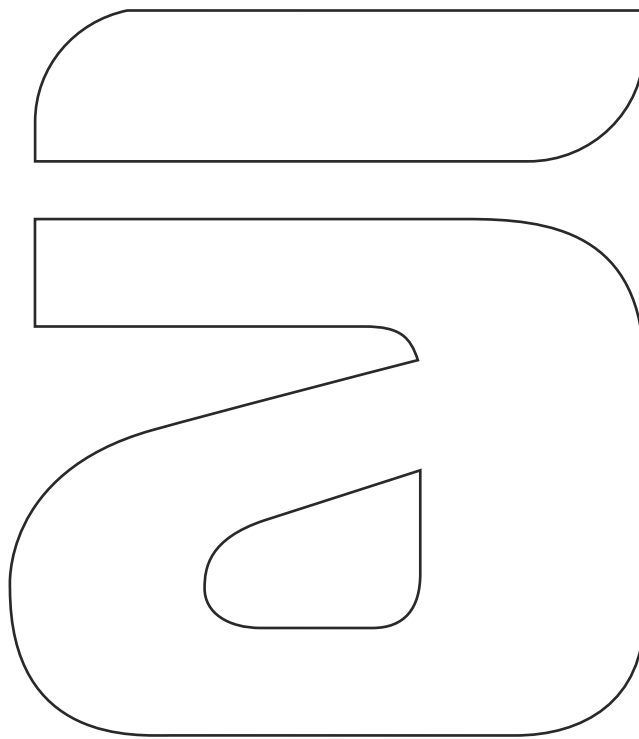




Fire Resistant & Non-Combustible Cladding



ALFREX FR MCM
DIGITAL ARCHITECTURAL BINDER

ALFREX OVERVIEW

Alfrex, LLC is specialized in fire-resistant and non-combustible architectural metal wall cladding for the North American market. Its foundation as a manufacturer dates back to 2000 for fire-resistant compounds, coatings, and bonding materials; and back to 2008 as a global manufacturer of fire-resistant MCM. Its company history and highlights include:

2000: Parent company Unience, Ltd. founded manufacturing fire-resistant compounds

2008: Alfrex FR Metal Composite Material launched with 2 manufacturing lines

2016: Alfrex USA commercial offices opened

2017: Alfrex Canada commercial offices opened

2019: Alfrex Plate - coil coated architectural aluminum plate added to portfolio

2020: New FR-core only MCM manufacturing plant and global headquarters inaugurated in Buford, Georgia USA

2020: All required product testing and certifications for the USA and Canada completed for Alfrex FR MCM and Alfrex Plate

2021: Alfrex launches Flat Sheet and Trim Profiles Program

Products

Alfrex FR MCM - Metal Composite Material Wall Panels

Alfrex Plate Pre-Finished Architectural Wall Panels

Matching Flat Sheet and Trim Profiles

PRODUCT OVERVIEW

Alfrex FR MCM - Metal Composite Material Wall Panels

Alfrex FR is a continuous process manufactured metal composite material (MCM) consisting of an extruded fire-resistant core permanently bonded to pre-finished aluminum skins on each side. It is fully tested and compliant with building codes in both the USA and Canada - holding key certifications such as ICC ES Evaluation Report ESR-4566, ICC AC25, NPFA 285, CAN S134, Florida Product Approval for High Velocity Hurricane Zones, and many others.

Alfrex Plate - Pre-Finished Architectural Wall Panels

Alfrex Plate is a 100% solid aluminum, non-combustible wall cladding panel with a standard nominal thickness of 0.125" (3mm) by a maximum 62" width - allowing it to be fabricated and installed with the same methods and system assemblies utilized with MCM. Like MCM, it is pre-finished via coil coating lines - providing better color consistency and economics versus the post-painting of individual plate panels.

Matching Flat Sheet and Trim Profiles

Alfrex stocks tension leveled 0.040" (1mm) aluminum flat sheet in all MCM standard colors to address the challenge of coordinating color match between metal wall cladding products and sheet metal for trim and accessories. Matching flat sheet can also be made-to-order in 5 standard profiles commonly used for flashing applications.

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134	...	Support Documentation <ul style="list-style-type: none"> › 4mm FR vs 6mm Comparison › Cleaning & Maintenance Recommendations › Post Painting Recommendations › Touch Up Paint Recommendations

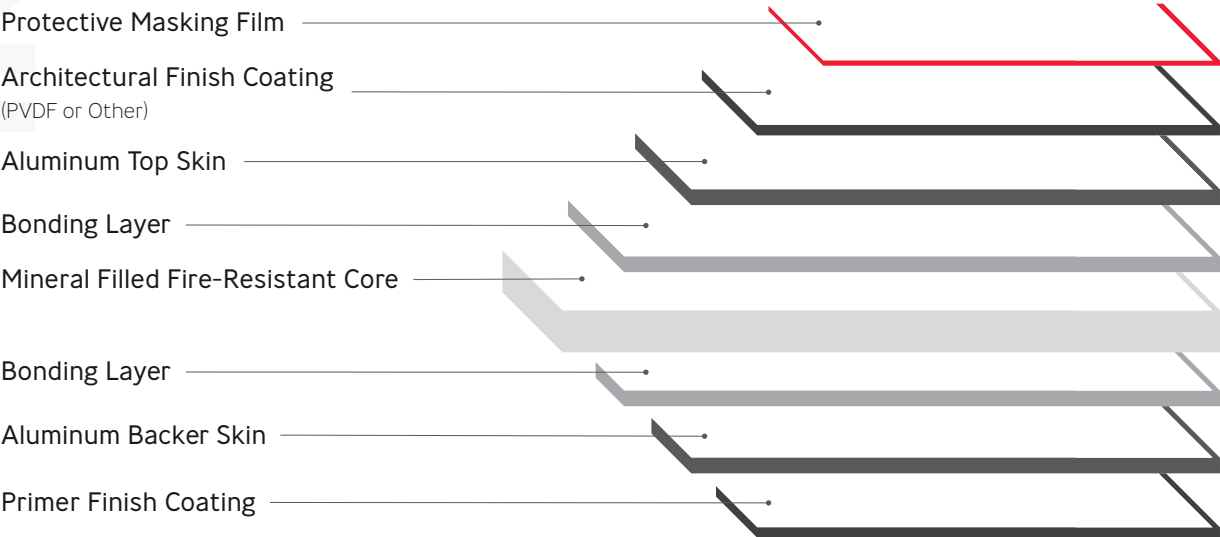
ALFREX FR MCM PRODUCT GUIDE

ALFREX FR INTRODUCTION

Alfred FR is a continuous process manufactured aluminum composite material (ACM) consisting of an extruded fire-resistant core permanently bonded to pre-finished aluminum skins on each side. It is extremely lightweight and exceptionally flat, yet easy to fabricate into any shape.

Alfred FR is coil coated utilizing 70% PVDF Kynar resin and other high-quality paint finishes - providing color uniformity, an extensive range of colors, unique coating patterns and textures, and the confidence of industry standard performance warranties. Its properties make **Alfred FR** an ideal choice for most any architectural design intent imaginable.

ALFRED FR COMPOSITION



ALFLEX FR FEATURES



Coil Coated for Performance

Alflex FR premium quality paint finishes are applied by coil coating lines specialized in the continuous roll coating of fluoropolymer and specialty paint coating systems. The process ensures superior color uniformity and the overall long-term performance expected of exterior architectural coatings.



Wide Standard Color Range

Alflex FR is offered in a broad range of standard colors geared towards exterior architectural building applications. Finishes utilizing 70% PVDF Kynar resin span popular color ranges in 2 Coat Solid, 2 Coat Mica, and 3 Coat Metallic configurations. Other specialty finishes include Prismatic Color-Shifting, Textured Wood Grain, Stone, Brushed Aluminum, and Faux Natural Metals.



Custom Colors

Alflex provides custom matching to transform your imagination into reality using the color or finish of your choice. Simply send us a color sample, coating manufacturer paint code, Pantone number, or PMS number and we will quickly turn around an accurate match that meets your project requirements.



Fire-Resistance is a Core Competency

The fire-resistant core of Alflex FR is an in-house manufactured, mineral-filled extruded material permanently bonded to aluminum skins. This provides an economical advantage for customers without sacrificing quality. Alflex FR has passed American and Canadian testing standards including ASTM E84, ASTM E119, NFPA 285, CAN/ULC S102, and CAN/ULC S134.



Lightweight and Highly Durable

Alflex FR is lightweight, at only 1.51 lbs/sqft yet durable with non-corrosive aluminum skins and weather resistant architectural coatings.



Ease of Fabrications and Formability

Alflex FR can be fabricated using proven methods such as: cutting, routing, shearing, bending, folding, and roll forming.

ALFREX FR REFERENCE DATA

STANDARD SIZES

PROPERTY	4mm FR		UNITS
Panel Thickness	0.157		in
	4.0		mm
Top & Backer Skin Thickness (<i>nominal</i>)	0.020		in
	0.5		mm
Standard Widths	50	62	in
	1,270	1,575	mm
Other Available Width <small>*Widths only available upon request</small>	40	49.2	in
	1,020	1,250	mm

TOLERANCES

PROPERTY	4mm FR		UNITS
Width	+ / - 0.080		in
	2.0		mm
Length	+ / - 0.157		in
	4.0		mm
Thickness	+ / - 0.008		in
	0.2		mm
Squareness	+ / - 0.157		in
	4		mm

TECHNICAL PROPERTIES

PROPERTY	STANDARD	4mm FR		UNITS
Panel Weight	-	1.51		lb/ft ²
		7.37		kg/m ²
Flexular Modulus (<i>Flexural Elasticity</i>)	ASTM C393	5.38 x 10 ⁶		Psi
		37.90 x 10 ³		Mpa
Modulus of Elasticity	ASTM E8	2.46 x 10 ⁶		Psi
		17.00 x 10 ³		Mpa
Tensile Strength (<i>aluminum skin</i>)	ASTM E8	6.96 x 10 ³		Psi
		48		Mpa
Yield Strength	ASTM E8	6.23 x 10 ³		Psi
		43		Mpa
Elongation	ASTM E8	5		%
Moment of Inertia	-	1.90 x 10 ⁻⁴		in ⁴ /in
		7.90 x 10 ⁻³		cm ⁴ /m
Section Modulus	-	1.81 x 10 ⁻³		in ³ /in
		29.70 x 10 ⁻³		cm ³ /m
Coefficient of Expansion	ASTM D696	1.44 x 10 ⁻⁵		in/in/°F (@-22-86°F)

BUILDING CODES

ICC AC-25	Certificate WHI18-26206601 (Spec ID 36858)	
ICC-ESR Evaluation Report	ESR-4566	
ICC-ESR Supplements [California]	CBC	California Building Code
	DSA	Division of the State Architect
	OSHDP	Office of Statewide Health Planning Development
	LABC	Los Angeles Building Code
Los Angeles Research Report	Per IB119 exempt with ICC ESR	
Florida Product Approval	FL 33597, FL 16406-R5	

FIRE PERFORMANCE

ASTM E84	Class A
ASTM E119	Fire Rating - 2 hours
NFPA 285	Passed
CAN/ULC S102	Class A
CAN/ULC S134	Passed
ASTM D635	Classified CC1

SUMMARY

ALFREX FR MCM EXECUTIVE SUMMARY

ALFREX FR MCM EXECUTIVE SUMMARY

4mm Aluminum Composite Material



Fire Resistant & Non-Combustible Cladding

ALFREX 4mm FR MCM

- » Fire Resistant Core Only - No PE
- » In-house produced FR core
- » Minimal price difference between solid, mica and metallics
- » Thickness: Standard 4mm
[Available in 3mm and 6mm]
- » Width: Standard 62in
50in in select colors
40.2in and 49.2in also available
- » 10 Year Bond Integrity Warranty
- » 10, 20 & 30 Year Finish Warranties
- » 32 colors in Finished Goods

MATCHING FLAT SHEET

- » Sheet Size: 0.040in x 48in x 120in
- » 30 standard matching colors in stock
- » Perfect for trim and accessories
- » Same paint finishes as Alfrex FR

FINISHED GOODS

- » Stocking Locations: Atlanta and Toronto
- » MCM FR: 32 standard colors - 4mm x 62in x 196in lengths
- » Matching Flat Sheet: 30 colors - 0.040in x 48in x 120in
- » 3mm Plate: 62in x 165in in 4 standard colors

CUSTOM COLORS

- » Minimum 2,500 sqft production quantity
- » No Setup Charges
- » Require color sample, paint code, PMS or Pantone number
- » Custom Wood and Metal Series 22,000 sqft minimum

MATCHING TRIM PROFILES

- » 5 Standard trim profiles cut-to-length to order
- » Custom dimensioned profile production capability
- » Made from Alfrex Matching Flat Sheet
- » Base Wall, Outside Corner, Inside Corner Flashing
- » Parapet Flashing, Z-Flashing

STANDARD COLORS

ALFREX FR MCM

» 2-Coat Solid:



» 2-Coat Mica:



» 3-Coat Metallic:



» Wood Series:



» Metal Series:



» Specialty Series:



* Hover over finishes for Finish Name.*

PRODUCT CERTIFICATIONS

ALFREX FR MCM - BUILDING CODES

ICC AC-25	Certificate WHI18-26206601 (Spec ID 36858)	
ICC-ESR Evaluation Report	ESR-4566	
ICC-ESR Supplements [California]	CBC	California Building Code
	DSA	Division of the State Architect
	OSHDP	Office of Statewide Health Planning Development
	LABC	Los Angeles Building Code
Los Angeles Research Report	Per IB119 exempt with ICC ESR	
Florida Product Approval	FL 33597, FL16406-R5	

ALFREX FR MCM - FIRE PERFORMANCE

ASTM E84	CAN/ULC S102
ASTM E119	CAN/ULC S134
NFPA 285	ASTM D635

LEED CERTIFICATION RECYCLED CONTENT MR CREDIT 4 - 26.07%

- » LEED v3 : 2 Points
- » LEED v4 : 1 Point

USA MANUFACTURING PLANT

- » 100,000 sqft facility in metro Atlanta
- » MCM Production Line:
 - › In-house designed & engineered
 - › Continuous manufacturing process
 - › Numerous color changeovers, minimal scrap, no line stoppage
 - › Cost control - 7,500 sqft as efficient as 50,000 sqft

**ALFREX FR MCM
SPECIFICATION
COMPLIANCE CHECKLIST**

SPECIFICATION COMPLIANCE CHECKLIST

Section 07 42 13 - Metal Composite Wall Panels



Fire Resistant & Non-Combustible Cladding

PART 1: GENERAL

ASTM E330 Structural Performance

Perimeter Framing Deflection ≤ L/175

Panel Deflection ≤ L/60

Panel Deflection - Compliant

± 75 psf, 20.0 psf water penetration per ASTM E330

		Deflection (in)		Permanent Set (in)	
		Measured	Allowed Per TAS 202 (L/250)	Measured	Allowed Per TAS 202 (L/720)
Design Pressure	+ 75.0/psf	0.15	0.48	0.01	0.17
	- 75.0/psf	0.10	0.48	< 0.01	0.17
Test Pressure	+ 112.5/psf	0.23	0.48	0.17	0.17
	- 112.5/psf	0.17	0.48	0.02	0.17

Perimeter Framing Deflection - Compliant

		Deflection (in)		Permanent Set (in)	
		Measured	Allowed Per TAS 202 (L/1333)	Measured	Allowed Per TAS 202 (L/3899)
Design Pressure	+ 75.0/psf	0.01	0.09	0.01	0.03
	- 75.0/psf	0.02	0.09	< 0.01	0.03
Test Pressure	+ 112.5/psf	0.01	N/A	< 0.01	0.03
	- 112.5/psf	0.12	N/A	< 0.01	0.03

Quality Assurance

Product Certifications & Test Report Compliance

ICC-ESR Certification Report (ESR-4566)	
ICC-AC 25 Certification of Compliance Listing	
	CBC
	DSA
ICC Supplements California	OSHPD
	LABC
	FL 33597
Florida Product Approval HVHZ	FL 16406-R5

MCM Manufacturer Qualifications

12 Years Manufacturing Experience
Produces FR core material in-house
Intertek - Product Testing, Certification, Listing Compliance
Project References

ASTM E283, Air Leakage

< 0.06 cfm per sf at 1.57 psf

0.02 cfm/ft² (0.10 L/s/m²) at 1.57 psf (25 mph)	Compliant
0.04 cfm/ft² (0.20 L/s/m²) at 6.27 psf (50 mph)	Compliant

ASTM E331, Water Penetration

No water infiltration at 6.24 psf (0.299 kPa)

No water infiltration at 20 psf (0.96 kPa)	Compliant
--	-----------

Fire Performance

Compliant with regulatory fire code testing

NFPA 285, ASTM E84, ASTM E119, ASTM E108, ASTM D1929,
CAN/ULC S102, CAN/ULC S134, ASTM D635

** See page 2 for result summaries for each test.

Warranty

Bond Integrity	10 Years	Product
Hairline Aluminum	10 Years	Finish
2 Coat Solid / 2 Coat Mica	30 Years	Finish
Vivid Solid	20 Years	Finish
3 Coat Metallic	30 Years	Finish
Wood and Metal Series	20 Years	Finish

PART 2: PRODUCT

MCM Material

Two sheets of aluminum sandwiching a solid core of extruded thermoplastic fire-resistant solid material formed in a continuous process with no glues or liquid adhesives between dissimilar materials.

MCM Face Sheets

Aluminum Alloy	3003-H14
Thickness	0.5mm (0.020") nominal of each

SPECIFICATION COMPLIANCE CHECKLIST

Section 07 42 13 - Metal Composite Wall Panels



Fire Resistant & Non-Combustible Cladding

PART 2: PRODUCT (con't)

MCM Panel Dimensions

Thickness	4mm (0.157 in) & 6mm (0.236 in)
Widths	40", 50", 62"
Lengths	Made to order 48" min - 300" max

MCM Fire Resistant Core

Fire Resistant Mineral Core:	
3.0 mm (0.117 in) nominal	4mm FR panel
5.0 mm (0.197 in) nominal	6mm FR panel

Finishes

AAMA 2605 Compliant Coil Coated
70% KYNAR® 500 based Polyvinylidene Fluoride (PVDF) finishes

PROPERTY	STANDARD	COIL COATED ALUMINUM
Color Uniformity	ASTM D2244	Max. 2 Delta E
Color Retention - Fade	ASTM D2244	≤ 5 Delta E units
Chalk Rating	ASTM D4214	≤ 8 units
Specular Gloss	ASTM D523	± 5 units
Dry Film Hardness	ASTM D3363	F - 2H
Dry Adhesion	ASTM D3359	No coating removal
Abrasion Resistance	ASTM D968	Abrasion Coefficient Value ≥ 40
Reverse Impact	ASTM D2794	No coating removal
Muriatic Acid Resistance (10% HCl, 15 min)	ASTM D1308	No blistering or visual change
Nitric Acid Resistance (HNO ₃ , 30 min)	ASTM D1308	≤ 5 Delta E
Alkali Mortar Resistance (10%, 25% NaOH, 60 min)	ASTM D1308	No removal No loss of adhesion or visual change
Flexibility	ASTM D4145	2T - no pick off
Humidity Resistance	ASTM D714	4000 hour exposure
	ASTM D2247	Less than "few" blisters Size No. 8
Cyclic Corrosion	ASTM B117	2000 hour exposure Min rating of 7 scribe or cut edge
	AAMA 2605-13	Min. blister rating of 8

Bond Integrity

No failure of bonding when tested to ASTM D1781

ICC-AC 25 ASTM D1781 Intertek Report No. J6080.01-106-16 R0

Condition	Peel Torque (in•lb/in)		Result
	Average	Required	
Control	39.91	22.5	Pass
8 Hour Boil	48.71	22.5	Pass
21 Day Water	40.31	22.5	Pass
Freeze - Thaw	42.21	22.5	Pass

Fire Performance

Test Standard	Results
NFPA 285 Multi-Story Fire Test	Passed
ASTM E84: Flame spread <25 Smoke Developed <450	Class A Flame Spread: 0 Smoke Developed: 0
CAN/ULC S102	Class A Flame Spread: 0 Smoke Developed: 0
CAN/ULC S134	Passed
ASTM E119	Passed - 2 Hour rating
ASTM E108 Surface Flammability	Passed
ASTM D1929 Ignition Temperature	Flash: 716 °F (380 °C) Ignition: 752 °F (400 °C)
ASTM D635 Rate of Burning	Classified CC1

Technical Properties Data Sheet

Alfred MCM 4mm FR
Alfred MCM 6mm FR

Related Materials

Matching trim and accessories formed from sheet metal to match MCM panel finish.

Alfred stocks 0.040" x 48" x 120" flat sheet in 32 colors that match Alfred FR MCM standard colors.

ALFREX FR MCM COMPETITIVE COMPARISON CHART

EXPANDED COMPETITIVE COMPARISON CHART

MCM Competitor Technical Data Comparison



Fire Resistant & Non-Combustible Cladding

GENERAL COMPARISON	Company MCM Brand	Alfred, LLC Alfred FR	Arconic Reynobond FR	Mitsubishi Chemical Alpolic fr	3A Composites Alucobond Plus	Alucoil N. America Larson by Alucoil
	Product 4mm FR Aluminum Composite Material (ACM/MCM)	✓	✓	✓	✓	✓
	ACM Manufacturing Experience 10+ Years	✓	✓	✓	✓	✓
	ACM Manufacturing Process Continuous Process Manufactured with No Glues or Adhesives	✓	✓	✓	✓	✓
	Fire Resistant Mineral Filled Core	✓	✓	✓	✓	✓
	FR Core Manufactured In-House	✓		✓	✓	
	USA Manufacturing Plant Location	Buford, GA	Eastman, GA	Chesapeake, VA	Benton, KY	Manning, SC
	Product Bond Integrity Warranty	✓	✓	✓	✓	✓
	Metal Composite Manufacturer Alliance Member	✓	✓		✓	✓
PRODUCT CERTIFICATIONS	3rd Party Certifying Agencies Intertek / International Code Council, Inc. (ICC)	✓	✓	✓	✓	✓
	ICC-ESR Certification Report	ESR-4566	ESR-3435	ESR-2653	ESR-1185	
	ICC-AC 25 Certification for ACM / MCM	✓	✓	✓	✓	✓
	Fire Performance Certification USA NFPA 285, ASTM E84, ASTM E119	✓	✓	✓	✓	✓
	Fire Performance Certification Canada CAN / ULC S102, S134	✓		✓	✓	✓
	ICC Supplement CBC California Building Code	✓				
	ICC Supplement DSA Division of the State Architect - California	✓				
	ICC Supplement OSHPD Office of Statewide Health Planning Development - California	✓				
	ICC Supplement LABC Los Angeles Building Code - California	✓	✓			
	Los Angeles Research Report Per IB119 exempt with ICC ESR	✓	✓	✓	✓	
	Florida State Product Approval	✓	✓	✓	✓	
	High Velocity Hurricane Zone	✓	✓	✓	✓	

EXPANDED COMPETITIVE COMPARISON CHART



MCM Competitor Technical Data Comparison

Fire Resistant & Non-Combustible Cladding

	Company MCM Brand	Alfred, LLC Alfred FR	Arconic Reynobond FR	Mitsubishi Chemical Alpolic fr	3A Composites Alucobond Plus	Alucoil N. America Larson by Alucoil
FIRE PERFORMANCE	ASTM E84 Class A	✓	✓	✓	✓	✓
	NFPA 285 Passed	✓	✓	✓	✓	✓
	CAN/ULC S102 Class A	✓		✓	✓	✓
	CAN/ULC S134 Passed	✓		✓	✓	✓
ARCHITECTURAL PAINT SYSTEMS	Primary System	70% Kynar PvDF	70% Kynar PvDF	Lumiflon	70% Kynar PvDF	70% Kynar PvDF
	Secondary System	Lumiflon	Lumiflon	70% Kynar PvDF	Lumiflon	Lumiflon
	Primary Paint Suppliers	PPG Beckers	PPG Beckers	Sherwin-Williams PPG	PPG Akzo Noble	PPG Akzo Noble
	AAMA 2605 Compliant	✓	✓	✓	✓	✓
	30 Year Finish Performance Warranty	✓	✓	✓	✓	✓
ARCHITECTURAL PRODUCT OFFERING AND SERVICES	Standard Widths (62" / 50")	✓	✓	✓	✓	✓
	Other Widths (49.2" / 40")	✓	✓	✓	✓	✓
	Custom Lengths : Panels are Cut to Length during Manufacturing	✓	✓	✓	✓	✓
	Standard Colors : 30+ Solid, Mica, 3-coat Metallic, Wood Grain, Brushed Metal, Natural Metals, Corten Rust	✓	✓	✓	✓	✓
	Custom Colors	✓	✓	✓	✓	✓
	Finished Goods ACM Panels	✓	✓	✓	✓	✓
	Company Finished Goods Locations	USA & Canada	USA only	USA only	USA only	USA only
	Matching Flat Sheet	✓	✓	✓	✓	✓
	Matching Flat Sheet Thickness	0.040"	0.040"	0.032"	0.040"	0.040"
	Matching Flat Sheet Trim Profiles	✓				

EXPANDED COMPETITIVE COMPARISON CHART

MCM Competitor Technical Data Comparison



Fire Resistant & Non-Combustible Cladding

TECHNICAL DATA COMPARISON	Company MCM Brand	Alfred, LLC Alfred FR	Arconic Reynobond FR	Mitsubishi Chemical Alpolic fr	3A Composites Alucobond Plus	Alucoil N. America Larson by Alucoil
	Product 4mm FR Aluminum Composite Material (ACM/MCM)	✓	✓	✓	✓	✓
	Aluminum Alloy 3000 Series	✓	✓	✓	✓	✓
	Product Thickness 4mm / 0.157"	✓	✓	✓	✓	✓
	Aluminum Skin Thickness (inches) [nominal] 0.020" Top Skin / 0.020" Bottom Skin	✓	✓	✓	✓	✓
	Panel Weight Pounds per Square Foot	1.51	1.53	1.56	1.56	1.57
	Minimum Bond Strength ASTM D1781 (in•lb/in)	22.5	22.5	22.5	22.5	22.5
	Flatwise Tensile Strength ASTM C297 (Psi)	In Progress	961	949	765	894
	Flexural Modulus ASTM C393 (Psi)	5.38 x 10 ⁶	6.7 x 10 ⁶	5.77 x 10 ⁶	-	-
	Modulus of Elasticity ASTM E8 (Psi), **ASTM D638 (Psi)	2.46 x 10 ⁶	-	-	**2.93 x 10 ⁶	-
	Moment of Inertia (in ⁴ /in)	1.9 x 10 ⁻⁴	1.89 x 10 ⁻⁴	-	-	-
	Tensile Strength (aluminum skin) ASTM E8 (Psi), **ASTM D638 (Psi)	6.96 x 10 ³	-	7.13 x 10 ³	**7.75 x 10 ³	-
	Yield Strength (aluminum skin) ASTM E8 (Psi), **ASTM D638 (Psi)	6.23 x 10 ³	6.37 x 10 ³	6.34 x 10 ³	**6.57 x 10 ³	-
	Elongation ASTM E8 (%)	5	-	5	-	-
	Coefficient of Expansion ASTM D696 (in/in/°F)	1.44 x 10 ⁻⁵	1.31 x 10 ⁻⁵	1.71 x 10 ⁻⁵	1.11 x 10 ⁻⁵	-
	Deflection Temperature ASTM D648 (°F)	> 239	-	> 242	> 185	-
	Self Ignition Temperature ASTM D1929 (°F)	775	-	811	783	-

ALFREX COLOR OFFERINGS

STANDARD STOCKING FR MCM FINISHES

- » Painted coil and finished goods panel inventory
- » 2,000 sqft Production Order Minimum
- » Matching 0.040in Flat Sheet finished goods inventory

2 COAT SOLIDS

30 Year Finish Warranty
Matching 0.040" Flat Sheet Available



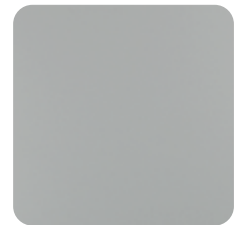
JY-5195
CLASSIC WHITE



JY-5165
BONE WHITE



JY-5110
ASCOT WHITE



JY-6120
DOVE GRAY



JY-6130
FASHION GRAY



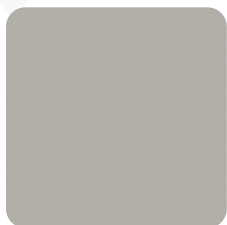
JY-6140
DARK GRAY



JY-6150
CHARCOAL



JY-6220
BLACK



JY-6160
CASTLE GRAY



JY-6175
SEA WOLF



JY-6180
BRONZE

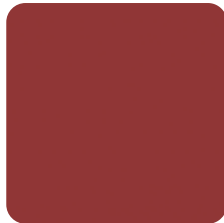
STANDARD STOCKING FR MCM FINISHES

VIVID SOLIDS

20 Year Finish Warranty
Matching 0.040" Flat Sheet Available



JY-7110
SIGNAL BLUE



JY-7120
VIBRANT RED

2 COAT MICA

30 Year Finish Warranty
Matching 0.040" Flat Sheet Available



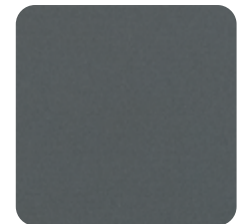
JY-2510
ANODIC CLEAR MICA



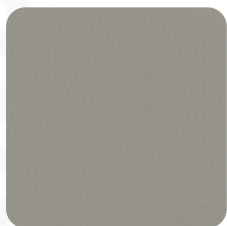
JY-2520
EXOTIC SILVER MICA



JY-2530
GRAY SILVER MICA



JY-2540
PEWTER MICA



JY-2550
CHAMPAGNE MICA



JY-2560
MEDIUM BRONZE MICA



JY-2570
COPPER PENNY MICA

3 COAT METALLICS

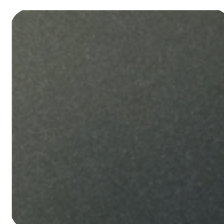
30 Year Finish Warranty
Matching 0.040" Flat Sheet Available



JY-3510
BRIGHT SILVER METALLIC



JY-3520
CHAMPAGNE METALLIC



JY-3530
GRAPHITE METALLIC

STANDARD STOCKING FR MCM FINISHES

WOOD SERIES

20 Year Finish Warranty
Matching 0.040" Flat Sheet Available



JY-W120
TEAK



JY-W140
GOLDEN OAK



JY-W150
DARK WALNUT

METAL SERIES

20 Year Finish Warranty
Matching 0.040" Flat Sheet Available



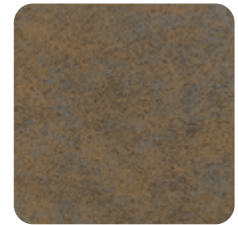
JY-M110
FAUX ZINC GRAPHITE



JY-M120
FAUX ZINC



JY-M130
FAUX ZINC LITE



JY-M140
TILE CORTEN

SPECIALTY SERIES

* Please contact us for Specialty Series warranty details. 470.589.7449



JY-H100
HAIRLINE CLEAR



JY-A160
MIRROR

ALFREX FR MCM
SPECIFICATION 07 42 13
COMPOSITE METAL
WALL PANELS

SECTION 07 42 13
COMPOSITE METAL WALL PANELS

PART 1: GENERAL

1.01 SCOPE

- A. Section Includes
 - 1. MCM - Fire Resistant Composite Metal Panels
 - 2. Panel systems requirements of composite fire resistive panels including exterior and interior installation assemblies, components, and accessories.
- B. Related Sections: Section(s) related to this section include:
 - 1. Division 05 Metal Framing Sections
 - 2. Division 07 Air and Vapor Barrier
 - 3. Division 07 Flashing and Trim Sections
 - 4. Division 07 Joint Treatment Section
 - 5. Division 08 Aluminum Windows Section
 - 6. Division 08 Glass and Glazing Section
 - 7. Division 08 Curtain Wall Sections

1.02 QUALITY ASSURANCE

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed have either been identified by the International Building Code (IBC), local building code, or specific requirement for this building construction type.
- B. Aluminum Association (AA)
 - 1. Aluminum Design Manual
 - 2. AA-M12C22A41: Anodized - Clear Coating
 - 3. AA-M12C22A44: Anodized - Color Coating
- C. American Society for Testing and Materials (ASTM) International
 - 1. ASTM D1781 Standard Test Method for Climbing Drum Peel for Adhesives
 - 2. ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
 - 3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - 4. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
 - 5. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference
 - 6. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Curtain Wall, and Doors By Uniform Static Air Pressure Difference
- D. American Architectural Manufacturers Associations (AAMA)
 - 1. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - 2. AAMA 509 Voluntary Test and Classification Method of Drained and Back Ventilated Rain Screen Wall Cladding Systems.
- E. National Fire Protection Association (NFPA)
 - 1. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.03 SYSTEM DESCRIPTION

- A. Performance Requirements:

1. Provide installed MCM system designed to withstand specified loadings while maintaining allowable deflection, thermal movement performance as defined by the Manufacturer.
- B. Deflection and Thermal Movement: Provide installed MCM systems that have been designed to resist to wind loading, acting inward and outward.
 1. Perimeter Framing Deflection: Deflection of panel perimeter framing member shall not exceed $L/175$ normal to plane of the wall where L is the unsupported span of the perimeter framing member.
 2. Panel Deflection: Deflection of the panel face shall not exceed $L/60$ at design load where L is the unsupported span of the panel.
 3. Anchor Deflection: At connection points of framing members to anchors, anchor deflection in any direction shall not exceed 0.0625in (1.6mm).
 4. Thermal Movements: Allow for free and noiseless horizontal and vertical thermal movement due to expansion and contraction of component parts over a temperature range of -20°F (-29°C) to +180°F (82.2°C) at the material surface.
 - a. Buckling, opening of joints, undue stress on fasteners, failure of sealants, or any other detrimental effects of thermal movement will not be permitted.
 - b. Fabrication, assembly and erection procedures shall take into account the ambient temperature range at the time of the respective operation.
- C. Water and Air Leakage - Provide systems that have been tested and certified to conform to the following criteria:
 1. Air Leakage, ASTM E283: Not more than 0.06cfm per ft² of wall area (0.003L/s m²) when tested at 1.57psf (0.075kPa)
 2. Water Penetration: No water infiltration under static pressure when tested in accordance with ASTM E331 at a differential of 10% of inward acting design load, 6.24psf (0.299kPa) minimum, after 15 minutes.
 - a. Water penetration is defined as the appearance of uncontrolled water in the wall.
 - b. Wall design shall feature provisions to drain to the exterior face of the wall any leakage of water at joints and any condensation that may occur within the construction.
- D. Structural: Provide systems that have been tested in accordance with ASTM E330 at a design pressure of [specify design pressure in psf (kPa)] and have been certified to be without permanent deformation or failures of structural members.
- E. Fire Performance: Provide composite fire rated panels that have been evaluated and are in compliance with regulatory code agency requirements specified herein.

1.04 SUBMITTALS

- A. Submit in accordance with Conditions of the Contract and Division 01 Submittal Procedures Sections.
- B. Submit product data, including manufacturer's brochures and Spec-Data Sheets.
- C. Shop Drawings: Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.
- D. Samples: Submit selection and verification samples for finishes, colors and textures.
 1. Selected Samples: Manufacturer's color charts or chips illustrating full range of colors, finishes and patterns available for composite metal panels with factory applied finishes.
 2. Verification Samples:
 - a. Panel System Assembly: Two samples of each assembly 12in x 12in (304mm x 304mm)
 - b. Two samples of each color in coil coated, or draw down samples on aluminum substrate, not less than 3in x 4in (76mm x 102mm)
- E. Quality Assurance Submittals - Submit the following:

1. Product Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties, or a third-part listing documenting compliance to a comparable code section.
 2. Product Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical requirements.
 3. Manufacturer's Product Literature
 4. Manufacturer's Field Reports: Manufacturer's field reports.
- F. Closeout Submittals - Submit the following:
1. Warranty: Warranty documents specified.

1.05 QUALITY ASSURANCE

A. MCM Manufacturer Qualifications

1. MCM Manufacturer Qualifications: Company with a minimum of 10 years of continuous experience manufacturing MCM of the type specified.
 - a. Able to provide specified warranty on finish.
 - b. Able to provide a list of other projects of similar size, including approximate date of installation and name of Architect for each.
 - c. Able to produce the composite material without outsourcing of the fire-resistant core manufacture and compounding, or panel bonding process.

B. MCM Fabricator Qualifications

1. MCM system fabricator will have at least (3) years of continuous documented experience fabricating the panel material type specified.
2. MCM system fabricator will have been in business under its present name for at least five (5) years prior to the start of this project.
3. MCM system fabricator will be capable of providing field service representation during construction.
4. MCM system fabricator will not have filed for protection from creditors under state or federal insolvency or debtor relief statutes or codes

C. MCM System Installer Qualification

1. MCM system fabricator will have been in business under its present name for at least five (5) years prior to the start of this project and have experience with similar sized MCM system projects.
2. MCM system fabricator will be capable of providing field service representation during construction.
3. The MCM System Installer must be an approved installer by the MCM Fabricator for the installation of their MCM System and have undergone proper training for the specified system thereof.

D. Mock-up

1. At location on building and to extent directed by Architect, install areas of specified wall panels, support framing, flashing, trim and accessories to show:
 - a. Substrate preparation
 - b. Support framing, furring, and flashing
 - c. Clearances and gaps between members
 - d. Fastening methods
 - e. Trim details
 - f. Joint protection
 - g. Workmanship
2. Prepare mock-up for Architect's approval before start of wall panel work. Prepare additional mock-ups, if required by Architect, until approved.
3. Maintain approved mock-up during construction to establish required standard of workmanship and basis of comparison for installation of wall panel work. Approved mock-up may remain as part of finished work.

E. Installation Documents On-Site

1. Maintain copies of installation instructions, approved submittal and other execution related documents on-site; make available as needed to confirm proper installation.

F. [____]

1.06 DELIVERY, STORAGE & HANDLING

- A. Adhere to manufacturer's ordering instructions and lead time requirements to avoid delays.
- B. Deliver materials to fabricator in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Protect finish of panels by applying heavy-duty removable plastic film during production.
- D. After fabrication, package composite wall panels for protection against transportation damage.
- E. Store material in accordance with manufacturer's guidelines.
 1. Exercise care unloading, storing and installing panels to prevent bending, warping, twisting and surface damage to the factory applied finish.
 2. Store materials protected from exposure to harmful weather conditions, out of direct sunlight when unpackaged, and at temperatures not to exceed 120°F.
 3. Protect panels from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
 4. Slope panels to ensure positive drainage of any accumulated water.
 5. Avoid contact with any other materials that might cause staining, denting or other surface damage to the factory applied finish.

1.07 WARRANTY

- A. Manufacturer's Warranties: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
- B. Warranty Periods:
 1. Panel Integrity: 10 Years commencing on Date of Substantial Completion.
 2. Painted Finish: 30 Years commencing on Date of Substantial Completion.
 3. MCM Natural Metals: No finish warranty
 4. Anodized Finish: 5 Years commencing on Date of Substantial Completion

PART 2: PRODUCTS

2.01 FIRE RESISTANT METAL COMPOSITE MATERIAL (MCM)

- A. Fire Resistant Metal Composite Material (MCM) Manufacturer
 1. Alfrex, LLC. 943 Gainesville Hwy. Bldg 100-4000, Buford, GA 30518
Phone - (470) 589-7449
Website - <http://alfrexusa.com>
Email - alfrex@alfrexusa.com

2.02 BASIS OF DESIGN

- A. Alfrex FR - Metal Composite Material
- B. Description: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic fire-resistant material formed in a continuous process with no glues or liquid adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products that are laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

C. MCM Thickness:

1. 4mm (0.157in)
2. 6mm (0.236in)

D. MCM Face Sheets:

1. Front Face: 0.5mm (0.020in) nominal
2. Fire Resistant Mineral Core:
 - a. 3.0mm (0.117in) nominal - 4mm FR panel
 - b. 5.0mm (0.197in) nominal - 6mm FR panel
3. Back Face: 0.5mm (0.020in) nominal

E. Aluminum Alloy: 3003-H14

F. Weight:

1. 4mm: 1.51lb/ft² (7.37kg/m²)
2. 6mm: 2.13lb/ft² (10.40kg/m²)

G. Finishes

1. Coil coated KYNAR® 500 or HYLAR® 5000 based Polyvinylidene Fluoride (PVDF) or Fluoro Ethylene - Alkyl Vinyl Ether (FEVE) resin in conformance with the following general requirements of AAMA 2605.
 - a. Color: (Select one of the following)
 - 1) Standard color as selected by the owner / architect / engineer from manufacturer's standard, color selection.
 - a) 2 Coat Solid
 - b) 2 Coat Mica
 - c) 3 Coat Metallic
 - d) [____]
 - 2) Custom color to be matched by the panel supplier
 - a) 2 Coat Solid
 - b) 2 Coat Mica
 - c) 3 Coat Metallic
 - d) [____]
 - 3) Clear coat over hairline aluminum substrate.
 - b. Dry Film Thickness:
 - 1) 2 Coat: 1.0mil (±0.2mil)
 - 2) 3 Coat: 1.0mil (±0.2mil) + 0.50mil (±0.05mil)
 - c. Hardness: ASTM D3383; HB minimum using Eagle Turquoise Pencil
 - d. Impact Resistance
 - 1) Test method: ASTM D2794; Gardner Variable Impact Tester with 5/8" mandrel
 - 2) Coating shall withstand reverse impact of 1.5in/lbs per mil substrate thickness
 - 3) Coating shall adhere tightly to metal when subjected to #600 Scotch Tape pick-off test. Slight minute cracking permissible. No removal of film to substrate.
 - e. Adhesion:
 - 1) Test Method: ASTM D3359: Coating shall not pick-off when subjected to an 11in x 11in x 1/16in grid and taped with #600 Scotch Tape.
 - f. Humidity Resistance:
 - 1) Test Method: ASTM D2247
 - 2) No formation of blisters when subject to condensing water fog at 100% relative humidity and 100°F for 4000 hours.
 - g. Salt Spray Resistance:

- 1) Test Method: ASTM B117; Expose coating system to 4000 hours, using 5% NaCl solution.
 - 2) Corrosion creepage from scribe line: 1/16" max.
 - 3) Minimum blister rating of 8 within the test specimen field.
- h. Weather Exposure:
- 1) Outdoor:
 - a) 10 Year exposure at 45° angle facing south Florida exposure.
 - b) Maximum color change of 5 Delta E units as calculated in accordance with ASTM D2244
 - c) Minimum chalk rating of 8 in accordance with ASTM D4214
 - d) No checking, crazing, adhesion loss
- i. Chemical Resistance:
- 1) ASTM D1308 utilizing 10% Muriatic Acid for an exposure time of 15 minutes. No loss of film adhesion or visual change when viewed by the unaided eye.
 - 2) ASTM D1308 utilizing 20% Sulfuric Acid for an exposure time of 18 hours. No loss of film adhesion or visual change when viewed by they unaided eye.
 - 3) AAMA 2605 utilizing 70% reagent grade Nitric Acid vapor for an exposure time of 30 minutes. Maximum color change of 5 Delta E units as calculated in accordance with ASTM D2244.

2.03 ALTERNATES

- A. Base Bid/Contract Manufacturer: [Specify base bid/contract manufacturer].
 1. Product: [Specify product base bid/contract brand/trade name with product attributes and characteristics].
- B. Alternate No. [Specify #]: [Specify alternate manufacturer].
 1. Product: [Specify product alternate brand/trade name with product attributes and characteristics].
- C. Alternate No. [Specify #]: [Specify alternate manufacturer].
 1. Product: [Specify product alternate brand/trade name with product attributes and characteristics].

2.04 MCM PRODUCT PERFORMANCE

- A. Bond Integrity: Tested for resistance to delamination as follows:
 1. Peel Strength (ASTM D1781): 22.5in-lb/in (100N-m/m) minimum.
 2. No degradation in bond performance after 8 hours of submersion in boiling water at 212°F (100°C).
 3. No degradation in bond performance after and 21 days of immersion in water at 70°F (21°C).
 4. Thermally bonded to the fire-resistant core material in a continuous process under tension.
- B. Fire Performance:
 1. Flamespread, ASTM E84: <25.
 2. Smoke Developed, ASTM E84: <450.
 3. Surface Flammability, Modified ASTM E108: Pass.
 4. Ignition Temperature:
 - a. Flash, ASTM D1929: 716°F (380°C)
 - b. Ignition: 752°F (400°C)
 5. Flammability, Exterior, Non-load-bearing wall assemblies and panels, NFPA 285: Pass.
- C. Production Tolerances:
 1. Width: ± 0.080in (2.0mm)
 2. Length: + 0.197in (5mm)
 3. Thickness (4mm Panel): ± 0.008in (0.2mm)
 4. Thickness (6mm Panel): ± 0.012in (0.3mm)
 5. Bow: Maximum 0.2% length or width.
 6. Squareness: Maximum 0.157in (4mm)

2.05 FABRICATION

- A. General: Shop fabricate to sizes and joint configurations indicated on drawings.

1. Fabricate panels too dimensions indicated on drawings based on an assumed design temperature of 70°F (21°C). Allow for ambient temperature range at time of fabrication.
2. Formed MCM panel lines, breaks and angles to be sharp and true, with surfaces that are free from warp or buckle.
3. Fabricate panels with sharply cut edges and no displacement of face sheet or protrusion of core.
- B. Fabrication Tolerances: Shop-fabricate panels to sizes and joint configurations indicated on drawings.
 1. Width: $\pm 0.079\text{in}$ [$\pm 2.0\text{mm}$] @ 70°F (21°C)
 2. Length: $\pm 0.079\text{in}$ [$\pm 2.0\text{mm}$] @ 70°F (21°C)
 3. Squareness: $\pm 0.079\text{in}$ [$\pm 2.0\text{mm}$] @ 70°F (21°C)

PART 3: EXECUTION

3.01 METAL PLANT FABRICATOR AND INSTALLER INSTRUCTIONS

- A. Compliance: Comply with provide product data, including product technical bulletins, product catalog installation instructions and product carton instructions.

3.02 EXAMINATION AND PREPARATION

- A. Verify that conditions of substrates previously installed under other sections or divisions are acceptable for metal plate panel rainscreen system installation. Documentation should be provided indicating any conditions detrimental to the performance or installation of the metal plate wall panel rainscreen system.
 1. Notify [Architect] of unacceptable conditions once discovered.
 2. Proceed with preparation and installation only after unacceptable conditions have been corrected.
- B. Field Measurements
 1. If required per project conditions, field measurements of the site condition are to be taken prior to beginning fabrication work and notification of any material modifications and resulting schedule adjustment shall be formally documented.
 2. Field measurements are to be made once all substrate and adjacent materials are installed, verifying the locations of wall framing members and wall opening dimensions before commencement of installation. Indicate measurements on the "As Build Shop Drawings".
- C. Project Schedule: Provisions in the project schedule must accommodate the time interval between field measurements and fabrication/installation.
- D. Miscellaneous Framing: Install miscellaneous MCM system support members and anchorage according to MCM System written instructions and drawings supplied by the MCM System Fabricator.

3.03 INSTALLATION

- A. General:
 1. Install panels plumb, level and true in compliance with fabricator's recommendations.
 2. Anchor panels securely in place in accordance with fabricator;s approved shop drawings.
 3. Comply with fabricator's instructions for installation of concealed fasteners and with provisions of Section 07 90 00 for installation of joint sealers.
 4. Installation Tolerances: Maximum deviation from horizontal and vertical alignment of installed panels: 0.25in in 20ft (6.4mm in 6.1m), noncumulative.
 5. Separate contact of dissimilar metals with bituminous paint, approved plastic shims, or other approved methods as defined within the Aluminum Design Manual (ASD). Use gasketed or approved coated fasteners where needed to eliminate the possibility of corrosive of electrolytic action between metals.
- B. Related Products

1. General: Refer to other related sections in Related Sections paragraph specified herein for related materials, including cold-form metal framing, flashing and trim, joint sealants, aluminum windows, glass and glazing and curtain walls.

3.04 FIELD QUALITY REQUIREMENTS

- A. Field Quality Control: Comply with panel system fabricator's recommendations and guidelines for field forming of panels.
- B. Field Quality Control: When required by contract, mock-up shall be constructed and tested at the expense of the Architect/Owner/General Contractor.
- C. Testing Agency: If required, the Owner shall engage a qualified testing agency to perform tests and inspections.
- D. Fabricator's Field Services: Upon Owner's request, provide fabricator's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with fabricator's instructions.

3.05 ADJUSTING AND CLEANING

A. Adjusting

1. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement are the responsibility of the General Contractor.
2. Removal of panels damaged by other trades is the responsibility of the General Contractor.
3. Repair components of the MCM system that present with minor damage provided said repairs are not visibly apparent at a distance of 10ft (3m) from the surface at a 90° angle per AAMA 2605.
4. Remove and replace components of the MCM system damage beyond repair.
5. Remove protective film immediately after installation of MCM and immediately prior to completion of the MCM system work. Protective film intentionally left in place after panel installation on any elevation at the direction of the General Contractor, is the responsibility of the General Contractor.
6. Any additional protection, after installation, is the responsibility of the General Contractor.
7. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
8. Promptly remove from the job site any damaged MCM panels, protective film, and other debris attributable to MCM system and installation, and legally dispose of said materials.

B. Cleaning

1. After MCM system installation remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3.06 PROTECTION

- A. Protect installed products from damage during subsequent construction work until final inspection and acceptance by Owner
- B. [____]

END OF SECTION

ALFREX FR MCM

TECHNICAL DATA

TECHNICAL DATA SHEET

Alfred FR Metal Composite Material 4mm



Fire Resistant & Non-Combustible Cladding

COMPOSITION		
PROPERTY	4mm FR	UNITS
Aluminum Skin Alloy	3003-H14	
Panel Thickness	0.157	in
	4.0	mm
Skin Thickness (nominal)	0.020	in
	0.5	mm
Core Material	Fire rated mineral filled core	
Panel Weight	1.51	lbs/ft ²
	7.37	kg/m ²
Specific Gravity (Product)	1.76	
Specific Gravity (Core Layer)	1.43	

STANDARD SIZES			
PROPERTY	4mm FR		UNITS
Standard Widths	50	62	in
	1,270	1,575	mm
Other Available Widths	40	49.2	in
	1,020	1,250	mm
Standard Lengths	Max 25 (300)		ft (in)
	7,620		mm

PRODUCTION TOLERANCES		
PROPERTY	4mm FR	UNITS
Width	+ / - 0.080	in
	2.0	mm
Length	+ / - 0.157	in
	4.0	mm
Thickness	+ / - 0.008	in
	0.20	mm
Squareness	+ / - 0.157	in
	4.0	mm

FIRE PERFORMANCE	
TEST	RESULT
ASTM E84 (Product)	Class A
ASTM E84 (Core Exposed)	Class A
NFPA 285	Passed
CAN/ULC S102	Class A
CAN/ULC S134	Passed
ASTM E119	2 Hour Rating
ASTM D635	Classified CC1

PRODUCT WARRANTY		
See warranty tables and sample warranties for conditions and exclusions		
Bond Integrity	Alfred FR MCM	10 Years

FINISH WARRANTIES		
See warranty tables and sample warranties for conditions and exclusions		
2 Coat Solid / 2 Coat Mica	Alfred FR MCM	30 Years
3 Coat Metallic	Alfred FR MCM	30 Years
3 Coat Vivid Solid	Alfred FR MCM	20 Years
Wood and Metal Series	Alfred FR MCM	20 Years
Hairline Aluminum / Mirror	Alfred FR MCM	10 Years

Alfred, LLC endeavors to provide accurate and current technical information but cannot warrant or make any representations as to the accuracy or completeness of the information contained herein. All data is intended for informational purposes only and subject to change without notice. Please consult a licensed structural engineer for evaluations of structural soundness, specification, or final design.

TECHNICAL PROPERTIES			
PROPERTY		4mm FR	UNITS
Minimum Bond Strength	ASTM D1781	22.5	in•lb/in
		100	Nm/m
Flatwise Shear Strength	ASTM C273	In Process	Psi
			Mpa
Flatwise Tensile Strength	ASTM C297	In Process	Psi
			Mpa
Flatwise Compression Strength	ASTM C365	In Process	Psi
			Mpa
Core Shear Modulus	ASTM C393	9.42 x 10 ³	Psi
		64.9	Mpa
Transverse Shear Stress	ASTM C393	3.34	Psi
		23 x 10 ⁻³	Mpa
Flexural Stiffness	ASTM C393	1.02 x 10 ³	Psi
		7.03	Mpa
Flexural Modulus (Flexural Elasticity)	ASTM C393	5.38 x 10 ⁶	Psi
		37.9 x 10 ³	Mpa
Modulus of Elasticity	ASTM E8	2.46 x 10 ⁶	Psi
		17 x 10 ³	Mpa
Tensile Strength (Aluminum Skin)	ASTM E8	6.96 x 10 ³	Psi
		48	Mpa
Yield Strength (Aluminum Skin)	ASTM E8	6.23 x 10 ³	Psi
		43	Mpa
Elongation	ASTM E8	5	%
Moment of Inertia	-	1.90 x 10 ⁻⁴	in ⁴ /in
		7.90 x 10 ⁻³	cm ⁴ /m
Section Modulus	-	1.81 x 10 ⁻³	in ³ /in
		29.7 x 10 ⁻³	cm ³ /m
Coefficient of Expansion	ASTM D696	1.44 x 10 ⁻⁵	in/in°F (@-22-86°F)
Deflection Temperature	ASTM D648	> 239 °	Fahrenheit
		> 115 °	Celsius
Self Ignition Temperature	ASTM 1929	775 °	Fahrenheit
		413 °	Celsius
Core Density	-	0.054	lb/in ³
		1.5	g/cm ³

COATING PROPERTIES		
70% Kynar 500 / Hylar 5000 PVDF Resin Coatings AAMA 2605 Compliant		
PROPERTY	STANDARD	COIL COATED ALUMINUM
Color Uniformity	ASTM D2244	Max. 2 Delta E
Color Retention - Fade	ASTM D2244	Delta E ≤ 5 units
Chalk Rating	ASTM D4214	≤ 8 units
Specular Gloss	ASTM D523	± 5 units
Dry Film Hardness	ASTM D3363	F - 2H
Dry Adhesion	ASTM D3359	No coating removal
Abrasion Resistance	ASTM D968	Abrasion Coefficient Value ≥ 40
Reverse Impact	ASTM D2794	No coating removal
Muriatic Acid Resistance	ASTM D1308	No blistering or visual change
Nitric Acid Resistance	ASTM D1308	≤ 5 Delta E
Alkali Mortar Resistance	ASTM D1308	No removal. No loss of adhesion or visual change
Flexibility	ASTM D4145	2T - no pick off
Humidity Resistance	ASTM D714	4000 hour exposure
	ASTM D2247	Less than "few" blisters Size No. 8
Cyclic Corrosion	ASTM B117	2000 hour exposure
	AAMA 2605-13	Min. rating of 7 scribe or cut edge Min. blister rating of 8

Wall Panel Assembly	Alfred FR with ACCU-TRAC DS Pressure Equalized Rainscreen System Courtesy of Altech Panel Systems	
Testing Protocols	Florida Building Code / Miami-Dade County Requirements	ASTM Standards
	TAS 201-94: Large Missile Impact Test, Level D, Wind Zone 4	ASTM E283
	TAS 202-94: Uniform Static Air Pressure	ASTM E330
	TAS 203-94: Cyclic Pressure Loading	ASTM E331
		ASTM E1996
		ASTM E1886
Florida Product Approval	FL 33597	
Panel Size Referenced	120 in wide x 60 in high	
Engineering Evaluation Report Download	Report No.: 514689	

ASTM E330 - Structural Performance

Panel Deflection

Deflection Criteria	Deflection Inches			Deflection (in)		Permanent Set (in)	
				Measured	Allowed Per TAS 202 (L/250)	Measured	Allowed Per TAS 202 (L/720)
L/360	0.33	Design Pressure	+ 75.0 / psf	0.15	0.48	0.01	0.17
TAS 202 L/250	0.48		- 75.0 / psf	0.10	0.48	< 0.01	0.17
L/240	0.50	Test Pressure	+ 112.5 / psf	0.23	0.48	0.17	0.17
L/180	0.67		- 112.5 / psf	0.17	0.48	0.02	0.17
L/90	1.33						
L/60	2.00						

Perimeter Framing Deflection

Deflection Criteria	Deflection Inches			Deflection (in)		Permanent Set (in)	
				Measured	Allowed Per TAS 202 (L/1333)	Measured	Allowed Per TAS 202 (L/3899)
TAS 202 L/1333	0.09	Design Pressure	+ 75.0 / psf	0.01	0.09	0.01	0.03
L/720	0.17		- 75.0 / psf	0.02	0.09	< 0.01	0.03
L/360	0.33	Test Pressure	+ 112.5 / psf	0.01	N/A	< 0.01	0.03
L/240	0.50		- 112.5 / psf	0.12	N/A	< 0.01	0.03
L/175	0.69						

ASTM 283 - Air Infiltration

	Results	Allowed per TAS 202
Air Leakage: 1.57 psf (25 mph)	0.02 cfm / ft² (0.10 L/s/m²)	0.06 cfm / ft² (0.30 L/s/m²)
Air Leakage: 6.27 psf (50 mph)	0.04 cfm / ft² (0.20 L/s/m²)	0.06 cfm / ft² (0.30 L/s/m²)

ASTM E331 - Water Penetration

	Results	Allowed per TAS 202
20 psf: 15% of Positive Design Pressure at 960 Pa	Pass	No Leakage

LEED is a world-renowned green building rating system that serves as an important tool in the building and construction industry. LEED certifications signify that buildings minimize their lifestyle impact on the environment through the compounded benefits of product selection, construction practices, performance, and recycling. The tables that follow summarize the direct and indirect benefits of Alfred FR Metal Composite Material wall panels. Alfred FR MCM can contribute to LEED® points under both versions 3 and 4 under the following areas:

MATERIALS & RESOURCES : Recycled Content MR Credit 4

Calculation	100% Post-Consumer Recycled Content + 50% Pre-Consumer Content
LEED v3	Use of recycled content constitutes at least 10% of the total value of materials in the project. 1 Point is awarded for 10%; 2 points are awarded for 20%.
LEED v4	Use of recycled content constitutes at least 25% of the total value of permanently installed materials in the project. 1 Point is awarded.

PRODUCT	THICKNESS	WEIGHT	POST-CONSUMER RECYCLED %	PRE-CONSUMER RECYCLED %	LEED CONTRIBUTION	POINTS
Alfred FR	4mm	1.51 lbs/SF	26.07%	0%	26.07%	2 Points
Alfred FR	6mm	2.13 lbs/SF	18.48%	0%	18.48%	1 Point

MATERIALS & RESOURCES : Regional Materials MR Credit 5

Alfred FR is manufactured from materials supplied from multiple sources and regions. Therefore, it is not possible to identify nor quantify a contribution to the Regional Materials MR Credit 5.

OPTIMIZE ENERGY PERFORMANCE : Energy & Atmosphere

Alfred FR may be able to indirectly contribute to LEED certification points for non-residential metal wall panel assemblies.

	U-VALUE	INDIRECT CONTRIBUTION
LEED v3	U-0.113	BD+C; Eac1 (1 to 19 points)
LEED v4	U-0.093	BD+C; EA credit (1 to 18 points)

MATERIAL SAFETY DATA SHEET

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

SECTION 1: PRODUCT IDENTIFICATION

A. Product Name	Alfred FR
B. Recommended Use	Fire-resistant composite wall cladding material
C. Restriction on Use	None
D. Manufacturer/Importer/Distributor	Alfred, LLC 943 Gainesville Hwy. Bldg. 100-4000 Buford, GA 30518 USA +1.470.589.7449
E. Emergency Phone Number	Chemtrec 1-800-424-9300
F. Website	www.alfredusa.com
G. Initial Release Date	14-February-2018
H. Revision Date	01-July-2020
I. Version Number	2.0

SECTION 2: HAZARD IDENTIFICATION

A. Classification	Not classified as hazardous per OSHA Hazard Communication Standard, 29 CFR 1910.1200.
B. Safety Phrase(s)	Not Applicable
Hazard Statement(s)	Not Applicable
Signal Word	Not Applicable
Symbol(s)	Not Applicable
Precautionary Statement	Not Applicable
- Prevention	Not Applicable
- Response	Not Applicable
- Storage	Not Applicable

Alfred FR MCM is defined under OSHA Hazard Communications standard 29 CFR 1910.1200 as an "article". As such, it is a manufactured item other than a fluid or particle, formed to a specific design during manufacture with end functions dependent in whole or in part upon its' shape or design use during end use, and which under normal conditions of use does not release, or otherwise result in exposure to hazardous chemicals, nor pose a physical hazard or health risk to employees.

SECTION 3: COMPOSITE / INFORMATION ON INGREDIENTS

Components	CAS Number	Percent % by Weight
Aluminum	7429-90-5	38%
Magnesium Hydroxide Mineral Filler	1309-42-8	43%
Polyethylene	9002-88-4	17%
Others (less than 1% each in weight)	-	2%

MATERIAL SAFETY DATA SHEET

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

SECTION 4: FIRST-AID MEASURES

- | | |
|---|--|
| A. Eye Contact | Dust from processing. Rinse eyes with water or saline solution for at least 15 minutes. Seek medical attention from a physician. |
| B. Skin Contact | Dust from processing. Wash skin with soap and water for at least 20 minutes while removing contaminated clothing and shoes. Seek medical attention from a physician. |
| C. Inhalation | Dust from processing. Move to fresh air. Seek medical attention from a physician. |
| D. Ingestion | Not inspected due to composition and form of product. Seek medical attention from a physician. |
| E. Most Important Symptoms & Effects | Prolonged exposure to dust and fumes may aggravate pre-existing chronic conditions of the skin or respiratory system. |
| F. Indication if Immediate Medical Attention and Special Treatment Needed | Notify medical personnel of any situation and avoid overexposure to irritants. |

SECTION 5: FIRE FIGHTING MEASURES

- | | |
|---|--|
| A. Suitable Extinguishing Media | Use Class D extinguishing agents on fines or molten metal. Do not use halogenated extinguishing agents on small chips, fines, or dust. |
| B. Specific Hazards | Dust from processing. Wash skin with soap and water for at least 20 minutes while removing contaminated clothing and shoes. Seek medical attention from a physician. |
| C. Special PPE and Precautions for Firefighters | Protective equipment including self-contained breathing apparatus. |

SECTION 6: ACCIDENTAL RELEASE MEASURES

- | | |
|--|--|
| A. Personal & Environmental Precautions | Avoid contact with sharp edges or heated metal. Wear protective gloves. No special environmental precautions are required. |
| B. Method and Materials for Containment and Cleaning | Clean releases of dust by sweeping the area and depositing in a closed container. Take measures to block dust from reaching surface water or grassy areas. |

SECTION 7: HANDLING AND STORAGE

- | | |
|----------------------------------|---|
| A. Precautions for Safe Handling | Avoid generating dust. Avoid contact with sharp edges or heated metal. There is no visual difference between hot and cold aluminum. |
| B. Conditions for Safe Storage | No special storage precautions noted. |

MATERIAL SAFETY DATA SHEET

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

A. OSHA Permissible Exposure Limit	Aluminum	15mg/m ³ (Total), 10mg/m ³ (Respirable)
	Magnesium Hydroxide	10mg/m ³ (Total), 5mg/m ³ (Respirable)
	Polyethylene	10mg/m ³ (Total), 5mg/m ³ (Respirable)
B. Appropriate Engineering Controls	A system of local and/or general exhaust is recommended to keep employee exposures below the Exposure Limits.	
C. Individual Protection Measures (PPE)		
- Eye & Face Protection	Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.	
- Respiratory Protection	Use an approved respirator designed for the specific hazards where concentrations exceed exposure limits.	
- Skin & Body Protection	Wear cut resistant gloves and avoid contact with sharp edged objects and materials	
- Thermal Protection	When handling heated materials, wear gloves and proper clothing to cover exposed areas and protect against thermal burns.	

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	Solid, Various Colors	
B. Odor	Odorless	
C. Odor Threshold	Not Applicable	
D. pH	Not Applicable	
E. Melting Point / Freezing Point	Aluminum	660°C (1221°F)
	Magnesium Hydroxide	105°C (220°F)
	Polyethylene	350°C (662°F)
F. Flash Point	Not Applicable	
G. Evaporation Rate	Not Applicable	
H. Flammability (Solid, Gas)	Not Applicable	
I. Upper / Lower Flammability or Explosive Limits	Not Applicable	
J. Solubility	Insoluble	
K. Vapor Density	Not Applicable	
L. Specific Gravity	1.7 - 1.9g/cm ³	
M. Partition Coefficient: n-Octanol/water	Not Applicable	
N. Auto Ignition Temperature	460°C (860°F)	
O. Decomposition Temperature	Not Applicable	
P. Viscosity	Not Applicable	
Q. Molecular Weight	Not Applicable	

MATERIAL SAFETY DATA SHEET

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

SECTION 10: STABILITY AND REACTIVITY

A. Chemical Stability	Stable under recommended storage and handling conditions.
B. Possibility of Hazardous Reactivity	Stable under recommended storage and handling conditions.
C. Conditions to Avoid	Heating, flames and hot surfaces.
D. Incompatible Materials	Combustible materials.
E. Hazardous Decomposition Products	Carbon monoxide, carbon dioxide, nitrogen oxide and smoke. Under certain conditions some aliphatic aldehydes and carboxylic acids may form.

SECTION 11: TOXICOLOGICAL INFORMATION

A. Toxicity Data	No toxicity data available for finished panel or individual components.
B. Suspected Cancer Agent	Trace elements used in the paint coatings for this product may be known cancer causing agents.
C. Irritancy of Product	Airborne particles of aluminum and or product materials may irritate the eyes and respiratory tract.
D. Sensitization of Product	The product is not known to cause human skin or respiratory sensitization.

SECTION 12: ECOLOGICAL INFORMATION

A. Ecotoxicity	No toxicity effects.
B. Persistence and Degradability	Not Applicable
C. Bio-accumulative Potential	Not Applicable

SECTION 13: DISPOSAL INFORMATION

Disposal must be in accordance with current applicable laws and regulations and material characteristics at time of disposal. Recover and reclaim or recycle, if practical. Aluminum in the form of particle may be reactive. Its hazardous characteristics, including fire and explosion, should be determined prior to disposal.

SECTION 14: TRANSPORTATION

A. UN Number	Not Applicable
B. UN Proper Shipping Name	Not Applicable
C. Transport Hazard Class	Not Applicable
D. Packing Group	Not Applicable
E. Environmental Hazards	Not Applicable
F. Special Precautions for User	Not Applicable

MATERIAL SAFETY DATA SHEET

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

SECTION 15: REGULATORY INFORMATION

OSHA: NOT classified as hazardous under the criteria in 29 CFR 1910.1200, Hazard Communication.

U.S. SARA REPORTING REQUIREMENTS: The product components are not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for any component of the product.

U.S. TSCA INVENTORY STATUS: The components of this product are listed in the TSCA Inventory.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): There may be elements present in the dust generated from the processing of this product, trace amounts, that are on the California Proposition 65 list. Warning! This product contains chemicals known to the State of California to cause cancer.

CANADIAN DSL/NDL INVENTORY STATUS: The components of this product are on the DSL Inventory, or are exempted from listing.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION AND SYMBOLS: Not Applicable

SECTION 16: OTHER INFORMATION

The information contained herein is believed to be accurate. It is not intended to constitute performance information related to this product. ALFLEX, LLC MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, CONCERNING THE ACCURACY OF COMPLETENESS OF THE INFORMATION AND DATA HEREIN. THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY EXCLUDED. ALFLEX, LLC has no responsibility or liability for any damage or injury resulting from abnormal use or from any failure to adhere to recommended procedures. ALFLEX, LLC will not be responsible for claims relating to any parties' use of reliance on information and data contained herein regardless of whether it is claimed that the information is inaccurate, incomplete, or otherwise misleading.

Initial Release	14-February-2018
Revision Date	01-July-2020
Revision Number	2.0

PRODUCT FABRICATION QUICK REFERENCE DATA

Alfred FR Metal Composite Material and Alfred Plate



Fire Resistant & Non-Combustible Cladding

SECTION	SUB-SECTION	DESCRIPTION	ALFREX FR MCM				ALFREX PLATE 3mm	
CUTTING	Circular Saw Vertical Panel Saw	Blade Type	Carbide tipped blades suitable for aluminum				Carbide tipped blades suitable for aluminum	
		Blade Diameter	80" (200mm)	10" (250mm)	12" (300mm)	14" (350mm)	9" (229mm) with 1" arbor	
		Blade Teeth	60 tooth or greater, extra fine				68 tooth or greater, extra fine	
		Max Cutting Speed	5,500 RPM				3,200 RPM	
		Feed Rate	≤ 16" (405mm) per second				40" - 80" (1000-2032mm) / minute	
	Shear Press	Clearance	4mm FR : 0.002" (0.05mm)				1/4" (6.3mm) Power Shear with Rake Angle of 0.25" per foot (21mm per meter) and 1° relief angle	
			6mm FR : 0.008" (0.20mm)					
		Rake Angle	4mm FR : 1° 30'					
			6mm FR : 2° 30'					
CUTTING & ROUTING	Routing Saw Blade	Blade Type	Carbide tipped blades suitable for aluminum				See Circular Saw / Vertical Panel Saw Information Lubrication May be Required	
		Teeth	8 teeth for grooving					
		Estimated Lifespan	-					
		Blade Diameter	12", (-305mm)					
		Blade Tip Width V-Groove	0.063" - 0.080" (1.6mm - 2mm)					
		Blade Tip Width U-Groove	0.551" (14mm)					
		Blade Tip Angle	95° or 110°					
		Recommended Route Depth	0.122" (3.1mm)					
		Route Depth from Outer Skin Side	0.035" (0.9mm)					
		Rotation Speed	3,000 - 5,000 RPM					
		Feed Rate	≤192" (4876mm) / min					
		Bit Lubrication	Not Required					

PRODUCT FABRICATION QUICK REFERENCE DATA

Alfred FR Metal Composite Material and Alfred Plate



Fire Resistant & Non-Combustible Cladding

SECTION	SUB-SECTION	DESCRIPTION	ALFRED FR MCM	ALFRED PLATE 3mm
CUTTING & ROUTING	V-Groove Router Bit	Router Bit Type	Carbide Router Bits	Poly-Crystalline Diamond (PCD) Helical End Mill Bits
				Belin Carbide Router Bit
		Teeth	2 to 4 Teeth	Not Applicable
		Estimated Lifespan	-	54,000 - 64,500sqft (5,000 and 6,000sqm)
		Router Bit Diameter	-	>0.315" <0.47" (>8mm <12mm)
		Router Bit Tip Diameter	0.063" - 0.080" (1.6mm - 2mm)	0.0480" - 0.0591" (1.22mm - 1.50mm)
		Bit Angle	95° or 110°	95° or 110°
				108°
		Recommended Router Depth	0.122" (3.1mm)	0.090" (2.3mm)
		Route Depth from Outer Skin Side	0.035" (0.9mm)	0.0275" (0.7mm)
		Double Parallel Routes - minimum distance centerpoint to centerpoint	1.0" (25mm)	0.236" (6mm)
		Rotation Speed	20,000 - 30,000 RPM	15,000 - 20,000 RPM
				16,000 RPM
		Feed Rate	120" - 192" (3,100 - 4876mm) / min	40" - 118" (1,000 - 3,000mm) / minute
				40" - 80" (1000 - 2032mm) / minute
		Bit Lubrication	Not Required	Ethanol or cutting oil based applied continuously to the router bit tip.
	U-Groove Router Bit	Router Bit Type	Carbide Router Bits	Please refer to above V-Groove Router Bit Information
		Teeth	2 to 4 Teeth	
		Router Bit Tip Diameter	0.551" (14mm)	
		Bit Angle	95° or 110°	
		Recommended Router Depth	0.098" (2.5mm)	
		Route Depth from Outer Skin Side	0.060" (1.5mm)	
		Rotation Speed	20,000 - 30,000 RPM	
		Feed Rate	120" - 192" (3100 - 4876mm) / min	
		Bit Lubrication	Not Required	
FOLDING		Routed Panel Minimum Bend Radius	0.080" (2mm)	0.080" (2mm)
		Non-Routed Minimum Bend Radius	Not Applicable	3mm Plate: 0.30" (7.5mm)

PRODUCT FABRICATION QUICK REFERENCE DATA

Alfred FR Metal Composite Material and Alfred Plate



Fire Resistant & Non-Combustible Cladding

SECTION	SUB-SECTION	DESCRIPTION	ALFREX FR MCM	ALFREX PLATE 3mm
CURVING	Press Break Pyramid Roller	Minimum Bend Radius (No Routing)	4mm FR : 4.0" (102mm)	5.5" (140mm)
			6mm FR : 5.5" (140mm)	
DRILLING		Drill Bit Type	High speed steel, twist drill bits	High speed steel, twist drill bits
		Tip Angle	100° to 140° or a counter-bore grind with a centering tip	100° to 140° or a counter-bore grind with a centering tip
		Rotation Speed	165-980 RPM	165-980 RPM
PUNCHING		Punch Die Clearance	4mm FR : 0.008" (0.2mm)	0.012" (0.3mm)
			6mm FR : 0.012" (0.3mm)	
PERFORATING		General	Only with approved machinery and methods	Only with approved machinery and methods
		Panel Reaction	MCM Panels can bow slightly after perforation	Better solution for perforated panel applications
		Total Perforated Area	Less than or equal to 45% of total panel surface area	Less than or equal to 30% of total panel surface area
		Distance between Perforations (Edge to Edge)	1.5 x Panel Thickness	1.5 x Panel Thickness 0.177" (4.5mm)
			4mm FR : 0.236" (6mm)	
			6mm FR : 0.354" (9mm)	
		Minimum Distance from Perimeter Edge	1.25" (32mm)	1.25" (32mm)
		Maximum Finish Warranty	Not Available	10 Years maximum with perforated panels
		Recommended Machinery / Process	Turrent punch press only	Turret punch press, punch press, tooled brake press, pre-approved water jet
JOINING, FASTENING, RIVETING		Non-Recommended Methods	Operations which can cause heat damage to the top paint layer, leaving exposed aluminum vulnerable to oxidation. Consult Alfred for more specifics.	Operations which can cause heat damage to the top paint layer, leaving exposed aluminum vulnerable to oxidation. Consult Alfred for more specifics.
			Only utilize Aluminum, Stainless Steel or steel materials coated or plated with zinc or aluminum. Do NOT use materials which will result in electrolysis including iron, uncoated steel, copper, brass, or bronze.	Only utilize Aluminum, Stainless Steel, or steel materials coated or plated with zinc or aluminum. Do NOT use materials which will result in electrolysis including iron, uncoated steel, copper, brass, or bronze. Only utilize aluminum rivets suitable for use with structural loads and high external temperatures.
WELDING			Not recommended as it will damage the panel and void all warranties	Not recommended for coil coated plate as it will damage the paint coating and void the finish warranty

ALFREX FR MCM CERTIFICATIONS & COMPLIANCE REPORTS



DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 42 43—Composite Wall Panels

REPORT HOLDER:

ALFLEX, LLC

EVALUATION SUBJECT:

ALFLEX FR COMPOSITE PANELS

1.0 EVALUATION SCOPE

1.1 Compliance with the following code:

2021 and 2018 *International Building Code*® (IBC)

Properties evaluated:

- Interior Finish
- Structural
- Fire-Resistance

For evaluation for compliance with codes adopted by Los Angeles Department of Building and Safety (LADBS), see [ESR-4566 LABC and LARC Supplement](#).

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning (OSHPD) and Division of State Architects (DSA), see [ESR-4566 CBC Supplement](#).

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

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

Attributes verified:

See Section 3.1

2.0 USES

Alflex FR composite panels are the cladding component of the MCM systems (fabricated panels and extrusion attachment systems), used as exterior wall panels in accordance with Chapter 14, and as interior wall finish in accordance with Chapter 8 of the IBC.

When Alflex FR MCM panels are used on exterior walls of Types I through IV Construction, they must be installed in accordance with Section 4.5 of this report.

3.0 DESCRIPTION

3.1 General:

Alflex FR panels are metal composite materials (MCM) that comply with the requirements of IBC Section 1406. The panels are fabricated to size and fitted with aluminum profiles used for stiffening the panel against deflection and for anchorage to the building substructure.

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

3.2 Material:

Alflex FR metal composite material consists of 0.019 inch (0.5 mm) thick aluminum facers bonded to both sides of a 0.118 inch (3 mm) extruded copolymer core material containing polyethylene with inorganic and fire-retardant fillers. The core components are compounded and extruded to form the final core profile and then bonded to the facers in a continuous process involving controlled heat and pressure to make the MCM. The aluminum facers may be painted or anodized as required.

Alflex FR material is manufactured in a nominal thickness of 0.157 inch (4 mm) and is available in widths up to 62 inches (1575 mm) and lengths up to 25 feet (7620 mm).

The Alflex FR panels have a Class A interior finish classification with a flame spread index less than 25 and a smoke developed index less than 450 when tested in accordance with ASTM E84.

3.3 Aluminum Extrusions:

The aluminum extrusions used as stiffeners and for perimeter anchorage are typically extruded 6063-T5 alloy aluminum complying with ASTM B317. Stiffener extrusions are adhered to the backside of the panel using a combination of tape and structural adhesive. Perimeter extrusions are mechanically fastened to the fabricated "return leg" of the panel and fastened to the substructure to transfer panel loading.

4.0 DESIGN AND INSTALLATION

4.1 Design:

The maximum allowable design wind load pressure for the Alfrex FR system installed in accordance with this report is +20 psf and -35 psf (+958 N/m² and -1677 N/m²). The MCM panel system as well as the MCM panel support framing, including wall studs and extrusions must be designed in accordance with the IBC to support applicable load combinations.

4.2 Installation:

The MCM fabricators (Fabricator) cut a route into the flat MCM panels a fixed distance from each edge leaving the face sheet uncut at the base of the routed groove. The edges are then folded to a 90-degree angle to create return legs measuring 3/4-inch (19 mm) deep, using the uncut facer to act as a hinge so that the flat MCM panel is formed into a pan shape. The Fabricator then attaches the aluminum perimeter extrusions to each return leg with No. 10 corrosion-resistant self-drilling screws. The Fabricator also installs H-shaped aluminum stiffeners to the back facer of the panels, parallel to the 60 inches (1524 mm) maximum panel span at a maximum spacing of 24 inches (610 mm) on center. The stiffeners are adhered to the back side of the MCM panels using self-adhering foam tape and an approved structural silicone sealant/adhesive complying with ASTM C1184, and attached to the perimeter aluminum extrusions with No. 8 corrosion-resistant self-drilling screws at each end. The maximum panel width, measured in the direction parallel to the stiffeners, must not exceed 5 feet (1.52 m). The perimeter extrusions are anchored with 2 inch (51 mm) aluminum anchor clips that interlock with the perimeter extrusion and are then attached to the supporting structure as determined by a registered design professional.

MCM systems must be assembled in a fabrication facility with only minor adjustments allowed to account for an accurate system installation. The appropriate installation procedures must follow the manufacturer's published installation instructions and the specific requirements of this report must be strictly adhered to.

4.3 Interior Wall Covering:

Alfrex FR panels may be used as an interior wall finish in compliance with IBC Chapter 8. The panels must be installed on the interior side of the wall in accordance with Section 4.2 of this report. The panels have a class A interior finish classification.

4.4 Two-hour Fire-resistance-rated Nonload-bearing Wall Assembly:

Where exterior nonload-bearing walls are required to be of two-hour fire-resistance-rated, the Alfrex FR panels must be built in accordance with the following:

Two layers of Type X gypsum board must be installed with the long dimension oriented perpendicular to minimum 25 gage thick steel studs spaced 24 inches (610 mm) on center on both the interior and exterior surfaces. The base layer must be fastened to the framing with 1 1/4-inch (31.8 mm) Type S self-drilling drywall screws spaced 16 inches (406 mm) on center. The face layer must be installed with the long dimension oriented horizontally offset 24-inch from the base layer and secured using 1 5/8-inch (41.3 mm) self-tapping Type S drywall screws spaced 16 inches (406 mm) on-center, 8-inch (203 mm) offset from those of the base layer. The opposite side of the wall assembly must receive the gypsum board in the same manner, but with the joints offset 24 inches (610 mm) from the opposite side of the assembly. The joints and fasteners of the face layers must receive a Level 2 finish.

The MCM panels must be installed in accordance with Section 4.2 of this report and this section. The MCM panel must be installed with the long dimension oriented vertically leaving a nominal 1/2 inch (12.7 mm) wide joint between panel edges. The MCM panels must be secured to the perimeter extrusions using No. 12 corrosion-resistant self-drilling screws. The joint must be filled with 0.875-inch-thick (22 mm-thick) open cell polyurethane backer rod (Industrial Thermo Polymers Limited Tundra Foam) and then sealed using Dow Corning 795 silicone sealant/adhesive.

4.5 Exterior Walls of Buildings of Type I, II, III or IV (Noncombustible) Construction of Any Height in Accordance with IBC Section 1406.10:

Where exterior walls are required to be of noncombustible construction, Alfrex FR panels must be built in accordance with the following:

The walls must be framed with minimum 20 gage C-channel steel studs at 24 inches (610 mm) on center. The interior surface of the wall must be faced with one layer of 5/8-inch (16 mm) thick Type X gypsum board in compliance with ASTM C1396. The gypsum board must be fastened to the wall framing with No. 6 by 1 1/4 inch (31.8 mm) long, self-drilling screws with a spacing of 8 inches (203 mm) around the board perimeter and 12 inches (305 mm) in the field. Gypsum board joints and fastener heads must be finished and taped in accordance with ASTM C840 or GA216. The walls must be filled with 4 pcf (64 kg/m³) mineral wool insulation at the intersection of the floor and exterior wall in accordance with IBC Section 715.4.

The exterior surface of the wall assembly must be faced with one layer of horizontally installed 5/8-inch (16 mm) thick gypsum sheathing in compliance with ASTM C1177. The gypsum sheathing must be fastened to the wall framing with No. 6 by 1 1/4 inch (31.8 mm) long, corrosion-resistant self-drilling screws at a spacing of 8 inches (203 mm) around the board perimeter and 12 inches (305 mm) in the field. Openings must be framed with No. 20 gage cold-formed steel framing. 0.040-inch (1.1 mm) thick aluminum flashing must be installed around the opening.

The exterior gypsum sheathing was covered with VaproShield® WrapShield® SA as a water membrane (water-resistive barrier). The self-adhering membrane must be installed with a minimum 6 inches (152 mm) overlap in accordance with the manufacturer's installation instructions.

Horizontally placed 18 gage thick cold-formed steel Z-shaped members are attached to frame wall studs using corrosion-resistant 5/16-inch-diameter (8 mm-diameter) hex head self-drilling screws. 3 inches (76 mm) thick mineral wool insulation with a density of 6.2 pcf (100 kg/m³) is installed between the Z-shaped members. The MCM panel system is attached through the aluminum perimeter extrusions in accordance with Section 4.2 of this report. The MCM panels were secured to the Z-shaped steel members using 5/16-inch-diameter (8 mm-diameter) hex-head self-drilling screws fastened to aluminum clips spaced 24 inches (610 mm) on center around the perimeter of the MCM panels. The MCM panel joints measured 1/2-inch (12.7 mm) wide. MCM panel splines were installed into vertical and horizontal panel joints to conceal the anchor fasteners.

5.0 CONDITIONS OF USE

The Alfrex FR composite panels and panel installation system described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Installation must comply with this report, the manufacturer's published instructions, the applicable code and the approved plans. If there are any conflicts between this report and the manufacturer's installation instructions, this report governs. A copy of the manufacturer's instructions must be available on the jobsite during installation.
- 5.2 The design of the structural support system (building framing, attachment accessories, and fasteners) and panel connections provided by the MCM systems fabricator must be submitted to and approved by the code official for each project. The allowable load capacity reported in Section 4.1 of this report must not exceed the design loads determined in accordance with Chapter 16 of the IBC.
- 5.3 The MCM systems fabricator must provide a certificate of compliance to the code official attesting that the MCM system fabrication includes the use of adhesives approved for use, that the adhesive application complies with the adhesive manufacturer's installation guidelines, and that the MCM system fabrication complies with approved construction documents. Additionally, when the attachment methods employ adhesives other than to adhere stiffeners to the backs of the panels, special inspections are required in accordance with IBC Section 1704.2.5, or the fabricator must be approved by the code official in accordance with IBC Section 1704.2.5.1, as such operations are outside the scope of this report.
- 5.4 Where Alfrex MCM panels are installed on exterior walls of Types I, II, III or IV construction, Alfrex MCM systems must be installed as specified in Section 4.5 of this report.
- 5.5 Installation of Alfrex MCM systems onto a fire-resistance-rated exterior wall must comply with Section 4.4 of this report. Alternatively, MCM systems may be installed on the outer surface of a fire-resistance-rated exterior wall in a manner such that the attachments do not penetrate through the entire exterior wall assembly.
- 5.6 Evidence of weather protection of the wall cladding system must be submitted to the code official in accordance with IBC Section 1406.6.
- 5.7 The Alfrex panels are manufactured in Chungcheongbuk-do, Korea under a quality control program with inspections conducted by ICC-ES.
- 6.0 EVIDENCE SUBMITTED**
- Data in accordance with the ICC-ES Acceptance Criteria for Metal Composite Material (MCM) (AC25), dated October 2010 (editorially revised March 2021), including NFPA 285.
- 7.0 IDENTIFICATION**
- 7.1 Labeling includes product name, product identification information, thickness, flame-spread and smoke-developed indices, manufacture date and time, and ICC-ES ESR number (ESR-4566).
- 7.2 The report holder's contact information is the following:
- ALFLEX, LLC**
943 GAINSVILLE HIGHWAY
BUILDING 100, SUITE #4000
BUFORD, GEORGIA 30518
(470) 589-7449
www.alfrexusa.com
john@alfrexusa.com

ICC-ES Evaluation Report

ESR-4566 LABC Supplement

Reissued April 2021

Revised August 2021

This report is subject to renewal April 2023.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 42 43—Composite Wall Panels

REPORT HOLDER:

ALFREX, LLC

EVALUATION SUBJECT:

ALFREX FR COMPOSITE PANELS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Alfrex FR composite panels, described in ICC-ES evaluation report [ESR-4566](#), have also been evaluated for compliance with the code noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code edition:

2020 *City of Los Angeles Building Code* (LABC)

2.0 CONCLUSIONS

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-4566](#), comply with LABC Chapters 7, 8 and 14 and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Alfrex FR composite panels described in this evaluation report supplement must comply with the following conditions:

- All applicable sections in the evaluation report [ESR-4566](#).
- The design, installation, conditions of use and identification of the Alfrex FR composite panels are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-4566](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 7, 8, 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued April 2021 and revised August 2021.

ICC-ES Evaluation Report

ESR-4566 CBC Supplement

Reissued April 2021

Revised August 2021

This report is subject to renewal April 2023.

www.icc-es.org | (800) 423-6587 | (562) 699-0543

A Subsidiary of the International Code Council®

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 42 43—Composite Wall Panels

REPORT HOLDER:

ALFREX, LLC

EVALUATION SUBJECT:

ALFREX FR COMPOSITE PANELS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Alfrex FR composite panels, described in ICC-ES evaluation report ESR-4566, have also been evaluated for compliance with the code noted below.

Applicable code edition:

2019 *California Building Code*® (CBC)

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

2.0 CONCLUSIONS

2.1 CBC:

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14, provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

2.1.1 OSHPD:

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14 [OSHPD 1, 1R, 2, 4 and 5], provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

2.1.2 DSA:

The Alfrex FR composite panels, described in Sections 2.0 through 7.0 of the evaluation report ESR-4566, comply with CBC Chapters 7, 8 and 14 [DSA-SS and DSA-SS/CC], provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 7, 8, 16 and 17, as applicable.

This supplement expires concurrently with the evaluation report, reissued April 2021 and revised August 2021.



LISTING INFORMATION OF
Unience Co. Ltd. - ALFREX
SPEC ID: 36858

Alfred, LLC
430 Satellite Blvd. NW
Suite 101
Suwanee, GA 30024
United States

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

LISTING INFORMATION

ALFLEX is an Aluminum Composite Panel that has a surfaced finish on the aluminum skin.

RATINGS

Standard	Rating	Design Number
ASTM E84 (4mm panel exterior side exposed)	Flame Spread Index:0 Smoke Developed Index:0	NA
ASTM E84 (Core Exposed)	Flame Spread Index:20 Smoke Developed Index:55	NA
NFPA 285	Met Criteria of Standard	UCL/MCMWP 30-01
ASTM E119	Fire Resistance Rating: 2hr	UCL/MCMWP 120-01
CAN/ULC S102	Flame Spread Index: 0 Smoke Developed Classification: 5	NA
CAN/ULC S134	Met Criteria of Standard	UCL/MCMWP 25-01

Attribute	Value
Criteria	CAN / ULC S102 (2010)
Criteria	NFPA 285 (2012)
Criteria	ASTM E84 (2013a)
Criteria	ASTM E119 (2012a)
Criteria	CAN / ULC S134 (2013)
CSI Code	07 42 13 Metal Wall Panels
Intertek Services	Certification
Listed or Inspected	LISTED

Listing Section	BUILDING MATERIALS WITH SURFACE BURNING CHARACTERISTICS
Listing Section	WALL ASSEMBLIES
Spec ID	36858

DRAWING INDEX

Certificate of Compliance - Unience Co. Ltd. - ALFLEX

Test Report Summary

UCL/MCMWP 120-01

UCL/MCMWP 25-01

UCL/MCMWP 30-01

CERTIFICATE OF COMPLIANCE - UNIENCE CO. LTD. - ALFREX

Certificate of Compliance



This is a certificate of compliance to certify that the bearer has successfully completed the requirements of the above scheme which include the testing of products, the initial assessment, and are subject to continuing annual assessments of their compliance and testing of samples of products taken from production (as applicable to the scheme) and has been registered within the scheme for the products detailed.

You have been awarded:

Intertek ETL Mark for Wall Assemblies

CAN / ULC S102 (2010), NFPA 285 (2012), ASTM E84 (2013a), ASTM E119 (2012a), CAN / ULC S134 (2013)

Certificate number: WHI18 - 26206601

Organization:**Unience Co., Ltd.**

46, Gwahaksaneop 1-Ro

Oksan -Myeon, Heungdeok-Gu

Cheongju-Si, Chungcheongbuk-Do, 28122

South Korea

Product: Unience Co. Ltd. - ALFREX

SPEC ID 36858

ALFREX is an Aluminum Composite Panel that has a surfaced finish on the aluminum skin.

RATINGS

Standard	Rating	Design Number
ASTM E84 (4mm panel exterior side exposed)	Flame Spread Index:0 Smoke Developed Index:0	NA
ASTM E84 (Core Exposed)	Flame Spread Index:20 Smoke Developed Index:55	NA
NFPA 285	Met Criteria of Standard	UCL/MCMWP 30-01
ASTM E119	Fire Resistance Rating: 2hr	UCL/MCMWP 120-01
CAN/ULC S102	Flame Spread Index: 0 Smoke Developed Classification: 5	NA
CAN/ULC S134	Met Criteria of Standard	UCL/MCMWP 25-01

Certification body: Intertek Testing Services NA, Inc.

Initial registration: March 15th, 2018Date of expiry: March 15th, 2023

Issue status: 2

Charles Meyers

Certification Coordination Manager

Name

Signature

3/15/2018

Date

www.intertek.com

Registered address:

Intertek Testing Services NA, Inc. 545 E. Algonquin Rd. Arlington Heights, IL 60005 USA

The certificate and schedule are held in force by regular annual surveillance visits by Intertek Testing Services NA, Inc. and the reader or user should contact Intertek to validate its status. This certificate remains the property of Intertek Testing Services NA, Inc. and must be returned to them on demand. This Certificate is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this certificate. Only the Client is authorized to permit copying or distribution of this certificate and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessment and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

TEST REPORT SUMMARY



Intertek Testing Services NA, Inc

545 E. Algonquin Rd., Arlington Heights, IL 60005 USA

Phone: 847-439-5667

Fax: 866-262-2753

Email: bpcerthelpdesk@intertek.comWeb: <http://www.intertek.com>

TEST REPORT SUMMARY

This Test Report Summary Validates the Following

TEST REPORT NUMBER 101530130SAT-007,
101530130SAT-009,
101530130SAT-010A, 101530130SAT-010B,
101530130SAT-020A and 101530130SAT-020B
DATE OF ISSUE Multiple Reports (April, June and August of 2014)
DATE OF EXPIRY None

NAME OF FACTORY/ MANUFACTURER:	Intraco Corporation	NAME OF THE BRAND:	ALFREX
FACTORY ADDRESS/ REGION	Unience Co. Ltd. 46, Gwahaksaneop1-ro, Oksan-myeon, Cheong- won-gun, Chungcheongbuk-do, Korea	MODEL NO:	ALFREX

LOGO ON THE
PRODUCT: NA

DESCRIPTION OF THE PRODUCT:	Aluminum Composite Panel															
TEST STANDARD:	ASTM E84, NFPA 285, ASTM E119															
TEST DESCRIPTION:	Standard Test Method for Surface Burning Characteristics of Building Materials, Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies containing Combustible, Components Standard Test Methods for Fire Tests of Building Construction Materials															
SPECIFICATION OF TEST SPECIMEN:	ALFREX is an Aluminum Composite Panel that has a surfaced finish on the aluminum skin.															
TEST RESULT:	<p>RATINGS</p> <table border="1"> <thead> <tr> <th>Standard</th> <th>Rating</th> <th>Design Number</th> </tr> </thead> <tbody> <tr> <td>ASTM E84 (4mm panel exterior side exposed)</td> <td>Flame Spread Index:0 Smoke Developed Index:0</td> <td>NA</td> </tr> <tr> <td>ASTM E84 (Core Exposed)</td> <td>Flame Spread Index:20 Smoke Developed Index:55</td> <td>NA</td> </tr> <tr> <td>NFPA 285</td> <td>Met Criteria of Standard</td> <td>ITC/MCMWP 30-01</td> </tr> <tr> <td>ASTM E119</td> <td>Fire Resistance Rating: 2hr</td> <td>ITC/MCMWP 120-01</td> </tr> </tbody> </table>	Standard	Rating	Design Number	ASTM E84 (4mm panel exterior side exposed)	Flame Spread Index:0 Smoke Developed Index:0	NA	ASTM E84 (Core Exposed)	Flame Spread Index:20 Smoke Developed Index:55	NA	NFPA 285	Met Criteria of Standard	ITC/MCMWP 30-01	ASTM E119	Fire Resistance Rating: 2hr	ITC/MCMWP 120-01
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ASTM E119	Fire Resistance Rating: 2hr	ITC/MCMWP 120-01														

TEST REPORT SUMMARY (2 OF 2)**Intertek Testing Services NA, Inc**

545 E. Algonquin Rd., Arlington Heights, IL 60005 USA

Phone: 847-439-5667

Fax: 866-262-2753

Email: bpcerthelpdesk@intertek.comWeb: <http://www.intertek.com>

NAME OF TEST FACILITY:

Intertek Testing Services NA, Inc.

TEST FACILITY ADDRESS/REGION:

16015 Shady Falls Road, Elmendorf, TX 78112

PRODUCT APPLICATION GUIDELINE
(END USE):Wall cladding requiring flame spread and smoke developed indexes/Listed and
Labeled Wall Cladding

SIGNED BY:

Michael Puls

The above certificate is valid only when used in collaboration with Intertek's approved product listings. To verify the validity of the product, please log into our website www.intertek.com to view the WH mark Directory of Listed Products.

ACCREDITED BY:

International Accreditation Service (IAS): (<http://iasonline.org>)

AS PER:

ISO 17025, ISO Guide 65, ISO 17020: Certification Certificate PCA-101, Test Lab
Certificate TL-143, Inspection Certificate AA-647

VALIDITY:

Certificates can be viewed at: <http://iasonline.org>

REFERENCE NUMBER:

Certification Certificate PCA-101, Test Lab Certificate TL-143, Inspection Certificate AA-647

THE LIST OF ACCREDITED TESTS (FIRE AND LIFE SAFETY PRODUCTS ONLY)

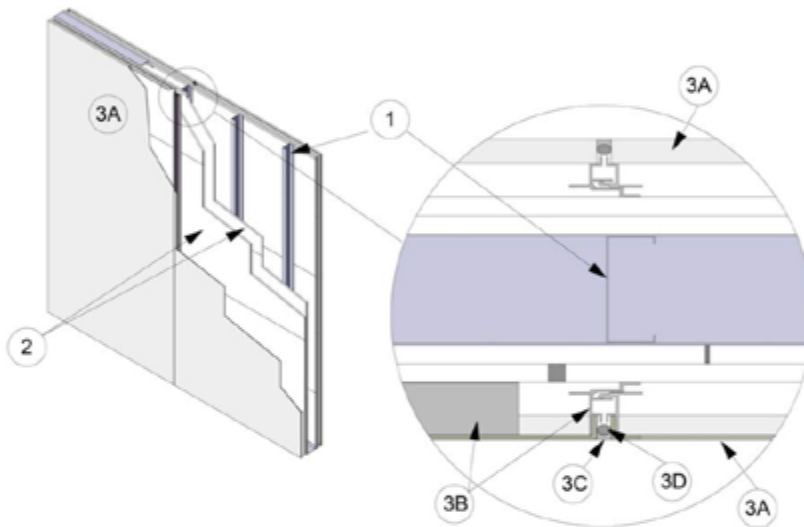
TEST STANDARD	TITLE
ASTM E84	Standard Test Method for Surface Burning Characteristics of Building Materials
NFPA 285	Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load Bearing Wall Assemblies containing Combustible Components
ASTM E119	Standard Test Methods for Fire Tests of Building Construction Materials

UCL/MCMWP 120-01

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 1 of 2

Unience Co., Ltd.
UCL/MCMWP 120-01
Non-Load Bearing Wall Assembly
ALFREX
ASTM E119 – 2 Hour Fire Resistance
Non-Load Bearing



1. **STEEL FRAMING:** Install nominal 2-1/2 in. 25 GA steel studs spaced nominally 24 in. on center (oc) friction fit into 25 GA top and bottom steel tracks. Studs cut to be nominal 1/4 in. shorter than wall height.
2. **GYPSUM BOARD:** Apply two layers of 5/8 in. thick, Type X gypsum board to each side of the steel framing (Item 1) with the long dimension perpendicular to the steel studs. Secure base layer using #6 1-1/4 in. long, Type S screws spaced nominally 16 in. oc. Install face layer with joints offset min. 24 in. from the base layer joints. Secure face layer using #6 1-5/8 in. long, Type S screws spaced nominally 16 in. oc and offset 8 in. from the base layer screws.

A. **JOINT TAPE AND COMPOUND (Not Shown)** – Apply a level 2 finish of vinyl or casein, dry or premixed joint compound applied in two coats to all exposed fastener heads and gypsum board joints. Embed min. 2 in. wide paper, plastic, or fiberglass tape in first layer of compound over joints in gypsum board (Item 3).

3. **CERTIFIED MANUFACTURER:** Unience Co., Ltd.

CERTIFIED PRODUCT: Aluminum Composite Panels

MODEL: ALFREX 4mm Panel

Date Revised: February 3, 2016
Project No. G101530130

Intertek

Valued Quality. Delivered.

UCL/MCMWP 120-01 (2 OF 2)

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 2 of 2

EXTERIOR VENEER: Install aluminum composite panels using the following elements:

A. ALUMINUM COMPOSITE PANELS – Secure aluminum composite panels to aluminum extrusions (Item 5B) with #12 x 3/4 in. long self-drilling hex-head steel screws 24 in. oc. Where applicable secure aluminum composite panel to aluminum angles (Item 5A).

B. ALUMINUM EXTRUSIONS – Install aluminum extrusion to aluminum composite panels (Item 5A) prior to installation onto wall. Secure aluminum extrusion through the gypsum board (Item 2) into the steel framing (Item 1) using #12 x 3 in. long self-drilling TEK screws.

C. BACKER ROD – Install nominal 7/8 in. diameter foam backer rod compressed into joints between the aluminum composite panels (Item 5B). Install backer rod imbedded into the joint so that a min. 1/4 in. space is remaining between the backer rod and the exterior face of the aluminum composite panels (Item 5B).

D. SEALANT – Install a min. 1/4 in. thick bead of Dow Corning® 795 Silicone Building Sealant into joints between aluminum composite panels (Item 5B) over the backer rod. Sealant installed to be flush with the exterior surface of the aluminum composite panels (Item 5B).

Date Revised: February 3, 2016
Project No. G101530130

Intertek

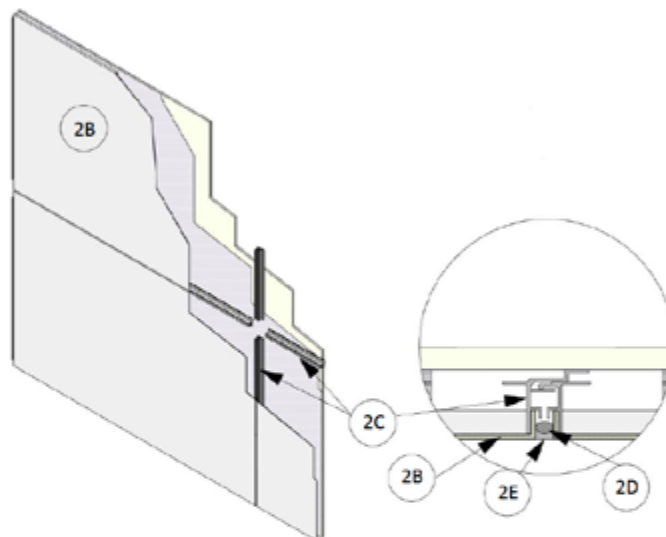
Valued Quality. Delivered.

UCL/MCMWP 25-01

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 1 of 2

Unience Co., Ltd.
Design No. UCL-MCMWP 25-01
Exterior Wall Systems
ALFREX
CAN/ULC S134 (2013) – Meets Conditions of Acceptance



1. **NON-COMBUSTIBLE WALL ASSEMBLY (Not Shown):** ALFREX ACM Panels (Item 2) are to be installed on non-combustible non-load-bearing wall assemblies as established by the applicable code and criteria.

2. **CERTIFIED MANUFACTURER:** Unience Co., Ltd.

CERTIFIED PRODUCT: Aluminum Composite Panels

CERTIFIED MODEL: ALFREX 4 mm Panel

EXTERIOR VENEER: Install aluminum composite panels using the following elements:

- A. **ALUMINUM ANGLES (Not Shown):** Where applicable (such as opening for windows and wall perimeters) install "L" shaped aluminum angle

secured into the supporting construction of Item 1 using approved fasteners and methods.

- B. **ALUMINUM COMPOSITE PANELS:** Secure aluminum composite panels to aluminum extrusions (Item 5C) with #12 x 3/4 in. long self-drilling hex-head steel screws min 24 in. on center (oc). Where applicable secure aluminum composite panel to aluminum angles (Item 2A).

- C. **ALUMINUM EXTRUSIONS:** Install aluminum extrusion to aluminum composite panels (Item 2B) prior to installation onto wall. Secure aluminum extrusion into the supporting construction of Item 1 using approved fasteners and methods.

Date Issued: December 22, 2016
Project No. G102654321



UCL/MCMWP 25-01 (2 OF 2)

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 2 of 2

D. BACKER ROD: Install nominal 7/8 in. diameter foam backer rod compressed into joints between the aluminum composite panels (Item 2B). Install backer rod imbedded into the joint so that a min 1/4 in. space is remaining between the backer rod and the exterior face of the aluminum composite panels (Item 2B).

E. SEALANT: Install a min 1/4 in. thick bead of Dow Corning® 795 Silicone Building Sealant into joints between aluminum composite panels (Item 2B) over the backer rod. Sealant installed to be flush with the exterior surface of the aluminum composite panels.

Date Issued: December 22, 2016
Project No. G102654321

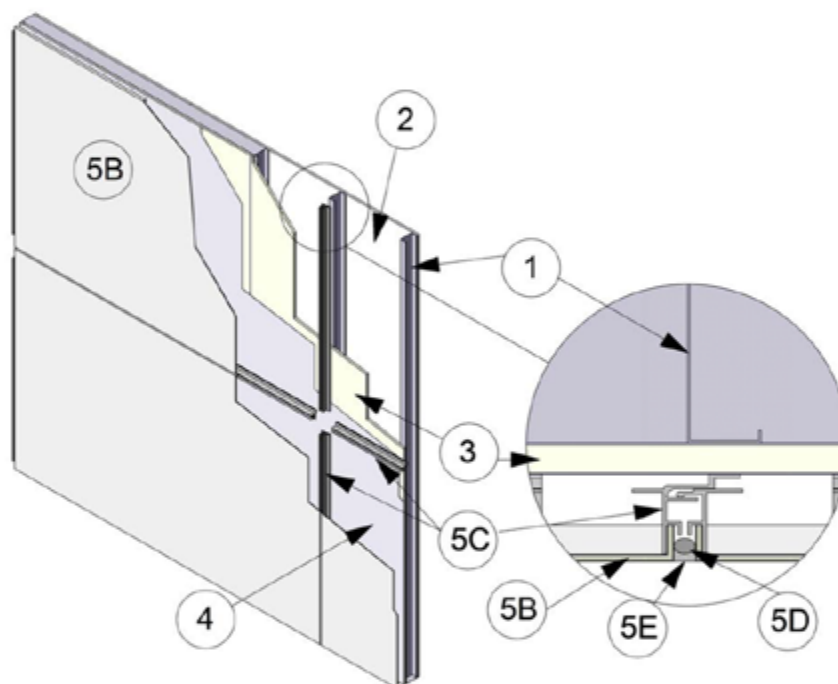


UCL/MCMWP 30-01

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 1 of 2

Unience Co., Ltd.
UCL/MCMWP 30-01
Exterior Wall Systems
ALFREX
NFPA 285 – Meets Conditions of Acceptance



1. **STEEL FRAMING:** Install nominal 3-5/8 in. 20 GA steel studs spaced nominally 24 in. on center (oc). Attach steel studs to 20 GA top and bottom steel tracks using nominal 7/16 in. long pan-head framing screws attached to front and back of each steel stud. Nominal 1-1/2 in. x 1/2 in., 16 GA lateral bracing installed in the knockouts of the steel studs spaced 48 in. oc vertically up the wall. Nominal 4 in. thick, 4 pound per cubic foot (pcf) density mineral fiber insulation installed at the floor line for firestopping.

2. **INTERIOR GYPSUM:** Apply one layer of 5/8 in. thick, Type X gypsum board to the interior side of the steel framing (Item 2) with the long dimension parallel to the steel studs. Secure using #6 1-1/4 in. long, Type S screws spaced nominally 8 in. oc around the perimeter and 12 in. oc in the field.

- A. **JOINT TAPE AND COMPOUND (Not Shown)** – Apply a level 2 finish of vinyl or casein, dry or premixed joint compound applied in two coats to all exposed fastener heads and gypsum board joints.

Date Revised: February 3, 2016
Project No. G101530130

Intertek

Valued Quality. Delivered.

UCL/MCMWP 30-01 (2 OF 2)

Division 7 – Thermal and Moisture Protection
07 42 00 Wall Panels
07 42 13.23 Metal Composite Material Wall Panels

Page 2 of 2

Embed min. 2 in. wide paper, plastic, or fiberglass tape in first layer of compound over joints in gypsum board (Item 3).

3. **EXTERIOR SHEATHING:** Install 5/8 in. thick DensGlass® Gold exterior sheathing to the exterior side of the steel framing (Item 2) with the long dimension perpendicular to the steel studs. Secure using #6 1-1/4 in. long, Type S screws spaced nominally 8 in. oc around the perimeter and 12 in. oc in the field.
4. **WEATHER BARRIER:** Install a single layer of DuPont™ Tyvek® vapor barrier to the exterior side of the exterior sheathing (Item 3) with min. 6 in. overlaps at the seams and attached with staples spaced 24 in. oc.

5. **CERTIFIED MANUFACTURER:** Unience Co., Ltd.

CERTIFIED PRODUCT: Aluminum Composite Panels

MODEL: ALFLEX 4mm Panel

EXTERIOR VENEER: Install aluminum composite panels using the following elements:

- A. **ALUMINUM ANGLES (Not Shown) –** Where applicable (such as opening for windows and wall perimeters) install "L" shaped aluminum angles secured through the exterior sheathing (Item 3) into the steel framing (Item 1). Secure aluminum composite panels (Item 5B) to aluminum angles using #12 x 3/4 in. long self-drilling screws spaced max. 24 in. oc.

- B. **ALUMINUM COMPOSITE PANELS –** Secure aluminum composite panels to aluminum extrusions (Item 5C) with #12 x 3/4 in. long self-drilling hex-head steel screws 24 in. oc. Where applicable secure aluminum composite panel to aluminum angles (Item 5A).

- C. **ALUMINUM EXTRUSIONS –** Install aluminum extrusion to aluminum composite panels (Item 5B) prior to installation onto wall. Secure aluminum extrusion through the exterior sheathing (Item 3) into the steel framing (Item 1) using #12 x 1-1/2 in. long self-drilling TEK screws.

- D. **BACKER ROD –** Install nominal 7/8 in. diameter foam backer rod compressed into joints between the aluminum composite panels (Item 5B). Install backer rod imbedded into the joint so that a min. 1/4 in. space is remaining between the backer rod and the exterior face of the aluminum composite panels (Item 5B).

- E. **SEALANT –** Install a min. 1/4 in. thick bead of Dow Corning® 795 Silicone Building Sealant into joints between aluminum composite panels (Item 5B) over the backer rod. Sealant installed to be flush with the exterior surface of the aluminum composite panels (Item 5B).

6. **FLASHING (Not Shown):** Where applicable, min. 0.04 in. thick aluminum flashing shall be installed in openings spanning from the interior to the exterior side of the window opening.

Date Revised: February 3, 2016
 Project No. G101530130

Intertek

Valued Quality. Delivered.

FLORIDA PRODUCT APPROVAL COMPLIANCE SUMMARY

Alfred FR Metal Composite Material - 4mm



Fire Resistant & Non-Combustible Cladding

Florida Product Approval No.		FL 33597	FL 16406-R5
System		Accu-Trac DS Pressure Equalized Rainscreen	Accu-Trac ES Exposed Sealant
Joint Condition		Rainscreen Spline	Caulk Joint
HVHZ High Velocity Hurricane Zone		Approved	Approved
Design Pressure Rating		+ 75 / - 75 psf*	+ 100 / - 160 psf**
Max Panel Size		60" x 120"	60" x 120"
ASTM E283 Air Infiltration	1.57 psf (25 mph)	Pass	Pass
	6.27 psf (50 mph)	Pass	Pass
ASTM E330 Structural Performance		± 75 psf, 20.0 psf Water penetration	± 50 psf, 15.0 psf Water penetration
ASTM E331 Water Penetration		20 psf	15 psf
TAS 201 - ASTM E1996 & E 1886 Impact Testing		Large Missile Impact Test, Level D, Wind Zone 4. No signs of penetration, rupture, or opening. Meets requirements of section 1626 of the Florida Building Code, Building.	
TAS 202 Uniform Static Pressure		No signs of penetration, rupture, or opening. Meets requirements of section 1620 of the Florida Building Code, Building.	
TAS 203 Cyclic Wind Pressure Loading		No signs of penetration, rupture, or opening. Meets requirements of section 1625 of the Florida Building Code, Building.	
Testing Protocols		Florida Building Code Miami - Dade County ASTM Standards	
Testing Documents		FL3357_RO_II-03594	FL16406_R5_II_08-02268B
Evaluation Report		Report No.: 514689	Report No.: 513012B, 512711C
Notes		* Stiffeners required 11" O.C.	** Reinforcements required 15" O.C.

Manufacturer: **Altech Panel Systems, Inc.**
 1 Johnson Street, Suite 118
 Cartersville, GA 30120

Product Line: Accu-Trac DS/ALFREX FR Reinforced Wall System Panel - Impact

Compliance:

The above mentioned product has been evaluated for compliance with the requirements of the Florida Department of Business and Professional Regulation for Statewide Acceptance per Rule 61G20-3.005 method 1(d). The product listed herein complies with requirements of the current Florida Building Code.

Supporting Technical Documentation:

1. Approval document: drawing number 08-03594, prepared, signed and sealed by Luis Roberto Lomas P.E.
2. Report No.: K8138.01-550-18 R1 signed and sealed by Vinu J. Abraham P.E.
Intertek, Lithia Springs, GA.
TAS 201 Large Missile Impact Test, Level D, Wind Zone 4
TAS 202 Uniform Static Air Pressure, ± 75.0 psf design pressure, 20.0psf water penetration.
TAS 203 Cyclic Pressure loading ± 75.0 psf design pressure
3. Report No.: K8138.02-550-18 R1 signed by James Blakely
Intertek, Lithia Springs, GA.
ASTM E330 Uniform static air pressure ± 75.0 psf, 20.0psf water penetration.
ASTM E1886/ E1996 Large Missile Impact, Level D, Wind Zone 4
ASTM E1886/ E1996 Cyclic Load Test, ± 75.0 psf design pressure
4. Anchor calculations and comparative analysis, report number 514689-1, prepared, signed and sealed by Luis Roberto Lomas P.E.

Limitations and Conditions of use:

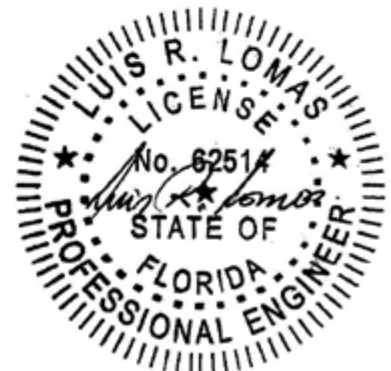
- Design pressure: ± 75.0 psf
- Panel Size: 120" x 60"
- This product is rated to be used in the HVHZ.
- Panel material to be composite with 3003-H16 aluminum faces 5/32" thickness Alfrex FR MCM.
- Stiffener material to be Extruded Aluminum.
- All clips material to be Extruded Aluminum.
- Panels maybe obtained under the following brand names and manufacturers:
 - Alfrex, LLC
- Mechanical properties of composite material:
 - ASTM E8 Tensile strength: 7900PSI
 Yield strength: 7500PSI
 Elongation: 3.6%
 - ASTM C393/D790 Flexural Elasticity: 5740×10^3 PSI
 - ASTM E413 Sound transmission loss: 27 STC

Installation:

Units must be installed in accordance with manufacturer's installation instructions and approval document 08-03594.

Certification of Independence:

Please note that I don't have nor will acquire a financial interest in any company manufacturing or distributing the product(s) for which this report is being issued. Also, I don't have nor will acquire a financial interest in any other entity involved in the approval process of the listed product(s).



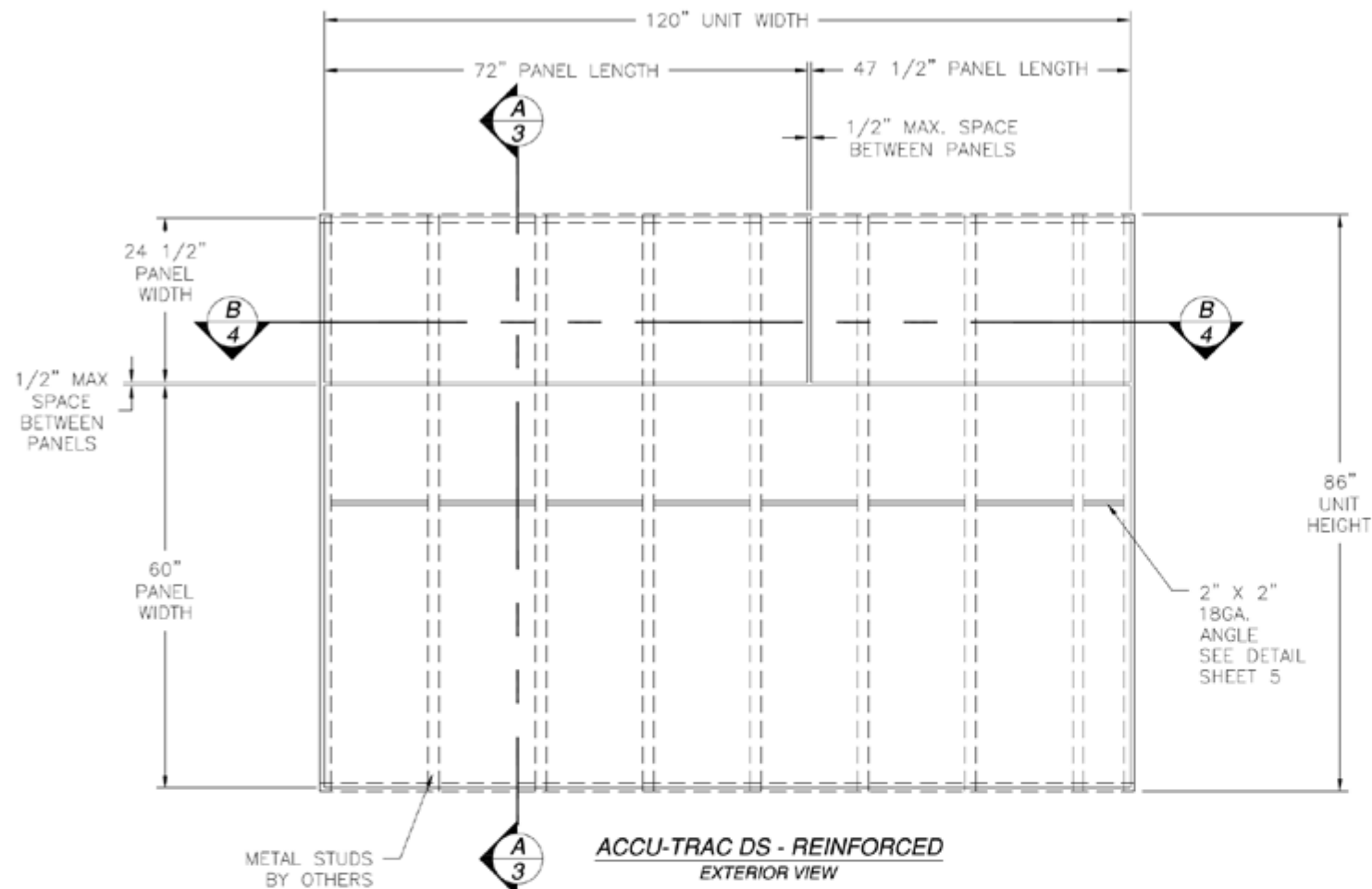
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

NOTES:

1. THE PRODUCT SHOWN HEREIN IS DESIGNED AND MANUFACTURED TO COMPLY WITH REQUIREMENTS OF THE FLORIDA BUILDING CODE INCLUDING THE HVHZ.
2. METAL FRAMING TO BE DESIGNED AND ANCHORED TO PROPERLY TRANSFER ALL LOADS TO STRUCTURE. FRAMING STRUCTURE IS THE RESPONSIBILITY OF THE ARCHITECT OR ENGINEER OF RECORD.
3. SHEATHING TO BE 5/8" THICK MINIMUM AND SECURED TO FRAMING TO PROPERLY TRANSFER ALL LOADS TO STRUCTURE. FRAMING STRUCTURE IS THE RESPONSIBILITY OF THE ARCHITECT OR ENGINEER OF RECORD.
4. PANEL THICKNESS TO BE 4MM OR 6MM.
5. PANEL MATERIAL TO BE COMPOSITE WITH A 3003-H16 ALUMINUM FACE 5/32" MINIMUM THICKNESS ALFREX FR MCM.
6. MAXIMUM PANEL SIZE: 60" X 120"
7. PANELS MAY BE OBTAINED FROM THE FOLLOWING MANUFACTURERS AND UNDER THESE BRAND NAMES:
ALFREX, LLC
8. SHIM AS REQUIRED AT EACH INSTALLATION ANCHOR WITH LOAD BEARING SHIM. SHIM WHERE SPACE OF 1/16" OR GREATER OCCURS.
9. FOR ANCHORING INTO METAL STRUCTURE USE #12 SMS OR SELF DRILLING SCREWS WITH SUFFICIENT LENGTH TO ACHIEVE 3 THREADS MINIMUM BEYOND STRUCTURE INTERIOR WALL. LOCATE ANCHORS 3" MAX FROM EACH END AND 16" MAX O.C. THEREAFTER AS SHOWN IN ELEVATIONS AND INSTALLATION DETAILS.
10. FOR ANCHORING PANELS INTO EXTRUSIONS USE 1/8" 5052 ALUMINUM POP RIVETS. LOCATE RIVETS 3" MAX FROM EACH END AND 16" MAX O.C. THEREAFTER AS SHOWN IN ELEVATIONS AND INSTALLATION DETAILS.
11. ALL FASTENERS TO BE CORROSION RESISTANT.
12. INSTALLATION ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH ANCHOR MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ANCHORS SHALL NOT BE USED IN SUBSTRATES WITH STRENGTHS LESS THAN THE MINIMUM STRENGTH SPECIFIED BELOW:
A. METAL STRUCTURE: GALVANIZED STEEL 16GA FY: 55KSI MIN.

TABLE OF CONTENTS	
SHEET NO.	DESCRIPTION
1	NOTES
2	ELEVATION
3 - 4	INSTALLATION DETAILS
5	COMPONENTS

ALTECH PANEL SYSTEM LLC 1 JOHNSON STREET, SUITE 118 CARTERSVILLE, GA 30120			
ACCU-TRAC DS/ALFREX FR REINFORCED WALL PANEL SYSTEM IMPACT NOTES			
DRAWN: A.R.	DWG NO. 08-03594	REV —	
SCALE NTS	DATE 08/04/2020	SHEET 1 OF 5	
L. ROBERTO LOMAS P.E. 1432 WOODFORD RD LEWISVILLE, NC 27023 434-688-0609 rllomas@rlomaspe.com			
			SIGNED: 09/18/2020 Luis R. Lomas P.E. FL No.: 62514



ACCU-TRAC DS - REINFORCED
EXTERIOR VIEW

DESIGN PRESSURE RATING	IMPACT RATING
±75.0PSF	LARGE AND SMALL MISSILE IMPACT

MISSILE LEVEL D, WIND ZONE 4 AND HVHZ

60" X 120" PANEL SHOWN. OTHER SIZES ARE APPROVED AS LONG AS PANEL AREA DOES NOT EXCEED 50.0 FT²

Chart #1

		Stiffener spacing (in)						
		Panel width (in)						
		24.00	30.00	36.00	42.00	48.00	54.00	60.00
Design pressure (psf)	20.0	NO STF REQ'D	NO STF REQ'D	NO STF REQ'D	NO STF REQ'D	NO STF REQ'D	53.00	43.00
	30.0	NO STF REQ'D	NO STF REQ'D	NO STF REQ'D	58.00	45.00	35.00	28.00
	40.0	NO STF REQ'D	NO STF REQ'D	60.00	44.00	33.00	26.00	21.00
	50.0	NO STF REQ'D	NO STF REQ'D	48.00	35.00	27.00	21.00	17.00
	60.0	NO STF REQ'D	57.00	40.00	29.00	22.00	17.00	14.00
	70.0	NO STF REQ'D	49.00	34.00	25.00	19.00	15.00	12.00
	75.0	NO STF REQ'D	46.00	32.00	23.00	18.00	14.00	11.00

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

Chart #2

Design pressure (psf)	Rivet spacing (in)	
	20.0	30.0
20.0	18.00	18.00
30.0	18.00	18.00
40.0	18.00	18.00
50.0	18.00	18.00
60.0	14.00	14.00
70.0	12.00	12.00
75.0	11.00	11.00

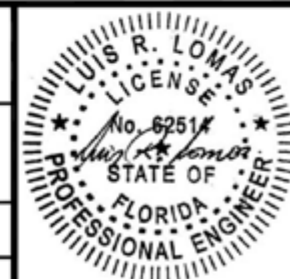
SIGNED: 09/18/2020

ALTECH PANEL SYSTEM LLC
1 JOHNSON STREET, SUITE 118
CARTERSVILLE, GA 30120

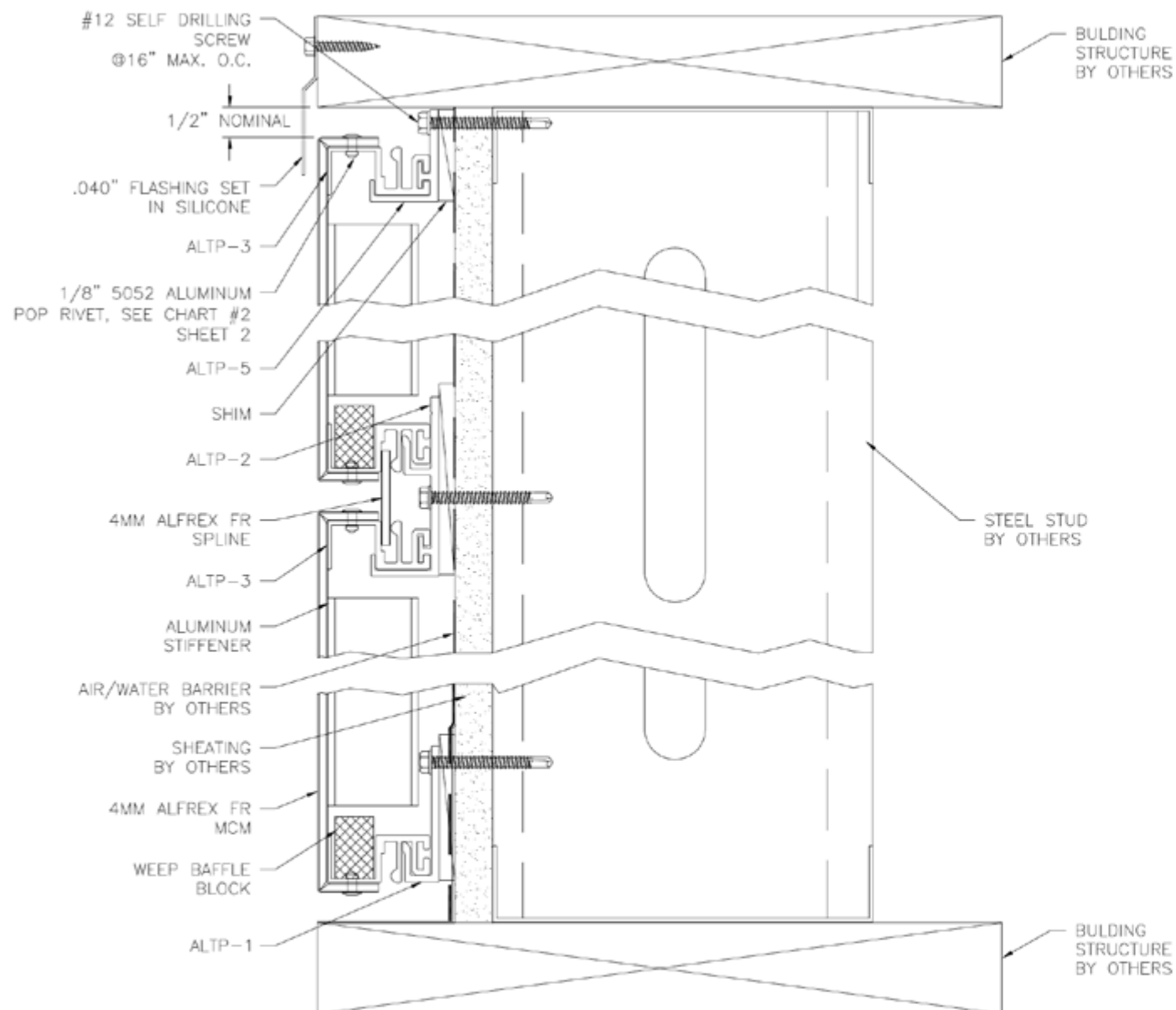
ACCU-TRAC DS/ALFREX FR REINFORCED
WALL PANEL SYSTEM IMPACT
ELEVATION

DRAWN: A.R.	DWG. NO. 08-03594	REV —
SCALE NTS	DATE 08/04/2020	SHEET 2 OF 5

L. ROBERTO LOMAS P.E.
1432 WOODFORD RD LEWISVILLE, NC 27023
434-688-0609 rllomas@rlformaspe.com



Luis R. Lomas P.E.
FL No.: 62514



A
3

VERTICAL SECTION
INSTALLATION DETAILS

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED

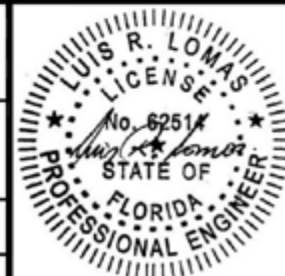
SIGNED: 09/18/2020

ALTECH PANEL SYSTEM LLC
1 JOHNSON STREET, SUITE 118
CARTERSVILLE, GA 30120

ACCU-TRAC DS/ALFREX FR REINFORCED
WALL PANEL SYSTEM IMPACT
INSTALLATION DETAILS AND COMPONENTS

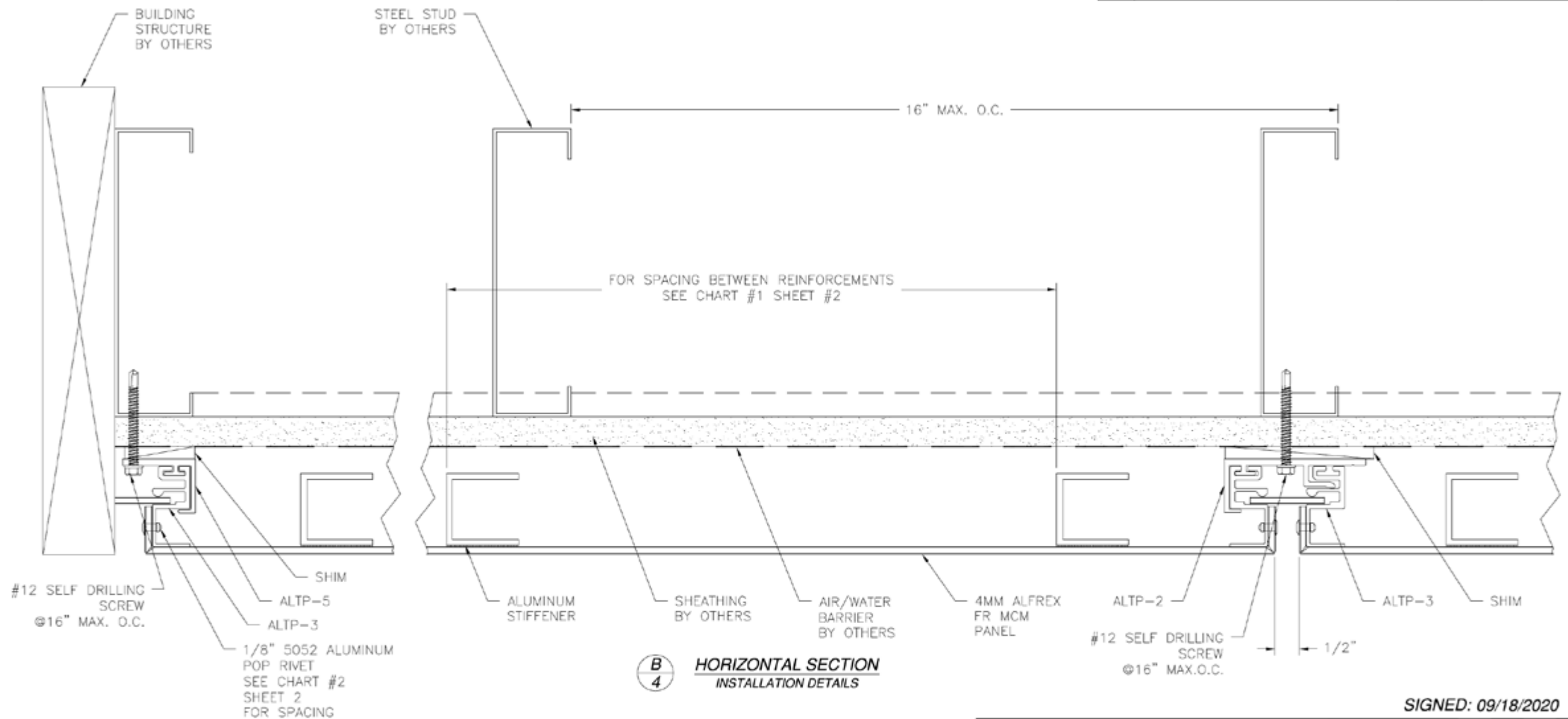
DRAWN: A.R.	DWG NO. 08-03594	REV —
SCALE NTS	DATE 08/04/2020	SHEET 3 OF 5

L. ROBERTO LOMAS P.E.
1432 WOODFORD RD LEWISVILLE, NC 27023
434-688-0609 rllomas@rlomaspe.com



Luis R. Lomas P.E.
FL No.: 62514

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



SIGNED: 09/18/2020

ALTECH PANEL SYSTEM LLC
1 JOHNSON STREET, SUITE 118
CARTERSVILLE, GA 30120

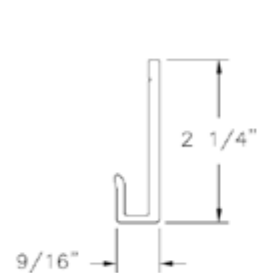
ACCU-TRAC DS/ALFREX FR REINFORCED
WALL PANEL SYSTEM IMPACT
INSTALLATION DETAILS

DRAWN: A.R.	DWG NO. 08-03594	REV —
SCALE NTS	DATE 08/04/2020	SHEET 4 OF 5
L. ROBERTO LOMAS P.E. 1432 WOODFORD RD LEWISVILLE, NC 27023 434-688-0609 rllomas@rlomaspe.com		

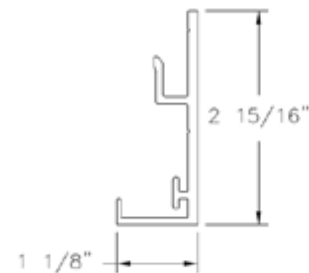


Luis R. Lomas P.E.
FL No.: 62514

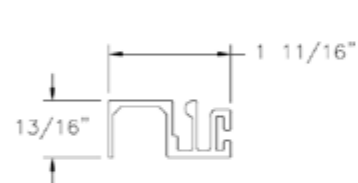
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED



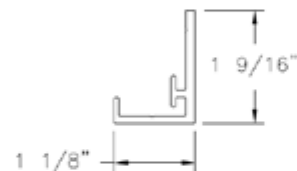
ALTP-1
ALUMINUM 6063-T5 .134" THICK



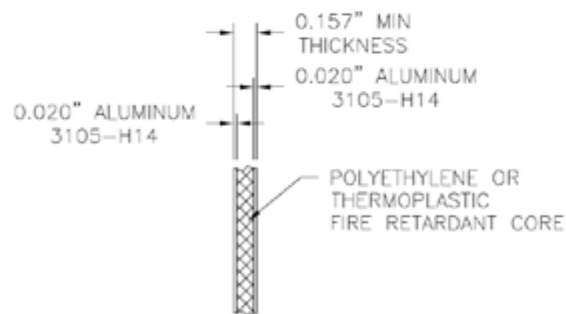
ALTP-2
ALUMINUM 6063-T5 .134" THICK



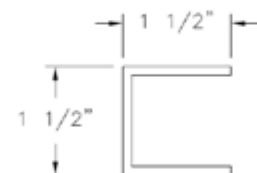
ALTP-3
ALUMINUM 6063-T5 .083" THICK



ALTP-5
ALUMINUM 6063-T5 .134" THICK



PANEL DETAIL



STIFFENER
ALUMINUM 6063-T5 .125" THICK

SIGNED: 09/18/2020

ALTECH PANEL SYSTEM LLC
1 JOHNSON STREET, SUITE 118
CARTERSVILLE, GA 30120

ACCU-TRAC DS/ALFREX FR REINFORCED
WALL PANEL SYSTEM IMPACT
COMPONENTS

DRAWN: A.R.	DWG NO. 08-03594	REV —
SCALE NTS	DATE 08/04/2020	SHEET 5 OF 5

L. ROBERTO LOMAS P.E.
1432 WOODFORD RD LEWISVILLE, NC 27023
434-688-0609 rllomas@rlomaspe.com



Luis R. Lomas P.E.
FL No.: 62514

Manufacturer: Altech Panel Systems, LLC
1 Johnson Street, Suite 118
Cartersville, GA 30120

Product Line: Accu-Trac Systems by Altech Panel Systems/Alpolic/Alpolic Fr

Compliance:

The above mentioned product has been evaluated for compliance with the requirements of the Florida Department of Business and Professional Regulation for Statewide Acceptance per Rule 61G20-3.005 method 1(d). The product listed herein complies with requirements of the current Florida Building Code.

Supporting Technical Documentation:

1. Approval document: drawing number 08-02268 Revision B, prepared, signed and sealed by Luis Roberto Lomas P.E.
2. Report No.: NCTL 210-3064-1 signed and sealed by Gerald Ferrara P.E.
National Certified Testing Laboratories, Orlando, FL
TAS 201-94 Large Missile Impact Test, Level D, Wind Zone 4
TAS 202 -94 Uniform Static Air Pressure, ± 50.0 psf design pressure, 15.0psf water penetration.
TAS 203-94 Cyclic Pressure loading ± 50.0 psf design pressure
3. Polyethylene and Thermoplastic core testing:
Report No.: 01-8361-038 signed by Alex B. Wenzel.
Southwest Research Institute, San Antonio TX
Report No.: 01-8361-320 signed by Alex B. Wenzel
Southwest Research Institute, San Antonio TX
Report No.: 01-43055.02 signed and sealed by Joseph A. Reed P.E.
Architectural Testing Laboratories, York, PA.

Results for Polyethylene Core.

Description	Tests	Results
Tensile Strength	ASTM E8	7452 PSI
Punching Shear Resistance (1" dia)	ASTM D732	4637 PSI
Punching Shear Max Load	ASTM D732	1920 PSI
Bond Integrity Vertical Pull	ASTM C297	1806 PSI
Drum Peel	ASTM D1781	33.6 IN – LB/IN
Flatwise Shear	ASTM C273	1225 PSI
Rate of Burning	ASTM D635	CCI
Flame Spread Index	ASTM E84	00
Smoke Developed Index	ASTM E84	00
Self Ignition Temperature	ASTM D1929	752°F
Flash Ignition Temperature	ASTM D1929	716°F

Results for Thermoplastic Fire Retardant Core.

Description	Tests	Results
Tensile Strength	ASTM E 8	5693PSI
Punching Shear Resistance (1" dia)	ASTM D732	4637 PSI
Punching Shear Max Load	ASTM D732	2259 PSI
Bond Integrity Vertical Pull	ASTM C297	427 PSI
Drum Peel	ASTM D1781	27.6 IN-LB/IN
Flatwise Shear	ASTM C273	949 PSI
Rate of Burning	ASTM D635	--
Flame Spread Index	ASTM E84	00
Smoke Developed Index	ASTM E84	10
Self Ignition Temperature	ASTM D1929	837°F
Flash Ignition Temperature	ASTM D1929	811°F



4. Anchor calculations and comparative analysis, report number 513012-1B and -2, prepared, signed and sealed by Luis Roberto Lomas P.E.

Limitations and Conditions of use:

- Maximum design pressure: Refer to installation instructions
- Panel size: 60"x120"
- This product is rated to be used in the HVHZ.
- Qualified panel thickness: 4mm(tested) and 6mm (qualified by comparative analysis)
- Panel material to be composite with 3105-H14 aluminum faces .020" minimum thickness.
- Core material to be Polyethylene or Thermoplastic (see above test results).
- Panels maybe obtained under the following brand names and manufacturers:
 - Alpolic by Mitsubishi
 - Reynobond by Alcoa
 - Alucobond by 3M
 - Larson by Alucoil
 - Alfrex FR by Alfrex, LLC

Installation:

Units must be installed in accordance with manufacturer's installation instructions and approval document 08-02268, Revision B.

Certification of Independence:

Please note that I don't have nor will acquire a financial interest in any company manufacturing or distributing the product(s) for which this report is being issued. Also, I don't have nor will acquire a financial interest in any other entity involved in the approval process of the listed product(s).



Manufacturer: Altech Panel Systems, LLC
1 Johnson Street, Suite 118
Cartersville, GA 30120

Product Line: R-Trac HVHZ by ALTECH/RMAX/ALPOLIC MCM Wall

Compliance:

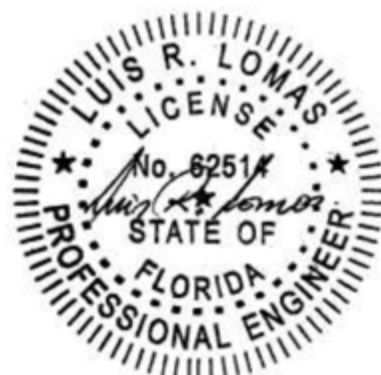
The above mentioned product has been evaluated for compliance with the requirements of the Florida Department of Business and Professional Regulation for Statewide Acceptance per Rule 61G20-3.005 method 1(d). The product listed herein complies with requirements of the current Florida Building Code.

Supporting Technical Documentation:

1. Approval document: drawing number 08-01998 revision C, prepared, signed and sealed by Luis Roberto Lomas P.E.
2. Report No.: C5743.01-550-18 signed and sealed by Vinu J. Abraham, P.E.
Architectural Testing Inc. Lithia Springs, GA
TAS 201-94 Large Missile Impact Test, Level D, Wind Zone 4
TAS 202 -94 Uniform Static Air Pressure, ± 120.0 psf design pressure, 18.0psf water penetration.
TAS 203-94 Cyclic Pressure loading ± 120.0 psf design pressure
3. Report No.: C1134.01-550-36 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: +200.0/-60.0psf
4. Report No.: C2063.01-550-36 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: -120.0psf
5. Report No.: C3034.01-550-44 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: -130.0psf
6. Report No.: C3691.01-550-44 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: -190.0psf
7. Report No.: C3691.02-550-44 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: -130.0psf
8. Report No.: C3691.03-550-44 signed by Ryan K. Hedgepeth.
Architectural Testing Inc. Lithia Springs, GA
ASTM E330-02 Test Uniform load: -190.0psf
9. Polyethylene and Thermoplastic core testing:
Report No.: 01-8361-038 signed by Alex B. Wenzel.
Southwest Research Institute, San Antonio TX
Report No.: 01-8361-320 signed by Alex B. Wenzel
Southwest Research Institute, San Antonio TX
Report No.: 01-43055.02 signed and sealed by Joseph A. Reed P.E.
Architectural Testing Laboratories, York, PA.

Results for Polyethylene Core:

Description	Tests	Results
Tensile Strength	ASTM E8	7452 PSI
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Punching Shear Max Load	ASTM D732	1920 PSI
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Drum Peel	ASTM D1781	33.6 IN – LB/IN
Flatwise Shear	ASTM C273	1225 PSI
Rate of Burning	ASTM D635	CCI
Flame Spread Index	ASTM E84	00
Smoke Developed Index	ASTM E84	00
Self Ignition Temperature	ASTM D1929	752°F
Flash Ignition Temperature	ASTM D1929	716°F



Results for Thermoplastic Fire Retardant Core:

Description	Tests	Results
Tensile Strength	ASTM E 8	5693PSI
Punching Shear Resistance (1" dia)	ASTM D732	4637 PSI
Punching Shear Max Load	ASTM D732	2259 PSI
Bond Integrity Vertical Pull	ASTM C297	427 PSI
Drum Peel	ASTM D1781	27.6 IN-LB/IN
Flatwise Shear	ASTM C273	949 PSI
Rate of Burning	ASTM D635	--
Flame Spread Index	ASTM E84	00
Smoke Developed Index	ASTM E84	10
Self Ignition Temperature	ASTM D1929	837°F
Flash Ignition Temperature	ASTM D1929	811°F

10. Anchor calculations and comparative analysis, report number 512711-2, prepared, signed and sealed by Luis Roberto Lomas P.E.

Limitations and Conditions of use:

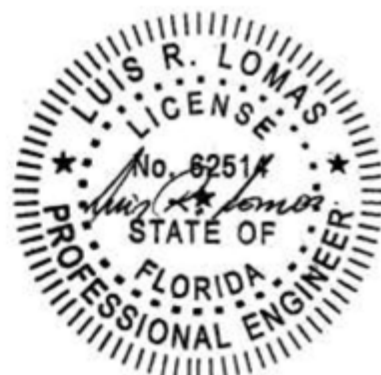
- Maximum design pressure: Refer to installation instructions.
- Panel size: 59 1/4"x143"
- This product is rated to be used in the HVHZ.
- Qualified panel thickness: 4mm(minimum)
- Panel material to be manufactured by Mitsubishi Plastics composite with 3105-H14 aluminum face .020" minimum thickness with Polyethylene or fire retardant core.
- Panels maybe obtained under the following brand names and manufacturers:
 - Alpolic by Mitsubishi Plastics.
 - Alfrex FR by Alfrex, LLC

Installation:

Units must be installed in accordance with manufacturer's installation instructions and approval document 08-01998, Revision C.

Certification of Independence:

Please note that I don't have nor will acquire a financial interest in any company manufacturing or distributing the product(s) for which this report is being issued. Also, I don't have nor will acquire a financial interest in any other entity involved in the approval process of the listed product(s).



WARRANTY

ALFREX FR MCM WARRANTIES

WARRANTY SUMMARY

Alfred FR Metal Composite Material and Alfred Plate



Fire Resistant & Non-Combustible Cladding

WARRANTY	TYPE	ALFREX FR MCM	ALFREX PLATE
Bond Integrity	Product	10 Years	N/A
2 Coat Solid/ 2 Coat Mica	Finish	30 Years	20 Years
3 Coat Metallic	Finish	30 Years	20 Years
3 Coat Vivid Solid	Finish	20 Years	20 Years
Design Series - Wood & Metal	Finish	20 Years	20 Years
Hairline Aluminum	Finish	10 Years	N/A
Mirror Finish	Finish	10 Years	N/A
Highly Durable Polyester	Finish	10 Years	N/A
Perforation	Finish	N/A	10 Years

30 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material Coil Coated PVDF Finish



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province		Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province		Zip Code
Product(s)	Alfred FR ACM		
Finish(s)	<input type="checkbox"/> 2 Coat Solid	<input type="checkbox"/> 2 Coat Mica	<input type="checkbox"/> 3 Coat Solid
	<input type="checkbox"/> 3 Coat Metallic		
	Other		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

- Company warrants that the painted finish on the Product(s) listed above will retain its Film integrity, Color and Chalk, as defined below for 30 years after the installation of the coil coated ACM consistent with the table attached per the location and environmental conditions detailed therein.
- The Warranty starts 6 months from manufacturing date or upon substantial completion of the job.
- Film Integrity shall be defined as the absence of peeling, checking, chipping or cracking, except for such crazing or slight cracking as may occur on tightly roll formed edges or brake bends at the time of forming the pre-painted sheet.
- Color Change shall be defined as freedom from fade or change as warranted in ΔE units calculated in accordance with ASTM D2244-02, paragraph 6.2.2 CIE L*a*b*, 100 Observer, specular included. Color Change is measured on an exposed painted surface that has been cleaned of surface soils and chalk and then compared to corresponding values measured on the original or unexposed coated surface.
- Chalk or Oxidation shall be defined as a numerical rating as warranted when measured in accordance with the standard procedures specified in ASTM D4214-98.
- Non-uniform color changes that result from unequal exposure to sunlight and/or the elements are not covered by this Limited Warranty.
- Applications exposed to salt spray or within 0.5 mile (0.8 km) of salt-water, must be maintained by washing with fresh tap water (in accordance with AAMA 610.1-1979) at least annually and documentation of this maintenance provided upon request (Copy of 610.1 provided on request). It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.
- This Limited Warranty does not extend to, or cover: (a) damage to the Product occasioned by improper storage of the coated metal prior to installation or moisture or other contamination detrimental to the Product because of improper packaging, handling, shipping, processing and/or installation; or (b) damage to the Product which suffers from improper forming, fabrication, cut edge exposure, corrosion of the substrate or any other condition between the substrate and coating which causes coating degradation or delamination; or (c) Forming Alfred® Plate panels at temperatures below an ambient temperature of 60°F (16°C) which may adversely affect the appearance and performance of the finish coating; (d) any external contaminant or condition which causes coating degradation or delamination.

30 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material Coil Coated PVDF Finish



Fire Resistant & Non-Combustible Cladding

9. This Limited Warranty does not extend to, or cover any failure caused by perforation processes which (a) may cause potential heat damage to the top paint layer, (b) leave exposed aluminum vulnerable to oxidation, paint degradation, or delamination, (c) are not specifically approved by Alfred prior to issuance of the warranty.
10. This Limited Warranty does not cover damage or failure of Product which damage or failure is attributable to acts of God, falling objects, external forces, explosions, fire, terrorism, or other such similar or dissimilar occurrences.
11. Owner's sole and exclusive remedy, and Alfred, LLC's liability under this Limited Warranty will be limited, at Alfred, LLC's option, to re-coating or replacing the coil coated Plate with the Product claimed to be defective. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive or consequential damages.
12. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. If after inspection of the product, Alfred, LLC determines that the claimed defect is covered by this warranty, Alfred, LLC as its sole option, shall refinish, repair, or replace, the defective Product without charge to the owner.
13. Alfred, LLC must approve any re-coating of the metal substrate through submission of three (3) estimates that each includes the name of the coating products to be used, labor and material costs as well as any other costs associated with the work for refinishing or replacing the metal substrate. Alfred, LLC reserves the right to approve or negotiate the contract for such re-coating or replacement work if the initial estimate is unacceptable to Alfred, LLC.
14. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC. Any such work undertaken by the claiming party or any other party shall be for the claiming party's own account and shall result in this warranty becoming null and void. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
15. The warranty for any refinished or replaced metal substrate shall be only for the remainder of the original warranty period applicable to the original coated metal substrate.
16. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
17. In the event of any subsequent failure of any re-coated or replaced coil coated Plate, the Owner shall first make any claims against the supplier of those replacement materials.
18. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth in the warranty table.
19. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
20. All claims must be submitted in writing to Alfred LLC in 943 Gainesville Hwy. Bldg. 100-4000, Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within thirty days from the date the damage is first discovered or could have been discovered. No claims can be submitted 30 days after expiration of the warranty period.
21. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
22. Alfred LLC reserves the right to discontinue or modify its products lines and coating colors. If the original product or coating color is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
23. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
24. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
25. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
26. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
27. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
28. EXCEPT AS SET FORTH HEREIN, ALFRED, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY

30 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material Coil Coated PVDF Finish



Fire Resistant & Non-Combustible Cladding

IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.

- 29. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFRED, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFRED, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
- 30. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFRED, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFRED, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFRED, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFRED, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.
- 31. Owner is solely responsible for proper selection and installation of Alfred, LLC's products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

Accepted By:
Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

30 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material Coil Coated PVDF Finish



Fire Resistant & Non-Combustible Cladding

WARRANTY TABLES

		2 Coat Solid / 2 Coat Mica		
		Residential, Commercial, Institutional Residential housing, offices, schools, universities, hotels, shopping malls, banks, retail, distribution centers	Industrial Steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure.	Severe Marine Less than 1500 ft (0.46 km) from a body of salt-water or coastline.
Above 20 North and South Latitude	Film Integrity years	30	10	15
	Color Delta E ≤ 5 years	30	N/A	15
	Chalking ≥ 8 Rating years	30	7	15

		3 Coat Solid / 3 Coat Metallic		
		Residential, Commercial, Institutional Residential housing, offices, schools, universities, hotels, shopping malls, banks, retail, distribution centers	Industrial Steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure.	Severe Marine Less than 1500 ft (0.46 km) from a body of salt-water or coastline.
Above 20 North and South Latitude	Film Integrity years	30	10	20
	Color Delta E ≤ 5 years	30	N/A	20
	Chalking ≥ 8 Rating years	30	7	20

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: 3 Coat Vivid Solid Finishes



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province		Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province		Zip Code
Product(s)	Alfred FR ACM		
Finish(s)	3 Coat Vivid Solid		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

1. Company warrants that the painted finish on the Product(s) listed above will retain its Film integrity, Color and Chalk, as defined below for 20 years after the installation of the Product within North America consistent with the table attached per the location and environmental conditions detailed therein.
2. The Warranty starts 6 months from manufacturing date or upon substantial completion of the job.
3. Film Integrity shall be defined as the absence of peeling, checking, chipping or cracking, except for such crazing or slight cracking as may occur on tightly roll formed edges or brake bends at the time of forming the pre-painted sheet.
4. Color Change shall be defined as freedom from fade or change as warranted in ΔE units calculated in accordance with ASTM D2244-02, paragraph 6.2.2 CIE L*a*b*, 100 Observer, specular included. Color Change is measured on an exposed painted surface that has been cleaned of surface soils and chalk and then compared to corresponding values measured on the original or unexposed coated surface.
5. Chalk or Oxidation shall be defined as a numerical rating as warranted when measured in accordance with the standard procedures specified in ASTM D4214-98.
6. Non-uniform color changes that result from unequal exposure to sunlight and/or the elements are not covered by this Limited Warranty.
7. Applications exposed to salt spray or within 0.5 mile (0.8 km) of salt-water, must be maintained by washing with fresh tap water (in accordance with AAMA 610.1-1979) at least annually and documentation of this maintenance provided upon request (Copy of 610.1 provided on request). It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.
8. This Limited Warranty does not extend to, or cover: (a) damage to the Product occasioned by improper storage of the coated metal prior to installation or moisture or other contamination detrimental to the Product because of improper packaging, handling, shipping, processing and/or installation; or (b) damage to the Product which suffers from improper forming, fabrication, cut edge exposure, corrosion of the substrate or any other condition between the substrate and coating which causes coating degradation or delamination; or (c) Forming product panels at temperatures below an ambient temperature of 60°F (16°C) which may adversely affect the appearance and performance of the finish coating; (d) any external contaminant or condition which causes coating degradation or delamination.

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: 3 Coat Vivid Solid Finishes



Fire Resistant & Non-Combustible Cladding

9. This Limited Warranty does not extend to, or cover any failure caused by perforation processes which (a) may cause potential heat damage to the top paint layer, (b) leave exposed aluminum vulnerable to oxidation, paint degradation, or delamination, (c) are not specifically approved by Alfred prior to issuance of the warranty.
10. This Limited Warranty does not cover damage or failure of Product which damage or failure is attributable to acts of God, falling objects, external forces, explosions, fire, terrorism, or other such similar or dissimilar occurrences.
11. Owner's sole and exclusive remedy, and Alfred, LLC's liability under this Limited Warranty will be limited, at Alfred, LLC's option, to re-coating or replacing the coil coated Plate with the Product claimed to be defective. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive or consequential damages.
12. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. If after inspection of the product, Alfred, LLC determines that the claimed defect is covered by this warranty, Alfred, LLC as its sole option, shall refinish, repair, or replace, the defective Product without charge to the owner.
13. Alfred, LLC must approve any re-coating of the metal substrate through submission of three (3) estimates that each includes the name of the coating products to be used, labor and material costs as well as any other costs associated with the work for refinishing or replacing the metal substrate. Alfred, LLC reserves the right to approve or negotiate the contract for such re-coating or replacement work if the initial estimate is unacceptable to Alfred, LLC.
14. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC. Any such work undertaken by the claiming party or any other party shall be for the claiming party's own account and shall result in this warranty becoming null and void. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
15. The warranty for any refinished or replaced metal substrate shall be only for the remainder of the original warranty period applicable to the original coated metal substrate.
16. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
17. In the event of any subsequent failure of any re-coated or replaced coil coated Plate, the Owner shall first make any claims against the supplier of those replacement materials.
18. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth in the warranty table.
19. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
20. All claims must be submitted in writing to Alfred LLC in 943 Gainesville Hwy. Bldg. 100-4000, Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within thirty days from the date the damage is first discovered or could have been discovered. No claims can be submitted 30 days after expiration of the warranty period.
21. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
22. Alfred LLC reserves the right to discontinue or modify its products lines and coating colors. If the original product or coating color is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
23. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
24. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
25. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
26. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
27. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
28. EXCEPT AS SET FORTH HEREIN, ALFRED, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: 3 Coat Vivid Solid Finishes



Fire Resistant & Non-Combustible Cladding

- 29. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFRED, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFRED, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
- 30. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFRED, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFRED, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFRED, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFRED, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.
- 31. Owner is solely responsible for proper selection and installation of Alfred, LLC's products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

Accepted By:
Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: 3 Coat Vivid Solid Finishes



Fire Resistant & Non-Combustible Cladding

WARRANTY TABLES

		3 Coat Vivid Solid		
		Residential, Commercial, Institutional Residential housing, offices, schools, universities, hotels, shopping malls, banks, retail, distribution centers	Industrial Steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure.	Severe Marine Less than 1500 ft (0.46 km) from a body of salt-water or coastline.
Above 20 North and South Latitude	Film Integrity years	20	10	10
	Color Delta E ≤ 5 years	20	N/A	10
	Chalking ≥ 8 Rating years	20	7	10

SAMPLE

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: Design Series Finishes



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City		State or Province	Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City		State or Province	Zip Code
Product(s)	Alfred FR ACM		
Finish(s)			
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

1. Company warrants that the painted finish on the Product(s) listed above will retain its Film Integrity, Color and Chalk, as defined below for 20 years after the installation of the Design Series finished FR MCM consistent with the table attached per the location and environmental conditions detailed therein.
2. The Warranty starts 6 months from manufacturing date or upon substantial completion of the job.
3. Film Integrity shall be defined as the absence of peeling, checking, chipping or cracking when vertically observed by naked eye from a distance of 2 meters, except for such crazing or slight cracking as may occur on tightly roll formed edges or brake bends at the time of forming the pre-coated sheet.
4. Color Change shall be defined as freedom from visually inconsistent fade or change as viewed by the naked eye as observed on an exposed painted surface that has been cleaned of surface soils and chalk and then compared to corresponding values measured on the original or unexposed coated surface in accordance with ASTM D2244-93.
5. Chalk or Oxidation shall be defined as a numerical rating of 4 as warranted when measured in accordance with the standard procedures specified in ASTM D4214-8 on clean surfaces prepared in accordance with ASTM D3964.
6. Color Change and Chalk Base values are applicable to the Design Series finish as a 3-coat paint system, in full, and not applicable to the base coat or subsequent color coats if measured individually.
7. Non-uniform color changes that result from unequal exposure to sunlight and/or the elements are not covered by this Limited Warranty.
8. The Product(s) finish must not be scratched, abraded, damaged in any way, coated with an incompatible material, become immersed with concrete or mortar during construction, or remain in permanent contact with either after installation.
9. Applications exposed to salt spray, sheltered from natural rinsing from rainfall, or located within 1.5 mile of salt-water or industrial atmospheres, must be maintained by washing with fresh tap water (in accordance with AAMA 610.1-1979) every 6 months and documentation of this maintenance provided upon request (Copy of 610.1 provided on request). It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements, nor washed at the same time or frequency.
10. This Limited Warranty does not extend to, or cover: (a) damage to the Product occasioned by improper storage of the coated metal prior to installation or moisture or other contamination detrimental to the Product because of improper packaging, handling, shipping, processing and/or installation; or (b) damage to the Product which suffers from improper forming, fabrication, cut edge exposure, corrosion of the substrate or any other condition between the substrate and coating which causes coating degradation or delamination ; or (c) Forming Alfred® FR at temperatures below an ambient temperature of 60°F (16°C) which may adversely affect the appearance and performance of the finish coating; (d) any external

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: Design Series Finishes



Fire Resistant & Non-Combustible Cladding

contaminant or condition which causes coating degradation or delamination including, but not limited to: excessively polluted areas, excessively humid areas, tropical areas, in the vicinity of chemical or iron industry, contact with concrete, mortar, soil, ash, fertilizer, moisture, retaining substance, lead or copper and other dissimilar metals, chemical agents, liquid from copper flashings or copper pipes, green or wet timber or treated timber, attack from chemical or other agents, fumes, liquids or solids other than direct rain or run-off falling onto the product; (e) failure to remove debris and/or failure to provide free drainage of water including internal condensation from all surfaces of the product; (f) installation subject to unusually corrosive environments at any time in the future; (g) corrosion arising within lapped areas of end-lapped sheets; (h) corrosion at cut edges; (i) failure to replace corroded fasteners; (j) all exterior applications exposed to salt spray or within 1 km / 0.62 miles of salt-water or industrial atmospheres; (k) use of applied post paint treatments, coatings, cleaning systems, flashing, fasteners, or components that cause damage to the Design Series finish.

11. This Limited Warranty does not cover damage or failure of Product which damage or failure is attributable to acts of God, falling objects, external forces, explosions, fire, terrorism, natural disaster, flood, acts of war, riots, or other such similar or dissimilar occurrences.
12. This Limited Warranty is applicable only to installations in the USA and Canada and valid only when confirmed in writing by Alfred, LLC for a specific project after review of published warranty application forms submitted by the Customer or Owner.
13. Owner's sole and exclusive remedy, and Alfred, LLC's liability under this Limited Warranty will be limited, at Alfred, LLC's option, to re-coating or replacing the Design Series finished FR MCM with the Product claimed to be defective. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive or consequential damages.
14. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. If after inspection of the product, Alfred, LLC determines that the claimed defect is covered by this warranty, Alfred, LLC as its sole option, shall refinish, repair, or replace, the defective Product without charge to the owner.
15. Alfred, LLC must approve any re-coating of the metal substrate through submission of three (3) estimates that each includes the name of the coating products to be used, labor and material costs as well as any other costs associated with the work for refinishing or replacing the metal substrate. Alfred, LLC reserves the right to approve or negotiate the contract for such re-coating or replacement work if the initial estimate is unacceptable to Alfred, LLC.
16. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC. Any such work undertaken by the claiming party or any other party shall be for the claiming party's own account and shall result in this warranty becoming null and void. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
17. The warranty for any refinished or replaced metal substrate shall be only for the remainder of the original warranty period applicable to the original coated metal substrate.
18. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
19. In the event of any subsequent failure of any re-coated or replaced Design Series finished FR MCM the Owner shall first make any claims against the supplier of those replacement materials.
20. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth in the warranty table.
21. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
22. All claims must be submitted in writing to Alfred LLC in 943 Gainesville HWY, Building 100-4000, Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within thirty days from the date the damage is first discovered or could have been discovered. No claims can be submitted 30 days after expiration of the warranty period.
23. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
24. Alfred LLC reserves the right to discontinue or modify its products lines and coating colors. If the original product or coating color is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
25. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
26. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
27. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
28. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
29. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: Design Series Finishes



Fire Resistant & Non-Combustible Cladding

- 30. EXCEPT AS SET FORTH HEREIN, ALFRED, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.
- 31. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFRED, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFRED, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
- 32. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFRED, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFRED, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFRED, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFRED, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.
- 33. Owner is solely responsible for proper selection and installation of Alfred, LLC's products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

Accepted By:
Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

20 YEAR LIMITED PAINT FINISH WARRANTY

Alfred FR Aluminum Composite Material: Design Series Finishes



Fire Resistant & Non-Combustible Cladding

WARRANTY TABLES

Design Series Finishes Installations in the USA & Canada						
Residential, Commercial, Institutional & Light Industrial, Wall Panels, Roofing > 5 degrees from horizontal				Industrial & Severe Marine		
> 1 mile (1.6 km) from a body of salt-water or coastline, steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure		> 0.62 miles (1.0 km) and < 1 mile (1.6 km) from a body of salt-water or coastline, steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure		≤ 0.62 miles (1.0 km) from a body of salt-water or coastline, steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure		
	Walls	Roofing	Walls	Roofing	Walls	Roofing
Film Integrity	20 Years	20 Years	10 Years	10 Years	N/A	N/A
Color Change	20 Years	20 Years	10 Years	10 years	N/A	N/A
Chalking Rating	> #4 20 Years	> #2 20 Years	> #4 10 Years	> #2 10 Years	N/A	N/A

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Hairline Aluminum Finish



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province		Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province		Zip Code
Product(s)	Alfred FR ACM		
Finish(s)	Hairline Aluminum with FEVE Clear Coat		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

1. Company warrants that the painted finish on the Product(s) listed above will retain its Film integrity, Color and Chalk, as defined below for 10 years after the installation of the Hairline Aluminum with FEVE Clear Coat FR MCM consistent with the table attached per the location and environmental conditions detailed therein.
2. The Warranty starts 6 months from manufacturing date or upon substantial completion of the job.
3. Film Integrity shall be defined as the absence of peeling, checking, chipping or cracking, except for such crazing or slight cracking as may occur on tightly roll formed edges or brake bends at the time of forming the pre-coated sheet.
4. Color Change shall be defined as freedom from fade or change as warranted at a rating not exceeding 5 ΔE units calculated in accordance with ASTM D2244. Color Change is measured on an exposed painted surface that has been cleaned of surface soils and chalk and then compared to corresponding values measured on the original or unexposed coated surface.
5. Chalk or Oxidation shall be defined as a numerical rating of 8 as warranted when measured in accordance with the standard procedures specified in ASTM D4214.
6. Non-uniform color changes that result from unequal exposure to sunlight and/or the elements are not covered by this Limited Warranty.
7. Applications exposed to salt spray or within 1.5 mile of salt-water or industrial atmospheres, must be maintained by washing with fresh tap water (in accordance with AAMA 610.1-1979) at least annually and documentation of this maintenance provided upon request (Copy of 610.1 provided on request). It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.
8. This Limited Warranty does not extend to, or cover: (a) damage to the Product occasioned by improper storage of the coated metal prior to installation or moisture or other contamination detrimental to the Product because of improper packaging, handling, shipping, processing and/or installation; or (b) damage to the Product which suffers from improper forming, fabrication, cut edge exposure, corrosion of the substrate or any other condition between the substrate and coating which causes coating degradation or delamination ; or (c) Forming Alfred® FR at temperatures below an ambient temperature of 60°F (16°C) which may adversely affect the appearance and performance of the finish coating; (d) any external contaminant or condition which causes coating degradation or delamination.
9. This Limited Warranty does not cover damage or failure of Product which damage or failure is attributable to acts of God, falling objects, external forces, explosions, fire, terrorism, or other such similar or dissimilar occurrences.

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Hairline Aluminum Finish



Fire Resistant & Non-Combustible Cladding

10. This Limited Warranty is applicable only to installations in the USA and Canada above 30 degrees Latitude North and valid only when confirmed in writing by Alfred, LLC for a specific project after review of published warranty application forms submitted by the Customer or Owner.
11. Owner's sole and exclusive remedy, and Alfred, LLC's liability under this Limited Warranty will be limited, at Alfred, LLC's option, to re-coating or replacing the Hairline Aluminum with FEVE Clear Coat FR MCM with the Product claimed to be defective. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive or consequential damages.
12. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. If after inspection of the product, Alfred, LLC determines that the claimed defect is covered by this warranty, Alfred, LLC as its sole option, shall refinish, repair, or replace, the defective Product without charge to the owner.
13. Alfred, LLC must approve any re-coating of the metal substrate through submission of three (3) estimates that each includes the name of the coating products to be used, labor and material costs as well as any other costs associated with the work for refinishing or replacing the metal substrate. Alfred, LLC reserves the right to approve or negotiate the contract for such re-coating or replacement work if the initial estimate is unacceptable to Alfred, LLC.
14. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC. Any such work undertaken by the claiming party or any other party shall be for the claiming party's own account and shall result in this warranty becoming null and void. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
15. The warranty for any refinished or replaced metal substrate shall be only for the remainder of the original warranty period applicable to the original coated metal substrate.
16. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
17. In the event of any subsequent failure of any re-coated or replaced Hairline Aluminum with FEVE Clear Coat FR MCM, the Owner shall first make any claims against the supplier of those replacement materials.
18. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth in the warranty table.
19. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
20. All claims must be submitted in writing to Alfred LLC in 943 Gainesville Hwy. Bldg. 100-4000, Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within thirty days from the date the damage is first discovered or could have been discovered. No claims can be submitted 30 days after expiration of the warranty period.
21. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
22. Alfred LLC reserves the right to discontinue or modify its products lines and coating colors. If the original product or coating color is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
23. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
24. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
25. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
26. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
27. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
28. EXCEPT AS SET FORTH HEREIN, ALFRED, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Hairline Aluminum Finish



Fire Resistant & Non-Combustible Cladding

- 29. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFRED, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFRED, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
- 30. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFRED, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFRED, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFRED, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFRED, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.
- 31. Owner is solely responsible for proper selection and installation of Alfred, LLC's products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

Accepted By:
Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Hairline Aluminum Finish



Fire Resistant & Non-Combustible Cladding

WARRANTY TABLES

Hairline Aluminum with FEVE Clear Coat			
	Residential, Commercial, Institutional Residential housing, offices, schools, universities, hotels, shopping malls, banks, retail, distribution centers	Industrial Steel mills, power generating facilities, oil fields, oil refineries, ore mines, chemical plants, paper mills, or other unusual environmental exposure.	Severe Marine Less than 1 mile (1.6 km) from a body of salt-water or coastline.
Film Integrity years	10	N/A	5
Color Delta E ≤ 5 years	10	N/A	5
Chalking ≥ 8 Rating years	10	N/A	5

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Mirror Finish



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province		Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province		Zip Code
Product(s)	Alfred FR MCM		
Finish(s)	DECO PRIME 4 FL22 Mirror Finish		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

1. Company warrants that the DECO PRIME 4 FL22 Mirror Finish on the Product(s) listed above is warranted for a period of 10 years after the installation of the DECO PRIME 4FL22 mirror finished Alfred FR MCM.
2. The Warranty starts 6 months from manufacturing date or upon substantial completion of the job.
3. Non-uniform color changes that result from unequal exposure to sunlight and/or the elements are not covered by this Limited Warranty. It is acknowledged that fading or color changes may not be uniform if the surfaces are not equally exposed to the sun and elements.
4. All exterior applications regardless of location must be cleaned and maintained by washing with fresh tap water (in accordance with AAMA 610.1-1979) at a minimum once per calendar year. Documentation in written form of this maintenance per AAMA 610.1 has to be maintained and presented in the case of any complaint. A copy of 610.1 provided can be provided upon request. Inspection, Maintenance, Repair Guidelines are detailed on pages 5 through 7.
5. This Limited Warranty does not extend to, or cover: (a) damage to the Product occasioned by improper storage of the coated metal prior to installation or moisture or other contamination detrimental to the Product because of improper packaging, handling, shipping, processing and/or installation; or (b) damage to the Product which suffers from improper forming, fabrication, cut edge exposure, corrosion of the substrate or any other condition between the substrate and coating which causes coating degradation or delamination ; or (c) Forming Alfred® FR at temperatures below an ambient temperature of 60°F (16°C) which may adversely affect the appearance and performance of the finish coating; (d) any external contaminant or condition which causes coating degradation or delamination; (f) any condition where the product is exposed to standing water (horizontal position); (g) all exterior applications exposed to salt spray or within 1.25 mile of salt-water or industrial atmospheres.
6. This Limited Warranty does not cover damage or failure of Product which damage or failure is attributable to acts of God, falling objects, external forces, explosions, fire, terrorism, or other such similar or dissimilar occurrences.
7. This Limited Warranty is applicable only to installations in the USA and Canada above 30 degrees Latitude North and valid only when confirmed in writing by Alfred, LLC for a specific project after review of published warranty application forms submitted by the Customer or Owner.
8. Owner's sole and exclusive remedy, and Alfred, LLC's liability under this Limited Warranty will be limited, at Alfred, LLC's option, to correcting visible finish defects or replacing the DECO PRIME 4FL22 Mirror Finish FR MCM with the Product claimed to be defective. If remedial action fails twice, Alfred, the owner may either accept a price reduction or withdraw from the contract. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive or consequential damages.

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Mirror Finish



Fire Resistant & Non-Combustible Cladding

9. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. If after inspection of the product, Alfred, LLC determines that the claimed defect is covered by this warranty, Alfred, LLC as its sole option, shall refinish, repair, or replace, the defective Product without charge to the owner.
10. Alfred, LLC must approve any remediation efforts through submission of three (3) estimates that each includes the name of the coating products to be used, labor and material costs as well as any other costs associated with the work for refinishing or replacing the metal substrate. Alfred, LLC reserves the right to approve or negotiate the contract for such re-coating or replacement work if the initial estimate is unacceptable to Alfred, LLC.
11. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC. Any such work undertaken by the claiming party or any other party shall be for the claiming party's own account and shall result in this warranty becoming null and void. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
12. The warranty for any remediation shall be only for the remainder of the original warranty period applicable to the original coated metal substrate.
13. In no event will the original applicable warranty period set forth herein be extended by a warranty claim.
14. In the event of any subsequent failure of any re-coated or replaced DECO PRIME 4FL22 Mirror Finish FR MCM the Owner shall first make any claims against the supplier of those replacement materials.
15. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth in the warranty table.
16. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
17. All claims must be submitted in writing to Alfred LLC at 943 Gainesville HWY, Building 100, Suite 4000, Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within thirty days from the date the damage is first discovered or could have been discovered. No claims can be submitted 30 days after expiration of the warranty period.
18. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
19. Alfred LLC reserves the right to discontinue or modify its products lines and coating colors. If the original product or coating color is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
20. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
21. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
22. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
23. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
24. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
25. EXCEPT AS SET FORTH HEREIN, ALFREX, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.
26. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFREX, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFREX, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
27. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFREX, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFREX, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFREX, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFREX, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.

10 YEAR LIMITED FINISH WARRANTY



Alfred FR Aluminum Composite Material: Mirror Finish

Fire Resistant & Non-Combustible Cladding

28. Owner is solely responsible for proper selection and installation of Alfred, LLC’s products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

SAMPLE

Accepted By:
Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: Mirror Finish



Fire Resistant & Non-Combustible Cladding

Inspection, Maintenance, and Repair Guidelines

Cleaning Recommendations

These recommendations are given regarding cleaning and maintenance of the DECO PRIME 4 FL22 finish. DECO PRIME 4 FL22 is a highly sensitive decorative surface and must be cleaned with highest level of attention and consistency.

Initial and Regular Cleaning

Any cleaning activities should ideally be done on balmy, cloudy days. Through proper and professional regular cleaning, the aesthetic and representative appearance of the mirror finish surface is not only maintained but also retains its valued appearance as dirt and aggressive deposits are removed. The cleaning interval depends on the location, the prevailing environmental conditions and the contamination level. Annual cleaning are recommended and required for execution of the product finish warranty. The cleaning process shall be conducted from top to bottom, manually or with appropriate cleaning devices. Non-abrasive, soft cleaning wipes shall be used. The optimal surface temperature during the cleaning process of facade elements is $< 25^{\circ}\text{C}$.

	WHAT TO DO!	WHAT NOT TO DO!
1	Use a neutral cleaning product and a fiber-free, soft cotton cloth. The cotton cloth has to be changed regularly.	Use Scrubbers, brushes or abrasive cloths
2	Residues can be removed using a mixture of alcohol and water (1:1), e.g. methylated spirits with fiber-free, soft cotton cloth.	Use white spirit
3	For rinsing, use clean water	-
4	Regular water rinsing in areas with high salt spray concentration.	-

Moderate Cleaning

Moderate cleaning should be first conducted with warm water. If cleaning with water is not suitable because of the contamination level, mild chemical detergents may be used. The following safety measures have to be taken during the use of chemical detergents:

- For the user (protective clothes, protective gloves, face guard)
- For the environment (passersby, sensitive components, plants, parked cars, etc.)
- The accrued dirty water has to be caught using appropriate methods. Afterwards it has to be disposed of, according to local regulations.

Use of Surfactants

Adding surfactants to the warm water can improve the cleaning effect and help removal of dirt. An intensive rinsing with running, warm water is essential. After cleaning the entire building facade has to be washed with deionized water to avoid spotting.

Use of Diluted Mineral Acids

The use of diluted muriatic acid is recommended ($\sim 9\%$) taking note of the following points:

- Surface contaminants such as rust (flash rust), cement residue, sintering (stubborn dirt), corrosion or oxidation products, slight oil and grease pollution, algae and moss.
- Most of the commercial acid facade detergents contain fluoric acid and/or muriatic acid.
- Because of the processed coating chemistry within facade elements the usage of detergents containing fluoric acid should be avoided (**fluoric acid might affect the coating system causing it to delaminate from the surface**).
- Fluoric and muriatic acid can destroy siliceous binder and can produce a bulk of construction damaging salts in case of an extended contact time.
- An intensive rinsing with running, warm water is essential followed by a mandatory rinse with deionized water to avoid spotting.

10 YEAR LIMITED FINISH WARRANTY

Alfred FR Aluminum Composite Material: *Mirror Finish*

alfrex

Fire Resistant & Non-Combustible Cladding

Inspection, Maintenance, and Repair Guidelines

Use of Alkalines

Because of the processed coating chemistry, the usage of detergents containing fluoric acid should be avoided. Fluoric acid might affect the coating system causing it to delaminate from the surface.

Inspection of the Facade

It is recommended to inspect the facade once a year. Where industrial residues and soils caused by building operations are expected, it is essential to clean the facade element.

The regular inspection and maintenance should include:

- Review local defects (e.g. scratches) which might cause earlier corrosion
- Remove graffiti

Cleaning is particularly necessary in areas with low rainfall or in industrial areas. Foggy coastal areas with cycles of condensation and drying may lead to an increased corrosion of the product through atmospheric salts and dirt.

In protected areas of the facade, contaminated parts cannot be cleaned sufficiently by rainwater. A sufficient rinsing after the cleaning process is very important.

Optical Control after Cleaning

Due to the high reflective surface of the product DECO PRIME 4 FL01 and DECO PRIME 4 FL22, the cleansing effect can be checked through visual perception. If cleaning is done efficiently, a previously perceptible "grey film" can no longer be seen.

Summary of general cleaning advice

- Excessive rubbing and powerful solvents can lead to defects to the facade
- The usage of abrasive detergents must be avoided
- The cleaning process should be conducted at moderate temperature. Extremes in temperature should be avoided
- Cleaning devices have to be dirt-free

10 YEAR LIMITED WARRANTY AND REMEDY BOND INTEGRITY

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfred® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province		Zip Code
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province		Zip Code
Product(s)	<input type="checkbox"/> Alfred FR Aluminum Composite Material		
	<input type="checkbox"/> Alfred FR Zinc Composite Material		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfred, LLC from its obligations hereunder.

1. Company warrants that the Product(s) listed above will not exhibit any visually observable deformation as a result of delamination of the aluminum skin or natural metal skin from the core material due to manufacturing defects.
2. The Warranty period shall be for (10) years and shall begin (6) months after the time of shipment by Company or upon the date of substantial completion, whichever comes first.
3. Should any panels show signs of delamination during the term of the warranty, at the sole discretion of Company, the portion of panels not conforming to this warranty shall be refunded at the purchase price or replaced at no cost to the Customer.
4. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth herein.
5. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
6. This Limited Warranty only pertains to delamination during normal use and service and in no way will cover any other forms of delamination including, but not limited to, mechanical abrasion or mechanical damages, faulty or improper fabrication or installation of the product, exposure to corrosive atmospheres such as, exposure to such as those containing salt spray, acid rain, harmful chemicals or vapors, improper storage, improper installation or mishandling during installation, improper cleaning, unreasonable use, misuse, physical abuse, accidental damage, vandalism, use of incompatible accessories, fire, flood, earthquake, lightning, ice, windstorms, other acts of God, wind borne objects, building settlement, structural failures, wall or foundation failure, use of harmful cleaning compounds, intermittent or continual submersion in water or any other liquid or solid material, deliberate damage, acts of terrorism, or any other physical damage.
7. This warranty does not cover weathering of any exposed core material due to UV radiation exposure.
8. Under no circumstances will Alfred, LLC be held liable for any incidental, special, punitive, or consequential damages and shall not be responsible for the installation or maintenance of the Customer's panels.
9. In no event does Alfred LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
10. All claims must be submitted in writing to Alfred LLC in 943 Gainesville Hwy. Bldg. 100-4000 Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within (30) days from the date the damage is first discovered or could have been discovered. No claims can be submitted (30) days after expiration of the warranty period.

11. Alfred, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. All warranty work will be performed by Alfred, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfred, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfred, LLC following the rules and regulations set herein, and the abiding of all maintenance of such panels of the industry standards to which the Customer belongs with respect to handling, delivering, storing, processing, treating, installing and maintaining. Any failure to satisfy the conditions contained herein or proceeding with such work undertaken by the claiming party or any other party shall be for the claiming party's own account, and shall be construed as a waiver by the Customer or Owner of any right they may have for enforcement of this warranty, and shall result in this warranty becoming null and void.
12. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
13. The warranty for any replaced Product(s) shall be only for the remainder of the original warranty period applicable to the Product(s).
14. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
15. Alfred LLC reserves the right to discontinue or modify its products lines. If the original product is no longer available, Alfred LLC agrees to use commercially reasonable efforts to substitute a comparable product.
16. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
17. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
18. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
19. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
20. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
21. EXCEPT AS SET FORTH HEREIN, ALFRED, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.
22. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFRED, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFRED, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
23. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFRED, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFRED, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFRED, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. ALFRED, LLC'S AGGREGATE TOTAL CUMULATIVE LIABILITY UNDER THIS WARRANTY IS LIMITED TO THE DOLLAR AMOUNT OF THE PURCHASE PRICE.
24. Owner is solely responsible for proper selection and installation of Alfred, LLC's products. Owner agrees that it will use Alfred, LLC products only for their intended uses and according to the specifications and limitations established by Alfred, LLC from time to time. Owner shall indemnify, defend and hold Alfred, LLC harmless from and against any and all damages arising out of or relating to improper product selection, application, use, misuse, neglect, abuse of products or improper installation or incorporation of products.

10 YEAR LIMITED WARRANTY AND REMEDY BOND INTEGRITY

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

Accepted By:

Alfred, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By

Authorized Signature

Date

SAMPLE

10 YEAR LIMITED WARRANTY AND REMEDY BOND INTEGRITY



Perforated Alfrex FR Aluminum Composite Material

Fire Resistant & Non-Combustible Cladding

This limited warranty ("Limited Warranty") is provided by Alfrex® LLC ("Company") to the property owner ("Owner") and relates to the ("Products") installed at the ("Property") at the ("Property Address") as identified below.

Property Name		Property Owner	
Property Address			
City	State or Province	Zip Code	
Date of Substantial Completion			
Customer Name			
Customer Address			
City	State or Province	Zip Code	
Product(s)	Alfrex FR Aluminum Composite Material (when perforated)		
Warranty Number			

The "Company" provides warranty coverage subject to the definitions, terms, conditions, limitations, and remedies stated herein. All of the following conditions and additional conditions constitute material terms of this limited warranty and failure to satisfy any one or more are of the conditions and additional conditions by owner or their agents or representatives shall render this limited warranty null and void and release Alfrex, LLC from its obligations hereunder.

1. Company warrants that the Product(s) listed above will not exhibit any visually observable deformation as a result of delamination of the aluminum skin or natural metal skin from the core material due to manufacturing defects.
2. The Warranty period shall be for (10) years and shall begin (6) months after the time of shipment by Company or upon the date of substantial completion, whichever comes first.
3. Should any panels show signs of delamination during the term of the warranty, at the sole discretion of Company, the portion of panels not conforming to this warranty shall be refunded at the purchase price or replaced at no cost to the Customer.
4. The applicable warranty period shall be limited to, and shall in no event extend beyond, the warranty period as set forth herein.
5. In no event will the original applicable warranty period set forth in the warranty table be extended by a warranty claim.
6. This Limited Warranty only pertains to delamination during normal use and service and in no way will cover any other forms of delamination including, but not limited to, mechanical abrasion or mechanical damages, faulty or improper fabrication or installation of the product, exposure to corrosive atmospheres such as exposure to such as those containing salt spray, acid rain, harmful chemicals or vapors, improper storage, improper installation or mishandling during installation, improper cleaning, unreasonable use, misuse, physical abuse, accidental damage, vandalism, use of incompatible accessories, fire, flood, earthquake, lightning, ice, windstorms, other acts of God, wind borne objects, building settlement, structural failures, wall or foundation failure, use of harmful cleaning compounds, intermittent or continual submersion in water or any other liquid or solid material, deliberate damage, acts of terrorism, or any other physical damage.
7. This Limited Warranty defines perforated and exposed edge applications as fabricated panel edges and open areas located on the panel surface that are visibly exposed to open atmospheres, and do not serve as a terminating edge of the panel. All applications are limited specifically by the following including but not limited to (a) the total perforated area or combined open area of any individual panel should not exceed 45% of total area of the panel; (b) all perforated and other exposed edges must be located greater than or equal to 1.25" (32 mm) from any other open area defined as a terminating edge of the panel; (c) this warranty will be applicable only for installations located greater than or equal to 1 mile (1.6 km) from any coastline, saltwater, or brackish saltwater; (d) panels must be washed and maintained as stipulated in point 7. Any failure to satisfy the conditions contained herein shall result in this warranty becoming null and void. This Limited Warranty does not extend to, or cover any failure caused by perforation or fabrication processes or unapproved machinery and equipment which (a) may cause potential heat damage to the top paint layer, (b) leave exposed aluminum vulnerable to oxidation, paint degradation, or delamination, (c) are not specifically approved by Alfrex prior to issuance of the warranty.

10 YEAR LIMITED WARRANTY AND REMEDY BOND INTEGRITY



Perforated Alfrex FR Aluminum Composite Material

Fire Resistant & Non-Combustible Cladding

8. This warranty does not cover weathering of any exposed core material due to UV radiation exposure.
9. Under no circumstances will Alfrex, LLC be held liable for any incidental, special, punitive, or consequential damages and shall not be responsible for the installation or maintenance of the Customer's panels.
10. In no event does Alfrex LLC cover the cost of labor or sundry materials required to remove and/or replace any defective product.
11. All claims must be submitted in writing to Alfrex LLC in 943 Gainesville Hwy. Bldg. 100-4000 Buford, GA 30518. All claims must be accompanied by this certificate, fully completed and signed by the customer that furnished the product to the owner. In order to qualify for warranty coverage, all claims must be submitted within (30) days from the date the damage is first discovered or could have been discovered. No claims can be submitted (30) days after expiration of the warranty period.
12. Alfrex, LLC shall be given a reasonable opportunity to inspect the product claimed to be defective. All warranty work will be performed by Alfrex, LLC or by a company, customer, contractor, applicator, or distributor selected by Alfrex, LLC. At no time does this warranty confer upon the claiming party or any other party the right to proceed with repair, replacement or restoration without written notice and agreement by a duly authorized officer of Alfrex, LLC following the rules and regulations set herein, and the abiding of all maintenance of such panels of the industry standards to which the Customer belongs with respect to handling, delivering, storing, processing, treating, installing and maintaining. Any failure to satisfy the conditions contained herein or proceeding with such work undertaken by the claiming party or any other party shall be for the claiming party's own account, and shall be construed as a waiver by the Customer or Owner of any right they may have for enforcement of this warranty, and shall result in this warranty becoming null and void.
13. As color variances may occur between replacement or refinished product in comparison with the originally installed product due to normal weathering and aging of the originally installed product, this condition will not be indicative of a defect in either the replacement product or the originally installed product.
14. The warranty for any replaced Product(s) shall be only for the remainder of the original warranty period applicable to the Product(s).
15. This Limited Warranty is given solely to the Owner and is non-transferable and non-assignable.
16. Alfrex LLC reserves the right to discontinue or modify its products lines. If the original product is no longer available, Alfrex LLC agrees to use commercially reasonable efforts to substitute a comparable product.
17. This warranty is subject to, enforced by, and construed according to the laws of the State of Georgia. Any legal action to enforce or construe any portion of this warranty shall be brought in a Court of Company's choice in Georgia.
18. Any attempt to construe this warranty, be it by law or other legal means, that ultimately leads to any court of competent jurisdiction stating any provision herein as invalid or unenforceable the remainder of the provisions following shall come into effect. These provisions shall come into effect as though the prior provisions had not been contained herein.
19. The United Nations Convention on Contracts for the International Sale of Goods is expressly disclaimed and does not apply to the sale of Seller products. Any and all disputes between the parties that may arise pursuant to this order will be heard and determined before an appropriate arbitrator, federal or state court located in Atlanta, Georgia. The owner hereto acknowledges such court has the jurisdiction to interpret and enforce the provisions herein and/ or an arbitrator's judgment, and the owner and the Customer waives any and all objections that they may have as to personal jurisdiction or venue in any of the above courts.
20. Company has the right to termination of the warranty at any time if a (30) day notice is given to the Customer prior to Rights accruing to Customer are not lost prior to termination.
21. All information hereto shall be adhered to by both parties and shall not extend beyond the directives made herein. No modification shall be made without the understanding, consent, and signing by both Customer and Company of a contract explicitly stating this warranty's subsequent modification.
22. EXCEPT AS SET FORTH HEREIN, ALFREX, LLC MAKES NO OTHER EXPRESS WARRANTIES AND DISCLAIMS ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, WITH RESPECT TO ANY OF THE PRODUCTS.
23. IT IS UNDERSTOOD AND AGREED THAT THE REMEDIES PROVIDED FOR HEREIN FOR THE FINISH OF THE PRODUCT DESCRIBED ABOVE ARE EXCLUSIVE WHETHER FOR BREACH OF EXPRESS WARRANTIES OR OTHERWISE AND SHALL CONSTITUTE THE OWNER'S EXCLUSIVE REMEDY AND ALFREX, LLC'S EXCLUSIVE LIABILITY. IN NO EVENT SHALL ALFREX, LLC BE LIABLE FOR LABOR COSTS, DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES FOR ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTIES IN CONNECTION WITH THE PRODUCT.
24. THIS WARRANTY IS THE ONLY EXPRESS WARRANTY EXTENDED BY ALFREX, LLC IN CONNECTION WITH THE PRODUCT, OTHER THAN ALFREX, LLC'S STANDARD COATING WARRANTY, IF ANY, AND THE LIMITED WARRANTY SET OUT IN ALFREX, LLC'S SALES TERMS AND CONDITIONS, FOR THE PRODUCT, AND IT EXCLUDES ALL OTHER WARRANTIES, REPRESENTATIONS OR GUARANTEES, EXPRESS OR IMPLIED, WRITTEN OR ORAL, BY OPERATION OF LAW OR OTHERWISE, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

10 YEAR LIMITED WARRANTY AND REMEDY BOND INTEGRITY

Perforated Alfrex FR Aluminum Composite Material



Fire Resistant & Non-Combustible Cladding

Accepted By:
Alfrex, LLC.
943 Gainesville Hwy.
Building 100-4000
Buford, GA 30518
Phone: 470.589.7449

Authorized By _____

Authorized Signature _____

Date _____

SAMPLE

ALFREX FR MCM PROJECT REFERENCES

PORTFOLIO

HUTCHINSON METRO CENTER (TOWER II AND ATRIUM)



Location:	New York, USA
Finish:	Bone White
Architect / Specifier:	Newman Design
Installer / Contractor:	McGowan
Size:	140,485 sqft



VICTORIA THEATER



Location:	New York, USA
Finish:	Dove Gray, Pure White, Clean White, RVW White, Bronze
Architect / Specifier:	Aufgang Architects
Installer / Contractor:	Flintlock Construction
Size:	37,131 sqft

FAIRBOURNE STATION OFFICE TOWER



Location:	Utah, USA
Finish:	Bright Silver Metallic
Architect / Specifier:	EDA Architects
Installer / Contractor:	ICO Development
Size:	33,616 sqft



RUTGERS UNIVERSITY (ATHLETIC PERFORMANCE CENTER)



Location:	New Jersey, USA
Finish:	Bone White
Architect / Specifier:	Perkins Eastman
Installer / Contractor:	Epic Management
Size:	17,018 sqft



PORTFOLIO

MOUNTAIN TECH SOUTH



Location:	Utah, USA
Finish:	Dove Gray, Dark Gray
Architect / Specifier:	FFKR Architects
Installer / Contractor:	R&O Construction
Size:	15,696 sqft

OVERLAND ONE B3



Location:	Kansas, USA
Finish:	Pewter Mica
Architect / Specifier:	Burns & McDonnell
Installer / Contractor:	Standard Sheet Metal
Size:	16,000 sqft

PANERA BREAD



Location:	Florida, USA
Finish:	Bronze
Installer / Contractor:	Sundance Architectural Products
Size:	800 sqft

FENWICK TOWER / THE VUZE



Location:	Nova Scotia, Canada
Finish:	Black, Gray Silver
Architect / Specifier:	Stantec Architecture
Installer / Contractor:	Templeton Construction
Size:	231,974 sqft

HAT @ WEST VILLAGE



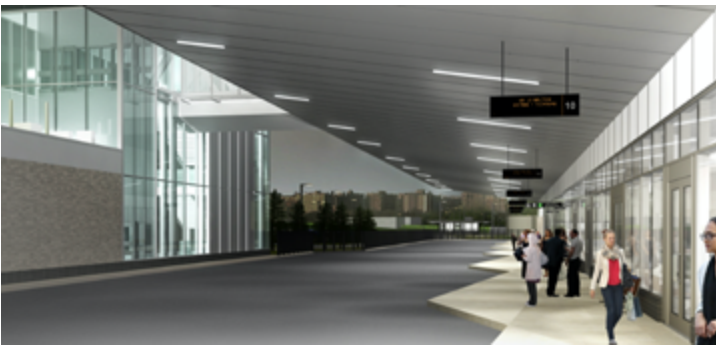
Location:	Alberta, Canada
Finish:	Custom
Architect / Specifier:	NORR Architects
Installer / Contractor:	Cidex Group
Size:	140,485 sqft

PORTFOLIO

KIPLING GO BUS STATION



Location:	Ontario, Canada
Finish:	Pure White
Architect / Specifier:	Strasman Architects
Installer / Contractor:	EllisDon Design-Build
Size:	87,904 sqft



THE ARC (UNIVERSITY OF MANITOBA STUDENT HOUSING)



Location:	Manitoba, Canada
Finish:	Deep Black, Pure White
Architect / Specifier:	Ark
Installer / Contractor:	Concord Pacific
Size:	62,870 sqft

PORTFOLIO

CASADONA PLACE



Location:	Alberta, Canada
Finish:	Bone White
Architect / Specifier:	Gibbs Gage
Installer / Contractor:	EllisDon Design-Build
Size:	59,077 sqft



SNC LAVALIN OFFICE



Location:	Ontario, Canada
Finish:	Pure White, Ascot White
Architect / Specifier:	De Silva Architect
Installer / Contractor:	Arguson Projects, Inc.
Size:	44,833 sqft

PORTFOLIO

THE WINDSOR



Location:	Alberta, Canada
Finish:	Black, Dark Gray, White
Architect / Specifier:	NORR Architects
Installer / Contractor:	Westpointe Building Services, Inc.
Size:	59,077 sqft



HAT @ EAST VILLAGE



Location:	Alberta, Canada
Finish:	Custom Wood, Bone White, Dark Gray, Dove Gray
Architect / Specifier:	NORR Architects
Installer / Contractor:	Cidex Group
Size:	34,395 sqft



PORTFOLIO

GATEWAY MEADOWVALE



Location:	Ontario, Canada
Finish:	Bone White
Architect / Specifier:	Quadrangle Architects
Installer / Contractor:	Carttera Private Equities
Size:	16,041 sqft

NCS MULTI-STAGE



Location:	Alberta, Canada
Finish:	Cherry Wood, Pure White, Silver
Architect / Specifier:	Genesis Building Corp.
Installer / Contractor:	ARTE Group
Size:	9,302 sqft



PORTFOLIO

DESA GLASS



Location:	Alberta, Canada
Finish:	Black
Installer / Contractor:	ARTE Group
Size:	7,427 sqft

CANADIAN BLOOD SERVICES



Location:	Alberta, Canada
Finish:	Dark Gray
Architect / Specifier:	NORR Architects
Installer / Contractor:	Bird Construction
Size:	5,908 sqft

MNP TOWER



Location:	Alberta, Canada
Finish:	Dove Gray, Black, Cherry Wood
Architect / Specifier:	Kohn Pedersen Fox
Installer / Contractor:	ARTE Group
Size:	5,655 sqft

PORTFOLIO

TEMPO AMENITY BUILDING



Location:	British Columbia, Canada
Finish:	Gold
Architect / Specifier:	Ciccozzi Architecture
Installer / Contractor:	Cressey Development
Size:	2,115 sqft



ALFIE DENTAL OFFICE



Location:	Ontario, Canada
Finish:	Black, Pure White
Architect / Specifier:	Vanessa Fong Architect
Installer / Contractor:	Lincoln Stevens Construction & Design Ltd
Size:	2,026 sqft

NORTH AMERICAN PROJECT REFERENCES

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

LOCATION	PROJECT NAME	SIZE (SQFT)	ARCHITECTURAL FIRM	ARCHITECT CONTACT	GENERAL CONTRACTOR	GC CONTACT
Nova Scotia, Canada	Fenwick Tower / The Vuze	231,974	Stantec Architecture	866.782.6832	Templeton Construction	902.422.6901
Alberta, Canada	HAT at West Village	140,485	NORR Architect	403.264.4000	Cidex Group	403.245.6996
Ontario, Canada	Kipling Go Bus Station	87,904	Strasman Architects	416.588.1800	EllisDon Design-Build Inc.	905.896.8900
Manitoba, Canada	The Arc	62,870	Ark	647.777.3500	Concord Pacific	604.681.8882
Alberta, Canada	Casadona Place	59,077	Gibbs Gage	403.233.2000	EllisDon Design-Build Inc.	905.896.8900
Ontario, Canada	CAMH - 1st	48,731	KPMB Architects	416.977.5104	PLC Constructors Canada Inc.	905.276.7600
Ontario, Canada	SNC Lavalin Office	44,833	De Silva Architect	905.491.6823	Arguson Projects Inc.	905.848.0707
Alberta, Canada	The Windsor	37,303	NORR Architects	403.264.4000	Westpointe Building Services Inc.	587.774.9579
New York, USA	Victoria Theater	37,131	Aufgang Architects	845.368.0004	Flintlock Construction	914.630.7503
Alberta, Canada	HAT at East Village	34,395	NORR Architects	403.264.4000	Cidex Group	403.245.6996
Utah, USA	Fairbourne Station Office Tower	33,616	EDA Architects	801.531.7600	ICO Development	213.270.8000
Alberta, Canada	West Village - 1	29,536	NORR Architects	403.264.4000	Cidex Group	403.245.6996
Ontario, Canada	360 Oakville	18,116	B+H Architects	416.596.2299	Cooper Construction	905.829.0444
New Jersey, USA	Rutgers University Health Athletic Performance Center	17,018	Perkins Eastman	212.353.7200	Epic Management	732.752.6100
Ontario, Canada	Gateway Meadowvale	16,041	Quadrangle Architects	416.598.1240	Carttera Private Equities	416.593.4747
Utah, USA	Mountain Tech South	15,696	FFKR Architects	801.521.6186	R&O Construction	801.627.1403
Alberta, Canada	West Village - 2	12,658	NORR Architects	403.264.4000	Cidex Group	403.245.6996
Idaho, USA	Fruitland Subaru	10,127	BRS Architects	208.336.8370	ESI Construction	208.362.3040
New York, USA	Hutchinson Metro Center Tower II and Atrium	N/A	Newman Design	212.673.3110	McGowan	201.865.4666
Alberta, Canada	Canadian Blood Services	5,908	NORR Architects	403.264.4000	Bird Construction	403.319.0470
B. Columbia, Canada	Tempo Amenity Building	2,115	Robert Ciccozzi Architecture	604.687.4741	Cressey Development	604.683.1256

GLOBAL PROJECT REFERENCES

Alfred FR Metal Composite Material

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Fire Resistant & Non-Combustible Cladding

COUNTRY	PROJECT NAME	ARCHITECTURAL FIRM	SIZE (SQFT)
Korea	The Hillstate	KMD Architects & Samoo Architects	753,480
Korea	Doosan We've The Zenith	De Stefano + Partners	317,538
Korea	Sangam Kaiser Palace	HAEAHN Architecture	269,100
Korea	Kolon-Parkpolis	Morphosis Architects	258,336
Korea	Seongnam City Hall	KMD Architects & Samoo Architects	129,168
Korea	OCI Central R&D center	HAEAHN Architecture + H Architecture	129,168
Korea	Dangin Power Plant of TAIHAN	Obra Architects	118,404
Korea	Lions Valley	Mass Studies	107,640
Korea	National Police Agency	H Architecture	96,876
Korea	KEPCO Research Institute	KEPCO Research Institute	75,348
Korea	Korea Land & Housing Corp	DRDS, Moo Young & Tomoon	16,146
Thailand	Honda Big Wing	VaSLab Architecture	53,820
Vietnam	Landmark 81 Tower	Atkins	484,380



Case Study



Project Name	West Village Towers - The Hat @ West Village
Location	Alberta, Canada
Architect	NORR Architecture & Planning
Owner	Cidex Group of Companies & Wexford Developments LP
Fabricator	Custom Metal Contracting Ltd.
Alfred Product	Alfred FR 4mm Metal Composite Material
Product Finish	Rough 1 (Custom)
	Rough 2 (Custom)
	Concrete White (JY-5140)
	Silver (AL-1220)

The West Village Towers project in downtown Calgary is a rising complex of three interconnected high-rise towers designed to reflect the natural beauty of the nearby Rocky Mountains and Bow River. Also known as “The Hat @ West Village”, when completed, it will be the tallest multi-residential mixed-use project in downtown Calgary – occupying an entire city block and commanding spectacular views of the surroundings.

Each tower features a slanted translucent roofline and multi-colored spandrel panels to exude a combination of shining reflectivity and warm earth tones. The wall cladding design challenge centered around choosing materials that would blend well with the specified clear and blue glazing, project a look and feel reminiscent of the surrounding landscape, and not require highly specialized installation systems.



Custom Metal Contracting Ltd. of Calgary, Alberta Canada and Alfred, LLC of Buford, Georgia USA partnered to develop a comprehensive solution that would achieve the design intent while providing economic benefits versus other alternatives. A key component of the solution was the development of three rough textured finishes to mimic the look and feel of concrete. After color and texture approval, a specially formulated protective film was employed to adhere to the textured finish surface and provide for maximum protection during the fabrication and installation phases of the project. Utilizing Custom Metal Contracting’s Composite Panels System Series 20 rainscreen system, at project completion approximately 130,350 square feet of Alfred FR 4mm MCM in four colors will clad the exterior of the three towers and integrate beautifully as a new addition to the Calgary skyline.

Alfred, LLC is the newest North American domestic MCM manufacturer and is pleased to be a member of the Metal Construction Association and MCM Alliance. Alfred specializes in fire-resistant and non-combustible architectural metal wall cladding with a portfolio including Alfred FR Metal Composite Material, matching 0.040” flat sheet, and coil coated aluminum Alfred Plate in 0.080” and 3mm thick panels up to 62” wide. Its parent company, Unience, Co Ltd., began operation in 2000 as a manufacturer of specialty fire-resistant coatings, bonding materials, and pelletized mineral filled FR core compound for globally recognized MCM manufacturers. In 2008, Unience launched Alfred in South Korea with a multi-line MCM production facility dedicated to the exclusive production of FR core MCM utilizing in-house, fire-resistant core technology. Today, both Unience and Alfred are headquartered in Buford, Georgia USA, with a new state of the art FR core MCM production plant complimented by a commercial branch in Toronto, Ontario Canada.

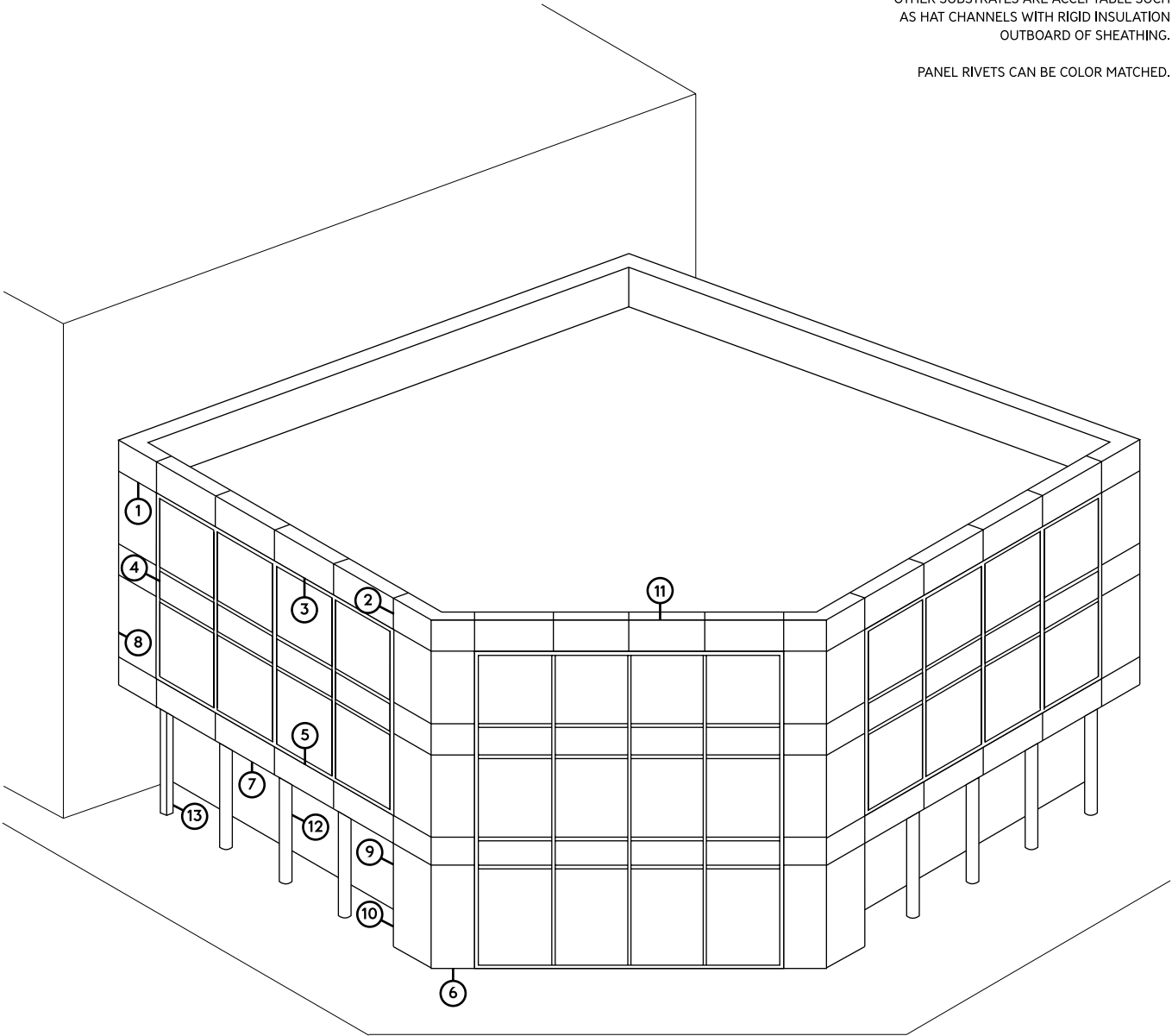
ALFREX FR MCM INSTALLATION DETAILS

THE ARCHITECTURAL DETAILS CONTAINED ARE PROVIDED FOR CONCEPTUAL PURPOSES ONLY. ALFLEX ONLY MANUFACTURES MCM PANELS. PANEL SYSTEMS AND ASSEMBLY DESIGN, FABRICATION, AND INSTALLATION ARE PROVIDED BY QUALIFIED FABRICATORS AND INSTALLERS. ALFLEX, LLC DOES NOT MAKE ANY WARRANTIES, EXPRESS OR IMPLIED INCLUDING MERCHANTABILITY AND FITNESS FOR PURPOSE. PLEASE CONSULT ALFLEX, LLC FOR RECOMMENDATIONS OF TESTED SYSTEMS AVAILABLE IN THE MARKET.

ARCH / FABRICATOR NOTES:
MAX PANEL SIZE IS 60" IN EITHER DIRECTION.
MICA / METALLIC FINISHES ARE DIRECTIONAL FINISHES AND MUST BE INSTALLED IN THE SAME DIRECTION FOR CONSISTENT COLOR.

DETAILS SHOWN ARE IN A RAINSCREEN APPLICATION ON EXTERIOR GWB SHEATHING WITH COMMERCIAL TYVEK (OR SIMILAR). OTHER SUBSTRATES ARE ACCEPTABLE SUCH AS HAT CHANNELS WITH RIGID INSULATION OUTBOARD OF SHEATHING.

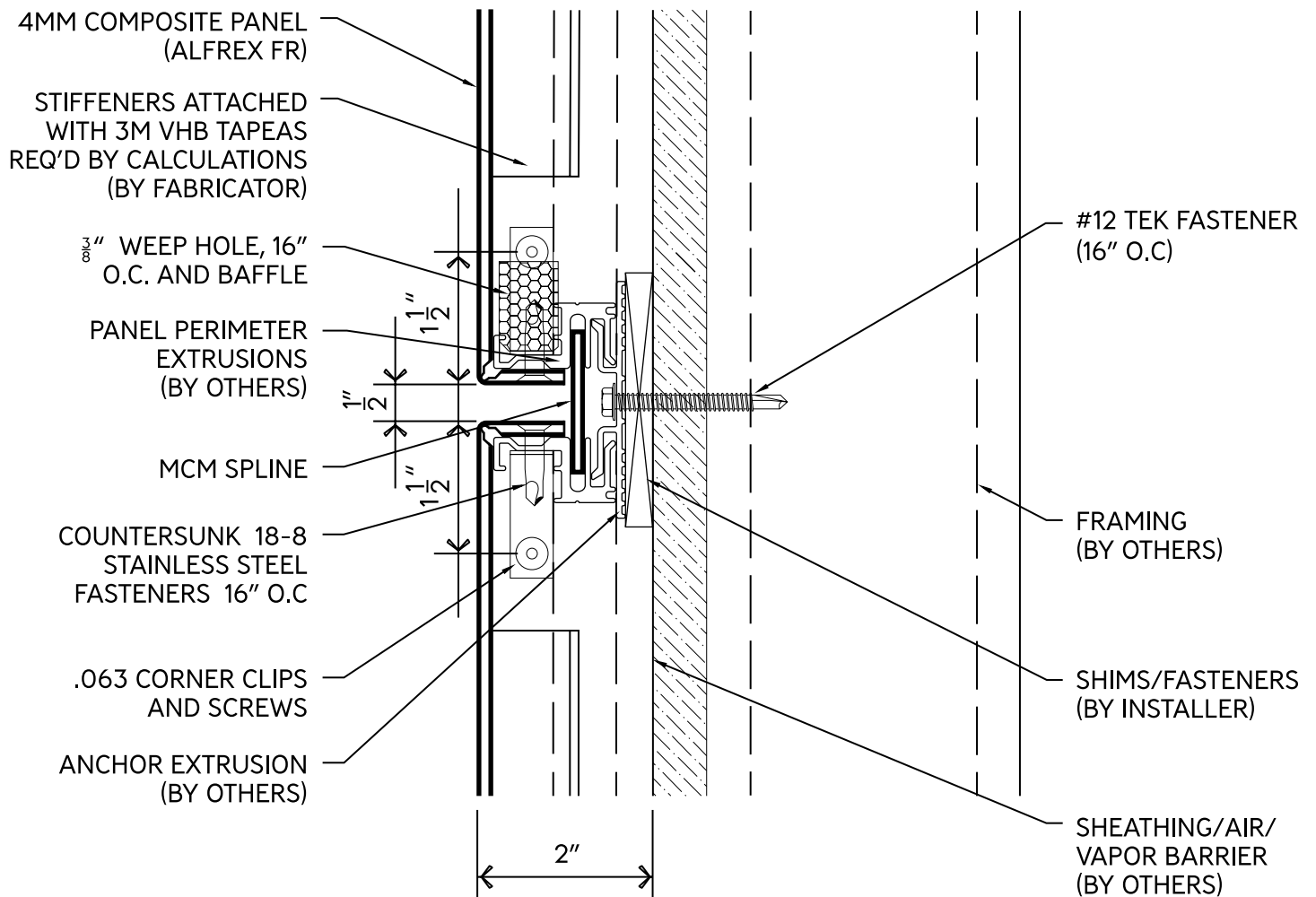
PANEL RIVETS CAN BE COLOR MATCHED.



943 Gainesville Hwy. Bldg 100-4000 Buford, GA 30518
470.589.7449 alfrex@alfrexusa.com

GENERIC RAINSCREEN SYSTEM APPLICATION

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May 2021



HORIZONTAL JOINT

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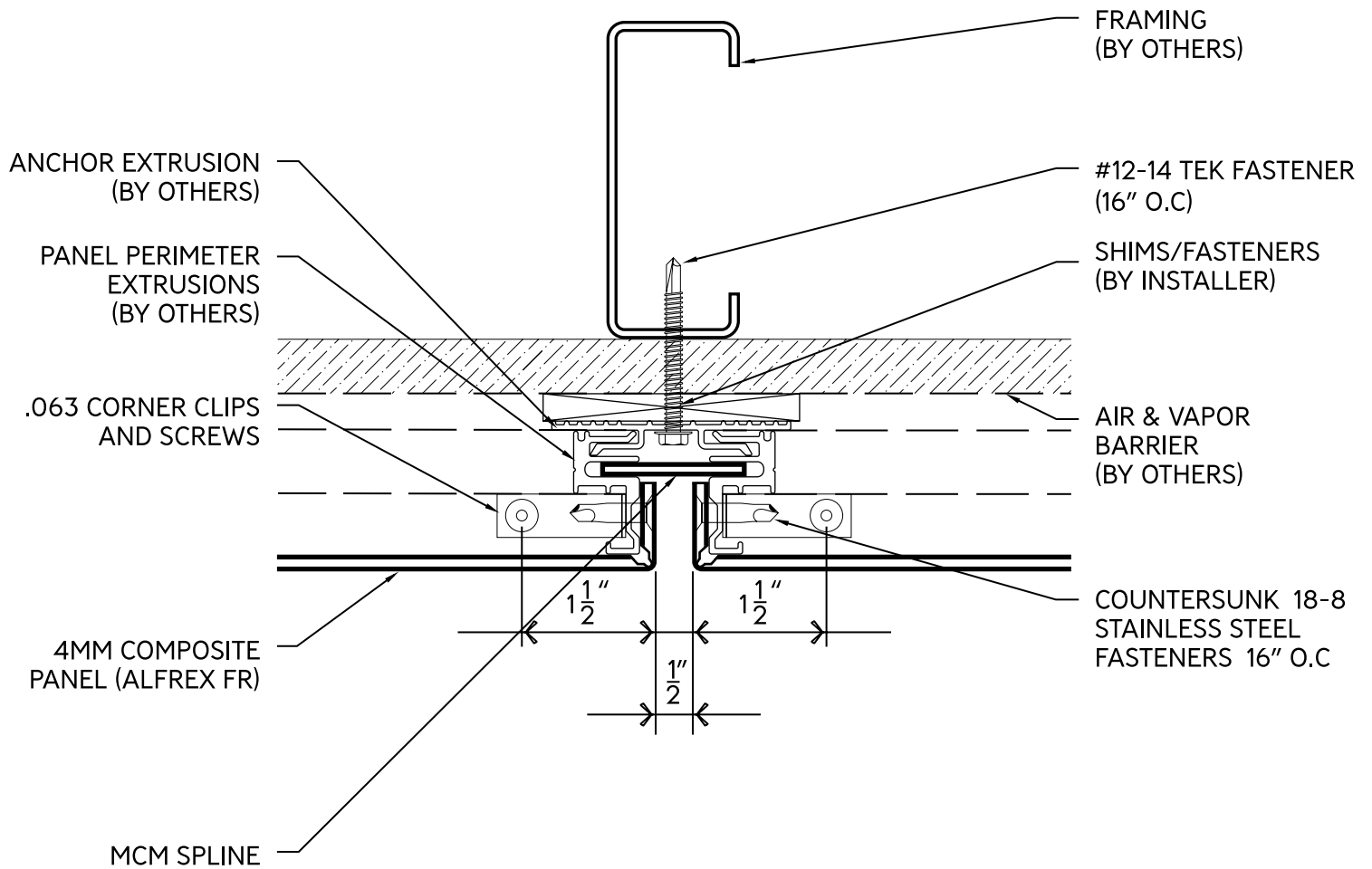
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GENERIC RAINSCREEN SYSTEM APPLICATION

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VERTICAL JOINT

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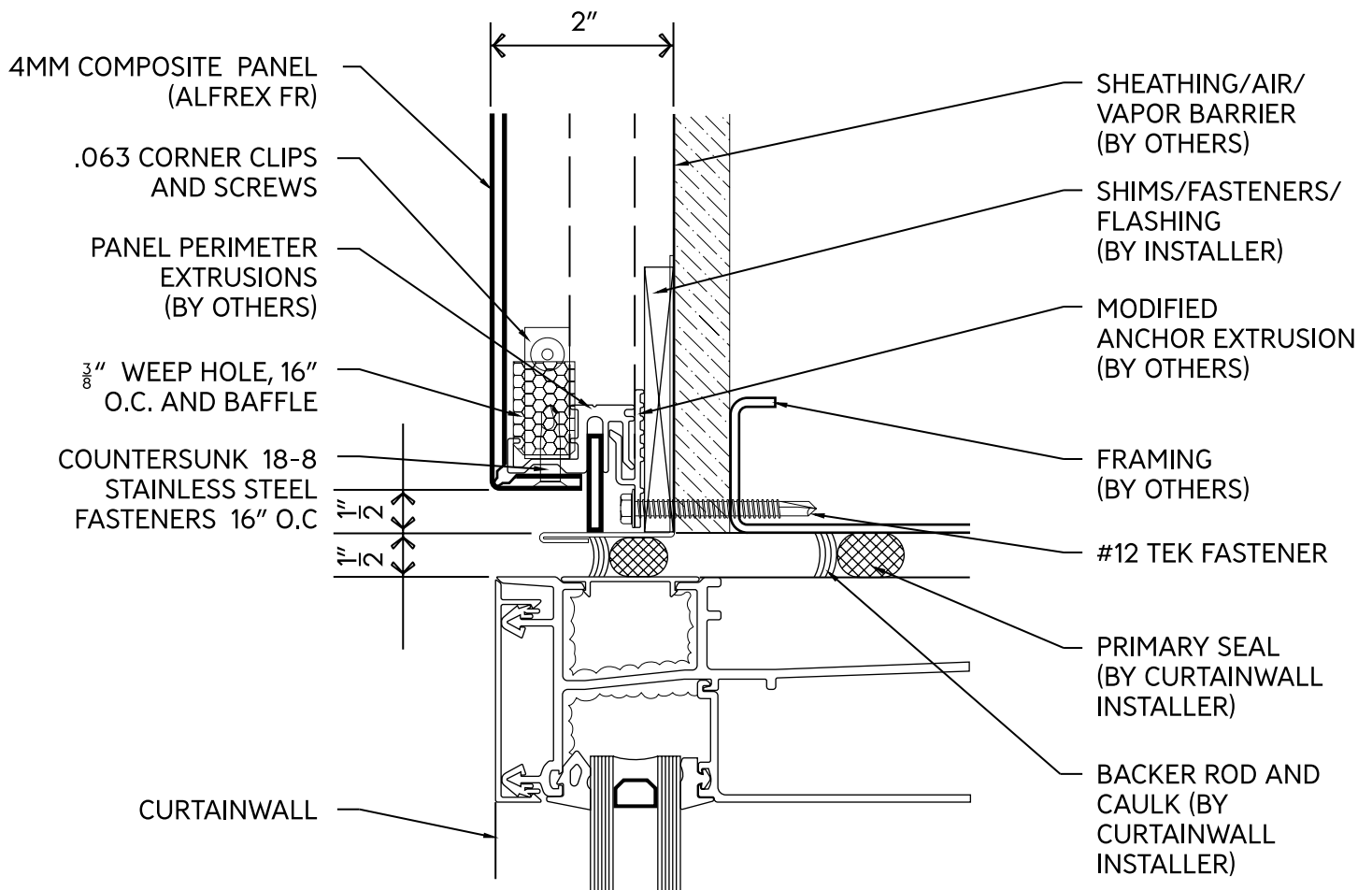
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GENERIC RAINSCREEN SYSTEM APPLICATION

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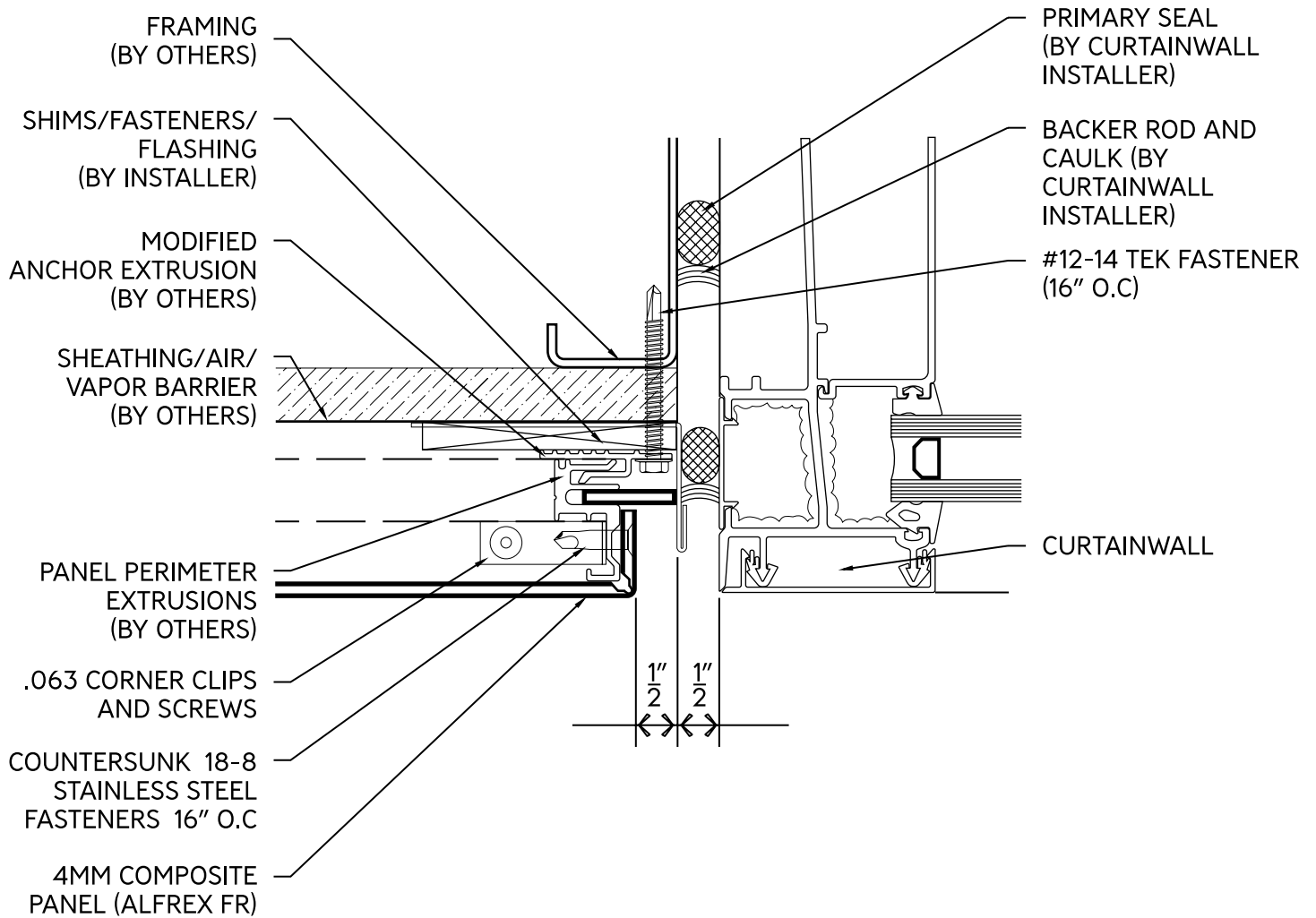
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GENERIC RAINSCREEN SYSTEM APPLICATION

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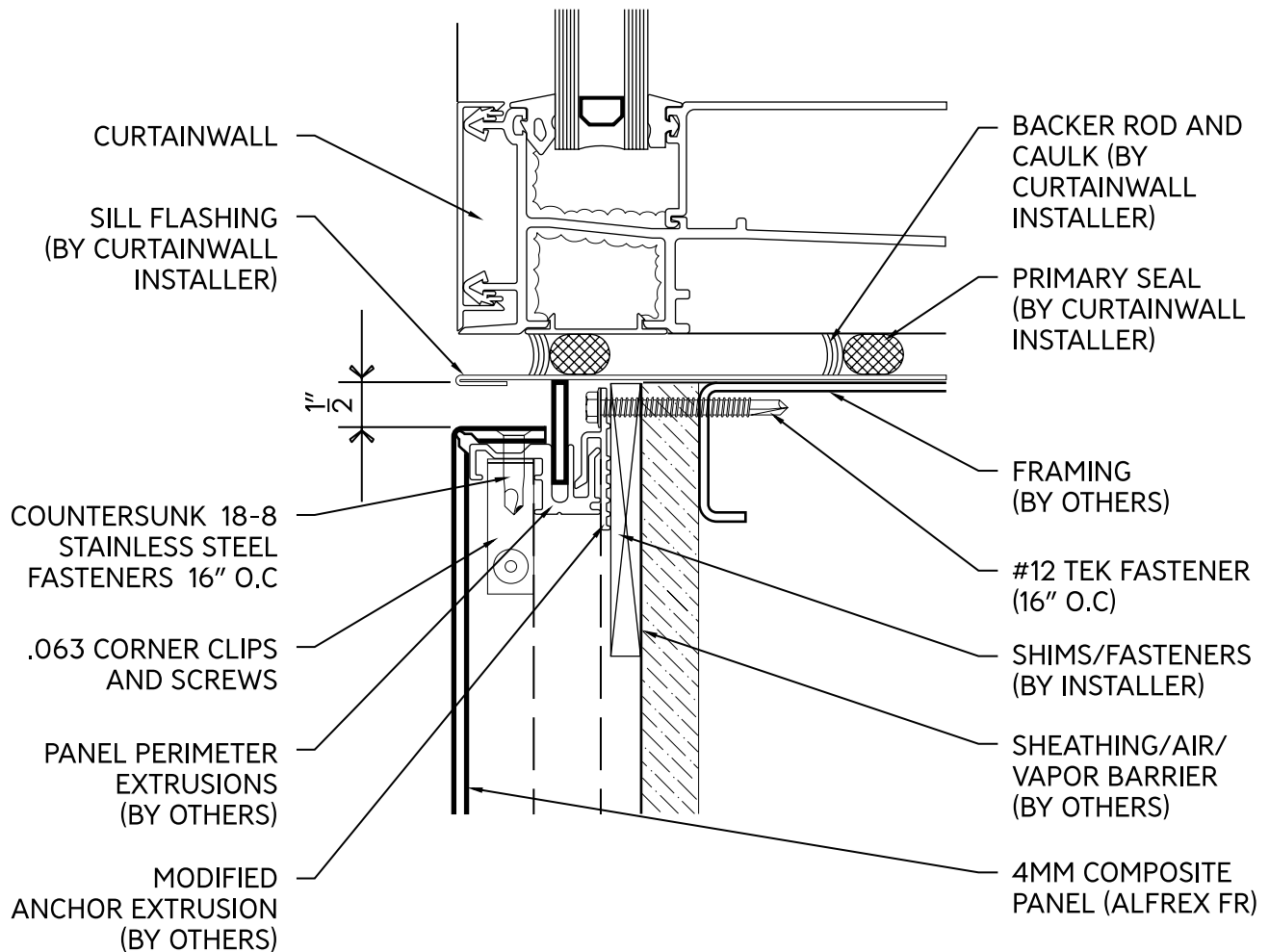
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GENERIC RAINSCREEN SYSTEM APPLICATION

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SILL

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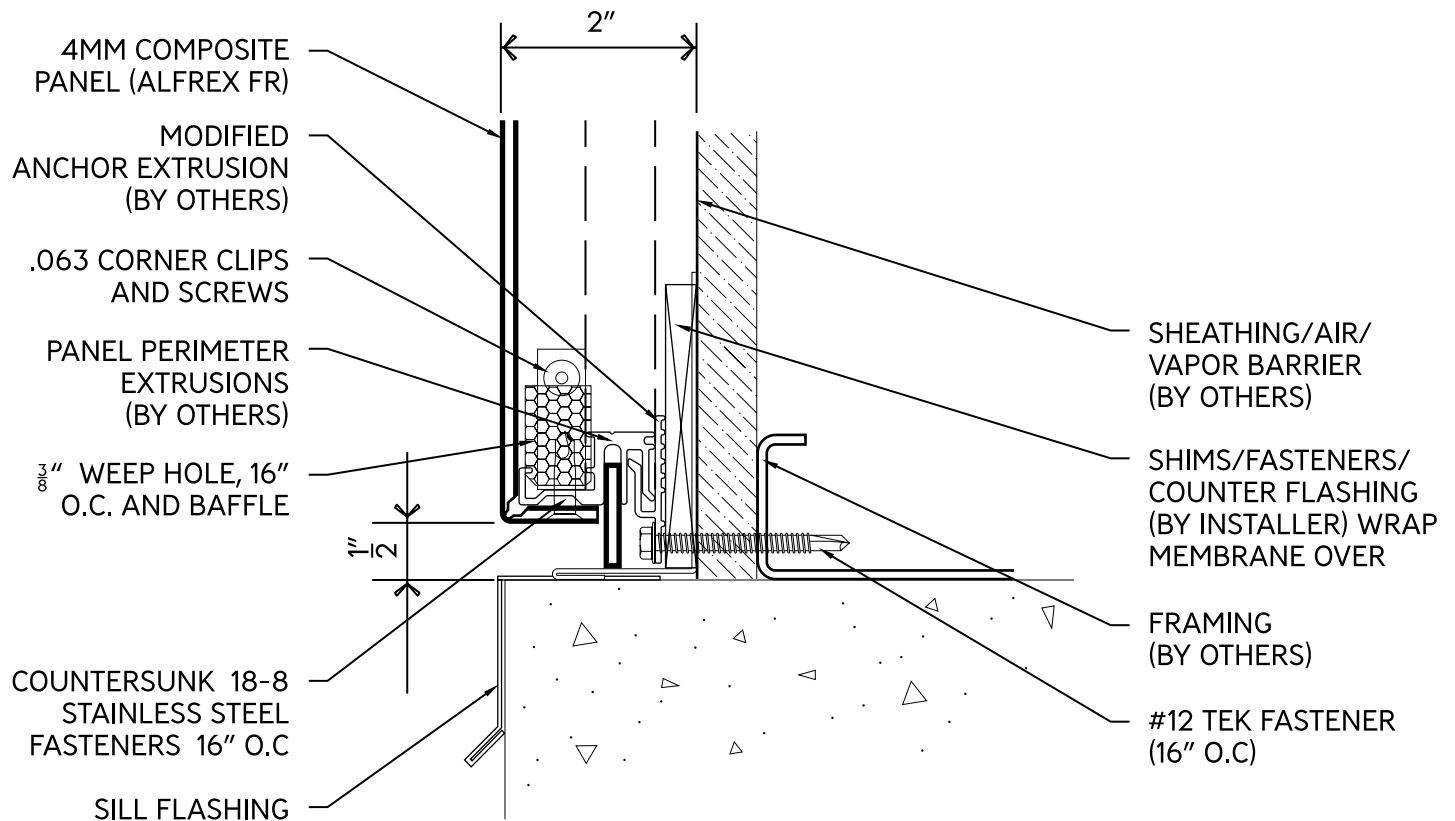
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GENERIC RAINSCREEN SYSTEM APPLICATION

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BASE CONDITION

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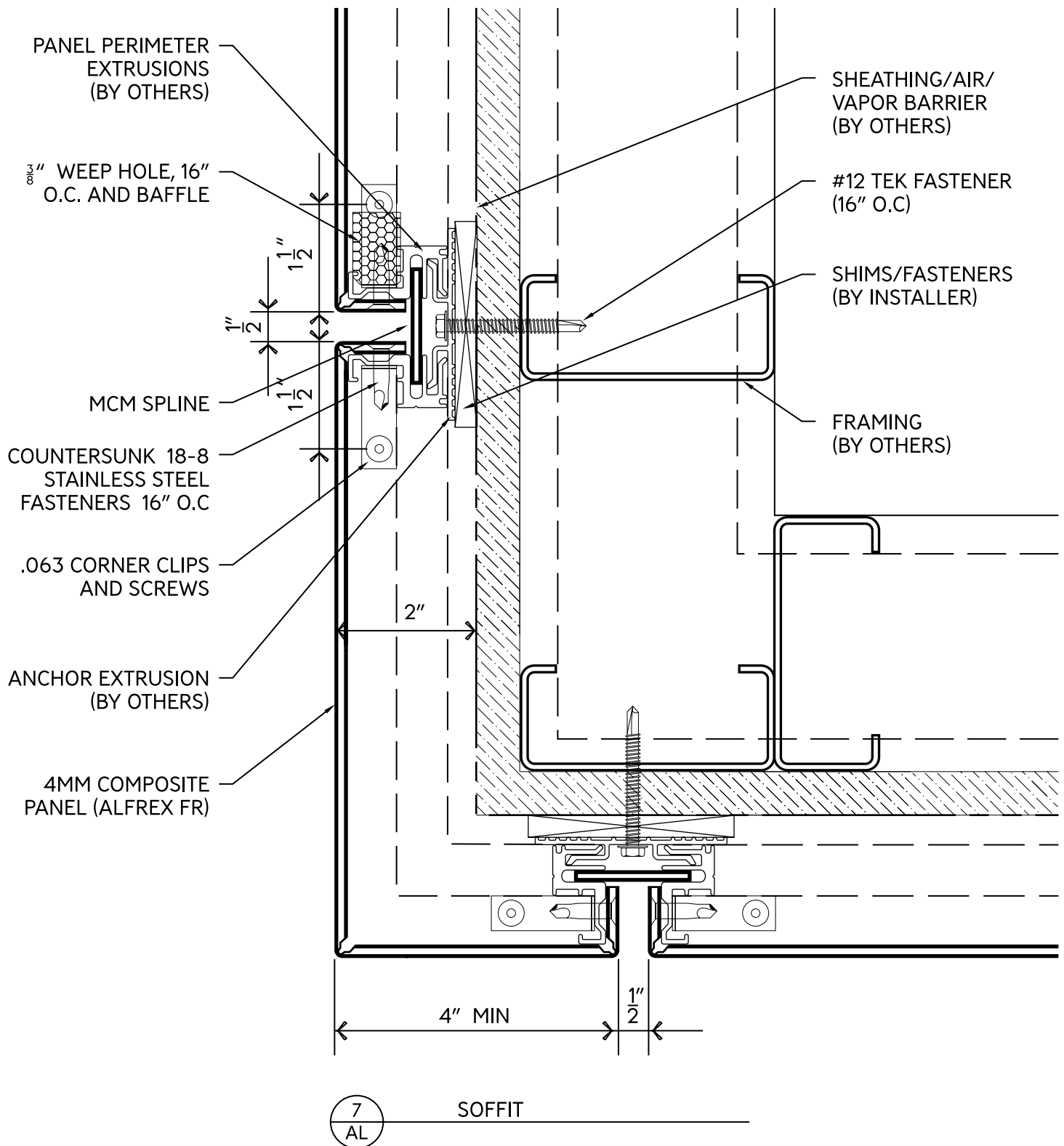
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GENERIC RAINSCREEN SYSTEM APPLICATION

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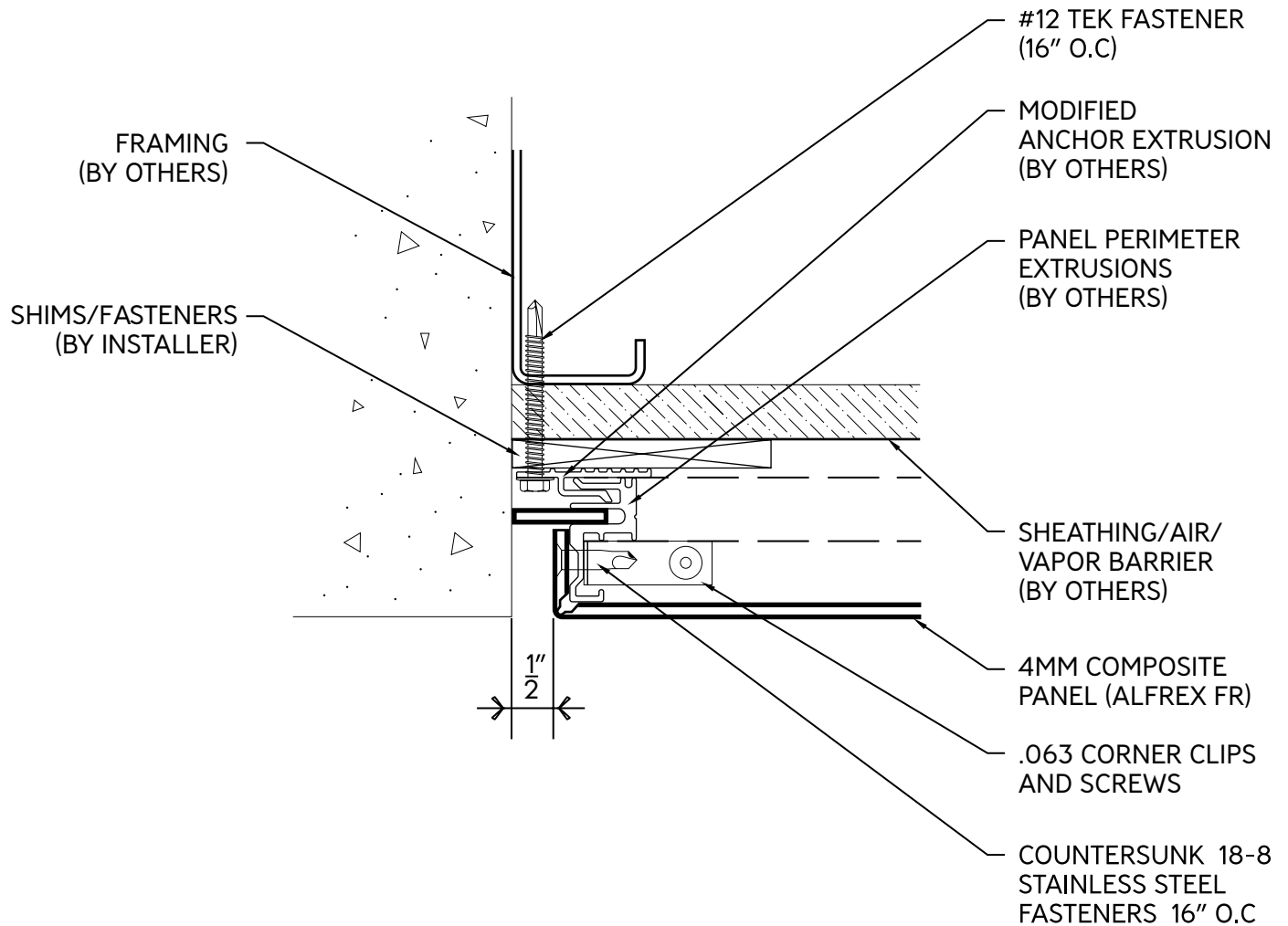
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470.589.7449 alfrex@alfrexusa.com

GENERIC RAINSCREEN SYSTEM APPLICATION

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TERMINATION

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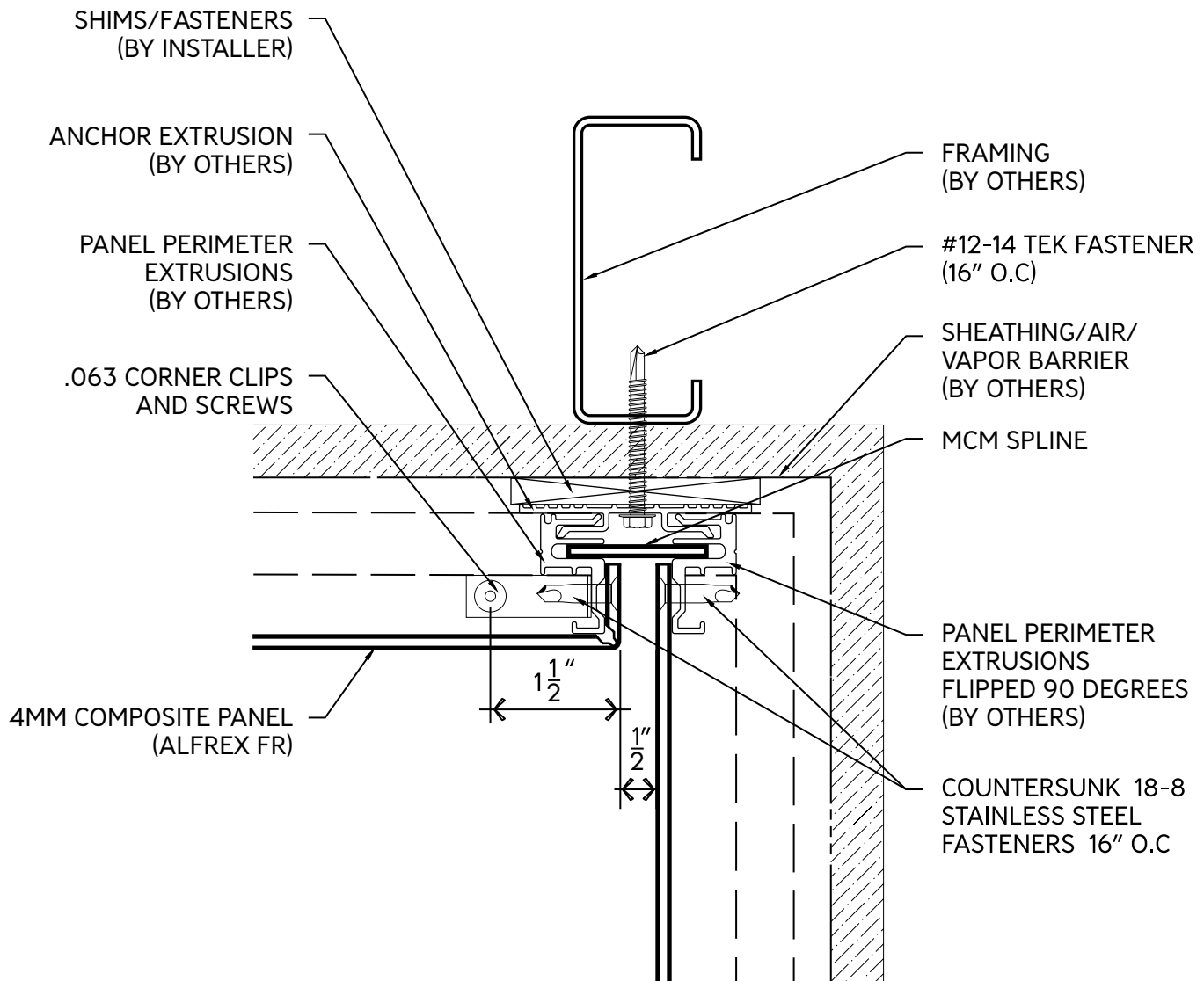
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GENERIC RAINSCREEN SYSTEM APPLICATION

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AL

INSIDE CORNER

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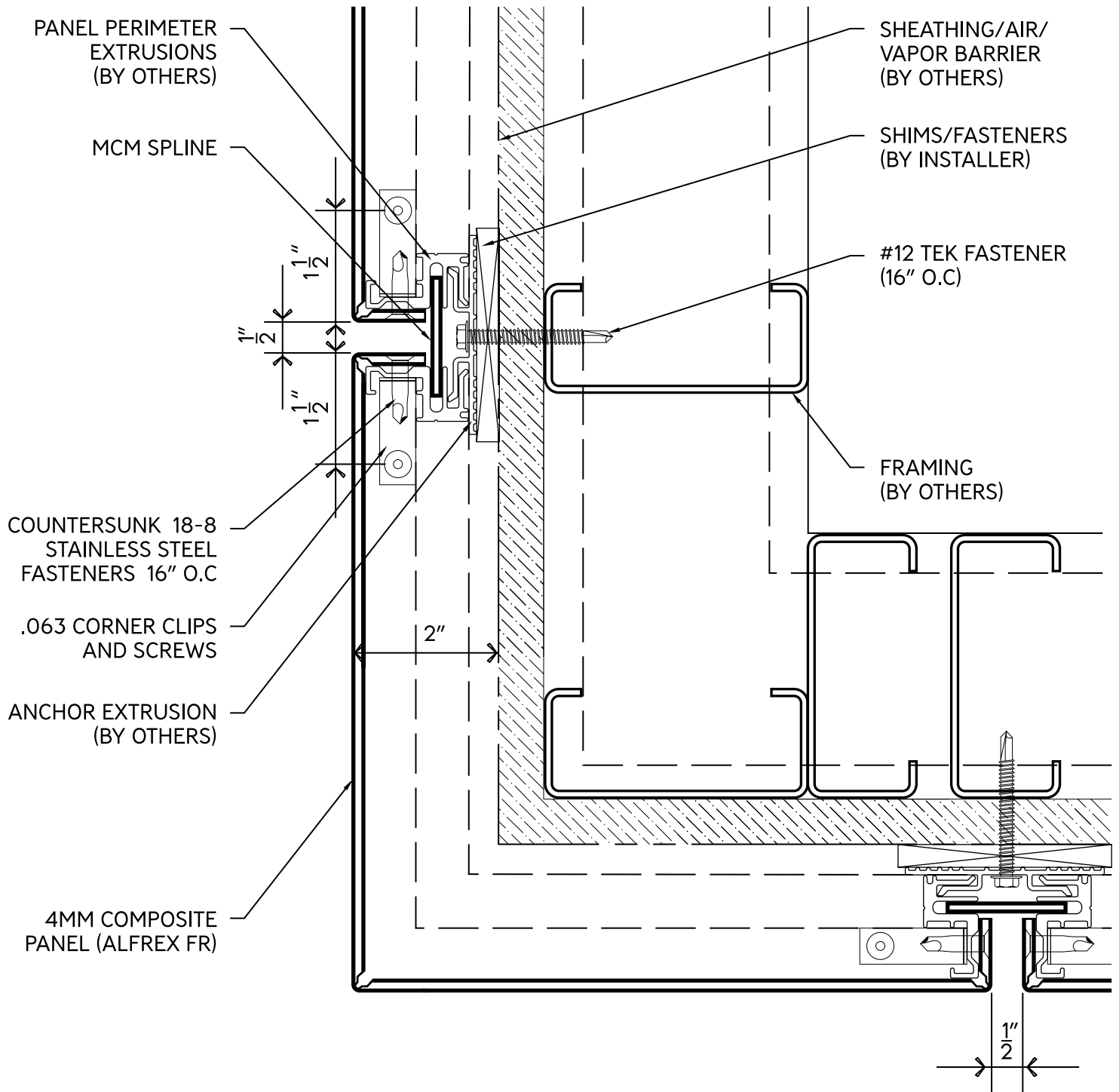
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OUTSIDE CORNER

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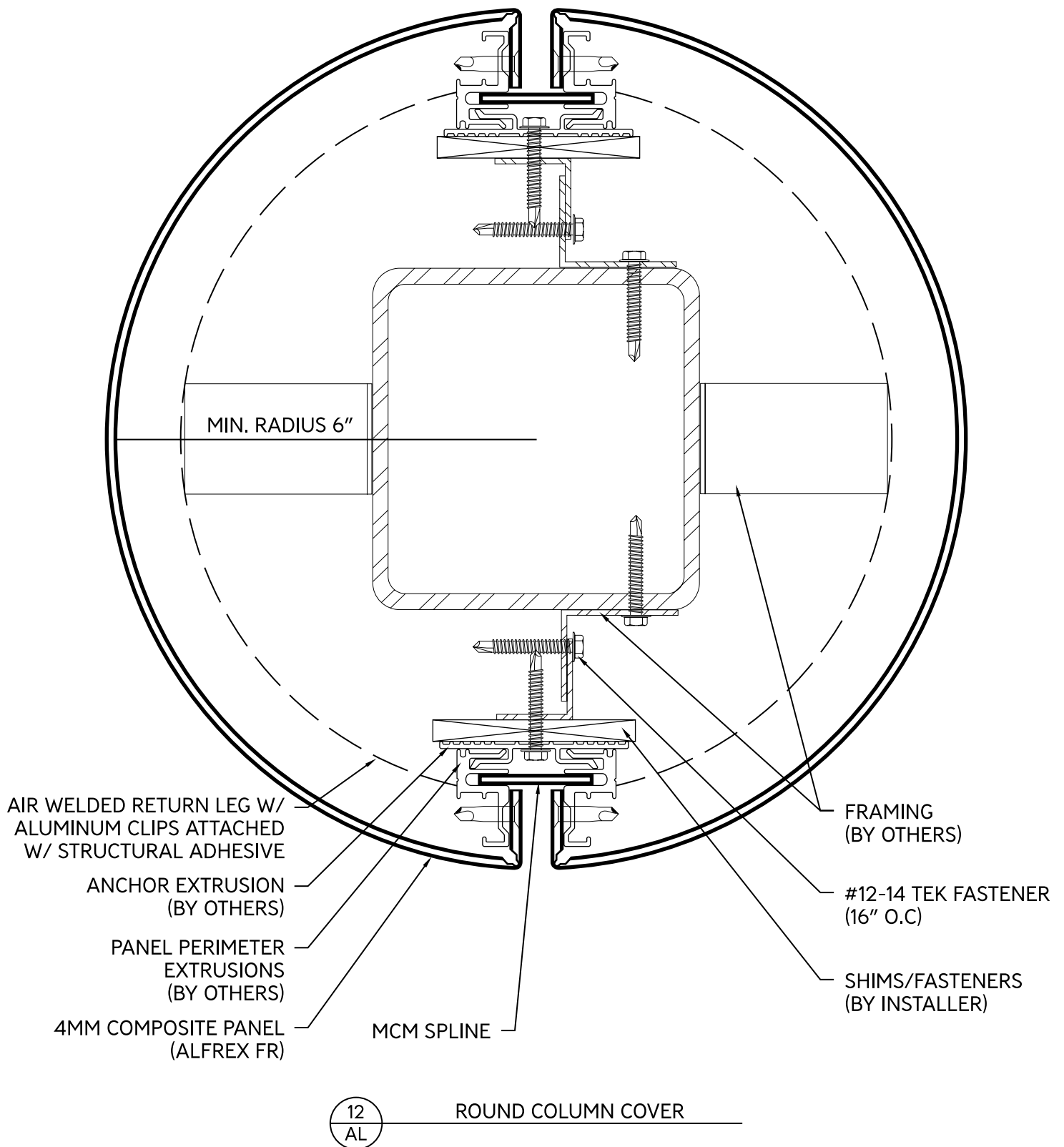
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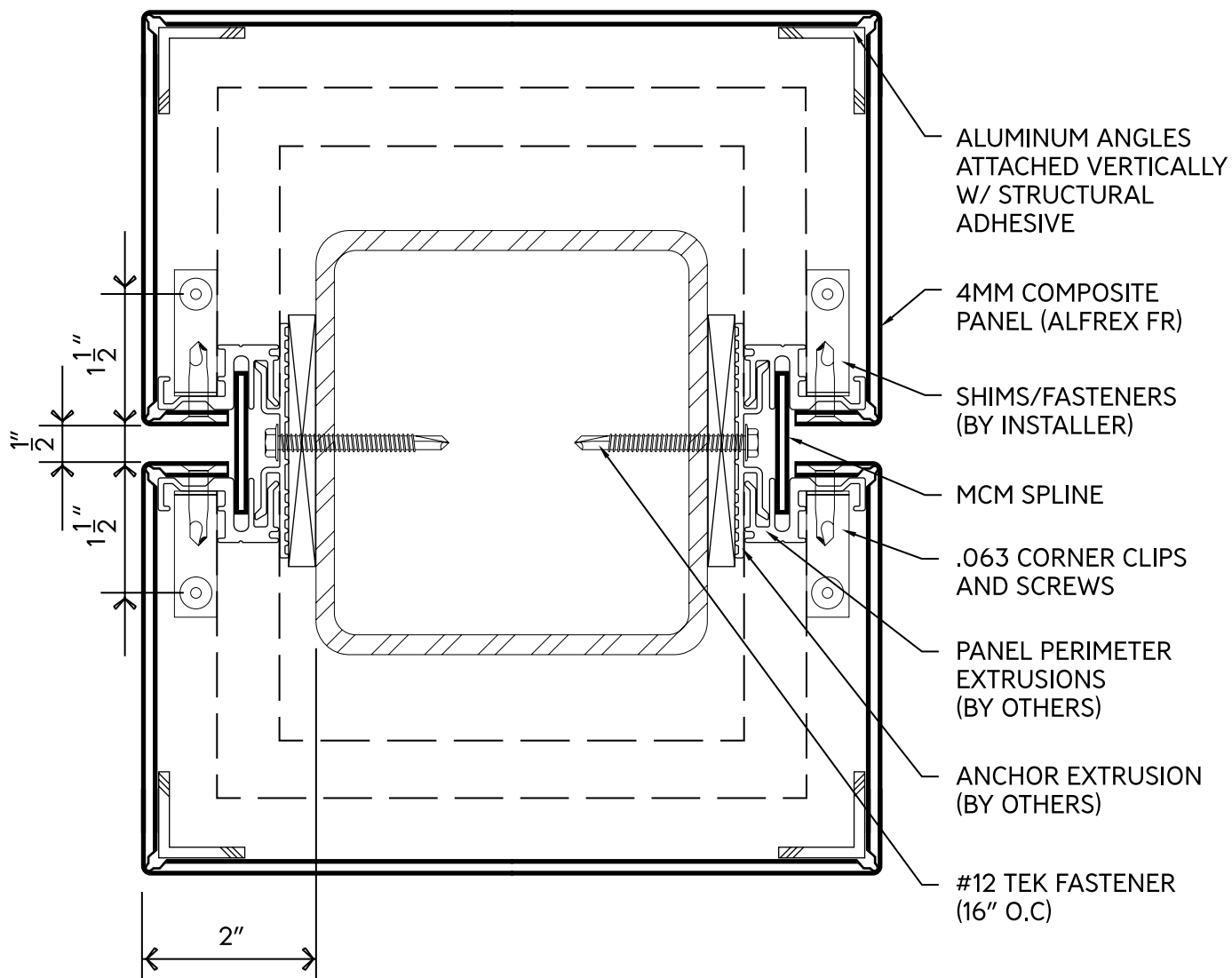
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SQUARE COLUMN COVER

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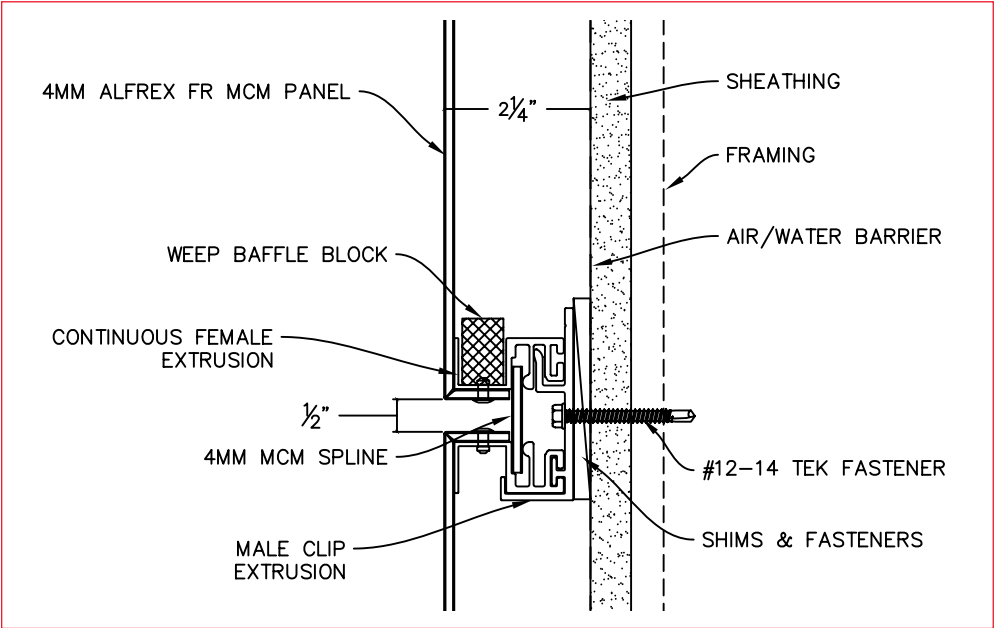
**GENERIC RAINSCREEN
SYSTEM APPLICATION**

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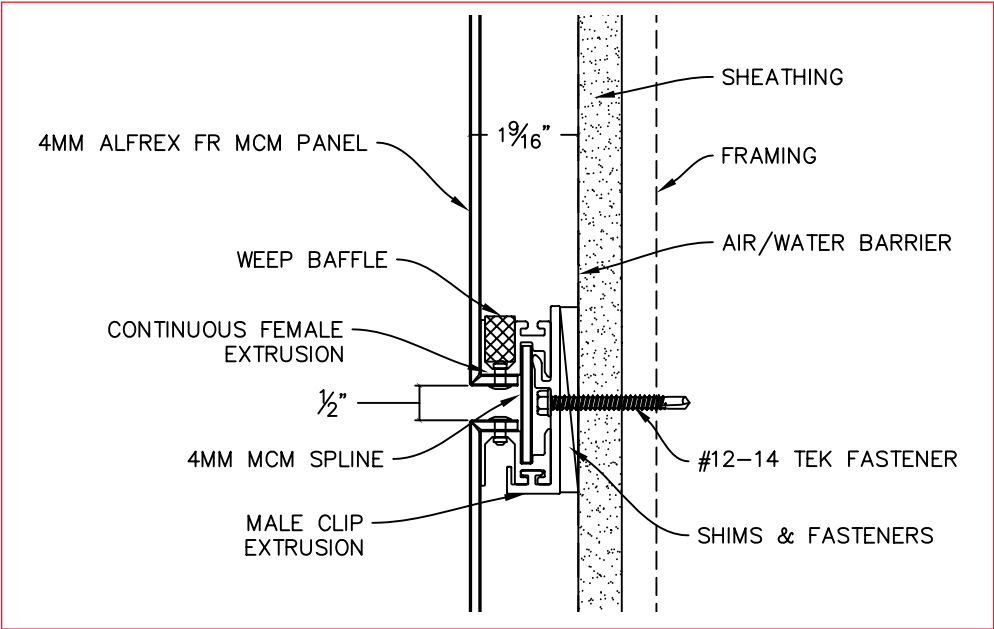
ACCU-TRAC® DS
 Pressure Equalized Rainscreen System



FULL DETAILS

TEST DATA

ACCU-TRAC® LOW PROFILE DS
 Back Ventilated Rainscreen System

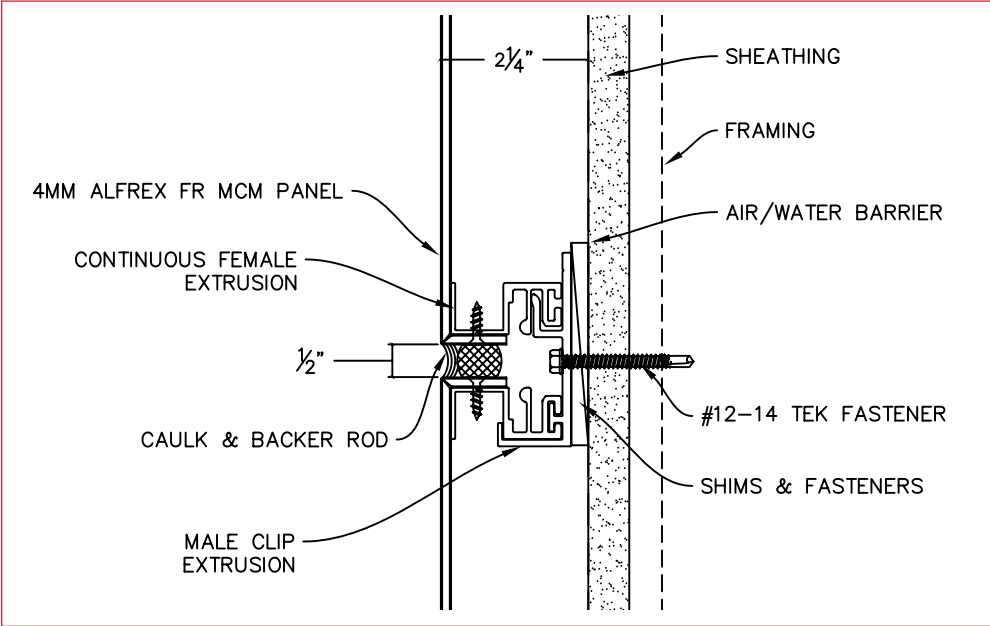


FULL DETAILS

DOCUMENTATION

The details below are provided for conceptual purposes only and are the property of Altech Panel Systems. Panel systems and assembly design, fabrication, and installation are provided by qualified fabricators and installers. Alfrex, LLC does not make any warranties, express or implied including merchantability and fitness for purpose.

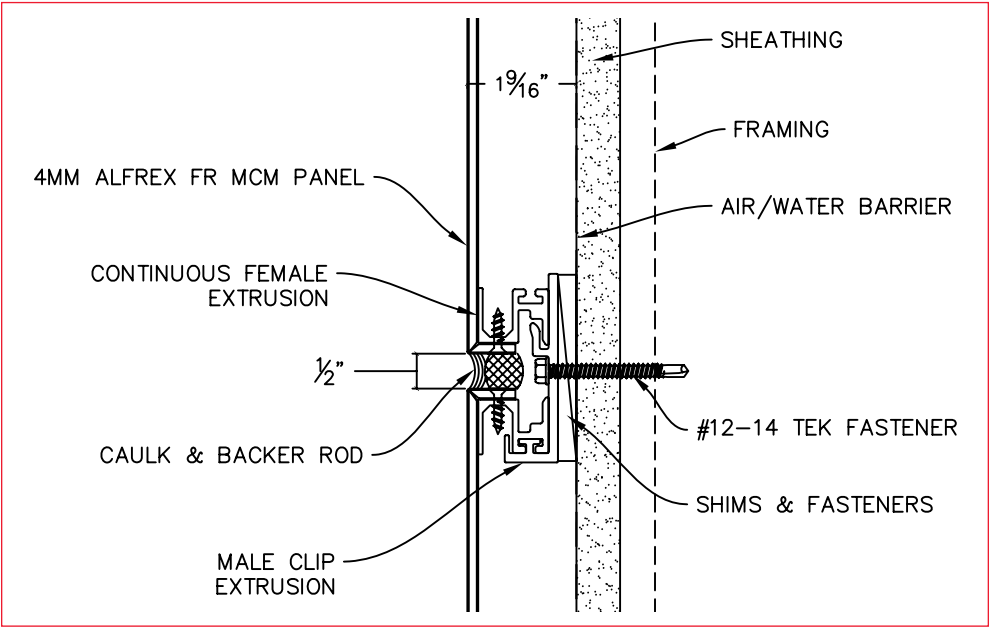
ACCU-TRAC® ES
 Route & Return Exposed Sealant System



FULL DETAILS

TEST DATA

ACCU-TRAC® LOW PROFILE ES
 Low Profile Route & Return Exposed Sealant System



FULL DETAILS

DOCUMENTATION

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ALFREX FR MCM SUPPORT DOCUMENTATION

THE DISADVANTAGES OF 6mm FR

Alfred FR Metal Composite Material



Fire Resistant & Non-Combustible Cladding

Alfred, LLC has taken the decision to neither actively offer nor promote 6mm FR MCM. We strongly feel 6mm FR provides no tangible advantages or benefits versus 4mm FR that justify the increased costs and risks which are detailed in the table below.

	6mm FR vs 4mm FR
MCM PANEL COST	<ul style="list-style-type: none">» 15% to 20% more expensive in price» 67% more core material required» 40% slower production line speed
MCM PANEL WEIGHT	<ul style="list-style-type: none">» 41% heavier than 4mm FR» 16.6% heavier than 1/8" aluminum plate
LABOR REQUIREMENTS	<ul style="list-style-type: none">» 50% increase in manpower required for handling and installation» 3 people minimum per panel vs 2 people for 4mm FR
TRANSPORTATION & PACKAGING	<ul style="list-style-type: none">» 23.6% less material can be shipped per truckload» 30% to 100% potential increase in costs
ALUMINUM STIFFENERS	<ul style="list-style-type: none">» Stiffeners are used to limit L/60 panel deflection for 4mm FR MCM» 6mm FR can reduce the quantity of stiffeners required by 40% - 50% but will not eliminate the need» Stiffeners are inexpensive off-the-shelf extrusions» Potential stiffener savings do not justify cost increases in panels, labor, packaging, and transportation
POCKET GLAZED CURTAIN WALL SYSTEMS	<ul style="list-style-type: none">» 6mm FR conveniently fits into 1/4" deep pocket-glazed curtain wall» 4mm FR is easily installed in the same with standard spacers» The extra labor required for 6mm FR does not justify the benefit
LIMITED PRODUCT AVAILABILITY	<ul style="list-style-type: none">» One domestic supplier actively promotes 6mm FR» Increased risk of longer lead times» Less competition = potential higher pricing» Higher risk in force majeure situation with only one manufacturer
NO TANGIBLE PERFORMANCE ADVANTAGES	<ul style="list-style-type: none">» No flatness advantage vs 4mm FR» Fire Performance Advantage - 6mm FR passes fire tests but contains 67% more core material, which is technically fuel content.
SPLINE PANEL JOINTS	<ul style="list-style-type: none">» Special extrusions are needed to accommodate 6mm FR versus the more common and readily available 4mm FR spline system

Alfred, LLC (Alfred FR aluminum composite and Alfred Plate panels are manufactured utilizing aluminum coils painted on continuous process coil coating lines. The high-quality architectural coatings used contain combinations of UV resistant resins, organic pigments, inorganic pigments, and protective clear coats engineered for long term exterior exposure in the elements and minimal maintenance.

Alfred recommends that panels be cleaned on a regular basis in order to maintain their aesthetic appearance and to prevent the accumulation of dirt and particulate present in the local environment. The frequency and degree of cleaning is dependent upon several factors including the building location, proximity to bodies of fresh water or the ocean, local climate, pollution levels, proximity to heavy industry, and overall air quality. A general practice is to clean panels at the same time a building's windows are cleaned.

General Recommendations

- Always avoid the use of abrasive materials that pose a potential to scratch or degrade the painted surface of panels including, but not limited to, steel wool, wire brushes, metal scrapers, abrasive sponges, powder abrasives, and chemical abrasives.
- Commence cleaning at the bottom of building walls and progress upwards, working in the opposite direction of window cleaning, which traditionally progresses from top to bottom.
- To avoid streaking, cleaning should be done either on a cloudy day, or when areas of the building to be cleaned are shaded from direct sunlight.
- Regardless of the cleaning method used, the methods and materials should be first tested on either a product sample, or on a small, inconspicuous section of the building.
- Always start with a freshwater rinse and progress to the other cleaning methods from mildest to strongest as needed.
- It is recommended that more frequent cleaning intervals utilizing freshwater and mild detergents be employed as opposed to less frequent intervals which may require the use of harsher chemicals, solvents, and mild abrasive methods.
- NEVER use Acetone or Paint Removers on any painted product surface.
- Utilize personal protection equipment and proper safety precautions when handling solvents and other chemical agents to prevent chemical irritation or burns to the eyes, skin, or lungs.
- Follow closely cleaning product or chemical manufacturer recommendations regarding the mixing of certain chemicals in order to avoid the production of toxic gases or explosive chemical reactions.
- Only apply cleaning solutions, chemicals, or solvent solutions in conditions where panels can be rinsed with freshwater before the cleaning solution can dry. NEVER allow cleaning solutions to dry on the panels.

Freshwater Rinse

- Frequent freshwater rinsing of panel surfaces is ideal for the removal of water-soluble dirt, residues, and other organic material deposits. Mechanical pressure washers should not be used as this may damage panels, coated surfaces, or components critical for the function of the panel assembly.
- Annual freshwater rinses may be mandatory as stipulated in finish warranties under certain environmental conditions, such as proximity to salt-water and ocean mist. Please consult warranties for specific details.
- If surface contaminants or stains persist after freshwater rinsing, then the utilization of mild detergents is recommended.

Mild Detergent Cleaning

- For more persistent areas requiring deeper cleaning, Alfred recommends that a 5% mild detergent solution diluted with freshwater be used and applied directly to the area using non-abrasive cloth, sponges, or soft bristle brushes.
- Mild detergents may be classified as those used in residential applications, commonly under popular brand names, which do not pose risks of irritation when coming in direct contact with exposed skin.

Intense Cleaning

- More intense cleaning methods may be required when mild detergent solutions are not successful in the removal of stubborn stains, or areas where non water-soluble contaminants such as paint, oils, tar, dirt, graffiti, silicone, or other sealing compounds are present.
- Alfred recommends that a solution of Mirachem® 500 diluted to a 10% to 30% concentration be used before other common solvents or chemicals. Follow the manufacturer guidelines as well as the same processes detailed above in the general recommendations, always followed by a freshwater rinse.
- Solvents that may be used include alcohol solvents (ethanol, isopropyl alcohol, methanol), petroleum solvents (Turpentine, mineral spirits), aromatic solvents (xylene, toluene), ketones (MEK, MIBK), and esters (ethyl acetate, lacquer thinner). NEVER use acetones or paint removers.

Alfred FR MCM is a coil coated metal wall cladding panel top side coated with a 70% PVDF / kynar resin finish. For situations requiring smaller quantities of a custom color, post-painting may be the only economically viable option. Post-painting should only be done by experience applicators with experience in proper preparation of architectural wall panels and application of coating systems for exterior applications

General Recommendations

- It is important to confirm with Alfred in advance if panels are to be post-painted and properly identify the type of coatings present. The backside of Alfred FR is typically coated with an epoxy finish suitable for post-painting. However, some finished goods may have a kynar resin finish present on each side out of design, or they may have been manufactured using remnant coils of various colors - a common practice.
- Before painting, it is highly recommended that spot testing be done on small sample panel, or in a small inconspicuous area to confirm if the preparation procedures and paint application achieve the desired color and adhesion levels required for long term exterior exposure.
- Surfaces must be properly prepared before post-painting and should be degreased, clean, dry, and free of dust, dirt, oils, or any other surface contaminants.
- Surfaces must be lightly abraded utilizing fine grade sandpaper or similar products. Special care must be taken to abrade the surface uniformly across the entire panel substrate without significantly decreasing its dry film thickness. Sanding should never expose aluminum.
- After abrasion, the panel surface should be thoroughly wiped clean to remove dust and other surface contaminants. Utilize soft cloth and epoxy resin compatible, solvent based cleaners.
- Though the abraded epoxy primer can serve as a post-paint primer, it is recommended that the panel surface be primer coated again. For sanded kynar resin finishes, compatible primers must be used to ensure proper prime coat finish adhesion. This is especially important for exterior applications where longer term UV performance, film integrity, and coating warranties extended by the post-painter are required.
- Both air-dry and baked on finishes should be spray applied by a professional finish applicator.
- It is recommended that the finish applicator be informed in advance of material, process, and compatibility concerns.
- Alfred FR MCM may be coated with air-dry finishes. Heat may be used to assist in the curing process but should not exceed temperatures of 140 °F (60 °C).

Exclusions

1. For any post-painted Alfred MCM product, all finish warranties for the top side coating are null and void. All other warranties, representations or guarantees, express or implied, written or oral, by operation of law or otherwise, including without limitation, the implied warranties of merchantability and fitness for a particular purpose are excluded.
2. Alfred does not offer finish warranties for post-painted finishes. All warranties must be provided by the finish applicator directly to the warantee.
3. All sales of Alfred products are subject to its General Terms and Conditions which may be found at www.alfrexusa.com in the downloads section.

EPOXY COATING PROPERTIES	
PROPERTY	RESULT
Color	Light Gray
Particle Size	Max 25µm
Gloss at 60 °	30 ± 5
Viscosity (sec)	100 ± 20 (F.C#4/25°C)
Density	1.3 ± 0.05
NVM (%)	62 ± 3
MEK Rubbing	Min 50
Flexibility	2T
Pencil Hardness	2H
Acid Resistance	No Blisters
Alkali Resistance	No Blisters
Boiling Water Resistance	No Blisters
S.S.T 200hrs	Plain Surface : No Blisters
	Cross Hatch Surface : Max 2mm

For minor applications of touch up paint to coil coated Alfred metal wall cladding products, it is recommended that one use a high-quality, air-dry PVDF / kynar resin product. Crosslink Paints in Dallas, Texas is a quality manufacturer of touch up paint well known in the metal wall panel and roofing industry. Their touch up paint products, color matching capabilities, and contact information may be found below. Crosslink Paints should be contacted directly for purchase of their products.

TOUCH UP PAINT PRODUCTS

- Touch Up Pens
- Liquid Bottle & Brush
- Aerosol Spray Can
- Paint Cans

COLOR MATCH CAPABILITIES

- RAL Standard Colors
- PPG Duranar (kynar, PvDF)
- PPG Corafon (FEVE)
- Sherwin Williams Fluoropon®
- Akzo Nobel
- Custom Matches

Company Contact Information

Crosslink Paints

11078 Morrison Ln

Dallas, TX 75229

Phone: 972-364-7839

Email: Sales@crosslinkpaints.com

Website: <https://www.crosslinkpaints.com>