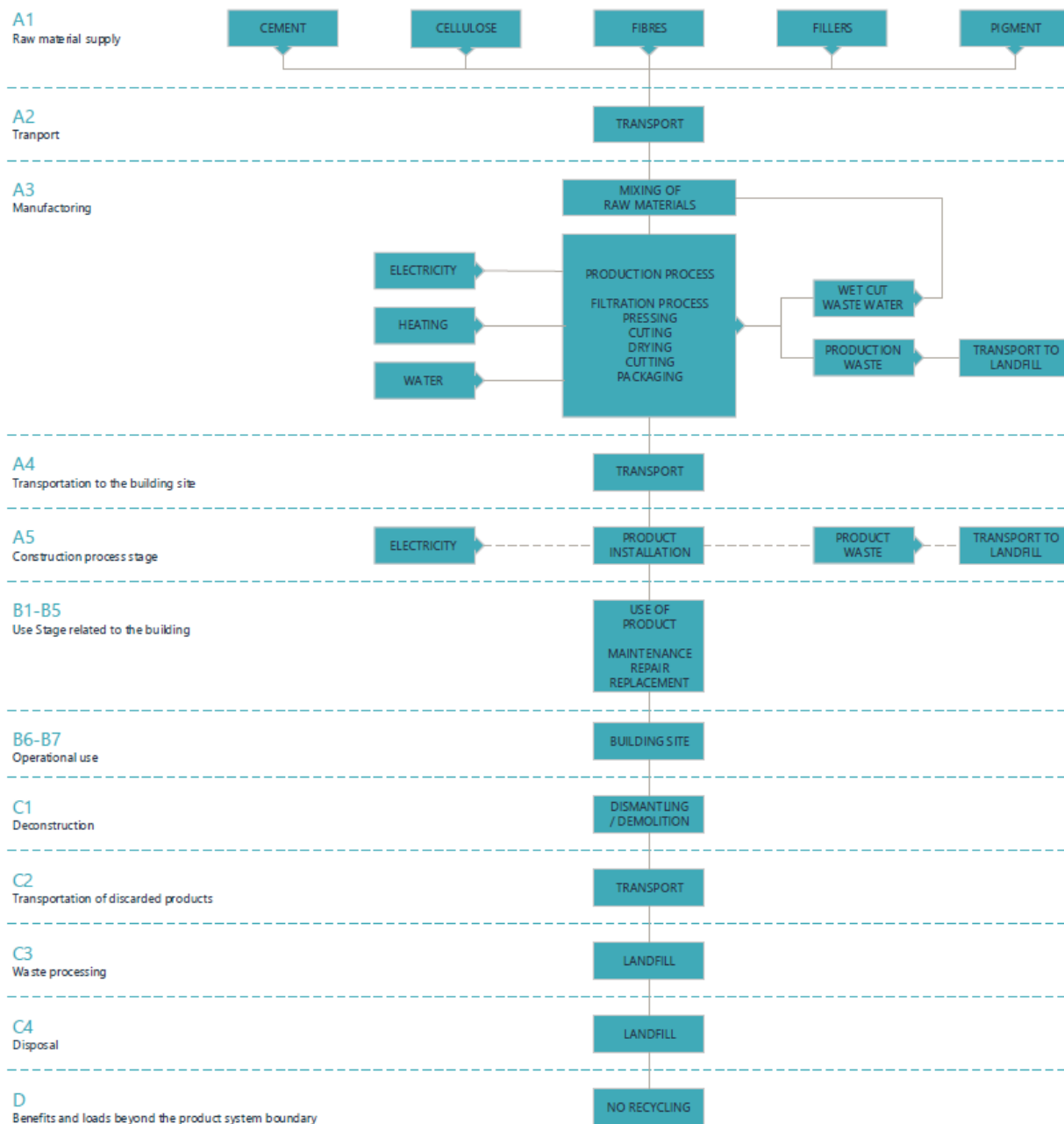
Results for these variations can be converted to the various thicknesses using the conversion factor described in the results.

Name	Value	Unit	Conversion factor to 1 kg.
Declared unit	1	m ²	
Cembrit Windstopper Extreme	14.4	kg/m ²	0.069
Cembrit Windstopper Extreme (Anthracite)	14.4	kg/m ²	0.069
Cembrit Windstopper Basic	13.3	kg/m ²	0.075
Cembrit Construction	16.8	kg/m ²	0.060
Cembrit Construction (Anthracite)	16.8	kg/m ²	0.067
Cembrit Multi Force	10.0	kg/m ²	0.100

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



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 fibre cement boards at Cembrit Holding 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 fibre cement boards are produced according to a flow-on method, partly automated to a certain extent. The base materials are processed into a homogeneous mixture with water and applied to a running endless felt loop, from which part of the water is filtered through the felt material. The evacuated water is returned to the process, and no wastewater is produced.

The format roller is gradually covered by layers of fibre cement. When the required thickness of the boards is reached, it is applied to a format roll which is gradually covered by layers of fibre cement material. Once the required thickness is

reached, the fibre cement layer is taken from the roll, cut, piled and compressed. The boards are cured in an oven, which runs on natural gas. After the drying process the products are ready to be sanded, trimming edges, cutting to customised size, painted, edge-sealed, 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 3,300 km. 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 the 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 fibre cement 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 fibre cement 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 fibre cement boards are sent to landfill after use. The product has therefore no impact during this stage and no associated environmental impacts. The Cembrit boards are expected to be reusable over time, but this is not included in the actual LCA calculation.

LCA results

Cembrit Windstopper Extreme

The declared unit is for 1 m² of Cembrit Windstopper Extreme with a thickness of 9 mm. A conversion factor 0.5 must be applied, when calculating results LCIA results for Cembrit Windstopper Extreme with a thickness of 4.5 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	9.36E+00	2.80E+00	2.17E-02	0.00E+00	8.47E-03	1.04E-01	0.00E+00	1.91E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	9.55E+00	2.74E+00	2.20E-02	0.00E+00	8.79E-03	1.02E-01	0.00E+00	2.07E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.99E-01	2.99E-02	-3.00E-04	0.00E+00	-3.86E-04	1.11E-03	0.00E+00	-1.64E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	7.30E-03	2.25E-02	5.48E-05	0.00E+00	6.83E-05	8.40E-04	0.00E+00	5.95E-04	0.00E+00
ODP	[kg CFC 11 eq.]	5.69E-08	5.10E-16	-9.85E-17	0.00E+00	1.55E-18	1.90E-17	0.00E+00	7.66E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.09E-02	3.10E-03	2.25E-05	0.00E+00	4.31E-05	1.20E-04	0.00E+00	1.48E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.35E-04	8.47E-06	-1.43E-08	0.00E+00	2.57E-08	3.16E-07	0.00E+00	3.55E-07	0.00E+00
EP-marine	[kg N eq.]	6.11E-03	9.29E-04	1.44E-05	0.00E+00	1.99E-05	3.68E-05	0.00E+00	3.82E-04	0.00E+00
EP-terrestrial	[mol N eq.]	6.62E-02	1.11E-02	1.73E-04	0.00E+00	2.21E-04	4.37E-04	0.00E+00	4.19E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.76E-02	2.55E-03	4.11E-05	0.00E+00	5.59E-05	9.93E-05	0.00E+00	1.16E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	5.51E-05	2.25E-07	-9.82E-10	0.00E+00	6.82E-10	8.39E-09	0.00E+00	1.86E-08	0.00E+00
ADPf ¹	[MJ]	8.13E+01	3.71E+01	-4.45E-02	0.00E+00	1.13E-01	1.38E+00	0.00E+00	2.71E+00	0.00E+00
WDP ¹	[m ³]	1.09E+00	2.71E-02	9.25E-04	0.00E+00	8.23E-05	1.01E-03	0.00E+00	2.17E-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 m ² CEMBRIT WINDSTOPPER EXTREME										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2.76E-07	2.10E-08	3.37E-10	0.00E+00	4.85E-10	7.95E-10	0.00E+00	1.84E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.77E-01	1.01E-02	-2.15E-03	0.00E+00	3.07E-05	3.78E-04	0.00E+00	3.18E-03	0.00E+00
ETP-fw ¹	[CTUe]	5.80E+01	2.78E+01	3.14E-02	0.00E+00	8.43E-02	1.04E+00	0.00E+00	1.55E+00	0.00E+00
HTP-c ¹	[CTUh]	1.91E-09	5.74E-10	1.61E-13	0.00E+00	1.74E-12	2.14E-11	0.00E+00	2.30E-10	0.00E+00
HTP-nc ¹	[CTUh]	1.34E-07	2.91E-08	4.76E-11	0.00E+00	1.02E-10	1.09E-09	0.00E+00	2.53E-08	0.00E+00
SQP ¹	-	5.67E+01	1.30E+01	-1.10E-01	0.00E+00	3.95E-02	4.86E-01	0.00E+00	5.65E-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 WINDSTOPPER EXTREME

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.76E+01	2.15E+00	-5.70E-02	0.00E+00	6.51E-03	8.00E-02	0.00E+00	3.55E-01	0.00E+00
PERM	[MJ]	9.47E+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]	1.76E+01	2.15E+00	-5.70E-02	0.00E+00	6.51E-03	8.00E-02	0.00E+00	3.55E-01	0.00E+00
PENRE	[MJ]	8.14E+01	3.73E+01	-4.41E-02	0.00E+00	1.13E-01	1.39E+00	0.00E+00	2.71E+00	0.00E+00
PENRM	[MJ]	2.84E+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]	8.14E+01	3.73E+01	-4.41E-02	0.00E+00	1.13E-01	1.39E+00	0.00E+00	2.71E+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]	4.32E-02	2.50E-03	6.17E-06	0.00E+00	7.59E-06	9.33E-05	0.00E+00	6.84E-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 WINDSTOPPER EXTREME

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.73E-07	1.72E-06	5.14E-09	0.00E+00	5.23E-09	6.43E-08	0.00E+00	4.13E-08	0.00E+00
NHWD	[kg]	1.57E+00	5.90E-03	2.29E-03	0.00E+00	1.79E-05	2.20E-04	0.00E+00	1.36E+01	0.00E+00
RWD	[kg]	5.52E-03	6.87E-05	-1.29E-05	0.00E+00	2.08E-07	2.56E-06	0.00E+00	3.09E-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]	5.00E-01	0.00E+00	1.00E-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	0.6
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Windstopper Extreme (Anthracite)

The declared unit is for 1 m² of Cembrit Windstopper Extreme (Anthracite) with a thickness of 9 mm. A conversion factor 0.5 must be applied, when calculating results LCIA results for Cembrit Windstopper Extreme (Anthracite) with a thickness of 4.5 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	9.52E+00	2.94E+00	2.21E-02	0.00E+00	8.91E-03	1.10E-01	0.00E+00	2.01E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	9.71E+00	2.89E+00	2.24E-02	0.00E+00	9.25E-03	1.08E-01	0.00E+00	2.17E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.99E-01	3.14E-02	-3.21E-04	0.00E+00	-4.06E-04	1.17E-03	0.00E+00	-1.72E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	7.92E-03	2.37E-02	5.84E-05	0.00E+00	7.18E-05	8.83E-04	0.00E+00	6.26E-04	0.00E+00
ODP	[kg CFC 11 eq.]	5.90E-08	5.37E-16	-9.82E-17	0.00E+00	1.63E-18	2.00E-17	0.00E+00	8.06E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.13E-02	3.26E-03	2.47E-05	0.00E+00	4.53E-05	1.26E-04	0.00E+00	1.56E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.50E-04	8.91E-06	-1.29E-08	0.00E+00	2.70E-08	3.32E-07	0.00E+00	3.73E-07	0.00E+00
EP-marine	[kg N eq.]	6.21E-03	9.77E-04	1.55E-05	0.00E+00	2.10E-05	3.87E-05	0.00E+00	4.01E-04	0.00E+00
EP-terrestrial	[mol N eq.]	6.75E-02	1.16E-02	1.85E-04	0.00E+00	2.32E-04	4.60E-04	0.00E+00	4.41E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.78E-02	2.68E-03	4.40E-05	0.00E+00	5.88E-05	1.04E-04	0.00E+00	1.22E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	5.53E-05	2.37E-07	-9.44E-10	0.00E+00	7.18E-10	8.82E-09	0.00E+00	1.95E-08	0.00E+00
ADPf ¹	[MJ]	8.33E+01	3.90E+01	-3.84E-02	0.00E+00	1.18E-01	1.46E+00	0.00E+00	2.85E+00	0.00E+00
WDP ¹	[m ³]	2.93E+00	2.85E-02	9.28E-04	0.00E+00	8.66E-05	1.06E-03	0.00E+00	2.28E-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 m ² CEMBRIT WINDSTOPPER EXTREME (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2,80E-07	2,21E-08	3,62E-10	0.00E+00	5,10E-10	8,36E-10	0.00E+00	1,93E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6,63E-01	1,07E-02	-2,15E-03	0.00E+00	3,23E-05	3,97E-04	0.00E+00	3,34E-03	0.00E+00
ETP-fw ¹	[CTUe]	6,56E+01	2,92E+01	3,59E-02	0.00E+00	8,86E-02	1,09E+00	0.00E+00	1,63E+00	0.00E+00
HTP-c ¹	[CTUh]	1,93E-09	6,04E-10	2,54E-13	0.00E+00	1,83E-12	2,25E-11	0.00E+00	2,41E-10	0.00E+00
HTP-nc ¹	[CTUh]	1,35E-07	3,06E-08	5,30E-11	0.00E+00	1,07E-10	1,14E-09	0.00E+00	2,66E-08	0.00E+00
SQP ¹	-	5,67E+01	1,37E+01	-1,07E-01	0.00E+00	4,16E-02	5,11E-01	0.00E+00	5,95E-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 WINDSTOPPER EXTREME (ANTHRACITE)

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.73E+01	2.26E+00	-5.65E-02	0.00E+00	6.85E-03	8.42E-02	0.00E+00	3.74E-01	0.00E+00
PERM	[MJ]	9.47E+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]	1.73E+01	2.26E+00	-5.65E-02	0.00E+00	6.85E-03	8.42E-02	0.00E+00	3.74E-01	0.00E+00
PENRE	[MJ]	8.33E+01	3.92E+01	-3.80E-02	0.00E+00	1.19E-01	1.46E+00	0.00E+00	2.85E+00	0.00E+00
PENRM	[MJ]	2.84E+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]	8.33E+01	3.92E+01	-3.80E-02	0.00E+00	1.19E-01	1.46E+00	0.00E+00	2.85E+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]	8.54E-02	2.63E-03	6.56E-06	0.00E+00	7.98E-06	9.81E-05	0.00E+00	7.19E-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 WINDSTOPPER EXTREME (ANTHRACITE)

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	2.20E-07	1.81E-06	5.41E-09	0.00E+00	5.50E-09	6.76E-08	0.00E+00	4.35E-08	0.00E+00
NHWD	[kg]	1.58E+00	6.21E-03	2.28E-03	0.00E+00	1.88E-05	2.32E-04	0.00E+00	1.43E+01	0.00E+00
RWD	[kg]	5.32E-03	7.22E-05	-1.29E-05	0.00E+00	2.19E-07	2.69E-06	0.00E+00	3.25E-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]	5.00E-01	0.00E+00	1.00E-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	0.6
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Windstopper Basic

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	6.14E+00	2.64E+00	2.03E-02	0.00E+00	7.99E-03	9.85E-02	0.00E+00	1.80E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	6.23E+00	2.59E+00	2.05E-02	0.00E+00	8.29E-03	9.66E-02	0.00E+00	1.95E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-9.27E-02	2.82E-02	-2.84E-04	0.00E+00	-3.64E-04	1.05E-03	0.00E+00	-1.55E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	3.40E-03	2.12E-02	5.19E-05	0.00E+00	6.44E-05	7.92E-04	0.00E+00	5.61E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.54E-08	4.81E-16	-9.17E-17	0.00E+00	1.46E-18	1.80E-17	0.00E+00	7.23E-16	0.00E+00
AP	[mol H ⁺ eq.]	1.31E-02	2.92E-03	2.15E-05	0.00E+00	4.06E-05	1.13E-04	0.00E+00	1.40E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	1.38E-04	7.99E-06	-1.30E-08	0.00E+00	2.42E-08	2.98E-07	0.00E+00	3.35E-07	0.00E+00
EP-marine	[kg N eq.]	3.90E-03	8.76E-04	1.37E-05	0.00E+00	1.88E-05	3.47E-05	0.00E+00	3.60E-04	0.00E+00
EP-terrestrial	[mol N eq.]	4.23E-02	1.04E-02	1.64E-04	0.00E+00	2.08E-04	4.12E-04	0.00E+00	3.95E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.14E-02	2.40E-03	3.89E-05	0.00E+00	5.27E-05	9.37E-05	0.00E+00	1.09E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	3.43E-05	2.12E-07	-9.06E-10	0.00E+00	6.44E-10	7.91E-09	0.00E+00	1.75E-08	0.00E+00
ADPf ¹	[MJ]	5.24E+01	3.50E+01	-4.01E-02	0.00E+00	1.06E-01	1.31E+00	0.00E+00	2.56E+00	0.00E+00
WDP ¹	[m ³]	5.43E-01	2.56E-02	8.63E-04	0.00E+00	7.76E-05	9.54E-04	0.00E+00	2.04E-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 m ² CEMBRIT WINDSTOPPER BASIC										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	2.14E-07	1.98E-08	3.20E-10	0.00E+00	4.58E-10	7.50E-10	0.00E+00	1.73E-08	0.00E+00
IRP ²	[kBq U235 eq.]	4.00E-01	9.55E-03	-2.00E-03	0.00E+00	2.90E-05	3.56E-04	0.00E+00	3.00E-03	0.00E+00
ETP-fw ¹	[CTUe]	3.53E+01	2.62E+01	3.03E-02	0.00E+00	7.95E-02	9.77E-01	0.00E+00	1.46E+00	0.00E+00
HTP-c ¹	[CTUh]	1.15E-09	5.41E-10	1.71E-13	0.00E+00	1.64E-12	2.02E-11	0.00E+00	2.17E-10	0.00E+00
HTP-nc ¹	[CTUh]	7.64E-08	2.74E-08	4.55E-11	0.00E+00	9.62E-11	1.02E-09	0.00E+00	2.39E-08	0.00E+00
SQP ¹	-	3.21E+01	1.23E+01	-1.02E-01	0.00E+00	3.73E-02	4.58E-01	0.00E+00	5.33E-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 WINDSTOPPER BASIC

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.03E+01	2.02E+00	-5.30E-02	0.00E+00	6.14E-03	7.55E-02	0.00E+00	3.35E-01	0.00E+00
PERM	[MJ]	5.93E+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]	1.03E+01	2.02E+00	-5.30E-02	0.00E+00	6.14E-03	7.55E-02	0.00E+00	3.35E-01	0.00E+00
PENRE	[MJ]	5.24E+01	3.51E+01	-3.97E-02	0.00E+00	1.07E-01	1.31E+00	0.00E+00	2.56E+00	0.00E+00
PENRM	[MJ]	3.15E-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]	5.24E+01	3.51E+01	-3.97E-02	0.00E+00	1.07E-01	1.31E+00	0.00E+00	2.56E+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]	2.14E-02	2.36E-03	5.83E-06	0.00E+00	7.16E-06	8.80E-05	0.00E+00	6.45E-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 WINDSTOPPER BASIC

Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.46E-07	1.62E-06	4.85E-09	0.00E+00	4.93E-09	6.06E-08	0.00E+00	3.90E-08	0.00E+00
NHWD	[kg]	7.45E-01	5.57E-03	2.13E-03	0.00E+00	1.69E-05	2.08E-04	0.00E+00	1.29E+01	0.00E+00
RWD	[kg]	3.25E-03	6.48E-05	-1.20E-05	0.00E+00	1.97E-07	2.42E-06	0.00E+00	2.91E-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]	2.50E-01	0.00E+00	9.33E-03	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	0.2
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Construction

The declared unit is for 1 m² of Cembrit Construction with a thickness of 9 mm. A conversion factor 0.667, 0.889 and 1.11 must be applied, when calculating results LCIA results for Cembrit Construction with a respective thickness of 6, 8 and 10 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	1.17E+01	2.90E+00	2.71E-02	0.00E+00	9.89E-03	1.22E-01	0.00E+00	2.23E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	1.21E+01	2.72E+00	2.73E-02	0.00E+00	1.03E-02	1.20E-01	0.00E+00	2.41E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-3.43E-01	1.83E-01	-3.40E-04	0.00E+00	-4.51E-04	1.30E-03	0.00E+00	-1.91E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	1.41E-02	4.01E-07	6.22E-05	0.00E+00	7.97E-05	9.80E-04	0.00E+00	6.94E-04	0.00E+00
ODP	[kg CFC 11 eq.]	4.85E-08	9.08E-21	-1.28E-16	0.00E+00	1.81E-18	2.22E-17	0.00E+00	8.94E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.70E-02	1.10E-03	2.35E-05	0.00E+00	5.03E-05	1.40E-04	0.00E+00	1.73E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.27E-04	1.51E-10	-2.19E-08	0.00E+00	3.00E-08	3.69E-07	0.00E+00	4.14E-07	0.00E+00
EP-marine	[kg N eq.]	8.31E-03	5.51E-04	1.61E-05	0.00E+00	2.33E-05	4.30E-05	0.00E+00	4.45E-04	0.00E+00
EP-terrestrial	[mol N eq.]	8.90E-02	6.15E-03	1.96E-04	0.00E+00	2.58E-04	5.10E-04	0.00E+00	4.89E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.28E-02	1.12E-03	4.60E-05	0.00E+00	6.52E-05	1.16E-04	0.00E+00	1.35E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	4.34E-05	4.00E-12	-1.36E-09	0.00E+00	7.96E-10	9.79E-09	0.00E+00	2.17E-08	0.00E+00
ADPf ¹	[MJ]	1.07E+02	6.60E-04	-7.25E-02	0.00E+00	1.31E-01	1.62E+00	0.00E+00	3.16E+00	0.00E+00
WDP ¹	[m ³]	1.33E+00	4.83E-07	1.19E-03	0.00E+00	9.60E-05	1.18E-03	0.00E+00	2.53E-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 m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	3.52E-07	4.75E-09	3.74E-10	0.00E+00	5.66E-10	9.28E-10	0.00E+00	2.14E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.71E-01	1.80E-07	-2.80E-03	0.00E+00	3.59E-05	4.41E-04	0.00E+00	3.71E-03	0.00E+00
ETP-fw ¹	[CTUe]	6.33E+01	2.39E-03	2.98E-02	0.00E+00	9.83E-02	1.21E+00	0.00E+00	1.81E+00	0.00E+00
HTP-c ¹	[CTUh]	2.41E-09	3.64E-13	-1.84E-14	0.00E+00	2.03E-12	2.50E-11	0.00E+00	2.68E-10	0.00E+00
HTP-nc ¹	[CTUh]	2.07E-07	4.78E-10	4.84E-11	0.00E+00	1.19E-10	1.27E-09	0.00E+00	2.95E-08	0.00E+00
SQP ¹	-	7.46E+01	2.32E-04	-1.48E-01	0.00E+00	4.61E-02	5.67E-01	0.00E+00	6.60E-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 m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.98E+01	3.82E-05	-7.48E-02	0.00E+00	7.60E-03	9.34E-02	0.00E+00	4.15E-01	0.00E+00
PERM	[MJ]	7.12E+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]	1.98E+01	3.82E-05	-7.48E-02	0.00E+00	7.60E-03	9.34E-02	0.00E+00	4.15E-01	0.00E+00
PENRE	[MJ]	1.07E+02	6.63E-04	-7.20E-02	0.00E+00	1.32E-01	1.62E+00	0.00E+00	3.17E+00	0.00E+00
PENRM	[MJ]	9.86E+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	6.63E-04	-7.20E-02	0.00E+00	1.32E-01	1.62E+00	0.00E+00	3.17E+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]	5.53E-02	4.45E-08	7.01E-06	0.00E+00	8.85E-06	1.09E-04	0.00E+00	7.98E-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 m ² CEMBRIT CONSTRUCTION										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	7.99E-08	3.07E-11	5.98E-09	0.00E+00	6.10E-09	7.50E-08	0.00E+00	4.83E-08	0.00E+00
NHWD	[kg]	8.90E-01	1.05E-07	2.96E-03	0.00E+00	2.09E-05	2.57E-04	0.00E+00	1.59E+01	0.00E+00
RWD	[kg]	5.12E-03	1.22E-09	-1.68E-05	0.00E+00	2.43E-07	2.99E-06	0.00E+00	3.60E-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]	2.80E-01	0.00E+00	1.30E-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 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	1.1
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Construction (Anthracite)

The declared unit is for 1 m² of Cembrit Construction (Anthracite) with a thickness of 9 mm. A conversion factor 0.889 must be applied, when calculating results LCIA results for Cembrit Construction (Anthracite) with a thickness of 8 mm.

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	1.17E+01	3.31E+00	2.72E-02	0.00E+00	1,00E-02	1,23E-01	0.00E+00	2,26E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	1.21E+01	3.25E+00	2.75E-02	0.00E+00	1,04E-02	1,21E-01	0.00E+00	2,44E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-3.42E-01	3.54E-02	-3.45E-04	0.00E+00	-4,56E-04	1,32E-03	0.00E+00	-1,94E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	1.41E-02	2.67E-02	6.33E-05	0.00E+00	8,07E-05	9,92E-04	0.00E+00	7,03E-04	0.00E+00
ODP	[kg CFC 11 eq.]	4.96E-08	6.05E-16	-1.28E-16	0.00E+00	1,83E-18	2,25E-17	0.00E+00	9,06E-16	0.00E+00
AP	[mol H ⁺ eq.]	2.71E-02	3.67E-03	2.42E-05	0.00E+00	5,09E-05	1,42E-04	0.00E+00	1,75E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	2.36E-04	1.00E-05	-2.15E-08	0.00E+00	3,04E-08	3,73E-07	0.00E+00	4,19E-07	0.00E+00
EP-marine	[kg N eq.]	8.36E-03	1.10E-03	1.64E-05	0.00E+00	2,36E-05	4,35E-05	0.00E+00	4,51E-04	0.00E+00
EP-terrestrial	[mol N eq.]	8.95E-02	1.31E-02	1.99E-04	0.00E+00	2,61E-04	5,17E-04	0.00E+00	4,95E-03	0.00E+00
POCP	[kg NMVOC eq.]	2.30E-02	3.02E-03	4.68E-05	0.00E+00	6,60E-05	1,17E-04	0.00E+00	1,37E-03	0.00E+00
ADPm ¹	[kg Sb eq.]	4.35E-05	2.66E-07	-1.35E-09	0.00E+00	8,06E-10	9,91E-09	0.00E+00	2,19E-08	0.00E+00
ADPf ¹	[MJ]	1.07E+02	4.40E+01	-7.08E-02	0.00E+00	1,33E-01	1,64E+00	0.00E+00	3,20E+00	0.00E+00
WDP ¹	[m ³]	1.79E+00	3.21E-02	1.19E-03	0.00E+00	9,72E-05	1,20E-03	0.00E+00	2,56E-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 m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	3.52E-07	2.49E-08	3.81E-10	0.00E+00	5.73E-10	9.39E-10	0.00E+00	2.17E-08	0.00E+00
IRP ²	[kBq U235 eq.]	6.75E-01	1.20E-02	-2.79E-03	0.00E+00	3.63E-05	4.47E-04	0.00E+00	3.75E-03	0.00E+00
ETP-fw ¹	[CTUe]	6.73E+01	3.29E+01	3.10E-02	0.00E+00	9.96E-02	1.22E+00	0.00E+00	1.83E+00	0.00E+00
HTP-c ¹	[CTUh]	2.41E-09	6.80E-10	7.13E-15	0.00E+00	2.06E-12	2.53E-11	0.00E+00	2.71E-10	0.00E+00
HTP-nc ¹	[CTUh]	2.07E-07	3.44E-08	4.99E-11	0.00E+00	1.21E-10	1.28E-09	0.00E+00	2.99E-08	0.00E+00
SQP ¹	-	7.47E+01	1.54E+01	-1.47E-01	0.00E+00	4.67E-02	5.74E-01	0.00E+00	6.68E-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 m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.99E+01	2.54E+00	-7.47E-02	0.00E+00	7.69E-03	9.46E-02	0.00E+00	4.20E-01	0.00E+00
PERM	[MJ]	7.12E+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]	1.99E+01	2.54E+00	-7.47E-02	0.00E+00	7.69E-03	9.46E-02	0.00E+00	4.20E-01	0.00E+00
PENRE	[MJ]	1.07E+02	4.41E+01	-7.03E-02	0.00E+00	1.34E-01	1.64E+00	0.00E+00	3.21E+00	0.00E+00
PENRM	[MJ]	9.90E+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	4.41E+01	-7.03E-02	0.00E+00	1.34E-01	1.64E+00	0.00E+00	3.21E+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]	6.61E-02	2.96E-03	7.12E-06	0.00E+00	8.97E-06	1.10E-04	0.00E+00	8.08E-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 m ² CEMBRIT CONSTRUCTION (ANTHRACITE)										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	8.02E-08	2.04E-06	6.06E-09	0.00E+00	6.18E-09	7.59E-08	0.00E+00	4.89E-08	0.00E+00
NHWD	[kg]	8.94E-01	6.99E-03	2.96E-03	0.00E+00	2.12E-05	2.60E-04	0.00E+00	1.61E+01	0.00E+00
RWD	[kg]	5.12E-03	8.13E-05	-1.68E-05	0.00E+00	2.46E-07	3.03E-06	0.00E+00	3.65E-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]	2.80E-01	0.00E+00	1.30E-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 m ²)		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	kg C	1.1
Biogenic carbon content in accompanying packaging	kg C	0.2

Cembrit Multi Force

ENVIRONMENTAL IMPACTS PER m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
GWP-total	[kg CO ₂ eq.]	6.90E+00	1.93E+00	1.64E-02	0.00E+00	5.85E-03	7.20E-02	0.00E+00	1.32E-01	0.00E+00
GWP-fossil	[kg CO ₂ eq.]	7.01E+00	1.89E+00	1.66E-02	0.00E+00	6.06E-03	7.07E-02	0.00E+00	1.43E-01	0.00E+00
GWP-biogenic	[kg CO ₂ eq.]	-1.07E-01	2.06E-02	-1.98E-04	0.00E+00	-2.66E-04	7.69E-04	0.00E+00	-1.13E-02	0.00E+00
GWP-luluc	[kg CO ₂ eq.]	4.14E-03	1.55E-02	3.64E-05	0.00E+00	4.71E-05	5.79E-04	0.00E+00	4.10E-04	0.00E+00
ODP	[kg CFC 11 eq.]	3.86E-08	3.52E-16	-7.88E-17	0.00E+00	1.07E-18	1.31E-17	0.00E+00	5.29E-16	0.00E+00
AP	[mol H ⁺ eq.]	1.51E-02	2.14E-03	1.33E-05	0.00E+00	2.97E-05	8.27E-05	0.00E+00	1.02E-03	0.00E+00
EP-freshwater	[kg PO ₄ eq.]	1.54E-04	5.84E-06	-1.42E-08	0.00E+00	1.77E-08	2.18E-07	0.00E+00	2.45E-07	0.00E+00
EP-marine	[kg N eq.]	4.46E-03	6.41E-04	9.37E-06	0.00E+00	1.38E-05	2.54E-05	0.00E+00	2.63E-04	0.00E+00
EP-terrestrial	[mol N eq.]	4.83E-02	7.64E-03	1.15E-04	0.00E+00	1.52E-04	3.02E-04	0.00E+00	2.89E-03	0.00E+00
POCP	[kg NMVOC eq.]	1.30E-02	1.76E-03	2.67E-05	0.00E+00	3.86E-05	6.85E-05	0.00E+00	7.97E-04	0.00E+00
ADPm ¹	[kg Sb eq.]	3.75E-05	1.55E-07	-8.58E-10	0.00E+00	4.71E-10	5.79E-09	0.00E+00	1.28E-08	0.00E+00
ADPf ¹	[MJ]	6.10E+01	2.56E+01	-4.78E-02	0.00E+00	7.77E-02	9.55E-01	0.00E+00	1.87E+00	0.00E+00
WDP ¹	[m ³]	5.26E-01	1.87E-02	7.30E-04	0.00E+00	5.68E-05	6.98E-04	0.00E+00	1.49E-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 m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PM	[Disease incidence]	1.86E-07	1.45E-08	2.16E-10	0.00E+00	3.35E-10	5.48E-10	0.00E+00	1.27E-08	0.00E+00
IRP ²	[kBq U235 eq.]	4.65E-01	6.99E-03	-1.72E-03	0.00E+00	2.12E-05	2.61E-04	0.00E+00	2.19E-03	0.00E+00
ETP-fw ¹	[CTUe]	4.40E+01	1.92E+01	1.60E-02	0.00E+00	5.81E-02	7.15E-01	0.00E+00	1.07E+00	0.00E+00
HTP-c ¹	[CTUh]	1.36E-09	3.96E-10	-6.05E-14	0.00E+00	1.20E-12	1.48E-11	0.00E+00	1.58E-10	0.00E+00
HTP-nc ¹	[CTUh]	8.74E-08	2.01E-08	2.69E-11	0.00E+00	7.04E-11	7.49E-10	0.00E+00	1.74E-08	0.00E+00
SQP ¹	-	3.56E+01	8.99E+00	-9.19E-02	0.00E+00	2.73E-02	3.35E-01	0.00E+00	3.90E-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 m ² CEMBRIT MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
PERE	[MJ]	1.15E+01	1.48E+00	-4.62E-02	0.00E+00	4.49E-03	5.52E-02	0.00E+00	2.45E-01	0.00E+00
PERM	[MJ]	6.48E+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]	1.15E+01	1.48E+00	-4.62E-02	0.00E+00	4.49E-03	5.52E-02	0.00E+00	2.45E-01	0.00E+00
PENRE	[MJ]	6.10E+01	2.57E+01	-4.75E-02	0.00E+00	7.80E-02	9.59E-01	0.00E+00	1.87E+00	0.00E+00
PENRM	[MJ]	6.00E-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]	6.10E+01	2.57E+01	-4.75E-02	0.00E+00	7.80E-02	9.59E-01	0.00E+00	1.87E+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]	2.28E-02	1.73E-03	4.10E-06	0.00E+00	5.23E-06	6.43E-05	0.00E+00	4.72E-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 m ² MULTI FORCE										
Parameter	Unit	A1-A3	A4	A5	B1 – B7	C1	C2	C3	C4	D
HWD	[kg]	1.75E-07	1.19E-06	3.53E-09	0.00E+00	3.61E-09	4.43E-08	0.00E+00	2.85E-08	0.00E+00
NHWD	[kg]	7.90E-01	4.07E-03	1.82E-03	0.00E+00	1.24E-05	1.52E-04	0.00E+00	9.41E+00	0.00E+00
RWD	[kg]	3.79E-03	4.74E-05	-1.04E-05	0.00E+00	1.44E-07	1.77E-06	0.00E+00	2.13E-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]	2.50E-01	0.00E+00	8.00E-03	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	0.3
Biogenic carbon content in accompanying packaging	kg C	0.2

Additional information

Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type and consumption	0.5-0.913	L diesel
Transport distance	3,300	km
Capacity utilisation (including empty runs)	80	%
Gross density of products transported	9.4 – 16.2	kg/m ²
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	0.038 – 0.053	kg
Output materials	0	kg
Direct emissions to air, soil or water	0	kg

Reference service life

RSL information	Unit
Reference service Life	30 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	9.4 – 16.2	kg

Indoor air

Cembrit has performed an emission classification of Building materials – M1, for the indoor products. The certification is voluntary and refers to indoor air quality standards for materials used in regular work and residential facilities. The certification test covers emission measurements of volatile organic compounds (VOC, TVOC, CMR), ammonia and formaldehyde. The classification enhances the development and use of low-emitting building materials.

Soil and water

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

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 Maria Magnea Steingrimsdottir COWI A/S www.cowi.com
LCA software / background data	GaBi Professional 2020 and EcoInvent 3.6 2019
3rd party verifier	Ninkie Bendtsen NIRAS A/S Sortemosevej 19 DK-3450 Allerød www.niras.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"

HPD UNIQUE IDENTIFIER: 29460
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	Threshold Level	Residuals/Impurities Evaluation	For all contents above the threshold, the manufacturer has:
<input checked="" type="radio"/> Nested Materials Method	<input checked="" type="radio"/> 100 ppm	<input type="radio"/> Completed	Characterized <input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="radio"/> Basic Method	<input type="radio"/> 1,000 ppm	<input checked="" type="radio"/> Not Completed	<i>Provided weight and role.</i>
Threshold Disclosed Per	<input type="radio"/> Per GHS SDS	Explanation(s) provided for Residuals/Impurities?	Screened <input checked="" type="radio"/> Yes <input type="radio"/> No
<input type="radio"/> Material	<input type="radio"/> Other	<input checked="" type="radio"/> Yes <input type="radio"/> No	<i>Provided screening results using HPDC-approved methods.</i>
<input checked="" type="radio"/> Product			Identified <input checked="" type="radio"/> Yes <input type="radio"/> No
			<i>Provided name and CAS RN or other identifier.</i>

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
CEMENT BOARD [PORTLAND CEMENT (PORTLAND CEMENT) LT-P1
| CAN | END LIMESTONE BM-3dg CELLULOSE, MICROCRYSTALLINE
LT-UNK | RES POLYVINYL ALCOHOL LT-UNK]

Number of Greenscreen BM-4/BM3 contents ... 1
Contents highest-concern GreenScreen score(s) (BM-1, LT-1, LT-P1) ... LT-P1
Nanomaterial ... No

INVENTORY AND SCREENING NOTES:

100% of the intentional ingredients are included in the HPD.

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
LCA: EPDDanmark

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: 2022-03-22
PUBLISHED DATE: 2022-08-01
EXPIRY DATE: 2025-03-22

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

CEMENT BOARD		%: 88.0000 - 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 not considered.			
OTHER MATERIAL NOTES: None.			

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

HAZARD DATA SOURCE: Pharos Chemical and Materials Library		HAZARD SCREENING DATE: 2022-03-22 7:40:07		
%: 55.0000 - 75.0000	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: None				

LIMESTONE ID: 1317-65-3

HAZARD DATA SOURCE: Pharos Chemical and Materials Library		HAZARD SCREENING DATE: 2022-03-22 7:40:08		
%: 30.0000 - 45.0000	GreenScreen: BM-3dg	RC: UNK	NANO: Unknown	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: No substance notes relevant or submitted.				

CELLULOSE, MICROCRYSTALLINE ID: 9004-34-6

HAZARD DATA SOURCE: Pharos Chemical and Materials Library		HAZARD SCREENING DATE: 2022-03-22 7:40:08		
%: 3.0000 - 8.0000	GreenScreen: LT-UNK	RC: UNK	NANO: Unknown	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: No substance notes relevant or submitted				

POLYVINYL ALCOHOL				ID: 9002-89-5
HAZARD DATA SOURCE: Pharos Chemical and Materials Library		HAZARD SCREENING DATE: 2022-03-22 7:40:09		
%: 0.0000 - 2.0000	GreenScreen: LT-UNK	RC: UNK	NANO: Unknown	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: No substance notes relevant or submitted.				

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	ISSUE DATE: 2022-03-22	CERTIFIER OR LAB: N/A
APPLICABLE FACILITIES: N/A	EXPIRY DATE:	
CERTIFICATE URL:		
CERTIFICATION AND COMPLIANCE NOTES: No emissions test conducted.		
VOC CONTENT		N/A
CERTIFYING PARTY: Self-declared	ISSUE DATE: 2022-03-22	CERTIFIER OR LAB: N/A
APPLICABLE FACILITIES: N/A	EXPIRY DATE:	
CERTIFICATE URL:		
CERTIFICATION AND COMPLIANCE NOTES: No emissions test conducted.		
LCA		EPDDanmark
CERTIFYING PARTY: Third Party	ISSUE DATE: 2021-10-18	CERTIFIER OR LAB: EDPDanmark
APPLICABLE FACILITIES: Single-site, Finland.	EXPIRY DATE: 2026-10-18	
CERTIFICATE URL:		
https://www.cembrit.com/download/CHDK/environmental-product-declaration/epd-fibre-cement-build-indoor		
CERTIFICATION AND COMPLIANCE NOTES: EDP Certified via EPDDanmark (third-party verified, EPD-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 entries are: 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.

MANUFACTURER INFORMATION

MANUFACTURER: American Fiber Cement Corporation
ADDRESS: 6901 S. Pierce St., Ste. 180
 Littleton CO 80128, United States
WEBSITE: <http://www.americanfibercement.com>

CONTACT NAME: Spencer Anderson
TITLE: Technical Director
PHONE: 303-972-5107
EMAIL: sanderson@afcccladding.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	LAN Land toxicity	PHY Physical hazard (flammable or reactive)
CAN Cancer	MAM Mammalian/systemic/organ toxicity	REP Reproductive
DEV Developmental toxicity	MUL Multiple	RES Respiratory sensitization
END Endocrine activity	NEU Neurotoxicity	SKI Skin sensitization/irritation/corrosivity
EYE Eye irritation/corrosivity	NF Not found on Priority Hazard Lists	UNK Unknown
GEN Gene mutation	OZO Ozone depletion	
GLO Global warming	PBT Persistent, bioaccumulative, and toxic	

GreenScreen (GS)

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

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.



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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 m²) 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 17¹/₁₆ 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 m²) 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 5⁷/₈-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 3⁵/₈-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 ¹/₂-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 1¹/₄-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/m³) 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 1¹/₄-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 ¾-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 6⅞ x 2½ x 2 ³
C-Hangers ¹	NA	Proprietary ¹
L-Profiles	1½ x 2⅜ x ⅝/64	1½ x 2⅜ x ⅝/64
Z-Profiles	16 Ga. 1⅞/16 x 1½ x 1⅞/16	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.

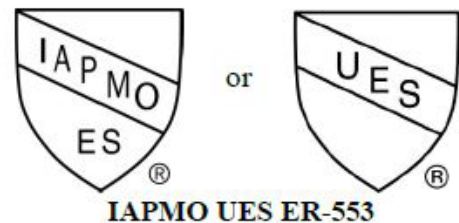
² Attached with one fastener per bracket.

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:





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.

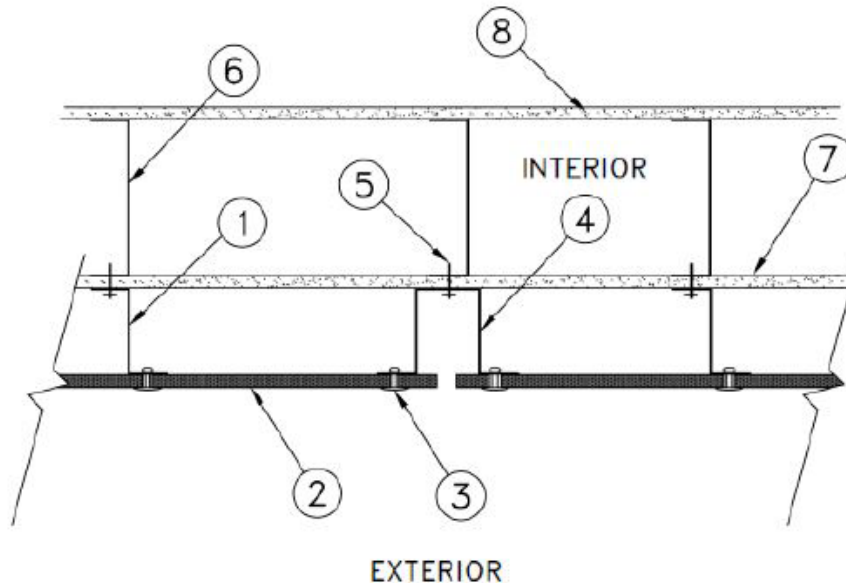
6.3 Reports of Surface Burning Characteristics testing in accordance with ASTM E84.

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

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



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.