

09

AL13™ Spec Sheet



AL13™
architectural
panel system



Vol 2

Version 1

www.al13.com

patent pending

 United States Patent
and Trademark Office

 London Design Patent
Registry Office



Standard Spec Sheet 1

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Part 1 GENERAL

1.1 SECTION INCLUDES

.1.1 Supply and installation of aluminum composite material (ACM) rain screen architectural wall panels with snap-lock tab-over attachment system and accessories as required to provide a rain screen panel wall system.

SPEC NOTE: List in 1.2 RELATED WORK only those specification sections that are directly referred to in the body of this section. If no other specification sections are referred to in the body of this section, then remove article in its entirety.

1.2 related work

- .2.1 [Section 03 30 00 - Cast-In-Place Concrete]
- .2.2 [Section 05 10 00 - Structural Steel Framing]
- .2.3 [Section 05 41 00 - Structural Metal Stud Framing]
- .2.4 [Section 06 10 00 - Rough Carpentry]
- .2.5 [Section 07 21 13 - Board Insulation]
- .2.6 [Section 07 25 13 - Modified Bituminous Air and Vapour Retarders]
- .2.7 [Section 07 62 00 - Sheet Metal Flashing and Trim]
- .2.8 [Section 07 92 00 - Joint Sealants]

1.3 References

- .3.1 Aluminum Association, Inc. (AA)
 - .3.1.1 DAF-45□03, Designation System for Aluminum Finishes.

.3.2 American Architectural Manufacturers Association (AAMA)

- .1.1.1 AAMA 508-07, Voluntary Test Method and Specification for Pressure Equalized Rain Screen Wall Cladding Systems.
- .3.2.1 AAMA 2605-11, Specification for Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.3.3 ASTM International (ASTM)

- .3.3.1 ASTM B221-12a, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .3.3.2 ASTM D903 – 98(2010), Standard Test Method for Peel or Stripping Strength of Adhesive Bonds.
- .3.3.3 ASTM D968 – 05(2010), Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
- .3.3.4 ASTM D2244-11, Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
- .3.3.5 ASTM D2794 – 93(2010), Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- .3.3.6 ASTM D3363 – 05(2011)e2, Standard Test Method for Film Hardness by Pencil Test.
- .3.3.7 ASTM D4214-12, Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films.



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- .3.3.8 ASTM E84-12c, Test Method for Surface Burning Characteristics of Building Materials.
- .3.3.9 ASTM E1354 – 11b Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- .3.4 Canada Green Building Council (CaGBC)
- .3.4.1 LEED Canada 2009 Rating System, LEED Canada for New Construction and Major Renovations. LEED Canada for Core and Shell Development.
- .3.5 Canadian Sheet Steel Building Institute (CSSBI)
- .3.5.1 CSSBI 20M-08, Standard for Sheet Steel Cladding for Architectural, Industrial and Commercial Building Applications.
- .3.5.2 CSSBI S8-08, Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.
- .3.6 International Organization for Standardization (ISO)
- .3.6.1 ISO 2360-03, Non-conductive coatings on non-magnetic electrically conductive basis materials - Measurement of coating thickness - Amplitude-sensitive eddy-current method.
- .3.7 Underwriters Laboratories of Canada (ULC)
- .3.7.1 ULC S135-04, Standard Test Method for the Determination of Combustibility Parameters of Building Materials Using an Oxygen Consumption Calorimeter (Cone Calorimeter), Includes Amendment 1

1.4 system description

.4.1 Architectural panel system comprised as follows:

- .4.1.1 Aluminum-faced [polyethylene core] [fire-rated mineral core] panels with high performance fluorocarbon finish coating.
- .4.1.2 Extruded aluminum panel frame and perimeter frame assembly, including back plates, inside and outside corner frames and end frames.
- .4.1.3 Formed aluminum panel spacers.
- .4.1.4 Adhesive tape for temporary adhesion of panels to framing prior to top cap installation.
- .4.1.5 Extruded aluminum snap-lock top cap with [high performance fluorocarbon] finish for final attachment of panels to frame assembly.

.4.2 Design Requirements

SPEC NOTE: Fill in design wind load requirement in accordance with applicable building code / building bylaw for project location and structure height.

- .4.2.1 Structural Design: Composite wall panel system capable of withstanding dead loads, wind loads, snow loads and normal thermal movement without evidence of buckling, oil canning or other permanent defects of assemblies or components.
 - .4.2.1.1 Dead Load: [] as required by applicable building code.
 - .4.2.1.2 Live Load: [] as required by applicable building code.
 - .4.2.1.3 Wind Load: Uniform pressure of [] kPA ([] psf) acting inward or outward.
- .4.2.2 General Panel Properties:

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- .4.2.2.1 Outdoor Temperature Resistance - ASTM D1654: No abnormality
- .4.2.2.2 Thermal Expansion - ASTM D696: $3.0 \times 10^{-5} / ^\circ\text{C}$
- .4.2.2.3 Thermal Deformation Temperature - ASTM D648: 115 $^\circ\text{C}$
- .4.2.2.4 Thermal Conduction - ASTM 976: 0.102 kcal/m.h $^\circ\text{C}$
- .4.2.2.5 Flexural Rigidity - ASTM C393: 14.0×10^{-5}
- .4.2.2.6 Impact Resistance - ASTM D732: 1650 kgf
- .4.2.2.7 Adhesive Strength - ASTM D903: 0.74 kgf/mm
- .4.2.2.8 Sound-Insulating Rate - ASTM E413: 29 dB
- .4.2.2.9 Flexural Elasticity - ASTM D790: 4055 kg/mm 2
- .4.2.2.10 Shear Resistance - ASTM D732: 2.6 kgf/mm 2
- .4.2.2.11 Minimum Bending Radius - ASTM D790: >300 mm
- .4.2.2.12 Fire Propagation - ASTM E84: Qualified
- .4.2.2.13 Smoke Developed - ASTM E84: <45
- .4.2.2.14 Wind-Pressure Resistance - ASTM E330: Passed
- .1.1.1.1 Properties Against Water - ASTM E331: Passed at 479 Pa
- .1.1.1.2 Properties Against Air - ASTM E283: 0.61 L/s/m 2
- .1.1.1.3 Pressure Cycling – ASTM E1288: passed 100 cycles

.4.2.3 Fire Resistance:

- .4.2.3.1 Passed:
 - .4.2.3.1.1 Average total heat release - ASTM E1354: $\leq 0.1 \text{ MJ/m}^2$;
 - .4.2.3.1.2 Average total smoke extinction - ASTM E1354: $\leq 1.0 \text{ m}^2$;
 - .4.2.3.1.3 Test duration - ASTM E1354: ≥ 920 seconds.

.4.2.4 High Performance Fluorocarbon Finish Coating:

- .4.2.4.1 Minimum Thickness - ISO 2360: 27 micrometers
- .4.2.4.2 Gloss - ASTM D523: 20-45%
- .4.2.4.3 Pencil Hardness - ASTM D3363: 2H
- .4.2.4.4 Toughness - ASTM D4145: 2T no rift
- .4.2.4.5 Adhesive Force - ASTM D3359: 4B
- .4.2.4.6 Impact Resistance - ASTM D2794: >100 kg.cm
- .4.2.4.7 Abrasion Resistance - ASTM D968: 64.6 L/mil
- .4.2.4.8 Mortar Resistance - ASTM 605.2: 24 hrs no blister
- .4.2.4.9 Humidity Resistance - ASTM D714: 3000 hrs no blister
- .4.2.4.10 Boiling Water Resistance - ASTM D3350: passed
- .4.2.4.11 Salt-Spray Resistance - ASTM C117: 3000 hrs no blister
- .4.2.4.12 Acid Resistance - ASTM D1308: No effect
- .4.2.4.13 Alkali Resistance - ASTM D1308: Passed
- .4.2.4.14 Solvent Resistance - ASTM D2248: Passed
- .4.2.4.15 Colour Retention - ASTM D2244: $\Delta E = 0.34$
- .4.2.4.16 Chalk Resistance - ASTM D4214: No chalking
- .4.2.4.17 Gloss Retention - ASTM D2244: >80 percent



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1.5 LEED CREDIT CONTRIBUTIONS

.5.1 Provide required information in accordance with Section 01 33 00 – Submittal Procedures.

.5.2 Coordinate LEED project and submittal requirements with Section 01 35 11 - LEED Requirements.

.5.3 MR Credit 2[.1] [.2] – Construction Waste Management:

.5.3.1 Content: Reduce the amount of construction waste materials going to landfill by using more efficiently sized materials; a minimum of [50%] [75%] by weight of construction waste materials must be diverted from landfill disposal; larger panel products having fewer off cuts may contribute to the required content.

.5.3.2 Compliance Requirements: Submit calculations indicating reduction in waste materials by comparing amount of waste arising from using standard panel products compared to larger panel products; products that use less packaging will be given preference over products that provide standard packaging.

.5.3.3 Coordinate waste management requirements with Section 01 74 21 □ Construction/Demolition Waste Management and Disposal.

.5.3.4 Remove from site and dispose of packaging materials at appropriate recycling facilities, as follows:

.5.3.4.1 Divert unused metal materials from landfill to metal recycling facility.

.5.3.4.2 Divert unused wood materials from landfill to recycling or composting facility.

.5.3.4.3 Divert unused coating materials and caulking material from landfill to official hazardous material collections site; do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

1.6 Submittals

.6.1 LEED Submittals: Coordinate LEED submittal requirements with Section 01 35 11 - LEED Requirements.

.6.2 Product Data: Submit manufacturer's product data, standard drawing details, installation instructions and Material Safety Data Sheets (MSDS) for system and individual components.

.6.3 Submit shop drawings in accordance with Section 01 33 00 – Submittals:

.6.3.1 Indicate layout, profiles and product components including anchorage, accessories, finish colours and textures.

.6.3.2 Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of movement joints.

.6.4 Colour Charts: Submit panel manufacturer's colour charts showing full range of standard colours and finishes.

.6.5 Close-out Submittals: Upon project completion, submit manufacturer's warranties, including limitations and conditions. Coordinate LEED Close-out Submittal requirements with Section 01 35 11 □ LEED Requirements.

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1.7 Quality Assurance

- .7.1 Coordinate requirements with Section 01 45 00 - Quality Control.
- .7.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .7.3 Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions, and manufacturer's warranty requirements.
SPEC NOTE: Edit required pre-installation meeting participants in the article below to meet project-specific requirements.
- .7.3.1 Participants: General Contractor, installation subcontractor, [Construction Manager,] [Owner,] [Consultant], [Architect,] and [Engineer].
- .7.3.2 Review wall framing for potential interference and conflicts; coordinate layout and support provisions for interfacing work.
- .7.3.3 Review construction schedule and confirm availability of products, installation personnel, equipment and facilities.
- .7.3.4 Review regulatory, insurance and certification requirements.
- .7.3.5 Review field quality control procedures.
- .7.4 Mock-Ups: Mock up complete system at location as directed by [Consultant] [Architect] [Engineer].
- .7.4.1 In mock-up, demonstrate prepared substrate, support/attachment framing, panel façade, exterior finishes and aesthetic appearance.
- .7.4.2 Verify mock-up as conforming to manufacturer's instructions and provisions of Contract Documents.
- .7.4.3 Do not commence work of this Section until after mock-up has been accepted in writing by [Consultant] [Architect] [Engineer].
- .7.4.4 Protect and maintain accepted mock-up as standard of quality for work of this Section.
- .7.4.5 Accepted mock-ups may be incorporated into the work of this Section.

1.8 Delivery, Storage and Handling

- .8.1 Ordering: Conform to manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- .8.2 Deliver materials and components in manufacturers' unopened containers or bundles, fully identified by name, brand, type and grade. Prevent damage during unloading, storing and installation.
- .8.3 Store, protect and handle materials and components in accordance with manufacturer's recommendations to prevent twisting, bending, mechanical damage, contamination and deterioration.
- .8.4 Store materials off ground and keep clean, dry, and free of dirt and other foreign matter.

1.9 Project/Site Conditions

- .9.1 Field Measurements: Verify location of structural members and openings in substrates by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work

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.9.2 Undertake installation work only when weather conditions meet manufacturers' specific environmental requirements and when conditions will permit work to be performed in accordance with manufacturer recommendations and warranty requirements.

1.10 WASTE MANAGEMENT AND DISPOSAL

.10.1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.11 Warranty

.11.1 Manufacturer's Product Warranties:

.11.1.1 Panel System: 15-Year Limited Product Warranty against physical defects of systems and products that are properly installed and maintained according to the manufacturer's published application instruction.

.11.1.2 Finish Coating: 25-Year Limited Finish Warranty against the following:

.11.1.2.1 Peeling and checking of finish, except slight crazing or cracking as may occur on tightly roll-formed edges or brake bends at time of forming.

.11.1.2.2 Chalking of exterior paint in excess of 8 when measured in accordance with ASTM D4214

.11.1.2.3 Fading or colour change in excess of 5 colour difference units when measured in accordance with ASTM D2244 on exposed painted surfaces.

.11.1.3 Contractor's Labour Warrantys: [1-year] [2-year] labour warranty, starting from [date of Owner acceptance of completed work][Substantial Performance], to cover repair of materials found to be defective as a result of installation errors.

Part 2 Products

2.1 Manufacturer

.1.1 AL13 Architectural™ Panel Systems, 827 Cambie Street, Vancouver, BC Canada, V6B 2P4
Tel: (604) 428-2513 or 1-855-438-2513, www.al13.ca.

2.2 Architectural Panels

.2.1 Aluminum-faced composite architectural panels:

.2.1.1 Panel Size[s]: [1220 mm x 2440 mm (4 feet x 8 feet)].

.2.1.2 Panel Thickness: 3 mm (0.12 inch).

.2.1.3 Core Material: [polyethylene] [fire-rated mineral core (non-combustible)].

SPEC NOTE: First option below applied to PE panels; second option applies to FR panels.

.2.1.4 Panel Weight: [4.6 kg/m² (0.94 lb/ft²)] [6.3 kg/m² (1.29 lb/ft²)]

.2.1.5 Aluminum face sheets: AA A3003-H24 Alloy, 0.5 mm (0.020 inch) thickness.

.2.1.6 Finish: fluorocarbon coating per AAMA 2605.

.2.1.7 Colour: [as selected by Owner from manufacturer's standard finish guide] [custom colour matched].

.2.1.8 Acceptable Materials:

.2.1.8.1 AL13™ Architectural Panels as manufactured by Anenda Systems Inc.



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2.3 ATTACHMENT FRAMING

.3.1 Girts: Fabricated from minimum 1.27 mm thickness galvanized steel to ASTM A653, Grade 230 with Z275 coating. Material visible after assembly of wall panel shall be finished to match aluminum panels.

.3.2 Subgirts: Structural quality steel to ASTM A653, with Z275 zinc coating to ASTM A792, adjustable double-angle profile as indicated to accept panel with structural attachment to building frame.

.3.2.1 Back Plates, Corner Frames and End Frames: AA 6063-T5 extruded aluminum, wall thickness 1.27 to 1.524 mm (0.050 to 0.060 inches).

.3.2.2 Panel Spacers: AA 3105-H24 aluminum; 0.56 mm (0.022 inch) thickness.

.3.2.3 Panel Joint Top Caps: AA 6063-T5 extruded aluminum snap-lock top cap providing 12.7 by 8.255 mm (0.5 by 0.325 inch) reveal.

.3.2.4 Coating: High performance fluorocarbon finish.

.3.2.5 Colour: [as selected by Owner from manufacturer's finish guide] [custom colour matched].

.3.2.6 Acceptable Materials:

.3.2.6.1 As recommended by manufacturer.

2.4 Accessories

.4.1 Foam Adhesive Tape: Acrylic foam adhesive tape for temporary adhesion of panels to framing prior to top cap installation.

.4.1.1 Acceptable Material: AL13™ Adhesive Tape as manufactured by Anenda Systems Inc.

.4.2 Fasteners:

SPEC NOTE: Retain fastener article appropriate to substrate; delete those that do not apply.

.4.2.1 Attachment of Panel System to Steel Substrate: Number 10-16 self-drilling, self-tapping screws with corrosion-resistant coating.

.4.2.1.1 Acceptable Materials:

.4.2.1.1.1 TEK #10-16 with Silver Climaseal coating as manufactured by ITW Buildex.

.4.2.2 Attachment of Panel System to Wood Substrate: Number 12 drill-point fasteners with EPDM washers and corrosion-resistant coating.

.4.2.2.1 Acceptable Materials:

.4.2.2.1.1 #12 Master Gripper Mini Drill Point fasteners with EPDM washers and DT2000 coating as manufactured by Leland Industries.

.4.2.3 Attachment of Panel Systems to Concrete Walls: 4.7 mm (3/16 inch) with corrosion-resistant coating.

.4.2.3.1 Acceptable Materials:

.4.2.3.1.1 UCAN SCRU-IT Ruspro coated anchors as manufactured by UCAN Fastening Products.

.4.3 Isolation Tape: Manufacturers standard material for separating dissimilar metals from direct contact.



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.4.4 Insulation Fastenings: Corrosion resistant, galvanized bugle head screws with 38 mm (1.5 inch) diameter washer, 25 mm (1 inch) minimum penetration into framing.

.4.5 Insulation: Rigid type [4] [3] [2] as specified in Section 07 21 13.

.4.6 Air/Vapour Retarder: Self-adhering membrane as specified in Section 07 27 13.

.4.7 System Sealants: Sealants within the panel system, as recommended by manufacturer, colour [as selected by Consultant] [to match adjacent surface].

.4.8 Gaskets: Santoprene or EPDM as recommended by manufacturer.

.4.9 Flashings: Fabricate flashing from 1.57 mm (0.062") minimum thickness aluminum sheet. Where exposed to view, finish to match adjacent panels. Provide lap strip under flashing at abutted conditions; with lapped surfaces sealed with a full-bed of non-hardening sealant.

2.5 FABRICATION

.5.1 Aluminum wall panels and components shall comply with details as indicated on shop drawings.

.5.2 All components shall be factory fabricated ready for field installation. All components shall match quality and installation of accepted mock-up specified above.

.5.3 Tolerances:

.5.3.1 Panel bow shall not exceed 0.8% of panel overall dimension in width or length.

.5.3.2 Panel dimensions shall allow for field adjustment and thermal movement.

.5.3.3 Panel lines, breaks and curves shall be sharp, smooth and free of warps or buckles.

.5.3.4 Panel shall be visually flat.

.5.3.5 Panel surfaces shall be free of scratches or marks caused during fabrication.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

.2.1 Obtain all dimensions from job site.

.2.2 Ensure all structural support is aligned and condition is acceptable.

.2.3 Building surfaces shall be smooth, clean and dry, and free from defects detrimental to the installation of the system. Notify Contractor of conditions not acceptable for installation of system.

.2.4 Inspect wall system and components before installation and verify that there is no shipping damage.

.2.5 Do not install damaged panels; repair or replace as required for smooth and consistent finished appearance.

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3.3 Installation

- .3.1 Install panel system and components in accordance with manufacturer's written installation instructions and shop drawings.
- .3.2 Ensure continuity of building envelope air barrier and vapour retarder systems.
- .3.3 Erect components plumb and true.
- .3.4 Attachment system shall allow for free and noiseless vertical and horizontal thermal movement due to expansion and contraction for material temperature range of -29°C to +82°C. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement shall not be permitted.
- .3.5 Drill 6.35 mm (0.25 inch) drainage weep holes every 406 mm (16 inches) on centre along length of horizontally oriented bottom end frames located at base of panelized wall areas or as recommended by building envelope engineer.
- .3.6 Adjust assembly to secure panels safely to wall while allowing for expansion and contraction of components. Ensure extrusion tabs overlap panel edges by at least half of extrusion tab depth.
- .3.7 Do not install defective component parts, including warped, bowed, dented, abraded, and broken members.
- .3.8 Do not cut, trim, weld, or braze component parts during erection in manner which would damage finish, decrease strength, or result in visual imperfection or failure in performance. Return component parts which require alteration to shop for fabrication, if possible, or for replacement with new parts.
- .3.9 Apply isolation coating to areas of contact between dissimilar metals.
- .3.10 Site Tolerances:
 - .3.10.1 Variation from plane or location shown on shop drawings: 10 mm over 10 m (0.4 inches over 33-foot) length to maximum of 20 mm over 100 m (0.79 inches over 328 feet).
 - .3.10.2 Deviation of vertical and horizontal members: 3 mm maximum over 8.5 m (0.12 inches over 28-feet) run.
 - .3.10.3 Offset between two adjacent members abutted end-to-end, in line: maximum 0.75 mm (0.03 inch) from true alignment.
- .3.11 Touch-Up Painting: Inspect completed wall system and apply matching touch-up paint as needed to correct minor paint flaws.

3.4 Field Quality Control

- .4.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.5 Cleaning and Protection

- .5.1 Remove and replace panels damaged beyond repair as direct result of panel installation.
- .5.2 Repair panels with minor damage

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- .5.3 Remove protective film from finish panels immediately once installation is complete or as otherwise directed by the [Owner]{Owner's Representative} [Architect] [Consultant] [Engineer].
- .5.4 Provide additional protection required after installation to protect assembly and finishes during construction.
- .5.5 Weep holes and drainage channels shall be unobstructed and free of dirt and sealants.
- .5.6 Upon final acceptance of installation, remove surplus and protective materials, excess materials, rubbish, tools and equipment from site.
- .5.7 Leave panels clean and free of debris and residue. Where required, clean exposed panel surfaces using non-abrasive detergent and clean water in accordance with manufacturer's instructions.

END OF SECTION

