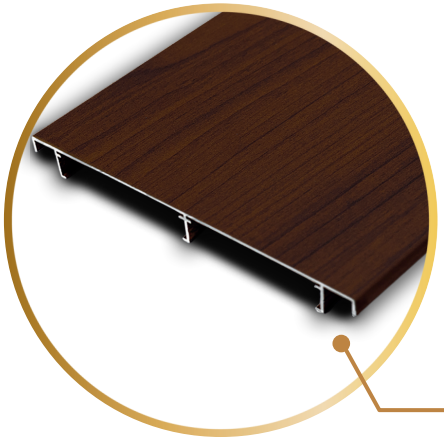
GTO ALUMINUM MANUFACTURING



ALUMINUM CLADDING

CLICK 120

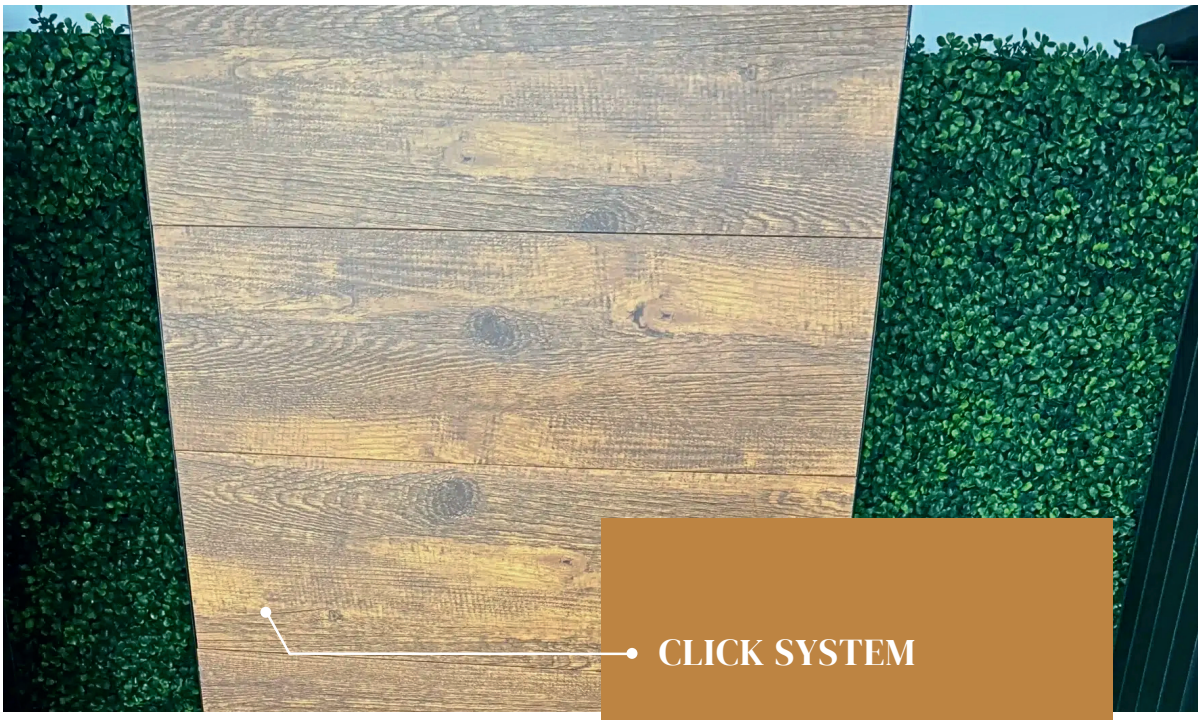
SUBMITTAL GUIDE

gtoaluminum.com

GTO ALUMINUM MANUFACTURING

Table of Contents

WELCOME!



CLICK SYSTEM

Snap-on installation with centimeter-wide gaps for an aesthetic look. Ideal for DIY enthusiasts, offering a quick and straightforward setup process.

Simply install the rails to the wall and easily just press & click on the aluminum profiles. Make sure to click it on, and not slide it in.

GTO ALUMINUM

Interior & Exterior Wall Cladding

GTO Aluminum is the leading innovator in Aluminum Cladding installation systems, profiles, and technology for both Interior & Exterior design.

A pioneer for both residential and commercial structures. Unlike anything else in the construction and design markets today!

A SUPERIOR PRODUCT

THAT GIVES CUSTOMER MORE OPTIONS

Using Aluminum is a better solution for an environmentally sustainable future. It does not rust or swell, its impervious to termites, its fire resistant, therefore great to cover the fireplace or BBQ walls for example, it also requires ZERO maintenance and can handle every climate type. Aluminum is 100% recyclable; that means Aluminum is a forever product. It is so long lasting that 75% of all aluminum ever created is still in use today! Remarkable.

Across all industries, innovators are looking to aluminum for greener, more sustainable solutions - and mostly cost efficiency.

- Does not rust or swell.
- Impervious to damage from pests such as termites.
- Fire-resistant. Safe to cover fireplaces
- 100% Recyclable & Enviromentally Sustainable.
- Includes lifetime warranty against water and pests.
- Does not require maintenance.

COLOR GUIDE

STANDARD

IN STOCK COLOR OPTIONS

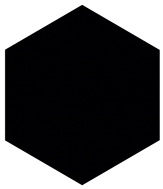

Gray


Espresso


Cedar


Pine


Hodge Wood


Toasted Walnut

CUSTOM

WALNUT COLLECTION


Cocoa


Grey Walnut


Dark Cherry


Toasted Walnut


Hodge Wood

GREECE COLLECTION


Natural Oak


Antique Oak


Teak

OAK COLLECTION


Warm Cedar

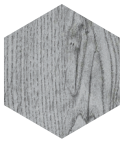

Birch


Rustic Chestnut

White Oak


Sandstone Oak


Warm Honeywood


Silver Ash


Urban Ash


Honey Wood


Bourbon Wood


Driftwood


Driftwood


Hickory Oak


Toasted Chestnut


Heritage Oak


Royal Oak

MORE WOOD COLLECTION


Tuscan Walnut


Cognac Ashwood


Rustic Pecan


Desert Eucalyptus


Sienna Timber


Golden Teak


Hazelnut

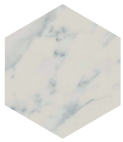

Chestnut


Burnt Chestnut

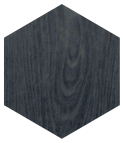

Warm Redwood

METAL & MARBLE COLLECTION


Rust


Marble

BLACK WOOD COLLECTION


Midnight Oak


Black Wood


Onyx Timber

CLICK 60

PRODUCT OVERVIEW

Description

Click 120 is the latest addition to the Click cladding category one of the wider profiles, measuring at 7.2"W x 0.047"T x 0.72"D x 19'L

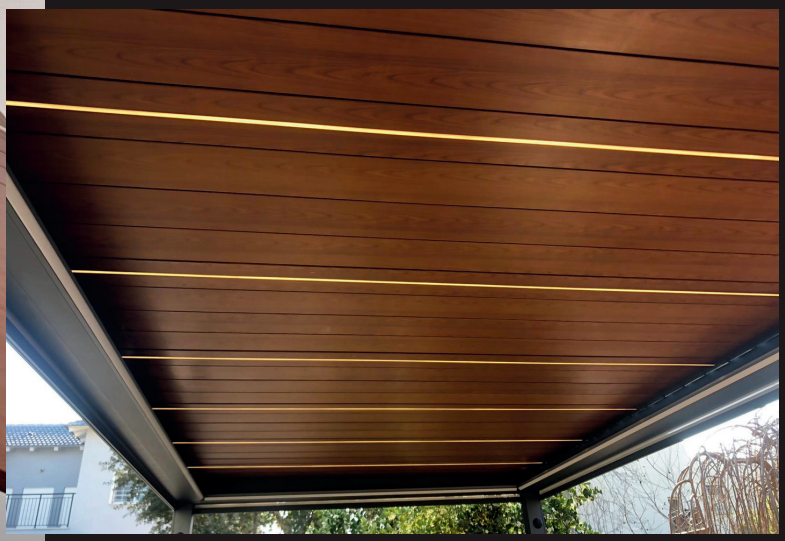
Ideal Applications:

These profiles offer an ideal solution for concealing cracks, peelings, and marks on walls without the necessity for additional wall treatment.

Key Features

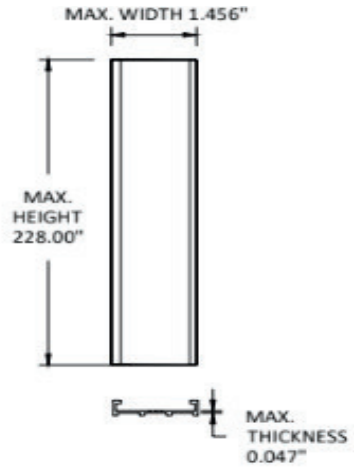
- Seamless installation with hidden fasteners.
- Available in a range of wood tones and custom colors.
- Engineered for durability in diverse climates.

Standard Color Options

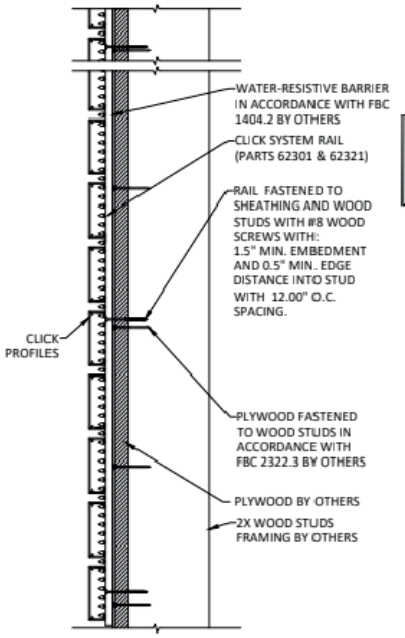


PRODUCT DETAILS &
SPECIFICATIONS

CLICK TRACK WITH RAIL PROFILE
ISOMETRIC RIGHT VIEW

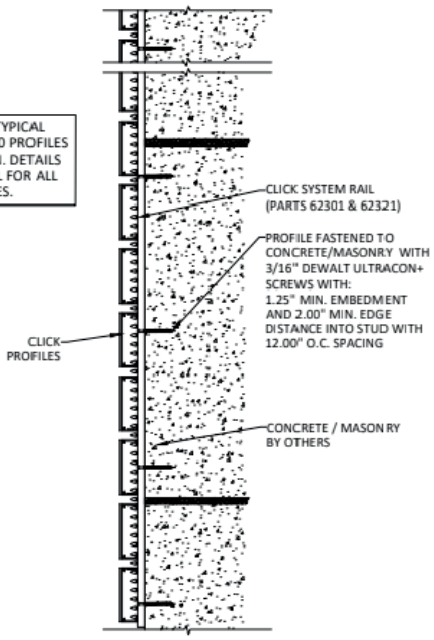


CLICK RAIL TRACK PROFILE
PART 32321

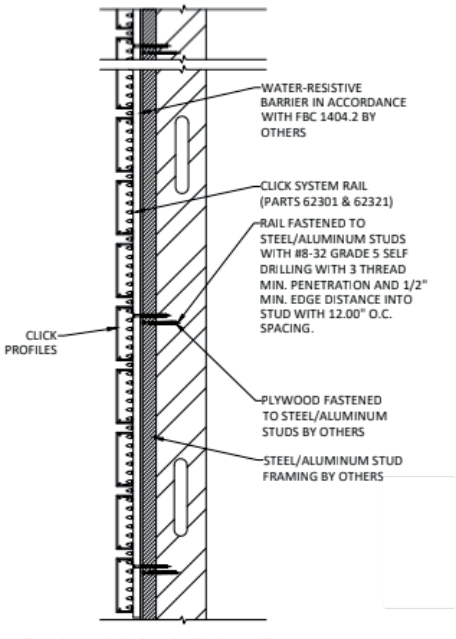


TYPICAL VERTICAL SECTION DETAIL
CLICK SYSTEM - 2X WOOD FRAMING INSTALLATION

NOTE: TYPICAL CLICK 60 PROFILES SHOWN. DETAILS TYPICAL FOR ALL PROFILES.

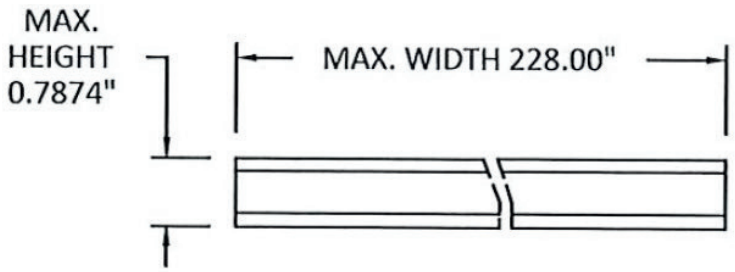


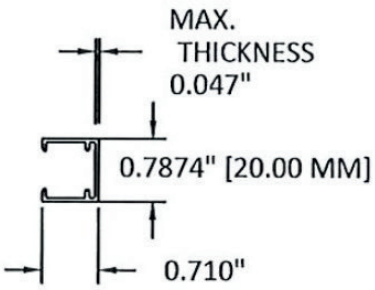
TYPICAL VERTICAL SECTION DETAIL
CLICK SYSTEM - CONCRETE/MASONRY INSTALLATION

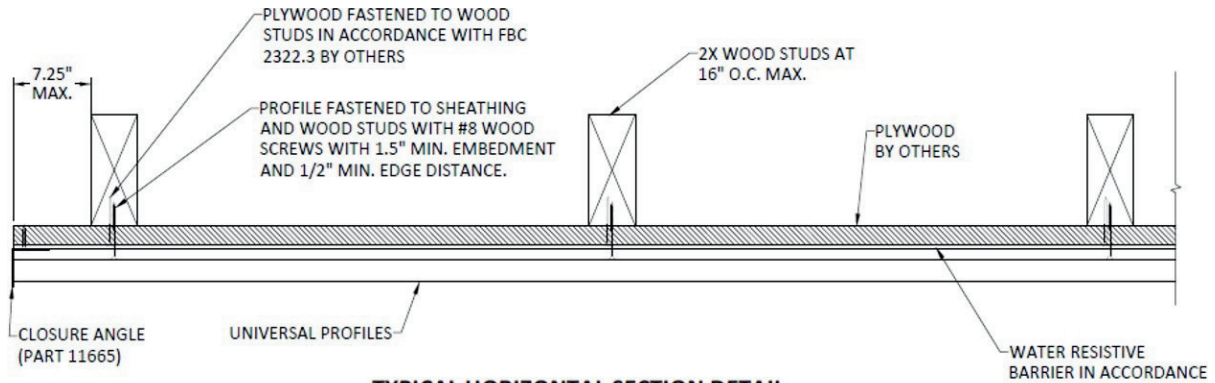


TYPICAL VERTICAL SECTION DETAIL
CLICK SYSTEM - STEEL/ALUMINUM STUD FRAMING INSTALLATION

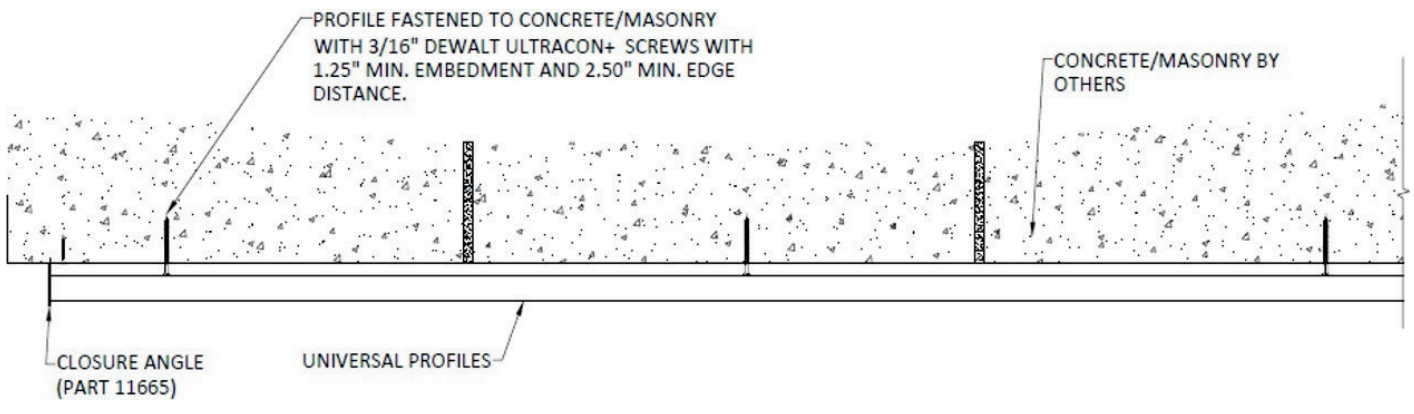
PRODUCT DETAILS &
SPECIFICATIONS



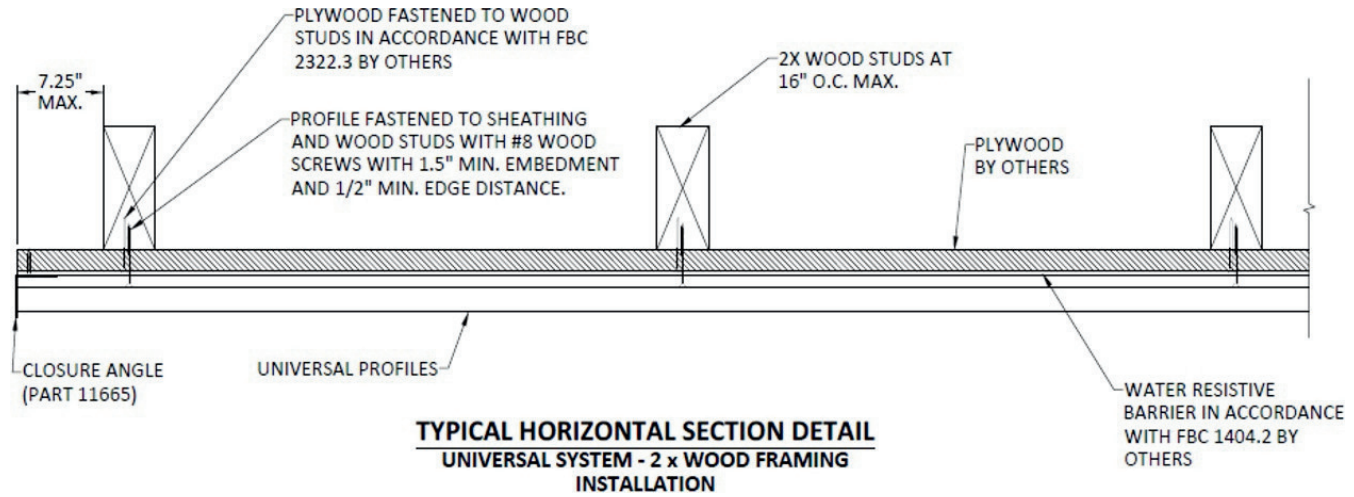




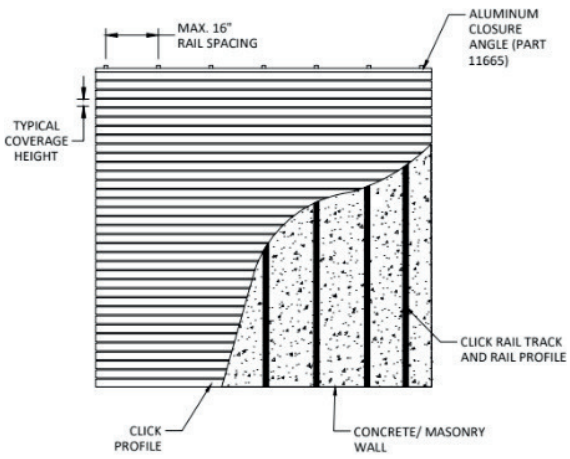
TYPICAL HORIZONTAL SECTION DETAIL
UNIVERSAL SYSTEM - 2 x WOOD FRAMING INSTALLATION



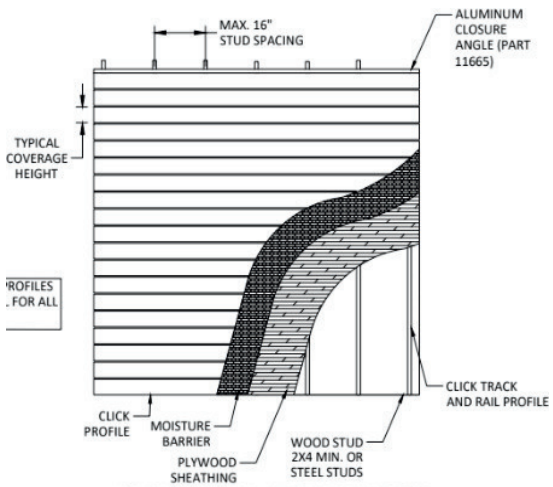
PRODUCT DETAILS &
SPECIFICATIONS



TYPICAL HORIZONTAL SECTION DETAIL
UNIVERSAL SYSTEM - 2 x WOOD FRAMING INSTALLATION



SIDING INSTALLATION ELEVATION
CLICK SYSTEM - MASONRY/CONCRETE WALL INSTALLATION



SIDING INSTALLATION ELEVATION
CLICK SYSTEM - PLYWOOD SHEATHING OVER 2X4 MIN. WOOD STUD OR STEEL/ALUMINUM STUDS

TECHNICAL DATA &
CERTIFICATIONS

Our products have successfully passed the rigorous TAS201, TAS202, and TAS203 testing as part of the Dade County NOA approval process.

It is essential to highlight that our products are engineered from the finest architectural grade extruded aluminum (6063-T5 alloy), known for its exceptional durability and rigidity. This non-combustible material boasts a Class A fire rating, ensuring maximum safety. The specifics of the aluminum alloy used are: 6063 Alloy in a T5 temper, with a robust thickness of 0.047 inches (Gauge 18) and finished with an electrostatic powder coating for a durable, sublimated surface.

EUROPEAN STANDARDS

- ISO 22479 — Resistance to humid atmospheres containing Sulphur dioxide
- ISO 9227 — Acetic acid salt spray resistance
- ISO 16474-2 — Solar box Accelerated weathering test
- ISO 2810 — Florida exposure Natural weathering test
- ISO 6270-2) — humidity chamber Constant climate condensation test
- ISO 9001 — Quality Management System
- ISO 14001 — Environmental Management System
- ISO 45001 — Occupational Health & Safety Management System
- ISO 50001 — Energy Management System
- ISO 4623-2 — Filiform corrosion test
- EN: 515
- EN: 573-3
- EN: 755-2
- EN: 755-9
- EN: 12020-2
- EN: 15088
- SUBLITEX — The Innovative Printing — Q-SUN XE-3 HS — Passed the Accelerated Weathering Test by SUBLITEX

QUALICOAT

- Quality Mark of Electrostatic Coating of Aluminum Surface according to the QUALICOAT Specification
- Quality Label for Powder Coated Aluminum Surfaces according to QUALICOAT Specification
- Decoration Quality Mark (Sub-color) Electrostatically Painted Aluminum Surface according to QUALIDECO specification
- Quality Label for Decoration (Sublimation) of Powder Coated Aluminum Surfaces according to QUALIDECO Specification QUALIMARINE
- Quality Mark for Electrostatic Painting of Aluminum Surface according to the French QUALIMARINE specifications
- Quality Label for Powder Coated Aluminum Surfaces according to the French QUALIMARINE Specifications QUALANOD
- Aluminum Surface Anodizing Quality Mark according to the QUALANOD Specification
- Quality Label for Anodized Aluminum Surfaces according to QUALANOD Specification

Certification and Powder Coating Mastery: Setting the Standard

QualiMarine® QUALICOAT SEASIDE

Our products are Qualicoat, Class 1 certified and have undergone rigorous testing for UV exposure and salt spray resistance. Most of our powder coat colors have been tested for 2000-3000 hours in a solar box and 1-3 years in Florida exposure tests.

Typically, this equates to 10-20 years of color resistance (with a 5% fade) and about 5 years of corrosion resistance within 5 kilometers of a beach. These are estimations based on test results, but it's important to note that our warranty does not extend to beachfront properties. For enhanced resistance in beachfront properties, we offer Qualimarin and Seaside Certified products, classified as Class 2. These are specifically designed for durability in marine or coastal environments.

They undergo a more intensive preparation process, including deeper acid or acid and alkaline dual etching, reaching 2 g/m2 (as opposed to the standard 1 g/m2), followed by a conversion layer that thoroughly seals the aluminum surface for superior corrosion protection. Class 2 certifications typically offer double the longevity compared to Class 1 products. However, they are also priced higher and require a 90-day lead time, in contrast to the standard 45 days for our regular offerings.

POWDER COATING WITH SUBLIMATION:

Sublimation & Unique Custom Color Process

·The sublimation or transfer technology consists of transferring an image previously printed on a specific film, to the aluminum profiles.

·Powder paints used as sublimation bases can be formulated with polyester or polyurethane resins.
·They must have both the ability to resist the sublimation temperature (190-200 °C) and to adequately absorb the inks transferred by the film.

THE PROCESS:

1)Base Application: The first step in the process is the base application the profiles to give them a colored base. The purpose in this is to create the right base tone to imitate the desired type of wood or the color of the thermo-print finish that is required.
Electrostatic paint is applied to the surface of the aluminum. The paints used are polyester or polyurethane resins. These finishes are highly resistant to UV rays, atmospheric agents, and corrosion.

2)Bagged: The ends of the profiles are protected with tape and placed in plastic film bags. These bags already have the wood pattern, or the established design printed on them using dyes.

3)Empty: Air is extracted from the bags through nozzles at the end of the bags, creating a vacuum. The profiles are revised so that the casing adjust to the geometry of the profile, eliminating the occluded air.

4)Sublimation: The profiles are introduced into an oven that is at a temperature between 190 and 220 C. Thesis where the sublimation effect on the aluminum occurs, passing the ink in the bag from a solid state to a gaseous state. After a few minutes, the coloring is transferred to the profile.

5)Withdrawal of the film: Air is introduced to the profiles in the bags do that the film can be removed, cooling them at the same time.

TECHNICAL DATA &
CERTIFICATIONS

Sustainability Information

UV & Accelerated Weathering Testing

- GTO Aluminum products undergo rigorous testing in a solar box for 2,000 to 4,000 hours, simulating approximately 20 years of real-world weather exposure.
- These tests include QUV accelerated weathering, a proven method for evaluating a coating's resistance to ultraviolet (UV) radiation and environmental conditions.

Testing Methodology

QUV Testing (QUV = "Quick UV"):

- Exposes samples to controlled UV radiation and moisture cycles (condensation or water spray).
- Simulates natural outdoor environments to accelerate degradation and assess long-term performance.
- Adjustable light intensity and wet/dry cycles replicate a wide range of climatic conditions.

Evaluation Criteria

- Following testing, samples are carefully evaluated for:
- Color shift and gloss retention
- Surface integrity, including chalking or cracking
- Coating adhesion and protective performance

Performance Expectations

- Color durability: Up to 10–20 years with no more than 5% fade under typical exposure conditions.
- Corrosion resistance: Up to 5 years within 5 km of coastal areas.
- These estimations are based on laboratory conditions and may vary depending on environmental factors.

Coastal Applications & Warranty Considerations

- Standard powder-coated finishes are not warranted for direct beachfront use.
- For projects in marine or coastal environments, GTO offers:
- Qualimarin® Certified Finishes
- Seaside Class 2 Certified Systems
- These options are engineered specifically for enhanced resistance in high-salinity, high-humidity conditions.

Enhancement Options

Sealing Edges and Joints

Ensure that the edges, joints, and other potential entry points for moisture are properly sealed and protected. – Use of Primers: Applying a corrosion-inhibiting primer before the topcoat can significantly reduce the risk of filiform corrosion. Primers often contain chromates or other inhibitors that provide additional protection.

TECHNICAL DATA &
CERTIFICATIONS

PART 1: GENERAL I.

1.1 RELATED SECTIONS

- **05 40 00** – Cold-Formed Metal Framing: Metal framing used to support aluminum cladding.
- **07 50 00** – Membrane Roofing: Used in conjunction with roof-related aluminum cladding.
- **07 60 00** – Flashing and Sheet Metal: Components used with aluminum siding.
- **07 46 16** – Aluminum Siding: Specifics for aluminum siding applications.
- **05 50 00** – Metal Fabrications: Involves metal workings that are necessary for structural supports and detailed metalwork integral to aluminum cladding installations.

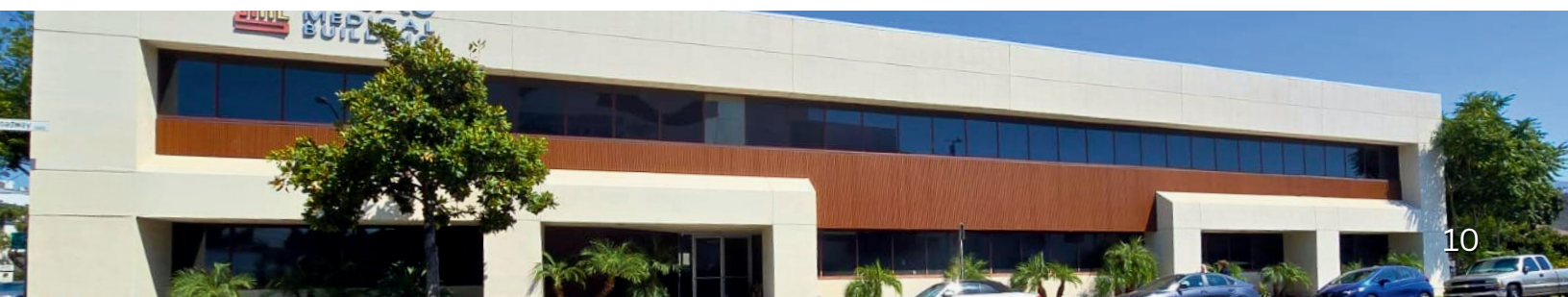
1.2 REFERENCES

- **Miami-Dade County NOA Approval (NOA No. 24-0408.05)**
  - Meets Florida Building Code and High-Velocity Hurricane Zone standards. Large and small missile impact resistant, ensuring durability in extreme weather.

- **Fire Safety Compliance**
  - ASTM E84-24 tested for surface burning characteristics.

- **Class A Fire Rating:**
  - Flame Spread Index (FSI): 0 (Highest fire resistance rating).
  - Smoke Developed Index (SDI): 35 (Universal 4+4) & 30 (Click 180).

- **ISO Standards**:
  - ISO 9001:2015 - Quality Management System.
  - ISO 14001:2015 - Environmental Management System.
  - ISO 45001:2018 - Occupational Health & Safety Management System.
  - ISO 50001:2018 - Energy Management System.



TECHNICAL DATA &
CERTIFICATIONS

PART 1: GENERAL II.

1.2 REFERENCES

- **European Standards / EU Standards:**
  - EN 515, EN 573-3, EN 755-2, EN 755-9, EN 12020-2, EN 15088:2005.
- **Testing and Performance Certifications:**
  - Resistance to humid atmospheres containing Sulphur dioxide (ISO 22479).
  - Acetic acid salt spray resistance (ISO 9227).
  - Accelerated weathering test (Solar box, ISO 16474-2).
  - Natural weathering test (Florida exposure, ISO 2810).
  - Filiform corrosion test (ISO 4623-2).
  - Q-SUN XE-3 HS – Accelerated Weathering Test by SUBLITEX.
  - AAMA 2605 - highest standard for powder-coated aluminum, ensuring durability and color retention in extreme environments.

1.3 SUBMITTALS

- Product data: Submit manufacturer's product literature, specifications, and data sheets.
- Samples: Submit duplicate samples of cladding material, of color and profile specified.
- Shop Drawings: Indicate dimensions, profiles, attachment methods, schedule of wall elevations, trim and closure pieces, soffits, fascia, and related work.
- Certifications: Submit proof of compliance with specified tests and standards.

1.4 WARRANTY

- Provide a 20-year limited warranty from the date of Substantial Completion covering manufacturing defects such as warping, corrosion, cracking, chalk resistance, and color retention. Warranty applies only to the original owner and is not transferable.

TECHNICAL DATA &
CERTIFICATIONS

PART 2: PRODUCTS

2.1 ALUMINUM CLADDING AND COMPONENTS

- **European Standards / EU Standards:**
  - Profile: Universal 4+4 - 4.72”W x 0.70”H x 19’L | 0.047” thickness
  - Material: 6063 Alloy, T5, powder-coated, 18 gauge.
  - Finish: Powder-coated in standard and custom colors.
  - Colors: Espresso, Oak, Pine, Gray, Charcoal Black, Gloss Black; custom colors available for large orders.

2.2 ACCESSORIES

- **Aluminum Furring Strips** - spaced every 24“-36”
  - **Ventilation**: The air gap created by the furring strips acts as a rainscreen, allowing moisture behind the cladding to dry and dissipating heat to reduce temperature buildup on the panels.
  - **Drainage**: Any excess water entering the system can drain downward through the gap, preventing water accumulation.
  - **Thermal Isolation**: The furring strips minimize direct heat transfer from the wall to the cladding, further limiting expansion.
  - **Flexibility**: The furring strips allow the cladding system to move slightly as a single unit, accommodating minor thermal expansion without causing stress points or buckling. By spacing the furring strips every 24inches, the panels are effectively divided into smaller sections. Each section undergoes less expansion compared to a single long, continuous panel, which helps prevent buckling.
  - **Recommended Tools**: Use a 96 teeth aluminum blade for cuts.

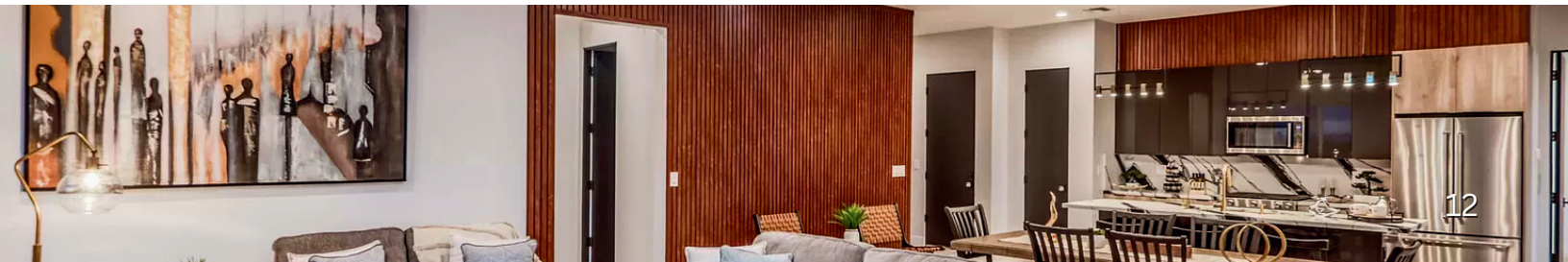
PART 3: EXECUTION

3.1 INSTALLATION

Install according to manufacturer’s instructions and approved shop drawings. Maintain joints true to line, tight-fitting, and with a seamless appearance.

3.2 CLEANING AND MAINTENANCE

Conduct freshwater cleaning and general maintenance quarterly. Use a soft cloth or brush with mild soap and warm water for routine cleaning. Avoid harsh chemical cleaners and maintain a log of all maintenance activities.



ICC-ES TEST REPORT

1.6 Witnessing

No representative of GTO Aluminum USA witnessed the testing reported herein.

1.7 Conditions of Testing

Unless otherwise indicated, all testing reported herein was conducted in a laboratory set to maintain temperature in the range of 65-80°F and humidity in the range of 45-60% RH. All test specimen materials were stored in the laboratory conditioning room of 73.4 ± 5°F and at a relative humidity of 50 ± 5% environment for no less than 24 hours prior to testing. The test specimens were conditioned for **16** days and obtained steady state.

2.0 ReferencedStandards

ASTM E84-24 Standard Test Method for Surface Burning Characteristics of Building Materials.

3.0 Summary of Results

Flame Spread Index – 0

Smoke Developed Index – 35

3.1 General

This fire-test–response standard for the comparative surface burning behavior of building materials is applicable to exposed surfaces such as walls and ceilings. This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

3.2 Test Specimens

The samples submitted by the manufacturer was identified as Universal 4+4 Cladding and was supplied in the form of (15) 0.047-in x 4.72-in x 288-in. They were received without damage.

ICC EVALUATION SERVICE®

3.3 Test Setup and Procedure

The product(s) were setup and evaluated in accordance with ASTM E84-24.

Substrate Used:	**N/A**
Mounting Method:	**Standard**
Support Used:	**Rods**
Side Exposed:	**Flat Side**
Adhesive Used & Coverage Rate (if Applicable):	**N/A**
Cement Board Used to Cover Sample (Y/N):	**Yes**
Sample Continuous or Sectioned:	**Sectioned**
No. & Size of Sections:	**(15) 0.047-in x 4.72-in x 288-in**
Lab Ambient Temp (°F):	**71**
Lab Ambient RH (%):	**27**
DateTested:	**1/24/2025**

ICC EVALUATION SERVICE®

3.4 Test Results

TEST DATA

Time to Ignition (mm/ss):	01:52
Maximum Flame Spread (ft):	0.000
Time to Max Flame Spread (mm/ss):	00:00
Maximum Temperature (°F):	499
Time to Max Temperature (mm/ss):	09:28
Total Fuel Burned (cubic feet):	45.007
Flame Spread*Time Area (ft*min):	0.000
Smoke Area (%A*min):	22.693
Unrounded FSI:	0.000
Unrounded SDI:	33.573

TEST OBSERVATIONS

01:35	Observed charring and discoloration
07:00	Observed charring on surface increasing

POST-TEST OBSERVATIONS

0 – 8 ft	Section was charred and discolored
8 – 16 ft	Section was slightly discolored
16 – 24 ft	Section was untouched

Analysis on Classification Criteria

Based on Flame Spread Index and Smoke Developed Index when tested in accordance with ASTM E84 or UL 723. Three classes of interior finish are specified by the International Building Code (IBC) that describes a set of classification criteria required for interior wall and ceiling finish materials. The classification criteria for all three model codes is the same: ASTM E84 and UL 723 do not include classification criteria for the results obtained from testing.

Class	Flame Spread Index	Smoke Developed Index
A	0-25	0-450
B	26-75	0-450
C	76-200	0-450

ICC EVALUATION SERVICE®

4.0 Closing Statement This report contains only findings and results arrived at after employing the specific test procedures listed herein. It does not constitute a recommendation for, endorsement of, or certification of the product or material tested. Unless differently required, ICC-ES reports apply the "Simple Acceptance" rule, also called "Shared Risk approach", of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity. ICC-ES makes no warranty, expressed or implied, except that the test has been performed, and a report prepared, based upon the specimen specified by the client. Extrapolation of data, from the test data provided herein, to the batch or lot from which the specimens were obtained may not correlate and should be interpreted with extreme caution. ICC-ES assumes no responsibility for variations in quality, composition, appearance, performance, or other features of similar materials produced by the client, other persons, or under conditions over which ICC-ES has no control. ICC-ES has issued this report for the exclusive use of the client to whom it is addressed. Any use or duplication of this report shall not be made without their consent. This report shall only be reproduced in its entirety.

For ICC-ES, LLC:

Brent Mynar

Tested by: Brent Mynar 01/27/2025
Project Manager

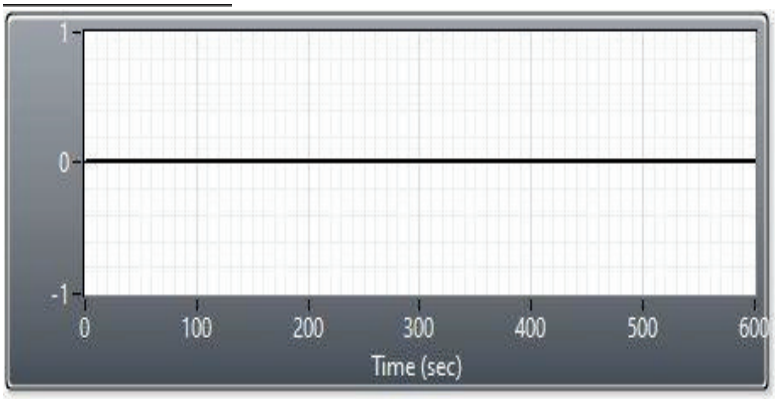
Gabriel Parra

Reviewed by: Gabriel Parra 01/27/2025
Project Engineer

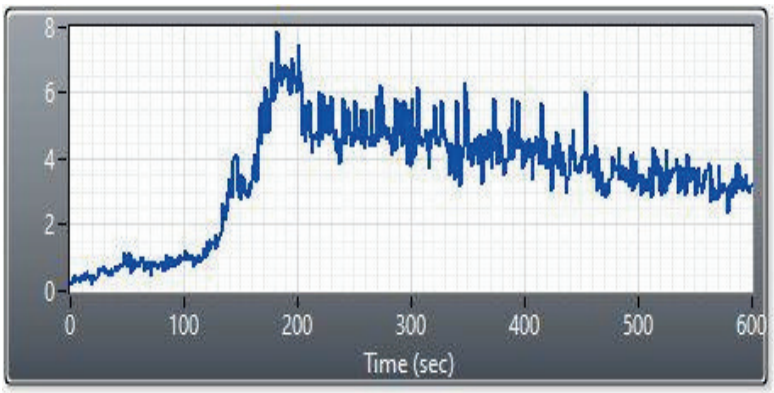
ICC EVALUATION SERVICE®

Appendix A - Data

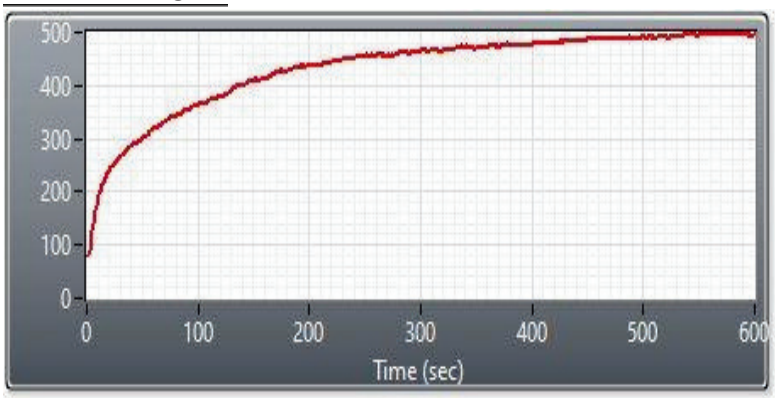
FLAME SPREAD



SMOKE (%A)



TEMPERATURE



TECHNICAL DATA &
CERTIFICATIONS

AMERICAN WOOD COUNCIL

#8 Wood Screw into Mixed Maple-Southern Pine w/ 0.1457 in. of Gap Space.
GTO Aluminum - Universal Aluminum Siding & CLICK Profile Siding System

Calculations herein are performed in accordance with the National Design Specification for Wood Construction - 2018, Chapter 12.3 and Technical Report 12 - General Dowel Equations for Calculating Lateral Connection Values, published by the American Wood Council

Wood Screw Type =	#8	Wood Screw	
Wood Screw Length =	1.75	in	
Wood Screw Embedment =	1.50	in	
Wood Screw Thread Length =	1.17	in	
D =	0.164	in	, Dowel Diameter
D_m =	0.131	in	, Dowel Diameter at max. stress in main member
D_s =	0.131	in	, Dowel Diameter at max. stress in side member
F_b =	90,000	psi	, Dowel bending strength

Wood Screw Withdrawal Calculations

Substrate:	Mixed Maple-Southern Pine		
Tabulated withdrawal design value:	W =	141	lbs
Penetration Factor:	C_p =	1.17	in
Duration Factor:	C_D =	1.60	

Withdrawal Allowable (W') = 263.0 lbs

Tension Design Value

Concrete Anchor Calculations				Masonry Anchor Calculations			
Fastener type:	3/16" DeWalt UltraCon+			Fastener type:	3/16" DeWalt UltraCon+		
Reference:	Manufacture Published Data			Reference:	Manufacture Published Data		
Substrate:	3000 PSI Concrete or Greater			Substrate:	Hollow Block CMU (Per ASTM C-90)		
Minimum embedment:	1.00	in		Minimum embedment:	1.25	in	
Minimum Spacing:	3.00	in		Minimum Spacing:	1.50	in	
Minimum edge distance:	2.50	in		Minimum edge distance:	2.00	in	
Allowable Design Value:	**W'=** 155	lbs /	anchor	**Allowable Design Value:**	**W'=** 150	lbs /	anchor

Minimum anchor capacity: 150 lbs / anchor

TECHNICAL DATA &
CERTIFICATIONS

AMERICAN WOOD COUNCIL

Determine Screwed Connection Tensile Capacity: #8-32 Gr. 5 Self-Drilling Screw

Limit states for screw connection in tension per 2020 Aluminum Design Manual,

J.5.4.2: Pull-Over

Design Tension Strength and Allowable Tension Strength Shall be determined as follows:

Φ = 0.5 (LRFD)

Ω = 3 (ASD buiiling-type structure)

Fastener Type: #8-32Gr. 5 Self-Drilling

J.5.5.1: Pull-Out

Thickness of member not in contact with head,	Le =	0.125	in.
Nominal diameter of the screw,	D =	0.164	in.
Threads per inch,	N =	32	per inch
Tensile yield of member not in contact with head,	Fty2 =	21000	psi
Tensile ultimate of member not in contact with head,	Ftu2 =	27000	psi
Thread stripping area of internal thread per thread,	TSA (I)	0.01	in.
Coefficient for design per 2015 ADM,	Ks =	1.2	(Not applicable for Le > 0.125)
Thread stripping area of internal thread per unit engaged,	Asn =	0.04	in.

Nominal pull out strength,

Use This Value	For 0.060in. ≤ Le ≤ 0.125 in.	Rn =	516.6	lbs
Not Applicable	For 0.125 in. < Le < 0.25 in.	Rn =	516.6	lbs
Not Applicable	For 0.25. ≤ Le < .375 in.	Rn =	78.3	lbs

Design Values,

ΦRn =	**258.3**	**lbs**
Rn/Ω =	**172.2**	**lbs**

J.5.5.2: Pull-Over

a) The nominal strength R_n for the limit state of pull-over for non-countersunk screws is:

$$R_n = C_{pov} t_1 F_{tu1} (D_{ws} - D_h) \qquad \text{(J.5-8)}$$

Coefficient for valley vs crown fastening,	Cpov =	1	
Nominal thickness of part in contact with screw head,	t1 =	0.0472	in.
Tensile ultimate of part in contact with screw head/washer,	Ftu1 =	27000	psi
Larger diam. of screw head or washer,	Dws =	0.438	in.
Nominal diameter of hole in material under screw head,	Dh =	0.1405	in.

Nominal Strength,

Rn =	379.134	lbs

Design Values,

ΦRn =	**189.567**	**lbs**
Rn/Ω =	**126.378**	**lbs**

TECHNICAL DATA &
CERTIFICATIONS

AMERICAN WOOD COUNCIL

E4.4.1 Pull-Out Stength: #8-32 Gr. 5 Self-Drilling Screw - Frame Installation

Reference: AISI Cold Formed Steel Specifications, E4.4.1

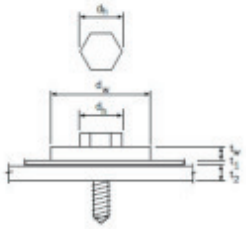
E4.4.1 Pull-Out Strength [Resistance]

The *nominal pull-out strength* [*resistance*], P_{not}, shall be calculated as follows:

$P_{not} = 0.85\, t_c\, d\, F_{u2}$ (*Eq.* E4.4.1-1)

Same formula is referenced in AAMA TIR A9-14 for thickness of 1/4" or less.

Figure 1: Typical Connection Detail



Where,				
Nominal screw diameter,	d =	0.164	in.	
Thickness of member in contact with screw head,	t1 =	0.051	in.	
Thickness of member not in contact with screw head,	t2 =	0.0478	in.	
Tensile strength of mem. not in contact with screw head,	Fu2 =	58000	psi	
Eq. E4.4.1	Pnot =	386.473	lbs	
Per ASD,	**Pns/Ω =**	**128.824**	**lbs, Ω =**	**3**
Per LRFD,	**ΦPns =**	**193.236**	**lbs, Φ =**	**0.5**

E4.4.2 Pull-Over Strength

Reference: AISI Cold Formed Steel Specifications, E4.4.2

Pnov = 1.5*t1*d'w*Fu1 (Eq. E4.4.2-1)

Where,				
Thickness of member in contact with screw head,	t1 =	0.0472	in.	
Tensile strngth of mem. in contact with screw head,	Fu1 =	27000	psi	
Effective Pullover Diameter,	d'w =	0.438	in.	
Eq. E4.4.2-1				
Per ASD,	**Pns/Ω =**	**279.094**	**lbs, Ω =**	**3**
Per LRFD,	**ΦPns =**	**418.64**	**lbs, Φ =**	**0.5**

Check Tensile Capacity of Screw,

#8-32 Gr. 5 Self-Drilling Screw,	D =	0.164	in.
	Pn/Ω =	**560**	**lbs, per AAMA TIR A9-14**

Design Value	**T=**	**128.824**	**lbs**

TECHNICAL DATA &
CERTIFICATIONS

BUILDING DROPS

Product Evaluation Report

Manufacture: Andersen Windows & Doors
Product : GTO Aluminum - Universal Aluminum Siding System & CLICK Profile Siding System

Manufacture Published Data

Ultimate and Allowable Load Capacities for UltraCon+ in Normal-Weight Concrete[1,2,3,4]

Nominal Anchor Diameter d in.	Minimum Embed. Depth h_nom in. (mm)	Minimum Edge Distance in. (mm)	Minimum Spacing in. (mm)	Minimum Concrete Compressive Strength											
				f'c = 2,500 psi (17.3 Mpa)				f'c = 3,000 psi (20.7 Mpa)				f'c = 4,000 psi (27.6 Mpa)			
				Ultimate		Allowable		Ultimate		Allowable		Ultimate		Allowable	
				Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16	1-3/4 (44)	1 (25)	1 (25)	1,080 (4.8)	305 (1.3)	270 (1.2)	75 (0.3)	1,145 (5.0)	325 (1.4)	285 (1.3)	80 (0.4)	1,245 (5.5)	325 (1.4)	310 (1.4)	80 (0.4)
	1-3/4 (44)		1-1/8 (29)	1,190 (5.2)	305 (1.3)	295 (1.3)	75 (0.3)	1,255 (5.5)	325 (1.4)	315 (1.4)	80 (0.4)	1,370 (6.0)	325 (1.4)	340 (1.5)	80 (0.4)
	1-3/4 (44)		2-1/4 (57)	1,365 (6.0)	600 (2.6)	340 (1.5)	150 (0.7)	1,440 (6.3)	635 (2.8)	360 (1.6)	160 (0.7)	1,570 (6.9)	635 (2.8)	395 (1.7)	160 (0.7)
	1 (25)		3 (76)	580 (2.6)	435 (1.9)	145 (0.7)	110 (0.5)	615 (2.7)	460 (2.0)	155 (0.7)	115 (0.5)	670 (2.9)	460 (2.0)	170 (0.7)	115 (0.5)
	1-3/8 (35)			815 (3.6)	455 (2.0)	205 (0.9)	115 (0.5)	860 (3.8)	485 (2.1)	215 (1.0)	120 (0.5)	940 (4.1)	485 (2.1)	235 (1.0)	120 (0.5)
	1-3/4 (44)		3-3/8 (86)	1,365 (6.0)	600 (2.6)	340 (1.5)	150 (0.7)	1,440 (6.3)	635 (2.8)	360 (1.6)	160 (0.7)	1,570 (6.9)	635 (2.8)	395 (1.7)	160 (0.7)
	1-3/4 (44)	2-1/2 (64)	1-1/8 (29)	1,465 (6.4)	1,200 (5.3)	365 (1.6)	300 (1.3)	1,550 (6.8)	1,265 (5.6)	390 (1.7)	315 (1.4)	1,690 (7.4)	1,265 (5.6)	425 (1.9)	315 (1.4)
	1-3/4 (44)		2-1/4 (57)	1,465 (6.4)	1,200 (5.3)	365 (1.6)	300 (1.3)	1,550 (6.8)	1,265 (5.6)	390 (1.7)	315 (1.4)	1,690 (7.4)	1,265 (5.6)	425 (1.9)	315 (1.4)
	1 (25)		3 (76)	580 (2.6)	640 (2.8)	145 (0.7)	160 (0.7)	615 (2.7)	680 (3.0)	155 (0.7)	170 (0.8)	670 (2.9)	680 (3.0)	170 (0.7)	170 (0.8)
	1-3/8 (35)			1,220 (5.4)	735 (3.2)	305 (1.4)	185 (0.8)	1,290 (5.7)	775 (3.4)	325 (1.4)	195 (0.9)	1,405 (6.2)	775 (3.4)	350 (1.6)	195 (0.9)
	1-3/4 (44)		3-3/8 (86)	1,465 (6.4)	1,200 (5.3)	365 (1.6)	300 (1.3)	1,550 (6.8)	1,265 (5.6)	390 (1.7)	315 (1.4)	1,690 (7.4)	1,265 (5.6)	425 (1.9)	315 (1.4)
1/4	1-3/4 (44)	1 (25)	1 (25)	1,265 (5.6)	340 (1.5)	315 (1.4)	85 (0.4)	1,360 (6.0)	370 (1.6)	340 (1.5)	95 (0.4)	1,525 (6.7)	370 (1.6)	380 (1.7)	95 (0.4)
	1-3/4 (44)		1-1/2 (38)	1,265 (5.6)	385 (1.7)	315 (1.4)	95 (0.4)	1,325 (5.8)	415 (1.8)	340 (1.5)	105 (0.5)	1,525 (6.7)	415 (1.8)	380 (1.7)	105 (0.5)
	1-3/4 (44)		3 (76)	1,720 (7.6)	420 (1.8)	430 (1.9)	105 (0.5)	1,850 (8.1)	450 (2.0)	465 (2.0)	115 (0.5)	2,075 (9.1)	450 (2.0)	520 (2.3)	115 (0.5)
	1 (25)		4 (102)	770 (3.4)	495 (2.2)	195 (0.9)	125 (0.6)	830 (3.7)	530 (2.3)	210 (0.9)	135 (0.6)	930 (4.1)	530 (2.3)	235 (1.0)	135 (0.6)
	1-3/8 (35)			1,105 (4.9)	640 (2.8)	275 (1.2)	160 (0.7)	1,190 (5.2)	690 (3.0)	300 (1.3)	175 (0.8)	1,335 (5.9)	690 (3.0)	335 (1.5)	175 (0.8)
	1-3/4 (44)			1,975 (8.7)	645 (2.8)	495 (2.2)	160 (0.7)	2,120 (9.3)	690 (3.0)	530 (2.3)	175 (0.8)	2,380 (10.5)	690 (3.0)	595 (2.6)	175 (0.8)
	1-3/4 (44)	2-1/2 (64)	1-1/2 (38)	2,200 (9.7)	1,590 (7.0)	550 (2.4)	400 (1.8)	2,365 (10.4)	1,710 (7.5)	590 (2.6)	430 (1.9)	2,650 (11.7)	1,710 (7.5)	665 (2.9)	430 (1.9)
	1-3/4 (44)		3 (76)	2,200 (9.7)	1,635 (7.2)	550 (2.4)	410 (1.8)	2,365 (10.4)	1,755 (7.7)	590 (2.6)	440 (1.9)	2,650 (11.7)	1,755 (7.7)	665 (2.9)	440 (1.9)
	1 (25)		4 (102)	805 (3.5)	1,260 (5.6)	200 (0.9)	315 (1.4)	865 (3.8)	1,355 (6.0)	215 (1.0)	340 (1.5)	970 (4.3)	1,355 (6.0)	245 (1.1)	340 (1.5)
	1-3/8 (35)			1,755 (7.7)	1,635 (7.2)	440 (1.9)	410 (1.8)	1,885 (8.3)	1,755 (7.7)	470 (2.1)	440 (1.9)	2,115 (9.3)	1,755 (7.7)	530 (2.3)	440 (1.9)
	1-3/4 (45)			2,290 (10.1)	1,635 (7.2)	570 (2.5)	410 (1.8)	2,460 (10.8)	1,755 (7.7)	615 (2.7)	440 (1.9)	2,650 (11.7)	1755 (7.7)	665 (2.9)	440 (1.9)

1. Tabulated Ultimate load values are for anchors installed in uncracked concrete. Concrete compressive strength must be at the specified minimum at the time of installation.
2. Allowable load capacities listed are calculated using an applied safety factor of 4.0. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
3. Linear interpolation may be used to determine allowable loads for intermediate compressive strengths.
4. For lightweight concrete multiply tabulated allowable load values by a reduction factor of 0.60.

MECHANICAL ANCHO
ULTRACON® + Concrete Screw Anchor

TECHNICAL DATA &
CERTIFICATIONS

BUILDING DROPS

Product Evaluation Report

Manufacture: Andersen Windows & Doors
Product : GTO Aluminum - Universal Aluminum Siding System & CLICK Profile Siding System

MECHANICAL ANCHORS

ULTRACON® + Concrete Screw Anchor

Ultimate and Allowable Load Capacities for UltraCon+ Anchors Installed in the Face of Hollow Concrete Masonry[1,2,3,4]

Nominal Anchor Diameter d in.	Minimum Embed. Depth h_{nom} in. (mm)	Minimum Edge Distance in. (mm)	Minimum End Distance in. (mm)	Minimum Spacing in. (mm)	Minimum ASTM C90 Block Type	Ultimate Load		Allowable Load	
						Tension lbs. (kN)	Shear lbs. (kN)	Tension lbs. (kN)	Shear lbs. (kN)
3/16	1-1/4 (32)"	1 (25)	2 (51)	1-1/2 (38)	Normal Weight	725 (3.2)	405 (1.8)	145 (0.6)	80 (0.4)
	1-1/4 (32)			3 (76)	Normal Weight	750 (3.3)	585 (2.6)	150 (0.7)	115 (0.5)
	1 (25)	2 (51)	2 (51)	1-1/2 (38)	Lightweight	300 (1.3)	460 (2.1)	55 (0.3)	90 (0.4)
	1 (25)			3 (76)	Lightweight	340 (1.5)	460 (2.1)	65 (0.3)	90 (0.4)
	1-1/4 (32)			1-1/2 (38)	Normal Weight	740 (3.3)	700 (3.1)	150 (0.7)	140 (0.6)
	1-1/4 (32)	2-1/2 (64)	2-1/2 (64)	1-1/8 (29)	Normal Weight	775 (3.4)	935 (4.1)	155 (0.7)	185 (0.8)
	1-1/4 (32)			2-1/4 (57)	Normal Weight	775 (3.4)	935 (4.1)	155 (0.7)	185 (0.8)
	1 (25)	3 (76)	3 (76)	1-1/2 (38)	Lightweight	385 (1.8)	670 (3.0)	80 (0.4)	135 (0.6)
	1 (25)	3 (76)	3 (76)	3 (76)	Lightweight	440 (2.0)	670 (3.0)	90 (0.4)	135 (0.6)
1/4	1-1/4 (32)	1 (25)	2 (51)	1-1/2 (38)	Normal Weight	775 (3.4)	475 (2.1)	155 (0.7)	95 (0.4)
	1-1/4 (32)			3 (76)	Normal Weight	775 (3.4)	800 (3.5)	155 (0.7)	160 (0.7)
	1 (25)	2 (51)	2 (51)	2 (50)	Lightweight	435 (1.9)	530 (2.4)	90 (0.4)	105 (0.5)
	1 (25)			4 (102)	Lightweight	495 (2.2)	530 (2.4)	100 (0.4)	105 (0.5)
	1-1/4 (32)			2 (51)	Normal Weight	760 (3.4)	740 (3.3)	150 (0.6)	150 (0.7)
	1-1/4 (32)	2-1/2 (64)	2-1/2 (64)	1-1/2 (38)	Normal Weight	800 (3.5)	1,200 (5.3)	160 (0.7)	240 (1.1)
	1-1/4 (32)			3 (76)	Normal Weight	880 (3.9)	1,450 (6.4)	175 (0.8)	290 (1.3)
	1 (25)	3 (76)	3 (76)	2 (51)	Lightweight	510 (2.3)	820 (3.6)	100 (0.4)	165 (0.7)
	1 (25)			4 (102)	Lightweight	580 (2.6)	820 (3.6)	115 (0.5)	165 (0.7)

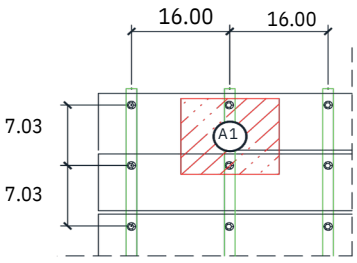
1. Tabulated load values are for anchors installed in minimum 8-inch-wide, Type II, light weight or normal weight concrete masonry units conforming to ASTM C90 that have reached the minimum designated ultimate compressive strength at the time of installation ($f'm \geq 2{,}000$ psi). Mortar must be Grade N,S or M..
2. Allowable load capacities listed are calculated using an applied safety factor of 5.0. Consideration of safety factors of 10 or higher may be necessary depending on the application, such as life safety or overhead.
3. Allowable shear loads into the face shell of a masonry wall may be applied in any direction.
4. The tabulated values are applicable for anchors installed into the ends of concrete masonry units (e.g. wall opening) where minimum edge distances are maintained

TECHNICAL DATA &
CERTIFICATIONS

BUILDING DROPS

Product Evaluation Report

Anchor Capacity Calculations: X - Universal 140 Profile



Size: 0.78 ft2

Design pressure:	70.0 psf

Zone	Area (ft2)
A1	0.78

Minimum Anchor Capacity per Substrate:			
Anchor Type	Tension Load Capacity		
#8 Wood Screw	26	lbs /	anchor
#8-32 Self-Drilling Screw	3	lbs /	anchor
3/16" ITW Tapcon	12	lbs /	anchor

Anchor Capacity Calculations: X - Universal 140 Profile

Design pressure:	70.0 psf

Zone	Area (ft2)	Tesnion Load (lbs)	Min. Anchor Capacities		
			Shear Cap. (lbs)	Tension Cap. (lbs)	Spacing (in)
A1	0.78		N/A		5.5

Installation:
Wood: Install #8 Wood Screw Anchors with 5.5" O.C. spacing on each stud.
Steel/ADM : Install #8-32 Self-Drilling Screw anchors with 5.5" O.C. spacing on each stud.
Concrete : Install 3/16" DeWalt Ultracon anchors at 3.00" Min. from the corners with 5.5" O.C. spacing.