High Performance Insulation System with OSHA Compliant Fall Protection

Saves on the following:

- HVAC
- Lighting
- Electrical
- Finishes
- Utilities
- Erection
Excellent Insulation System
The L&L Saver System™ FP creates the uniform depth space needed for the optimum insulation thickness and delivers the maximum possible insulation performance. Properly sealed ceiling and wall systems prevent air infiltration and isolate the conductive steel structure from the conditioned space. The L&L Saver System™ FP provides both low U-Factors and low emissivity values, stopping over 90% of the combined three types of heat transfer.

Engineered Strength for Safety
The L&L Saver roof liner system is engineered to be strong and durable for job site safety, is OSHA compliant and a patented fall protection system. The strong roof liner system withstands the rigors of installation and provides workers beneath with protection from most falling objects. The liner system then permanently supports the insulation. This protects workers, dramatically speeds construction and limits the liability of owners, designers and contractors (Standard 29 CFR Definitions–1926.751 "Controlling Contractor"). The fall protection material certification is free with the purchase of the legitimate, patented L&L Saver System™ FP (US Patent # 5901518).

Class A Fire Hazard Classification
The vapor retarder fabric liner of the standard L&L Saver System™ FP complies with: ASTM C1136, Types I through VI; NFPA 701 Large Scale; flame spread of 25 or less per ASTM E-84 (equivalent to NFPA 255, ANSI 2.5 or UL/ULC 723). Special order or modified products may be tested upon order by the purchaser for the costs of the tests.

Absorbs Sound
Provides excellent yet inexpensive acoustic finishes where conventional suspended ceilings are not appropriate or not in the budget. Standard system has up to 75% sound absorption (NRC 0.75). This superb by-product of the L&L Saver System™ FP comes free with the system. Excellent for gymnasiums, arenas, houses of worship, manufacturing, entertainment spaces and multipurpose rooms.

Finishes and Decorates
The L&L Saver System’s clean white appearance is often used as an exposed interior finish in buildings. Purlins and girts are hidden, eliminating the cost to paint them. Various colors and strap patterns may be specified to obtain unique aesthetic appearances. The ceiling and wall surfaces are washable and easy to maintain. Some minor wrinkles may be inevitable due to very large pieces of flexible fabric fabricated for each building area.

Brightens Interiors
The clean white, light reflective surface enhances efficiency of the lighting system and is superior to building with exposed purlins, joist and girts. Light reflectance tests of up to 80% are achieved. Savings of lighting equipment, wiring and electricity result in substantial dollar savings for the building owner. Low ultraviolet producing light sources or UV filtered lenses are necessary to prevent UV degradation and obtain optimum service life.

Helps Prevent Condensation
The high strength L&L Saver System™ FP fabric liner isolates the cold conductive purlin and girt surfaces from the inside conditioned air, reducing the exposed conductive purlin and girt surface areas from about 50% of the roof and wall areas to a fraction of 1%. Water vapor transmission rate is ≤ 0.02 grains per hour/sq. ft. for the standard fabric liner. Factory-made, triple extrusion welded seams are for safety and uniquely pressure resistant to assure the very low vapor permeance and excellent vapor retarder integrity as opposed to thousands of staple holes or hidden, unsealed lap joints typical with older methods of insulation.
The L&L Saver System™ FP is a patented fabric liner system that minimizes insulation compression and isolates the conductive purlins from the inside conditioned air.

The fabric liner is custom made for each order and the Syseal® fabric liner typically spans the entire bay’s width and length in one piece. It is supported by a grid platform of tensioned steel straps installed below the purlins or joists. This creates the required space for full insulation thickness between the structural members. In multi-layer systems the upper layer of insulation may be installed over the structural members with minimal compression.

Common Roof Structures In Which The System May Be Used

<table>
<thead>
<tr>
<th>Z-Purlin</th>
<th>Bar Joist</th>
<th>C-Purlin</th>
<th>Wood</th>
<th>Precast/Poured</th>
<th>Steel Beam</th>
<th>Concrete Tee</th>
</tr>
</thead>
</table>

Production Rates

The L&L Saver System™ FP is designed for rapid topside installation and optimum insulation performance with 80% fewer field seams. The production rates below are conservative ranges for installation of a single or double layer system in typical purlin roofs under average conditions with an experienced crew.

Roof: 150-200 sq. ft./man-hour  
Walls: 120-170 sq. ft./man-hour

In the summer of 2008, Thermal Design commissioned a third party time study which concluded production rates of over 235 sq. ft./man-hour. This equates to less than 25 cents per sq. ft. installation labor costs based on a $50 per hour labor rate.

Multiple layers and appropriate space is required for many of these systems. Contact technical support for thermal performance most representative of your specific project.
Performance

Performance Comparisons of R-30 Systems

Values are based on insulation assemblies in a 5' purlin space with a standing seam roof and thermal block. The hot box tested assemblies were tested in the horizontal position with vertical upward heat flow. Performance will vary with structural spacing and assembly orientation. Visit www.thermaldesign.com for more information.

A. ASTM-C 1363 hot box tests, Oak Ridge National Laboratory
B. Finite Element Modeling, NAIMA MB304 (8/06), System 3
C. ASHRAE Standard 90.1-2013, Table A2.3

<table>
<thead>
<tr>
<th>Pre-Installed R-value:</th>
<th>Installed R-value:</th>
<th>Exposed Purlin/Girt Area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-30 (R19+R11)</td>
<td>U-0.035</td>
<td>4.7% loss</td>
</tr>
<tr>
<td>R-29 (R19+R10)</td>
<td>U-0.057</td>
<td>39.7% loss</td>
</tr>
<tr>
<td>R-30 (R19+R11)</td>
<td>U-0.072</td>
<td>53.7% loss</td>
</tr>
</tbody>
</table>

Items to consider when ordering buildings.

Standardized Purlin Spacings

Custom made insulation widths are available, however by simply specifying or requesting standardized purlin spaces from the building manufacturer, you will increase your installation productivity, reduce waste and shorten lead times for delivery. Specify 2’, 3’, 4’, 5’ and 6’ purlin and girt spacings from your building manufacturer that match standard insulation widths. There should not be more than one non-standard width purlin spacing on each side of the ridge of any building.

Rafter Brace Clips

The design of the rafter brace attachment to the bottom plane of the purlin speeds installation of the liner system and provides superior vapor seal. Specify one of the above common details when ordering your building.

Hanging Methods

These are some of the many common hangers that can be used with the L&L Saver System™ FP without the need to cut the fabric liner. Compression seals or caulk type sealants may be used with any hanger type. Contact us for additional hanger details and products.
Metal Building Wall System

The L&L Saver wall insulation system is installed completely from the inside, out of the wind and weather. Unfaced insulation lengths are simply cut to fit the girt spacings and then impaled onto our Fast-R™ insulation hangers. This prevents the fiber glass insulation from sagging. The fabric liner is then installed on the inside plane of the wall to isolate the insulation and conductive girts from the conditioned air. This also provides a clean, white, finished appearance.

Filling The Full Girt Depth Is Required

Single layer systems help speed the wall sheeting process and a thick single layer of unfaced insulation is preferred to two layers of compressed laminated insulation in walls. The L&L Saver System™ FP single layer systems prevent bulging and dimpling of the metal wall panels which is common with thick insulation compressed between the panels and through-fastened to the sub-structure.

The full depth should be filled to minimize loss of thermal performance caused by convection currents. Exterior wall panel laps, trim and flashing should be sealed per codes to prevent air infiltration into the insulation from either side. Syseal Building Wrap™ is also available for the ultimate in air leakage resistance.

The L&L Saver System™ FP installs in virtually any wall structure type to make building envelopes energy efficient.

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**Quik-Stop™ Thermal Break**

Insulative foam thermal break with adhesive back. Recommended between metal wall panels and metal sub-structure with single layer insulation systems. Minimizes thermal conduction between metal wall panels or decking and the metal sub-structure.

108” long x 3 2/3" width x 3/16” thick

Other thicknesses available

**Fast-R™ Wall Insulation Hanger**

Preformed and punched Fast-R hangers attach to the girts or wall surfaces. These save time and hold the insulation in permanent position.

Packed 80 hangers/box, 32" long x 1" wide, 20 Gauge

One box covers approximately 1,000 sq. ft.

**Snap-R® Thermal Block**

Individual "snap-on" EPS thermal blocks save installation time and will not blow away with the wind.

24" long x 4" wide x designed thickness.

Standard above flange thicknesses are 3/8" and 1" thick which accommodates a 3" purlin flange. Other thicknesses are available to create the required space for any desired insulation thickness to fully expand.

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**Stand-off ‘Z’ Brackets™**

Brackets are purchased separately and include fasteners. Other sizes available.

3” 4” 6” 8”

Stand-off Bracket System for Hard Walls (conditions may vary).

Stand-off Bracket shown with optional steel tube or wood girt attached. Girts are required for the attachment of optional protective liner panels.

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**L&L Saver Wall Systems**

<table>
<thead>
<tr>
<th>Preinstalled R-Value</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-10</td>
<td>3”</td>
</tr>
<tr>
<td>R-11</td>
<td>3 1/2”</td>
</tr>
<tr>
<td>R-13</td>
<td>4”</td>
</tr>
<tr>
<td>R-19</td>
<td>6”</td>
</tr>
<tr>
<td>R-25</td>
<td>8”</td>
</tr>
<tr>
<td>R-30</td>
<td>9”</td>
</tr>
<tr>
<td>R-38**</td>
<td>12”</td>
</tr>
</tbody>
</table>

**Two insulation layers and stand-off brackets may be required to provide necessary insulation depth. Other combinations are available upon request. Installed performance is currently under study.**

**Liner Panel**

Optional steel or plywood wall liner panels protect the bottom of the wall fabric liner system.
Safety & Fall Protection

Patented Fall Protection
The L&L Saver System™ FP quickly installs from lifts and the workers are then safe to work from above without the need to be restrained by cumbersome lanyards or restricted to controlled decking zones. Thermal Design includes the patented fall protection as a free standard feature of the L&L Saver System™ FP. The L&L Saver System™ FP requires two critical strap end fasteners to achieve safe alternative fall protection.

Custom Project Drawings and Instructions
Detailed, custom project drawings are standard for each building. Specific strap and fastener locations, bay spacings, fabric sizes and exact insulation sizes and placements are all provided for the L&L Saver System™ FP to achieve a safe effective installation.

WARNING: Products that restrict the end fastening to “a single fastener” are attempting to avoid patent infringement over safety. Single end fastening does not reliably pass prescribed fall protection drop tests.

OSHA Steel Erection Standard
On January 18 of 2001, the new steel erection standard was published in the Federal Register. The new standard requires full fall protection for steel erectors and insulators at heights greater than 15 feet. This rule became effective July 18, 2001 (www.osha.gov). Owners, architects and upline contractors are potentially liable for compliance of workers on projects under their control (Standard 29 CFR Definitions–1926.751 “Controlling Contractor”). The Federal Registry, Vol. 66 No. 12 states that:

“A controlling contractor is an entity that has general supervisory authority over the work site such that it can correct safety and health violations itself or have others correct them.”

In the past, steel erectors and insulators were exempt on buildings of 25 feet or less. The revised rule requires full fall protection greater than 15 feet in height. The consequence is that most buildings are no longer exempt from fall protection compliance. Workers are required to tie off or use alternative means of fall protection, resulting in a significant loss of productivity. The patented L&L Saver System™ FP solves this problem and dramatically increases productivity by providing passive fall protection.

The L&L Saver System™ FP offers free OSHA Compliant through fall protection for new pre-engineered metal buildings. Perimeter protection within six feet of any edge is required using safety harness. Thermal Design has tested this system as instructed by OSHA and the system has passed this stringent test earning the OSHA letter of compliance.

The complete L&L Saver System™ FP including typical insulation can be installed for approximately 25 cents per sq. ft. labor costs.

Training & Technical Support
Reduce your liability, keep installers safe and speed up your construction time. Contact us for specifications, design manuals, installation instructions and training videos.
Energy Code Compliant
The L&L Saver System™ FP easily surpasses the most stringent local, state and government code requirements by providing both low U-Factors and low emissivity values, stopping over 90% of all three types of heat transfer. Thermal Design has commissioned numerous hot box tests which were done in accordance with ASTM C-1363, “Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.” Hot box tests, studies, and reports that pertain to the true effectiveness of “traditional” metal building insulation and the L&L Saver System™ FP are available upon request. Contact Thermal Design at 800-255-0776 or www.thermaldesign.com for test and technical information.

L&L Saver System™ FP vs. Traditional Methods
With today’s high energy costs and the potential for continued increases, owners, designers, builders and the government are all focusing their attention on more energy efficient buildings. Improving the building envelope design and maximizing your installed insulation performance will return more value to the owner than any other building material going into the project. The L&L Saver System™ FP is designed to solve the defects of “traditional” insulating methods. Properly placing and sealing the liner system to create the full required insulation space virtually eliminates insulation compression and assures the ultimate performance.

Screw Down Roofs
Screw down roofs can be approximately $0.50-$0.75 less expensive than a standing seam roof just considering the material cost. Most roof leak complaints are actually condensation problems. These savings would be more wisely invested in the high quality L&L Saver System™ FP with its sealed vapor retarder isolating the purlins. The verified performance of the L&L Saver System™ FP installed in a screw down roof exceeds all “traditional over-the-purlin” metal building insulation assemblies currently listed in ASHRAE 90.1, IECC and COMcheck™.

Third party hot box tests confirm a U-Factor as low as U-0.0203 can be achieved with the L&L Saver System™ FP installed in a screw down roof.

Commercial Building Tax Deduction
The L&L Saver System™ FP can help owners or designers claim a tax deduction of up to $1.80 per square foot for upgrading the envelope, HVAC and lighting that result in 50% savings over the ASHRAE 90.1-2001 Standard.

EPA '05 Energy Policy Act
L&L Insulations and Thermal Design provide support to customers incorporating energy efficient design to take advantage of available tax incentives, loans and grants. This includes technical assistance and products that meet the requirements set forth in the Energy Policy Act of 2005. These unique federal incentives allow owners or the designers to capitalize on up to a $1.80 per square foot tax deduction for incorporating energy efficiency in their design. This federal incentive is only available for a limited time so contact us today!
Warranties and Notices

Ten-Year Limited Materials Warranty

The L&L Saver System™ FP has a limited materials warranty. The warranty only covers materials furnished by Thermal Design. Thermal Design warrants this product subject to certain conditions and exceptions.

Please visit www.thermaldesign.com for full details regarding L&L Saver System FP's Ten-Year Limited Materials Warranty.

Notices

All represented and test values are for typical products tested and are not guaranteed values for actual installations.

Specification values are typical data subject to normal manufacturing variations and are not meant to be guaranteed or limiting specifications. Thermal Design, Inc. reserves the right to improve and change component specifications without notice.

States and/or jurisdictions may have a variety of insulation regulations. Check for specific details regarding the insulation regulations that apply in your area and notify your distributor or Thermal Design of any special requirements.

Patents, Trademarks and Licenses

Unauthorized making, using or selling of this patented technology or trademarks or service marks or copyrighted works shall be each subject to a minimum royalty and lost gross profit per square foot of surface insulated from such unauthorized acts. Sellers of any component with the knowledge or intent that such component is to be used to evade the purchase of legitimate materials from authorized sources shall be held liable as contributory infringers, as Lanham Act violations and otherwise as lawful. All costs of collection, including legal fees and costs, shall be sought as damages for unauthorized use and infringement.

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Contact your Authorized Distributor Below:

L&L Saver System™ FP manufactured by:

Thermal Design

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