

ThermalStar® LRi™ (Laminated Roofing Insulation)



PRODUCT DESCRIPTION

ThermalStar® LRi™ (Laminated Roofing Insulation) is rigid insulation with a polymeric film facer on both sides. This product is available as 4'x8' sheets or 4'x50' fan fold.

Standard features include:

- Warranted R-value
- Excellent moisture resistance
- Marked for nail spacing
- Compatible with PVC roof membranes
- Tested perm rating
- Recyclable
- Foil face available on one side*
- Thicknesses available:
 Sheets: 3/8", 1/2", 3/4", 1", 1-1/2", 2", 2-1/2", 3"
 Fan fold: 1/4", 3/8", 1/2", 3/4", 1"

Table 1 US Physical Properties

Property & ASTM Test Method	Type 15	Type 20	Type 25
Compressive Strength (minimum psi) @10% Deformation ¹ D1621	15	20	25
R-value per inch (minimum) at 75F mean temperature C518	4.0	4.2	4.2
ASTM Classification C578	Type VIII	Type II	Type IX
R-value per inch (minimum) at 40F mean temperature C518	4.4	4.6	4.7
R-value per inch (minimum) at 25F mean temperature C518	4.6	4.8	4.9
Compressive Strength (minimum psi) @1% Deformation ¹ D1621	7.0	8.8	11.0
Flexural Strength (minimum psi) C203	35	42	55
Water Absorption % by volume, maximum after 24 hr immersion C272	3.0	3.0	3.0
Water Vapor Permeance at 1" thick (perms) - typical E96	<0.1	<0.1	<0.1
Surface Burning - Flame Spread (FS) and Smoke Developed (SD) E84	FS 20, SD 400 [meets code]		
Maximum Use Temperature	Short Term (10-15 minutes) 180F, Long term 165F		

ThermalStar LRi is elastic within 1-2% deformation. To prevent long term creep, 3:1 design safety factors for static loads of the 10% deformation values are recommended, or use the tested 1% deformation values for design, whichever is greater.

TYPICAL USES

ThermalStar® LRi™ has been designed specifically for use under membrane roof assemblies. LRi can be used as a recover sheet that is typically applied over an existing roof assembly before the new membrane is installed. The combination of polymeric film facers, EPA listed termiticide and polystyrene assures long term performance.

THERMAL RESISTANCE

R-4.0 to 4.2 per inch

R means resistance to heat flow. The higher the R-value, the greater the insulating power.

INSTALLATION AND HANDLING

ThermalStar LRi can be handled much the same as wood sheathing, using similar tools or simple utility knives to cut, score, shape, or otherwise customize panels to fit the application.

WARRANTY

ThermalStar LRi is backed by a limited lifetime warranty for physical and thermal performance, as well as for termite resistance.

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*Contact Atlas EPS Technical Services regarding use of foil faced roofing underlayment with black membranes in southern states.



CHEMICAL & PHYSICAL PROPERTIES

Tables 1&2 list physical properties of various grades for US and Canada, respectively. Chemical resistance is listed in Table 3, contact Technical Services for compatibility of materials not listed.

MOLD RESISTANCE

ThermalStar LRi has been tested against 4 week exposure to various mold and fungi via ASTM G21, D3273, and C1338 with no growth of spores on the product. LRi provides no nutritive value for mold. However, construction practices greatly impact mold growth, and fungi have been known to even grow on glass.

FREEZE/ THAW EXPOSURE

ThermalStar LRi has been tested via ASTM C1512 Moisture & Temperature Cycling for Insulation with no loss of physical or thermal performance. This test places the product between a cold chamber and a high humidity chamber with temperature cycling, measuring the effect on the insulation as natural moisture drive occurs.

Table 2 Canadian Physical Properties

Property & ASTM Test Method	Type 15	Type 20	Type 25
Compressive Strength (minimum kpa) @10% Deformation ¹ D1621	88	110	175
RSI per 25mm (minimum) at 75F mean temperature C518	0.88	0.74	0.74
CAN/ULC S701 Type	N/A	Type 2	Type 3
RSI per 25mm (minimum) at 40F mean temperature C518	0.72	0.78	0.79
RSI per 25mm (minimum) at 25F mean temperature C518	0.74	0.81	0.83
Compressive Strength (minimum kpa) @1% Deformation ¹ D1621	54	60	80
Flexural Strength (minimum kpa) C203	210	276	345
Water Absorption % by volume, maximum after 96 hr immersion D2842	5.0	4.0	2.0
Water Vapor Permeance at 25mm thick (ng/PA*s*m ²) - typical E96	<100	<100	<100
Surface Burning - Flame Spread (FS) and Smoke Developed (SD) CAN/ULC S102.2	FS 290, SD Over 500		
Maximum Use Temperature	Short Term (10-15 minutes) 82C, Long term 74C		

¹ ThermalStar LRi is elastic within 1-2% deformation. To prevent long term creep, 3:1 design safety factors for static loads of the 10% deformation values are recommended, or use the tested 1% deformation values for design, whichever is greater

CODE COMPLIANCE

ThermalStar LRi complies with the model building codes when properly installed:

- Surface Burning – UL BRYX.R16529
- Cal Std Reg #CA472
- International Energy Conservation Code
- ASTM C578 – see product marking for Type
- Physical Properties – UL QORW.R16529
- International Residential Code (IRC) – UL ER16529.1, ESR-1962
- International Building Code (IBC) – UL ER16529.1, ESR-1962
- CAN/ULC S102.2, S701 – ULC BOZCC.R16529

Table 3 Chemical Compatibility of ThermalStar LRi

Inorganic Acids (Muriatic, Sulfuric, Boric Acid)	Excellent
Organic Acids (Carbolic, Citric, Acetic Acid)	Good
Bases (Sodium Hydroxide, Potassium Hydroxide, Ammonia)	Excellent
Alcohols (Methanol, Ethanol, Isopropyl Alcohol)	Good
Beer, Tea, Coffee, Carbonated Soda, Water, Fruit Juice	Excellent
Household Liquid Spray Insecticides (non-aqueous)	Poor
Cement	Excellent
MEK, Methylene Chloride, Acetone	Poor
Antifreeze (Ethylene Glycol - Green, Propylene Glycol - Orange)	Excellent
Hydrocarbons (Hexane, Gasoline, Diesel, Kerosene)	Poor
Mineral Oil	Excellent
Other Oils (Corn, Motor, Palm, Coconut Oil)	Good
Agricultural (Manure, Feed, Urine, Soil, Fertilizer)	Excellent
Formaldehyde, Turpentine, Chloroform, Naphtha	Poor
Salts (Ammonium, Ferrous, Sodium Chloride, Sulfur)	Excellent
MDI-based Adhesive (Gorilla Glue, Fast-Tac, Dow Great Stuff)	Good
Bleach, Detergents, Borax	Excellent
Cured Mastic, Construction Adhesive, Hardened Asphalt	Good
Wherever XPS insulation is used	Excellent

Excellent = No degradation, no effect from exposure

Good = some effect from exposure, but not significant for product performance

Poor = significant degradation affecting performance, up to completely dissolving product

This table is a guide only - consult Atlas Technical Services for specific chemical design questions

SAFETY

MSDS for this product available at www.atlaseps.com. Dust generated from cutting ThermalStar Laminated Roofing Insulation should be avoided using a dust mask as with other building materials. LRi is combustible and the product should be protected from ignition sources such as open flames or welder's torch. Applications not specifically listed in UL ER16529.1 or ICC-ES ESR-1962 require permanent separation of LRi from the interior of the building by a thermal barrier such as drywall or concrete for fire safety.

ENVIRONMENTAL

ThermalStar Laminated Roofing Insulation uses air in the insulating cells, emitting no gasses. The ppm levels of termiticide incorporated into the polystyrene do not present leaching concerns under typical applications. LRi is readily accepted for recycle. Visit www.epspackaging.org to locate a drop-off location nearest you.