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Technical Specifications

Expanded Polystyrene (EPS) Insulated Panel Systems

Since our establishment in 1969, Zero-Loc has grown to become a major worldwide producer of Insulated Panel and Door Systems. This achievement has been made possible by the dedication of our employees and the belief that giving greater service and value to our customers is essential to success.

ZERO-LOC
INSULATED PANEL AND DOOR SYSTEMS

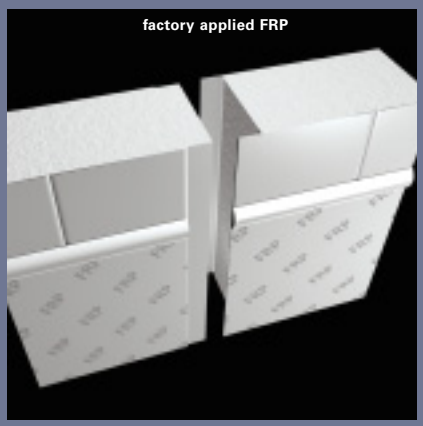
Zero-Loc EPS Insulated Panel System

Technical Data Table

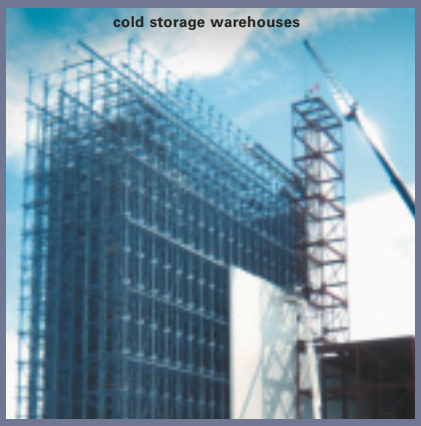
Insulation Tickness of Panels (Zelsius EPS) Inches (mm)	2 (50)	4 (100)	6 (150)	8 (200)	10 (250)
Insulation Type (Zelsius EPS)	Type 1	Type 1	Type 1	Type 1	Type 1
Thermal Conductance ASTM C518-19 @ 75°F (23.8°C)					
Imperial Units [BTU/(ft².hr.°F)	0.12	0.06	0.04	0.03	0.024
SI Units [w/(m².°C]	0.68	0.34	0.23	0.17	0.14
Thermal Conductance ASTM C518-19 @ -25°F (-31.66°C)*					
Imperial Units [BTU/(ft².hr.°F)	0.096	0.048	0.032	0.024	0.019
SI Units [w/(m².°C]	0.55	0.27	0.18	0.14	0.11
Total Thermal Resistance ASTM C518-19 @ 75°F (23.8°C)					
RT [(°F.ft².hr.)/(BTU.in.)]	8.34	16.68	25.02	33.4	41.7
RSI [(m².°C)/W]	1.47	2.94	4.4	5.88	7.34
Total Thermal Resistance ASTM C518-19 @ -25°F (31.66°C)*					
RT [(°F.ft².hr.)/(BTU.in.)]	10.34	20.68	31.02	41.36	51.7
RSI [(m².°C)/W]	1.82	3.64	5.46	7.28	9.1
Panel Weight Per Sq.Ft.					
Foam density Approx.	1#/cu/ft	1#/cu/ft	1#/cu/ft)	1#/cu/ft	1#/cu/ft
Sheet Steel, 26 gauge, galvanized & painted	2.16 lb	2.33 lb	2.5 lb	2.66 lb	2.83 lb
Bond Strength Metal to Polystyrene (EPS) When tested to ASTM C-297 Tension test of flat sandwich construction in a flat wise plane	29 psi (200kPa) [Styrene failure]				
Max. Girt Spacing for a Max Deflection L/180 For exterior wall panels: Interior Skin 26 gauge/Exterior Skin 26 gauge/ Uniform Load = 25PSF**	N/A	16′	20′	24′	27′
Max. Spans in Ceiling Panels (Uniform Load 25PSF)**					
Walk-on ceiling. Single Span. No ceiling Suspension Hangers.	N/A	16′	20′	24′	27′
Walk-on ceiling. Multi Span. With ceiling Suspension Hangers.	N/A	12′	12′	12′	12′
Non walk-on ceiling - Single Span	N/A	23′	28′	32′	32′
Non walk-on ceiling - Multi Span	N/A	23′	28′	30′	30′

**Value at -25°F (-33.66°C) are for reference only, indicating the increased efficiency of EPS at lower temperature. All design loads should be calculated using the values at 75°F (23.8°C).*

***Zero-Loc is not responsible for determining the implications of loads applied to a structure by either the wind loading of exterior wall panels or the live and dead of the ceiling system.*

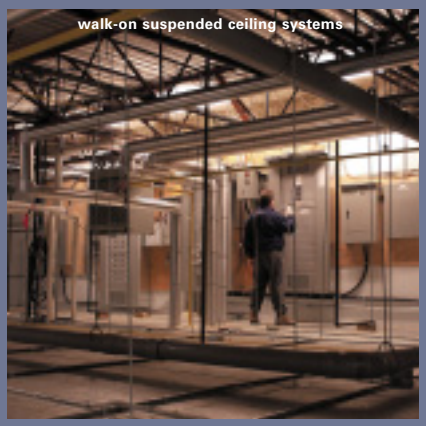


Fiberglass Reinforced Plastic (FRP) may be factory-bonded to the steel skins of the Zero-Loc EPS insulated panels, offering increased scratch and dent resistance. FRP protects panels from the frequent rigorous cleaning that is required in maintaining a sanitary environment.



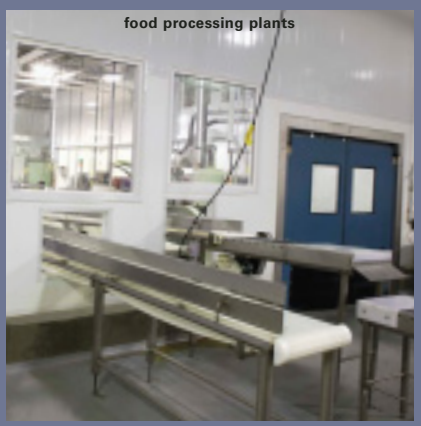
Cold Storage Warehouses

Ideally suited for low temperature facilties, Zero-Loc EPS "R" value performance increases as the temperature decreases.



Walk-on Suspended Ceiling System

Constructed with Zero-Loc EPS insulated panels, the finished Zero-Loc walk-on suspended ceiling system is energy efficient and durable and is ideally suited for low temperature, food processing and controlled environment applications.



Food Processing

The finished Zero-Loc insulated system is sanitary, energy efficient and durable.

ZERO-LOC
INSULATED PANEL AND DOOR SYSTEMS

5202-272nd St, Langley, BC Canada V4W 1S3 T: 604-607-1101 F: 604-607-1142
28 Plant Farm Blvd, Brantford, ON Canada N3S 7W3 T: 519-754-4500 F: 519-754-4214
119-9757 Juanita Dr N.E., Kirkland, WA USA 98033 T: 425-823-4588 F: 425-820-9749

A Wide Range of Applications

- Exterior/Interior EPS insulated building panels for warehouses, and food processing plants
- Standard & specialty insulated doors
- Walk-on suspended ceiling systems
- Storage freezers & coolers
- Blast/Spiral/IQF Freezer Tunnels & Enclosures
- Federally inspected food processing areas
- Environment/atmosphere control rooms
- Factory-Laminated Fiberglass Reinforced Plastic (FRP)

INSULATED PANEL SYSTEMS

ZERO-LOC
INSULATED PANEL AND DOOR SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Expanded polystyrene (EPS) insulated metal wall and ceiling panels with related accessories.

1.2 RELATED SECTIONS

A. Section 03300 - Concrete: Foundations.
B. Section 05120 - Structural Steel: Primary structure.
C. Section 05500 - Steel Fabrication: Supporting structure.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM) E96: Standard Test Methods for Water Vapor Transmission of Materials.
B. American Society for Testing and Materials (ASTM) E283: Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
C. Underwriters' Laboratories of Canada (ULC/ORD-C376-1995): Fire Growth of Foamed Plastic Insulated Building Panels in a Full-Scale Room configuration.

1.4 SYSTEM DESCRIPTION

A. General: Construct panel system to provide for expansion and contraction of component materials without causing buckling, failure of joint seals, undue stress on fasteners, or other detrimental effects to the panel system or adjacent building systems, or warping of faces of panel system.
B. Performance Requirements: Design and construct panels to meet requirements as indicated.
   1. Design panel composition to resist wind load mandated by code, with deflection limit of L/180.
      a. No permanent damage to panels or connections when sub jected to 1.5 times the design wind pressures for both inward and outward.
   2. Air leakage: Not greater than .06 cfm per square foot when tested in compliance with ASTM E283 at 1.56 pounds per square foot.

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.
B. [Product Data]: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Detailed specification of construction and fabrication.
   4. Manufacturer's installation instructions.
   5. Certified test reports indicating compliance with specified performance requirements.
C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, including specific requirements indicated.
   1. Profile and gauge of both exterior and interior sheet.
   2. Metal finish.
   3. Relationship to other work.
   4. Fully show details and connections to and locations of supporting steel indicating control points.
D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish product specified, two samples, minimum size 6" (150 mm) square, representing actual product, color, and patterns.
F. Quality Control Submittals:
   1. Statement of qualifications.
   2. Design data.
   3. Test reports.

1.6 QUALITY ASSURANCE

A. Manufacturer/installer shall be responsible for fabrication and installation of panel and support framing as specified in this section to comply with the following:
   1. Wind load engineering to comply with code requirements.
B. Manufacturer's Qualifications: Not less than 5 years experience in the actual production of specified products.
   1. Comply with rigid factory Quality Control program that includes quarterly unannounced inspections from UL, and independent testing laboratories providing reports directly to code authority.
   2. Successfully completed not less than 100 comparable scale projects using this system.
C. Installer's Qualifications: Firm experienced in installation of systems similar in complexity to those required for this Project, including specific requirements indicated.
   1. Acceptable to or licensed by manufacturer.
   2. Not less than 3 years experience with systems.
   3. Successfully completed not less than 5 comparable scale projects using this system.
D. Product Requirements:
   1. Metal members (prone to rust) and wood or wood by-products (prone to moisture absorption and rot), shall not be permitted within the panel connection system.
   2. Panel joints connection system, tested in accordance with ASTM E283 "Air Leakage Rate Testing" and ASTM E96 "Water Vapor Per meance Rate Testing" shall have an air leakage rate at 75 Pa OF 0.00m3/h-m2 (0.00cfm/sq.ft.) and a water vapor permeance rate of 0.00 perms.
   3. Insulated panels, related accessories, and construction details shall be in accordance with the following regulatory agencies, where required:
      a. Canadian Food Inspection Agency (CFIA)
      b. United States Department of Agriculture (USDA)
   4. Wall and ceiling panels, insulated with Type 1 Expanded Polystyrene (EPS) manufactured to EPS Type 1 standards, shall be listed in accordance with ULC/ORD-C376-1995, "Fire Growth of Foamed Plastic Insulated Building Panels in a Full-Scale Room Configuration", in compliance with Part 3.1.5.12 of the 2005 National Build Code of Canada (Combustible Insulation and its Protection).
      a. ICC-ES Legacy Report No. 96-43.
E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in per manufacturer's recommendation until ready for installation.
B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 WARRANTY

A. Provide manufacturer's standard limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Zero-Loc, Enterprises Ltd.; 5202 272nd Street, Langley, BC, Canada V4W 1S3. ASD. Tel: (604) 607-1101. Fax: (604) 607-1142. Email: sales@zeroloc.com. Web: www.zeroloc.com.
B. Substitutions: Not permitted.
C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. Panel General Requirements: Roll-formed exterior and interior steel sheet faces laminated to panel grade type 1 expanded polystyrene (EPS) foam core. EPS foam core shall not contain CFC's, HCFC's or HFC's. Insulated wall and ceiling panels shall be supplied in 46 inches (1168 mm) widths. Panel lengths shall be factory-sized to meet required site dimensions.
   1. Panel Thickness:
      a. 2 inches (50 mm).
      b. 4 inches (100 mm).
      c. 6 inches (150 mm).
      d. 8 inches (200 mm).
      e. 10 inches (250 mm)
   2. Interior wall and ceiling panels shall be clad on all exposed areas with 26 gauge (0.455 mm) pre-painted G90 galvanized steel (USDA & CFIA accepted).

a. High gloss white (QC5216 White Appliance Polyester)
b. Approved alternate.

3. Exterior insulated panels shall be clad on the weather-exposed side with 26 gauge (0.455 mm) pre-painted stucco embossed G90 galvanized steel.
   a. 8000 series (QC8317) white.
   b. USDA white.
   c. Approved alternate.
4. Concealed areas of panels (ie. top of ceiling panels) shall be clad with 28 gauge (0.378 mm) plain G90 galvanized steel.
5. Metal skins shall be thermal-set to the Type 1 EPS insulation. Insulated panels shall be manufactured individually laminated, ensuring uniform adhesion between metal skins and EPS insulation.
6. Panel edges shall be fabricated with a tongue-in groove type panel connection system (sleeve joint).
7. Sleeve-Joints shall be sealed internally by running continuous beads of butyloid caulking (or approved alternate) along the inside edges of the female sides of the panel joints.
8. Sleeve-Joints shall be externally caulked for USDA and Canadian Food Inspection Agency (CFIA) inspected areas only, or as specified, with Tremco Proglaze White silicone (or approved alternate).

B. Wall and Ceiling Panel Insulation:
1. Wall panels and ceiling panels shall consist of Type 1 Expanded Polystyrene (EPS) insulation.
2. Finished panels shall have an R-value of 4.17 per inch at 75 degrees F (23.8 degrees C). Insulation thickness of panels shall be adjusted in accordance with design R-value requirements.
3. Insulation shall not contain CFCs or HCFCs, or other expanding agents.
4. EPS Type 1 shall be manufactured with BASF KF262 bead size (or approved alternate), ensuring uniform densities throughout the insulation.
5. EPS Type 1 panel grade insulation shall meet or exceed federal standards for Type 1 EPS.

C. Panel Protection:
1. Manufacturer shall factory-bond 0.090 inch (2.3 mm) Fiberglass Reinforced Plastic (FRP) a minimum of 4 feet (1219 mm) high on the wall panels or as indicated. Refer to Room Finish Schedule.

D. Insulated Freezer Floor:
1. Insulated freezer floors shall be insulated with Zelsius EPS Type 2 high density insulation, complete with a minimum 10 mil (0.254 mm) polyethylene vapor barrier.
   a. Type 2 EPS shall meet or exceed federal standards for Type 2 EPS.

E. Insulated Doors:
1. Hinged doors.
2. Manually operated horizontal sliding doors.
3. Door leafs shall be insulated with 4" (102 mm) of Type 1 expanded polystyrene (EPS) insulation. Type 1 EPS shall meet or exceed federal standards for Type 1 EPS.
4. Door leafs shall be finished as follows:
   a. FRP 0.090" (2.3 mm) thickness fiberglass reinforced plastic factory-laminated (using a high-pressure heat-bonding process) to 28 gauge (0.378 mm) galvanized metal skins.
   b. 26 gauge (0.455 mm) stainless steel (304 2B) finish.
   c. 26 gauge (0.455 mm) prepainted white (QC5216 or approved alternate) G90 galvanized steel.
5. Door finishes shall be factory laminated (using a high-pressure heat-bonding process) to the Type 1 EPS insulation core.
6. Door leafs shall contain no wood or wood by-products.
7. Perimeter of door leafs shall be trimmed as follows:
   a. 18 gauge (1.214 mm) #304 2B stainless steel channel.
   b. 18 gauge (1.214 mm) G90 galvanized steel channel.
   c. 26 gauge (0.455 mm) prepainted white channel to match door leaf.
8. Doorframe Component: The Zero-Loc standard door frame component consists of a faceplate frame to which the door leaf is mounted, door jamb channel up to 8 inches (204 mm) thick for the perimeter of the door opening, and nuts, washers, through-bolts, reverse-side bolt plates and a snap-cap style sheet metal finishing channel to match wall finish.
   a. The faceplate component shall be fabricated from the following:
      1) 16 gauge (1.897 mm) (minimum) #304 2B stainless steel.
      2) 16 gauge (1.897 mm) (minimum) G90 galvanized steel.
      3) 26 gauge (0.455 mm) prepainted white G90 galvanized steel clad overtop 16 gauge G90 galvanized steel.
   b. Door jambs to be capped with the following:
      1) 18 gauge (1.214 mm) 304 2B stainless steel to match stainless steel faceplate.
      2) 18 gauge (1.214 mm) G90 galvanized steel to match galvanized steel faceplate.
      3) 26 gauge (0.455 mm) prepainted white steel to match white faceplate.
   c. The frame component supplied by Zero-Loc also includes 3/8" (9.5 mm) nuts, washers and through-bolts and for up to an 8" (204 mm) thick wall. Reverse side of faceplate shall include 16 gauge (1.519 mm) bolt plates for bolts and sheet metal snap-cap finish flashing to match wall panel finish.
9. Gasket:
   a. Hinged Door and Manual Sliding Door gaskets shall designed for heavy-duty applications, and shall be resistant to oils, grease and/or fats. Door gasket shall create a positive seal at all contact points between door leaf and frame, and door leaf and floor. Level floor surface required for positive gasket seal shall be provided by others.
10. Hinged Door Hardware:
   a. Overlap-type hinged doors shall be equipped with Kason #1398 Heavy-Duty Cam Rise hinges.
   b. Infitting-type hinged doors shall be equipped with Kason #1245 Reversible Cam-Rise Hinges.
   c. Hinged doors shall be equipped with Kason K56 Standard Latches complete with strike assemblies and Kason 481 inside Release Handles.
11. Sliding Door Hardware :
   a. Sliding door track shall consist of heavy gauge anodized alumi num. Door leaf hanger assembly to be fabricated from:
      1) 10 gauge (3.416 mm) 304 2B stainless steel to match door leaf trim finish and faceplate frame finish.
      2) G90 galvanized steel to match door leaf trim finish and face plate frame finish.
   b. Hanger wheels shall be 4" (102 mm) in diameter and made from "Delrin" plastic. The 10 gauge (3.416 mm) hanger assembly shall also serve as the cover for the hanger assembly.
12. Freezer Doors :
   a. Freezer doors shall be equipped with CSA/UL rated anti-frost heat trace in both door leaf and faceplate frame for heavy-duty hinged and sliding freezer doors and in door leaf or faceplate frame only for hinged and sliding freezer doors in lighter-duty commercial applications. Heat trace shall be factory-wired to a ground-fault circuit interrupter.

2.3 FABRICATION

A. Corners:
1. Corner panel connections shall be butt or mitered, flashed, and finished by installation crew on-site.
2. Where specified, corner panel connections shall be a single unit corner panel with a continuous metal skin on the outer bend.

B. Offset: Maximum offset from true alignment between two identical members abutting end-to-end: 1/8" (3 mm).

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper or timely completion.
1. Panel installer to verify that structural steel supports for wall panels are within tolerances in the AISC Code of Standard Practice, Section 7 and supplement modification controlling Section 7.11.3, adjustable items. Limit maximum deviation of steel alignment to plus or minus 3/16"(4 mm) from the control with a 1/8" (3 mm) maximum change in deviation for any member for any 10' (3 m) length of panel.
2. Do not proceed until unsatisfactory conditions have been corrected.

B. If support system preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.3 TOLERANCES

A. Variation: Maximum variation from vertical or horizontal plane, 1/4" (6mm) in 12' (3658 mm) length section or 1/2" (13 mm) over total length.

B. Offset: Maximum offset from true alignment between two identical members abutting end-to-end: 1/8" (3 mm).

3.4 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Manufacturer shall make periodic inspections and issue report to Architect regarding compliance with manufacturers installation recommendations developed for the Project.

3.5 ADJUSTING

A. Repair damage caused during construction.
1. Touch-up mars, scratches, and cut edges to match original finish.
2. If repairs cannot be made to comply with Architect's requirements, remove damage and install new materials.