

**SPECIFICATIONS FOR CLADDING FACADES
USING ENDUROBOND MATERIAL
SECTION 07 42 13
METAL WALL PANELS**

PART 1: GENERAL

1.01 SCOPE

A. SECTION INCLUDES

1. The extent of panel system work is indicated on the drawings and in these specifications.
2. Panel system requirements include the following components:
 - a. Aluminum faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation.
 - b. Parapet coping, column covers, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.

B. RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and Technical Specification Divisions 2 through 16 apply to this Section.

C. RELATED WORK SPECIFIED ELSEWHERE

1. Cold-Formed Metal Framing: Division 05 Cold-Formed Metal Framing Sections.
2. Sheet Metal Flashing and Trim: Division 07 Flashing and Sheet Metal Sections.
3. Joint Sealers: Division 07 Joint Sealers Sections.
4. Aluminum Windows: Division 08 Windows Sections.
5. Glazing: Division 08 Glass and Glazing Section.
6. Metal Framed Curtain Wall: Division 08 Glazed Curtain Wall Sections.

1.02 QUALITY ASSURANCE

1. Composite Panel Manufacturer shall have a minimum of 10 years' experience in the manufacturing of this product.
2. Composite Panel Manufacturer shall be solely responsible for panel manufacture and application of the finish.
3. Fabricator/installer shall be acceptable to the composite panel manufacturer.
4. Fabricator/Installer shall have a minimum 1 years' experience of metal panel work similar in scope and size to this project.
5. Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work. Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.

6. Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel system as determined by ASTM E 331. Systems not utilizing a construction sealant at the panel joints shall provide a means of concealed drainage with baffles and weeps for water which may accumulate in members of the system.
7. Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4") in 6m (20') non-accumulative.
8. Panel fabricator/installer shall assume undivided responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.

1.03 REFERENCES

A. AMERICAN SOCIETY FOR TESTING AND MATERIALS

1. ASTM E 283 Rate of Leakage through Exterior Windows, Curtain Walls, and Doors
2. ASTM D 1781 Climbing Drum Mean Peel Torque
3. ASTM E228 Mean Coefficient of Thermal Linear Expansion
4. ASTM C 297 Mean Ultimate Flatwise Tensile Strength
5. ASTM D 638 Tensile Properties
6. ASTM C 273 Ultimate Mean Core Shear Strength Properties Evaluation
7. ASTM C393 Core Shear Properties
8. ASTM E 84 Flame Spread and Smoke Developed

1.04 SUBMITTALS

A. SUBMITTALS SHALL BE IN CONFORMANCE WITH SECTION _____.

Include section number of Division 1, which outlines administrative procedures for submittals. Refer to CSI Division 1, Section 01340 - Shop Drawings, Product Data, and Samples.

B. SAMPLES

1. Panel System Assembly: Two samples of each type of assembly. (12") minimum.
2. Two samples of each color or finish selected, (4") minimum.

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. AFFIDAVIT CERTIFYING MATERIAL MEETS REQUIREMENTS SPECIFIED.

E. TWO COPIES OF MANUFACTURER'S LITERATURE FOR PANEL MATERIAL.

F. ALTERNATE MATERIALS MUST BE APPROVED BY THE ARCHITECT PRIOR TO THE BID DATE.

1.05 DELIVERY, STORAGE AND HANDLING

1. Protect finish and edges in accordance with panel manufacturer's recommendations.
2. Store material in accordance with panel manufacturer's recommendations.

PART 2: PRODUCTS

2.01 PANELS

A. COMPOSITE PANELS

1. EnduroBond materials manufactured by Nudo Products, 1500 Taylor Ave. Springfield, IL 62703 (800) 826-4132.
2. Items of the same function and performance, which have received prior approval from the architect, shall be allowed for this project. Approval shall be based on documentation submitted showing the adequacy of the material.

B. THICKNESS: 3MM (0.118"); 4MM (0.157"); 6MM (0.236")

Note to Architect: Select thickness for project

C. PRODUCT PERFORMANCE

1. Bond Integrity
When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured
115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F
2. Fire Performance
ASTM E 84 Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.

D. FINISHES

1. Coil coated KYNAR® 500 or HYLAR® 5000 based Polyvinylidene Fluoride (PVDF) 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 palette.
 - 2) Custom color to be matched by the panel supplier.
 - 3) Clear coat over pretreated natural and brushed aluminum substrates.
 - b. Coating Thickness:
 - 1) Colors: 1.0 mil (±0.2 mil).
 - 2) Clear: 0.50 mil (± 0.05 mil).

Note to Architect: Delete colors and finishes not required.

2.02 PANEL FABRICATION

A. COMPOSITION:

Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

B. ALUMINUM FACE SHEETS:

Thickness: 0.020 mm (nominal)

C. PANEL WEIGHT:

1. 3mm (0.118"): 0.92 lbs./ft²
2. 4mm (0.157"): 1.12 lbs./ft²
3. 6mm (0.236"): 1.59 lbs./ft²

Note to Architect: Delete weights not required...

D. TOLERANCES

1. Panel Bow: Maximum 0.8% of any 1828mm (72") panel dimension.
2. Panel Dimensions: Field fabrication shall be allowed where necessary, but shall be kept to an absolute minimum. All fabrication shall be done under controlled shop conditions when possible.
3. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.
4. Maximum deviation from panel flatness shall be 1/8" in 5'0" on panel in any direction for assembled units. (Non-accumulative - No Oil Canning)

E. SYSTEM CHARACTERISTICS

1. Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.
2. System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.
3. System shall comply with the applicable provisions of the "Metal Curtain Wall, Window, Storefront, and Entrance Guide Specifications Manual" by AAMA and ANSI/AAMA 302.9 requirements for aluminum windows.
4. Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70°F.
5. Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.
6. The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

F. SYSTEM TYPE

Note to Architect: Pick one of the following

1. Rout and Return Wet: Nudo WS 4475
System must provide a wet seal (caulked) reveal joint as detailed on drawings. The sealant type shall be as specified in Section 07900 and with foamed type backer rod as indicated on architectural drawings.
2. Rout and Return Dry: Nudo DS 4485
System must provide a perimeter aluminum extrusion with integral weather-stripping as

detailed on drawings. No field sealant required in joints unless specifically noted on drawings.

3. Rain Screen: Nudo RS 4495
System must provide a reveal joint as detailed on drawings. Provide moisture barrier and sheathing as shown on drawings.

G. SYSTEM PERFORMANCE

1. Composite panels shall be capable of withstanding building movements and weather exposures based on the following test standards required by the Architect and/or the local building code.

- a. Wind Load

If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels. Wind load testing shall be conducted in accordance with ASTM E330 to obtain the following results.

Normal to the plane of the wall between supports, deflection of the secured perimeter-framing members shall not exceed $L/175$ or $3/4"$, whichever is less.

Normal to the plane of the wall, the maximum panel deflection shall not exceed $L/60$ of the full span.

Maximum anchor deflection shall not exceed $1/16"$.

At 1-1/2 times design pressure, permanent deflections of framing members shall not exceed $L/100$ of span length and components shall not experience failure or gross permanent distortion. At connection points of framing members to anchors, permanent set shall not exceed $1/16"$.

- b. Air/Water System Test

If system tests are not available, mock-ups shall be constructed and tests performed under the direction of an independent third party laboratory, which show compliance to the following minimum standards:

Air Infiltration - When tested in accordance with ASTM E283, air infiltration at 1.57 psf must not exceed 0.06 cfm/ft² of wall area.

Water Infiltration - Water infiltration is defined as uncontrolled water leakage through the exterior face of the assembly. Systems not using a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated Systems) shall be designed to drain any water leakage occurring at the joints. No water infiltration shall occur in any system under a differential static pressure of 6.24 psf after 15 minutes of exposure in accordance with ASTM E331.

2.03 ACCESSORIES

1. Extrusions, formed members, sheet, and plate shall conform with ASTM B209 and the recommendations of the manufacturer.
2. Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.
3. Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

4. Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.
5. Fasteners (concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

Note to Architect: Delete fastener not required.

PART 3: EXECUTION

3.01 INSPECTION

1. Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.
2. Surfaces to receive panels shall be structurally sound as determined by a registered Architect/Engineer.

3.02 INSTALLATION

1. Erect panels plumb, level, and true.
2. Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F. Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted. Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.
3. Panels shall be erected in accordance with an approved set of shop drawings.
4. Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.
5. Conform to panel fabricator's instructions for installation of concealed fasteners.
6. Do not install component parts that are observed to be defective, including warped, bowed, dented, abraded, and broken members.
7. Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.
8. Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

Note to Architect: Delete above if exposed fasteners are used.

3.03 ADJUSTING AND CLEANING

1. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.
2. Repair panels with minor damage.

3. Remove masking (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor.
4. Any additional protection, after installation, shall be the responsibility of the General Contractor.
5. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.
6. Final cleaning shall not be part of the work of this section.