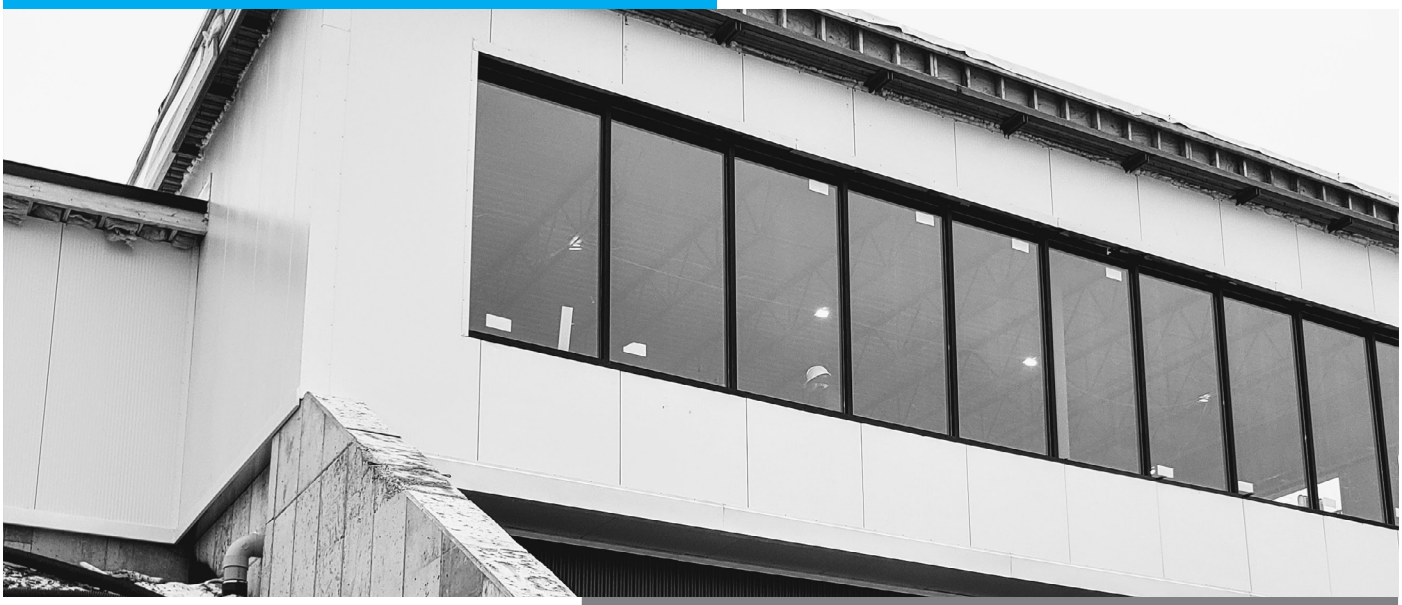
Insulated Panel Wall System

Installation Guide



ISOWALL®
STRUCTURAL PANELS INC.
INSULATED PANEL BUILDING SYSTEMS

Structural Panels Inc

Isowall® series industrial and commercial wall and ceiling panel system

STRUCTURAL PANELS INC.

INSULATED PANEL BUILDING SYSTEMS

ISOWALL® Help & Support

Our dedicated, highly specialized team is able to offer you all the technical support you need to carry out your building projects with **ISOWALL®** products.

For assistance with our products or questions please contact us at:

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Quick Start Guide

- Check that all structural components and attachment points are sufficient for the project specifications.
- Inspect panel bundles for any shipping damage.
- Review and understand project drawings and specifications.
- Start at a corner, installing left to right or right to left when looking at exterior of wall. Lead with male edge.
- Ensure all erected panels are plumb and level prior to installing the next panel.
- Install connection fasteners and clips before sliding next panel into place.
- Doors, windows, and other protrusions should be cut out when the panel in installed on the vertical plane once all connection fasteners and clips have been installed. If required, cuts in the metal panel skin (while leaving core intact) may be made prior to erecting the panel. Erecting a panel that has voids cut for doors, windows, and other protrusions should be avoided as it greatly weakens the integrity of the panel.
- All “weather cap” flashing must be installed at end of each day. If significant precipitation is expected during working hours, “weather cap” flashing should be installed in conjunction with each panel.

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Disclaimer

This installation guide is only to be used in conjunction with panel installation drawings and Structural Panels Inc (SPI) recommended details. Details shown in project shop drawings take precedence over any similar information in this manual. Shop drawings may be prepared either by SPI or by the panel contractor. SPI Technical Service Department is available to assist the panel contractor in the review of shop drawings.

This guide is intended to provide the panel contractor with recommended methods, procedures, and guidelines for the installation of the **ISOWALL®** series wall systems for commercial/industrial applications. Information presented is accurate but may not cover all situations, building conditions and/or details of your specific project. Consult your SPI technical representative where this guide does not cover your unique construction requirements. It is the sole responsibility of the project engineer and panel installer to ensure specified air and weather tightness of a building by good design and workmanship in accordance with approved drawings using only the appropriate type of sealants. It is the sole responsibility of the owner's representative and panel installer to maintain quality workmanship in accordance with approved shop drawings to ensure the best performance of the wall system. SPI recommends installers read this document fully before receiving the panels on the job site. Installation classes are available through SPI's Technical Services Department. Please call 1-905-372-0195 for more information.

Important

Please read all information related to your project before receiving materials at the job site and before starting the installation.

Follow the architect's approved shop drawings and engineering calculations for your project specific fastening patterns. The engineer of record is responsible for verifying applicable design loads and panel fastening requirements.

All safety procedures, including adequate fall protection, are the responsibility of the panel contractor.

PART 1: ISOWALL® GENERAL PROCEDURES

1.1 Introduction

Structural Panel Inc.'s (SPI) **ISOWALL®** expanded polystyrene metal panel system is designed for commercial and industrial walls. Installers need to follow **ISOWALL®** installation manual instructions to ensure an aesthetic, effective and cost-conscious installation process.

The vertical and horizontal joint applications of this panel system provide designers with a wide range of practical and aesthetically pleasing design flexibilities and the system allows a tight and well-designed building envelope on appropriate framing.

ISOWALL® panels have 26 gauge G90 galvanized steel skin with a smooth or embossed silicone modified polyester finish. **ISOWALL®** mineral wool panels meet requirements specified in most building codes.

1.2 Limitations

These instructions are provided as a general guide to SPI customers and their contractors.

Before using any of these instruction procedures the installer should:

- Review SPI **ISOWALL®** handling instructions details.
- Check all applicable federal, provincial, and local codes to verify compliance with the code.
- Be certain that site conditions are such that safe working practices are strictly observed.
- Review all installation drawings and associated documents for the project.
- Consult with general contractor, design engineer, architect and/or owner to confirm that the suggested procedures are suitable for each specific installation.
- Recognize that the substitution of components not supplied by SPI may require some procedures different from those recommended.
- Comply with all safety regulations.
- Use of wrong materials may cause installation and performance problems and may void the material warranties.
- All installed materials, especially sealants and fasteners, must be those which are specified on the project's installation drawings.
- SPI cannot be responsible for the performance of materials which are not provided, specified or approved by SPI.

1.3 Panel Installation

Ensuring the adequacy of anchoring panels to framing materials, structures, and girts shall be determined by the installer. SPI is not responsible for any claim resulting from any inadequacies.

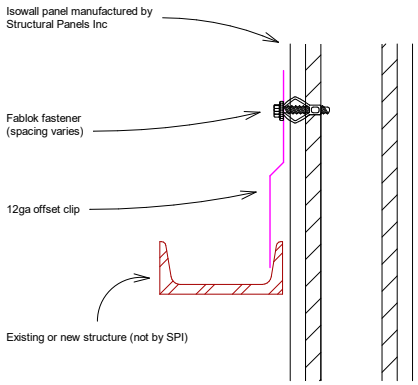
The installer must be qualified and experienced in the proper installation of SPI **ISOWALL®** panels and related construction. The installer is responsible for the execution of safe erection practices that may be defined and made mandatory by federal, provincial, municipal and/or local ordinances in Canada, as well as good construction and erection practices.

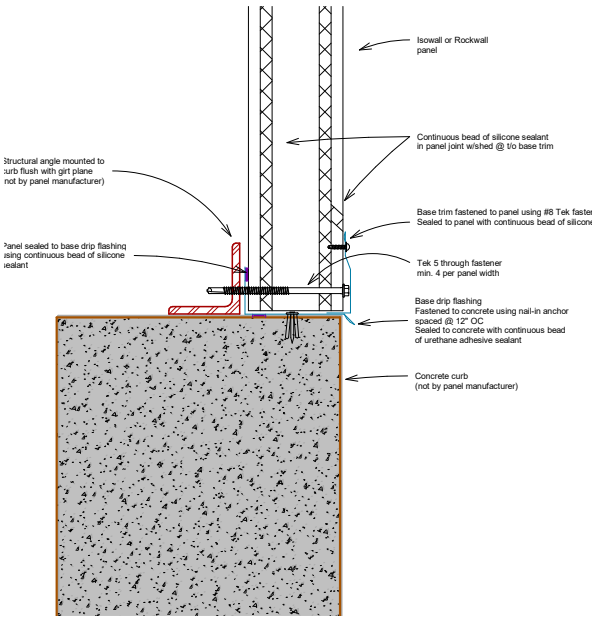
The following instructions are intended to describe the sequence and proper placement of parts; they are not intended to prescribe comprehensive safety procedures. If the installer cannot safely assemble the wall in accordance with the provincial or local ordinances, it is the responsibility of the contractor to stop all work and contact SPI to work out alternate assembly procedures that do not endanger the installers, other job-site personnel, or property, and do not compromise the integrity of the wall panels.

1.4 Panel Clips and Fasteners

To achieve published load values, fasteners and clips as recommended by SPI must be used. Fasteners are as equally important as clips and should be installed according to the instructions as verified by the structural calculations. In addition, they should be installed normal to the structure and the panels. They are not to be overdriven nor under driven because either condition can result in leakage.

Off-set clips can be inserted once the wall panel is vertical. Off-set clips are fastened to the panel using Fab-Lok expanding fasteners. The facing diagram(s) illustrates the panel fastening system. Do not over torque the fasteners or panel damage can occur. The exterior of the building will not have visible fasteners along mid-wall connection points.





1.5 Support Gauge and Alignment

Because factory insulated metal panels are strong and rigid, the structure they attach to must be held to a closer tolerance than that required for some other systems. If the steel substructure has excessive variation from the theoretical plane, the insulated panels could be subjected to undue stress. This may result in aesthetic changes or diminished load capacity.

It is recommended that wall panel attachments should be a minimum of 16 gauge steel designed for an L/180, 1½ inches maximum deflection criteria. Some projects may require tighter criteria when the same framework supports interior treatments such as gypsum wallboard. Fastening into wood is not recommended due to the cyclic fastener rocking caused by the panel's reaction to temperature differences of its skins as the sun heats the exterior face. If specific project requires wall panels to be fastened into wood please contact SPI's technical department.

The alignment of the supports is important especially with the most commonly used back seal or liner-side seal systems where the support alignment establishes the final alignment of the wall. In addition, improperly aligned supports can induce stress in the panels and cause face side distortions.

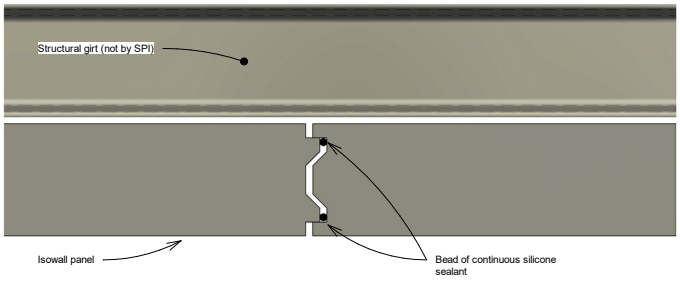
Fastener pull out values should be reviewed for each project. The minimum suggested bearing width at purlins is 2½ inches. It is necessary to specify steel tolerances and deflections similar to those required for insulated architectural walls. This requirement for steel alignment and deflection limits must be cross-referenced in the structural steel specification to ensure a quality installation.

For proper panel installation, the maximum deviation of a girt for industrial applications typically should not be more than ⅜ inch in any 20-foot length in any direction. The support alignment should not deviate more than ± ¾ inch from the theoretical girt plane at any point on the wall (thicker panels may require tighter alignment tolerances).

For architectural wall applications, the support alignment should not deviate more than ± ¼ inch in any 20-foot length in any direction. The total alignment envelope should be ± ½ inch over the entire panel surface with the exception of transition areas such as building corners and soffit areas where the alignment must be within ± ⅛ inch of the theoretical girt plane to accommodate formed transition or corner panels. If there is variation in the steel alignment from the theoretical plane, it should all be in an outward direction. If one purlin is on the plus side and the adjacent purlin is on the minus side, this can induce unacceptable stresses in the insulated panels.

1.6 Panel Caulking and Sealants

To achieve weather tightness and air and water infiltration performance levels a proper seal system is imperative. The most common technique is to apply a concealed bead of sealant prior to lifting the panel, using a small bead of silicone (Adfast AdSeal white silicone) on the inner and outer steel rolled edge (See diagram below). If the

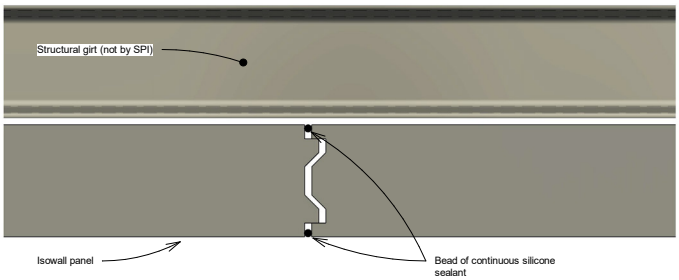


Panel Joint Sealant - Internal.pdf

bead is applied to the female side of the steel rolled edge it will prevent messy smearing during the installation phase. At transition areas such as corners or wall to soffit edges, proper liner trim is needed to maintain the liner seal continuity. Caulking of end lap panel joints is especially critical as the lap occurs in the "low" flutes of the panels.

A major advantage of the liner seal technique is that the critical seals are located away from the face of the panel, and will not cause staining or dirt attraction as occurs with other types of wall panel systems that are faced sealed. It is important that vertical panel systems allow water to weep at the panel base.

In some specific applications, sealant must be applied to the exterior face of the panel joint (See diagram below). In this instance care should be used to ensure that sealant in applied to the joint only. If external sealant is required then the internal bead(s) may not be necessary. Always check with project engineers, designers, and local authorities the ensure proper application for your project.



Panel Joint Sealant - External Iso.pdf

1.7 Lifting Panels

OKTOPUS® G1-B400

The recommended method of lifting **ISOWALL®** panels is with an OKTOPUS® G1-B400 vacuum lifting devise, Wood's Powr-Grip, or other suitable panel lifting suction device (if panels are too large to lift by hand)

The vacuum lift equipment is used on the exterior face of the panel therefore no equipment interference occurs on the interior surface of the panel when attaching to the structural framing during installation.

When using the vacuum lift there is no drilled hole or clamp damage to the panels. The vacuum lift cups should be uniformly spaced points of contact to minimize the bending of the panel as it is being lifted off the bundle and carried into position on the wall.

Wood's Powr-Grip vacuum lifter (above)
Optional forklift adapter (left)

The product range for crane attachments includes individual suction devices for the vertical and horizontal installation of wall panels. This devise is rated for up to 400kgs lifting weight. Lifters can be rented or purchased from SPI.

While a **ISOWALL®** panel secured in place is durable and self-supporting, lifting long (+40') panels into place can be a challenge and should be approached cautiously to avoid damage to the panel. While the panel is being lifted in a horizontal orientation there is a risk that the excess weight on the unsupported ends of the panel may stress the panel to the point of failure. To avoid this situation, SPI recommends limiting any **ISOWALL®** panels to lengths less than 40'.

Shorter panel lengths greatly reduce the risk of damage however **ISOWALL®** panels should not be suspended in a horizontal orientation for any longer than is absolutely necessary.

If panel lengths greater than 40' are required, SPI recommends contacting your sales representative.

Vacuum lifting devices should be attached centered over centerline of panel, 6"-12" *(152mm-304mm)* "north" of the panel mid-point.

1.8 Vertical Wall Panel

Panels will arrive on site with small corner cuts (at approximately 45 degrees) on all 4 corners. This is to prevent injury when handing panels. These corner cuts will be concealed in the U channel or angle attachment after installation.

On vertical joints, panels can be installed from left to right or right to left, leading with the male edge of the panel. Starting at a corner, erect the first wall panel with the male edge of the panel facing to the right when viewed from the outside of the building. Place panel in position, plumb panel and fasten to all applicable structure members.

Caution

Panels must be attached at all applicable girts during installation. Securing panels at top and bottom only may cause the panels to bow and it might be impossible to return the panel to their normal position.

White Tek screws are used to attach panel to U channel or angles. When installing these painted tek screws into U channel or angle edge, a ***Deck Bit*** (available at most hardware stores) will ease the positioning, insertion, and save time over the use of a regular bit. On some applications, Tek5 or Tek3 through fasteners will be required at base, parapet, window and door connections. These fasteners are designed to be self drilling and are suitable for fastening panels to structural steel members. Through fasteners typically require a $^{5}/_{16}$" or ⅜" driver bit (available at well stocked hardware stores). Care must be used to ensure the through fasteners do not get overtightened. Over-tightening of the through fasteners will cause irreparable damage to the panel appearance that may not be able to be covered with supplied trim/flashing.

The next step required is to place the offset clip into position aligned with girt. Once aligned with girt, the offset clip should be attached to the interior face of the panel using FabLok (or equiv) expanding fasteners. It is not imperative that the offset clips are installed prior to attaching next panel however it is good practice to install all fasteners and clips prior to end of day.

When placing second panel use 16 gauge edge protectors or use a U channel on male edge of 2nd panel to permit damage free pushing pressure. Repeat this technique with each new panel being placed into channel for installation.

Panel joint should be even through entire length of the panels. The joint should have a face gap of no more than ¼". If you are unable to maintain a face gap of no larger than ¼" please contact your SPI representative for direction.

When placing panel in position make sure panel remains vertical, not angled on one corner (doing so causes risk of panel buckling or steel separation from core). Check to ensure panel is square and level.

Note that on installations, sealants between panel and structure typically need to be placed before positioning panel.

Fasten panel on interior side of panel with off-set clip to the girt through the male edge. Additional fastening may be required depending on girt spacing and loading.

Exterior wall panels (and interior wall panels without roof cover) must not be installed during wet weather. The top ends of the panels will be exposed to the moisture until the eave or rake flashing is in place. The edges of the panels will be exposed to the moisture until the adjacent panels or flashing are installed.

While the wall panels are being installed, before finishing each day's work, or before stopping for pending wet weather, as much as possible of the eave or rake flashing should be installed over any erected wall panels. All remaining exposed panel top ends and exposed panel edges must be protected with a suitable temporary covering.

1.9 Field Cutting

Cutting Panels - the panels are easily cut with circular saws or reciprocating saws using proper metal cutting blades. If the saw cannot cut through the entire panel thickness, or if shears or nibblers are used, cut each panel face and use a knife or handsaw to cut through the remaining core.

Be sure to properly support the panel during the cutting operation to prevent separation of the face from the core or buckling of the panel. When necessary pad the saw's shoe plate and guides so they do not scuff or scratch the exposed panel surfaces.

CAUTION: WHEN CUTTING PANELS, ALWAYS WEAR PROTECTIVE EYE SHIELDS, GLOVES AND LONG SLEEVE CLOTHING TO PROTECT THE EYES AND SKIN FROM THE SAW CHIPS AND SAW DUST.

Abrasive Saw Problems - abrasive saws (circular saws with friction disks) are not recommended for cutting panels or flashing. Abrasive saws create high heat which may burn away the protective cladding from the panel edges causing the edge to rust. Abrasive sawing also emits fine, hot steel and abrasion particles which may be blown onto panel and flashing surfaces where they can cause staining and rusting of those surfaces.

Cutting Flashing - it is recommended that flashing be cut with good quality sheet metal shears to provide a clean, undamaged cut.

When field cutting through complex shapes, it is usually easier to cut out a 1" wide strip using the left and right hand shears. The 1" cut out provides the clearance to make smooth cuts and the clearance to work the shears around tight corners.

Layout and Marking - when marking the panels and flashing for cutting, avoid marking the panels in a manner which will leave visible marks or stains on the exposed surfaces. Use chalk or washable felt tip markers.

Note: Whenever possible, fit flashing splices so the factory cut edge is exposed and the field cut edge is covered. See 'Standard Details' for more information on recommended procedures

1.10 Cleaning

If panels need to be cleaned, use a hose at normal water pressure. Do not use high pressure or steam. Clean off any accumulation of airborne or waterborne contaminants that have not been naturally flushed.

In areas where heavy dirt deposits dull the surface, solution of water and detergent (1/3 cup tide per gallon of water for example) may be used. A soft bristle brush with a long handle may be useful. A clean water rinse should follow.

Mildew may occur in areas subject to high humidity, especially on dirt and spore deposits. This is not normally a problem on clean surfaces due to the high inherent mildew resistance of baked-on finishes. To remove mildew, the following solution is recommended:

- 1/3 cup detergent (e.g. Tide)
- 2/3 cup tri-sodium phosphate
- 1 quart sodium hypochlorite 5 %(e.g. Clorox)
- 3 quarts of water

Strong solvents and abrasive type cleaners should be avoided. Caulking compounds, oil, grease, tars, wax and similar substances can be removed by wiping with a cloth soaked with mineral spirits. Wipe only contaminated areas and follow with detergent cleaning and thorough rinsing.

1.11 Touch-up and Repair

1. *Surface Preparation*

- Edges of deep scratches should be lightly sanded or feathered with #400 grit sand paper.
- Scratches and areas immediately adjacent should be wiped with lint free cloth dampened in mineral spirits.
- Allow area to dry thoroughly before applying touch up paint.

2. *Touch-up Paint Application*

- Check touch-up paint for correct match before applying to damaged areas
- Shake and stir paint before applying
- Apply touch-up paint to damaged area in thin coatings.

3. *Precaution*

- Protect your eyes, face and hand from direct contact with touch-up paint and/or solvents.
- Provide good ventilation in work area.
- Enforce **NO SMOKING**. Remove all sources of ignition. These coatings and solvents are **FLAMMABLE**.

While it is possible to touch-up damages to the panel finish, it is highly recommended that every measure and caution be used to prevent any damages. ***Touch-up should be considered a last resort.***