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This Manu-Spec® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat™*, *SectionFormat™* and *PageFormat™*. A Manu-Spec is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies both rigid and flexible porcelain enameled steel panels for interior use.

SECTION 09 78 13

METAL INTERIOR WALL PANELING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: This Section specifies porcelain enameled steel panels for interior wall paneling in commercial applications.
- B. Related Requirements:

Specifier Note: Include in this paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the subparagraph below. Do not include Division 00 documents or Division 01 sections as it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the contract.

1. Section [07 92 00 - Joint Sealants].
2. Section [].

1.2 REFERENCES

Specifier Note: Define terms that are unique to this section and are not provided elsewhere in the contract documents. Include in this Article terms that are unique to the work result specified that may not be commonly known in the construction industry. Delete the following paragraph if no definitions are required.

- A. Definitions:
 1. [].

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced and update as applicable. Contract Conditions Section 01 42 00 - References may be used to establish the edition date of standards. This paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

B. Reference Standards:

1. ASTM International (ASTM).
 - a. ASTM C297 Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions.
 - b. ASTM C481 Standard Test Method for Laboratory Aging of Sandwich Constructions.
 - c. ASTM C501 Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
 - d. ASTM D523 Standard Test Method for Specular Gloss.
 - e. ASTM C538 Standard Test Method for Color Retention of Red, Orange, and Yellow Porcelain Enamels.
 - f. ASTM D1002 Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
 - g. ASTM D3363 Standard Test Method for Film Hardness by Pencil Test.
2. Deutsches Institut für Normung E.V. (DIN).
 - a. DIN EN 13501-1 Fire Classification of Construction Products and Building Elements - Part 1: Classification Using Data From Reaction To Fire Tests (Includes Amendments A1:2009).
3. International Organization for Standardization (ISO)
 - a. ISO 4532 Vitreous and Porcelain Enamels - Determination of the Resistance of Enamelled Articles to Impact - Pistol test.
 - b. ISO 4892 Plastics - Methods of Exposure to Laboratory Light Sources - Part 2: Xenon-arc Lamps.
 - c. BS EN ISO 9227 Corrosion Tests in Artificial Atmospheres. Salt Spray Tests.
 - d. BS EN ISO 10140 Acoustics. Laboratory Measurement of Sound Insulation of Building Elements.
 - e. ISO 15695 Vitreous and Porcelain Enamels -- Determination of Scratch Resistance Of Enamel Finishes.
 - f. BS EN ISO 28706-1 Vitreous and Porcelain Enamels. Determination of Resistance to Chemical Corrosion by Acids at Room Temperature.
 - g. BS EN ISO 28706-2 Vitreous and Porcelain Enamels. Determination of Resistance to Chemical Corrosion by Boiling Acids, Boiling Neutral Liquids and/or Their Vapours.
 - h. BS EN ISO 28722 Vitreous and Porcelain Enamels. Characteristics of Enamel Coatings Applied to Steel Panels Intended for Architecture.
4. Porcelain Enamel Institute (PEI).
 - a. PEI 1001
5. [].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section 01 33 00 - Submittal Procedures.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's standard specifications and descriptive literature, including:
1. Catalog pages and cut-sheets illustrating specified products.
 2. Material Safety Data Sheets (MSDS).

Specifier Note: Specify submittals intended to document manufacturer storage, installation and other instructions.

- B. Manufacturer's written instructions, including:
1. Delivery, storage and handling recommendations.
 2. Preparation and Installation recommendations.
- C. Manufacturer's Field Reports: Submit manufacturer's field reports within 3 days of each manufacturer representative's site visit and inspection.

Specifier Note: Coordinate Article below with Contract Conditions and with Section 01 78 36 - Warranties.

- D. Installer's Experience: Submit verification of manufacturer's approval and verifiable evidence of work similar to the work of this Section.
- E. Warranty: Fully executed, issued in [Owner's] name, and registered with manufacturer, including:
 1. Surface: 20 year limited warranty, from date of substantial completion, covering defects in materials.
 2. Panel construction: 10 year limited warranty, from date of substantial completion, covering defects in materials.

Specifier Note: Retain the following only if specifying for a LEED project. Specify only the technical submittal requirements necessary to achieve the credits desired for this Project.

1.4 QUALITY ASSURANCE

- A. Installer: Manufacturer approved and experienced in performing work similar to that required for this project.

1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver materials in accordance with manufacturer's written instructions.
 1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact and product name and manufacturer clearly visible.
- B. Store materials protected from exposure to harmful environmental conditions, clean, dry, frost-free and at recommended temperature and humidity levels.
 1. Store materials flat.
- C. Handling: Do not slide materials when selecting for use. Lift only.

1.6 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions.
- B. Manufacturer's warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official.
 1. Manufacturer's warranty is in addition to and not intended to limit other rights Owner may have under Contract Conditions.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes performance characteristics, material standards and descriptions in other Articles as applicable. Use of such phrases as or equal, approved equal or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining or equal products.

2.1 MANUFACTURER

- A. PolyVision: 10700 Abbotts Bridge Road, Johns Creek, Ga 30097; Phone: (678) 542-3020; FAX: (678) 542-3233; Email: info@polyvision.com; Web: www.polyvision.com.

Specifier Note: Verify model numbers with manufacturer and edit the following paragraph to meet project requirements.

- B. Acceptable Material:

Specifier Note: Retain and edit the following Article to suit the project requirements of standard panel types are included in the project. Delete the article in its entirety of flexible panel types only are included in the project.

2.2 STANDARD PANEL PERFORMANCE REQUIREMENTS

Specifier Note: Retain and edit the following paragraph to meet panel types used and project requirements.

- A. Tensile Strength to ASTM C297: Break load [3500] [1277] N minimum.
- B. Shear Strength to ASTM D1002: 1070 N.
- C. Fire Classification to DIN EN 13501-1: [AB] [B] ,s1, d0.
- D. Hardness to ASTM D3363: Greater than 9H.
- E. Wear resistance to ASTM C501: 0.1 g maximum.
- F. Neutral Salt Spray: Comply with ISO 9227.
- G. Color Tolerance: Comply with ASTM D2244.
- H. Reflectance to ASTM D2244: Y-Value up to 93%.
- I. Scratch Resistance to ISO 15695: 7 N minimum.
- J. Sound Reduction Index to ISO 10140: 32 dB (Rw).
- K. Graffiti Resistance to ISO 28722: No color or gloss change after cleaning.
- L. Impact Resistance to ISO 4532: No damage over 2 mm after 24 hours (20 N load).
- M. UV Resistance: Comply with ISO 4892.
- N. Cold Acid Resistance: To ISO 28706-1, Class A minimum.
- O. Boiling Acid Resistance: To ISO 28706-2, 18.5 g/m² maximum.
- P. Orange Peel (Specular Gloss): To ASTM D523.

2.3 FLEXIBLE PANEL PERFORMANCE REQUIREMENTS

- A. Tensile Strength to ASTM C297: Break load [greater than] 9000 N minimum.

Specifier Note: Delete the following paragraph if shear strength is not applicable. Retain and edit the following paragraph to meet panel types used and project requirements.

- B. Shear Strength: [115] [145] N to ASTM D1002.
- C. Fire Classification: A1 to DIN EN 13501-1.
- D. Aging of Sandwich Construction: Cycle-B: No delamination after 6 test cycles when tested to ASTM C481.
- E. Hardness to ASTM D3363: Greater than 9H.
- F. Wear resistance to ASTM C501: 0.1 g maximum.
- G. Color Tolerance: Comply with ASTM D2244.
- H. Reflectance to ASTM D2244: Y-Value up to 93%.
- I. Scratch Resistance to ISO 15695: 7 N minimum.

Specifier Note: Retain and edit the following paragraph to meet panel types used and project requirements.

- J. Sound Reduction Index to ISO 10140: [28] [32] [35] dB (Rw).
- K. Graffiti Resistance to ISO 28722: No color or gloss change after cleaning.
- L. Impact Resistance to ISO 4532: No damage over 2.0 mm after 24 hours (20 N load).
- M. UV Resistance: Comply with ISO 4892.
- N. Cold Acid Resistance: To ISO 28706-1, Class A minimum.
- O. Boiling Acid Resistance: To ISO 28706-2, 18.5 g/m² maximum.
- P. Orange Peel (Specular Gloss): To ASTM D523.

2.4 DESCRIPTION

Specifier Note: Retain and edit the following paragraph to meet panel types specified.

- A. [Flat, rigid] [and] [flexible] porcelain enameled steel sandwich panels for use as wall cladding in interior commercial spaces.

2.5 STANDARD CERAMIC STEEL PANEL MATERIALS

Specifier Note: Delete the following paragraph when wall construction must consider the use of more fire resistance materials.

- A. Standard Panel 1:
1. Face sheet: 0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness.
 - a. Enamel in accordance with PEI 1001.
 2. Core: Cement bonded particle board 12 mm thick.
 3. Adhesive: Hot melt polyurethane.
 4. Panel backing sheet: 0.4 mm thick cold rolled galvanized steel.
 5. Edge treatment: [Protected Edge 1, 0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness] [Water-resistant polyvinyl chloride tape] [High build, high solids siloxane coating].
 6. Overall panel thickness: 13.4 mm.
 7. Panel size: 1200 x 3050 mm.
 8. Panel weight: 23.3 kg/m².

Specifier Note: Retain the following paragraph when wall construction requires more fire resistant materials.

- B. Standard Panel 2:
1. Face Sheet: 0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness.
 - a. Enamel in accordance with PEI 1001.
 2. Core: Calcium silicate fiber board 11 mm thick.
 3. Adhesive: Hot melt polyurethane.
 4. Panel Backing Sheet: 0.4 mm thick cold rolled galvanized steel.
 5. Edge Treatment: [Protected Edge 2, 0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness] [Water-resistant polyvinyl chloride tape] [High build, high solids siloxane coating].
 6. Overall panel thickness: 12.4 mm.
 7. Panel size: 1200 x 3050 mm.
 8. Panel weight: 21 kg/m².
- C. Acceptable Materials: PolyVision, Ceramic Steel Standard Panel [1] [2].

Specifier Note: Retain the following article only when flexible panels are included as part of the project.

2.6 FLEXIBLE PANEL MATERIALS

Specifier Note: PolyVision Flexible 1 type panel is monolithic in nature and has no backing sheet. All other flexible sheets have a face sheet and a backing sheet bonded together. Choose the first option in the following paragraph for the PolyVision Flexible 1 type pane and choose the second option in the following paragraph for all of the other flexible panels.

- A. Face Sheet: [0.7 mm steel finished both sides with porcelain enamel for a total thickness of 1.0 mm] [0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness].
1. Enamel in accordance with PEI 1001.

Specifier Note: Delete the following paragraph if PolyVision Flexible 1 type panels are to be used.

- B. Adhesive: Rubber based contact adhesive in accordance with manufacturer's written recommendations.

- C. Panel Backing Sheet: [0.56 mm thick steel sheet with enameled porcelain finish on exterior side providing 0.84 mm total thickness] [Cold rolled galvanized steel 1.25 mm thick] [aluminum sheet 2.0 mm thick].
- D. Edge Treatment: Water-resistant polyvinyl chloride tape on two sides.

Specifier Note: Retain and edit the following paragraph to meet panel types used and project requirements. Refer to PolyVision Spec-Data product sheet for further information on panel type selection.

- E. Overall Panel Thickness: [1.0] [1.7] [2.1] [2.9] mm.
- F. Panel size: 1200 x 5000 mm.

Specifier Note: Retain and edit the following paragraph to meet panel types used and project requirements. Refer to PolyVision Spec-Data product sheet for further information on panel type selection.

- G. Panel Weight: [6.4] [10.2] [14.6] [10.7] kg/m².
- H. Acceptable Materials: PolyVision, Flexible [1] [2] [3] [4] [5] Panel.

PART 3 EXECUTION

3.1 INSTALLER

- A. Use only installers approved by manufacturer who have training and experience of work similar to the work of this Section.

3.1 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for metal interior wall paneling installation in accordance with manufacturer's written recommendations.
 1. Visually inspect substrate in presence of Consultant.
 2. Inform Consultant of unacceptable conditions immediately upon discovery.
 3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.
 4. Starting installation of metal interior wall paneling implies substrate conditions are acceptable for Work of this Section.

3.2 INSTALLATION

- A. Install interior [ceramic steel] [flexible] wall panels in accordance with manufacturer's written instructions.
- B. Install standard panels square and true.

Specifier Note: Retain and edit the following paragraph only if flexible panels are specified.

- C. Install flexible to profiles and radii indicated.
- D. Hand cut or drill panels only after receipt of approval from Consultant.

3.3 FIELD QUALITY CONTROL

- A. Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Manufacturer field reports are included under PART 1, Submittals.

3.4 CLEANING

- A. Perform daily progress cleaning.
 1. Leave work area clean at end of each day.

- B. Upon completion, remove surplus materials, rubbish, tools and equipment.
- C. Collect recyclable waste and dispose of at appropriate recycling facilities.

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Include only statements unique to this Section.

Specifier Note: Coordinate the following Article with Section [01 76 00 - Protecting Installed Construction].

3.5 PROTECTION

- A. Protect installed products and components from damage during construction.
- B. Repair or replace adjacent materials damaged by installation of metal interior wall paneling.

END OF SECTION