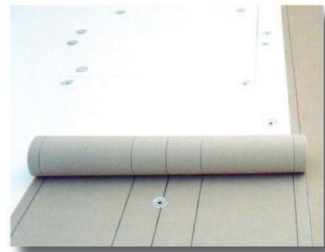
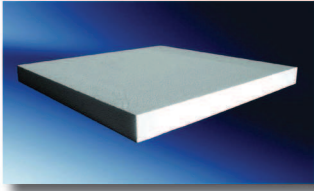


## PRODUCT SUMMARY

### Standard Products

#### *InsulFoam® I, II, VIII and IX*

Insulfoam's standard roof insulation product offering consists of InsulFoam I, InsulFoam II, InsulFoam VIII and InsulFoam IX. These products are high-performance insulations consisting of a superior closed-cell, lightweight and resilient expanded polystyrene meeting or exceeding the requirements of ASTM C578, *Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation*. These products have excellent dimensional stability, compressive strength and water resistant properties.



#### *SecurePly™*

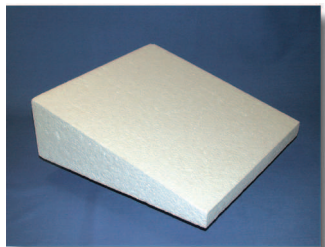
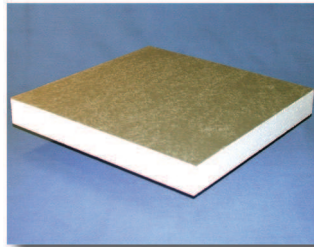
SecurePly is a slip sheet specifically offered for use over InsulFoam standard insulations when certain roof system ratings are required and InsulFoam SP is not a viable option. SecurePly is lightweight and easy to

handle, providing a more efficient installation than traditional fiber cover boards. Supplemental mechanical attachment of SecurePly is usually not required.

### Premium Products

#### *InsulFoam® SP*

InsulFoam SP is an advanced roof insulation consisting of an InsulFoam VIII base with a durable and stable factory-laminated fiber glass facer. InsulFoam SP is specifically designed for mechanically fastened TPO, PVC and EPDM single ply roof systems. The unique facer eliminates the need for an additional slip sheet, resulting in significant labor savings while still providing the necessary system approvals.

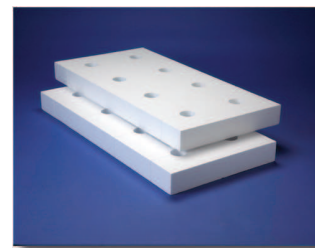


#### *Tapered InsulFoam®*

Tapered InsulFoam is cut from the same quality stock as our flat InsulFoam products. Available in thicknesses up to 40", Tapered InsulFoam is significantly more cost-effective than the competing tapered systems requiring fill pieces. Tapered InsulFoam can also be supplied as custom-cut crickets and saddles. Insulfoam employs well-trained taper design specialists throughout the country.

#### *R-Tech®*

R-Tech is a high-performance roof underlayment developed specifically for use in re-cover applications. R-Tech consists of a high-quality InsulFoam core that is laminated on both sides with a polymeric facer. R-Tech comes in both 4' x 8' panels and a 200 square foot fanfold. The lightweight, user-friendly fanfold makes it ideal for re-cover applications under mechanically attached and ballasted single ply roof systems. The polymeric facer allows for the direct application of TPO, EPDM, CSPE and most PVC membranes without an additional slip sheet.

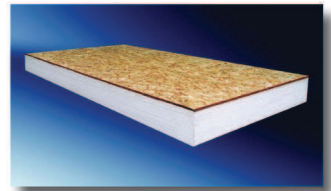


#### *InsulFoam® HB*

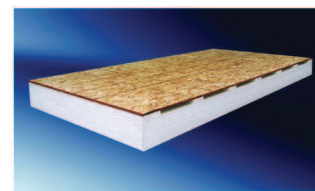
InsulFoam HB (Holey Board) is manufactured for use in lightweight insulating concrete systems consisting of cellular concrete, vermiculite or perlite. InsulFoam HB can be provided in a range of sizes, thicknesses and profiles to meet job-specific needs. InsulFoam HB is often installed in a stair-step fashion to create a tapered or sloped roof substrate.

#### *InsulLam™*

InsulLam is a composite insulation with an InsulFoam base and a factory-adhered oriented strand board (OSB). InsulLam is also available with DensDeck®, gypsum, plywood, wood fiber or perlite in lieu of the OSB. With the ability to provide an assortment of cover boards, InsulLam is compatible with most low-slope roof systems.



DensDeck is a registered trademark of G-P Gypsum Corporation.



#### *InsulVent™*

InsulVent is a composite insulation with an InsulFoam base and a factory-adhered oriented strand board (OSB). Unlike other nailbase products, the InsulFoam portion of this product comes with 1" precision-cut channels to provide venting below the OSB. These channels lower surface temperatures, making InsulVent an ideal alternative to non-vented nailbase products used in steep-slope applications. InsulVent is also suitable for use in most low-slope roofing applications.

**InsulFoam® FL**

InsulFoam FL (Flute-Fill) is cut from the same quality stock as our flat InsulFoam products. InsulFoam FL is designed and cut to act as fill material on standing seam metal roofs in need of insulation and a roof membrane.



The InsulFoam FL can be manufactured to fit virtually any deck configuration.

**Physical Properties**

InsulFoam mechanical properties depend on two primary factors: the density of the material and the fusion, or integral bonding, of the expanded polystyrene beads. Although density plays a key roll in defining the mechanical properties, density alone does not adequately define the important characteristics and should not be the sole criteria used to specify the product. The degree of fusion achieved in the forming process is a critical factor. Insulfoam's ongoing investment in state-of-the-art manufacturing equipment and controls results in the highest quality material available. Not all expanded polystyrene products are created equally. Care should be taken to make certain the manufacturer is able and willing to certify the mechanical properties of their product will meet those prescribed for the project. For roofing systems, the most critical mechanical properties to consider are compressive strength, flexural strength, dimensional stability, water and moisture absorption and thermal value.

ASTM C578, *Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation* is the generally accepted document used to define the physical properties of expanded polystyrene used in the United States. Note that the values in this specification are the minimum properties recommended for each material type. These properties are determined using ASTM C203, *Test Method for Breaking Load and Flexural Properties of Block-Type Thermal Insulation*, ASTM C165, *Test Method for Measuring Compressive Properties of Thermal Insulations* and ASTM D1621, *Test Method for Compressive Properties of Rigid Cellular Plastics*.

**Compressive Strength** is required to support or resist dynamic loads (e.g. foot and construction traffic) as well as static loads (e.g. mechanical fasteners) to which typical roof systems will be exposed during the construction process and while in service. InsulFoam VIII, II and IX will best meet or exceed the desired compressive resistance for mechanically attached systems. Compressive strength increases as density increases, and depending on the product, ranges between 10 and 60 psi. InsulFoam I performs best when overlaid with a cover board or with Insulfoam's SecurePly (fibrous-glass slip sheet). Without either a cover board or SecurePly, InsulFoam I may exhibit creep when under load for extended periods of time. Compressive Strength must be considered during the design and selection process.

**Flexural Strength** is required to ensure the product can be handled without being damaged, can span irregularities and roof deck flutes, and can resist bending forces from wind loads on the roof system. The flexural strength of the InsulFoam product increases with improved fusion and increased density.

**Dimensional Stability** is imperative to the long-term performance of a roof system. Inadequate dimensional stability can result in the exposure of roof membranes to stresses that can lead to splits, punctures, wrinkles and membrane delamination. InsulFoam products are among the most dimensionally-stable insulations available in the roofing industry. This dimensional stability remains even at thicknesses of 3" and above. InsulFoam products may exhibit some dimensional changes when under load or when exposed to extreme temperatures above 180 °F. The use of cover boards, light covered membranes or reflective coatings can protect the product from these exposure conditions.

**Absorption** indicates a product's susceptibility to take on moisture. InsulFoam products do not readily absorb moisture from the environment. All foam-plastic insulations absorb some moisture over time. However, in the long-term, InsulFoam will better retain its mechanical properties and outperform most alternative insulation materials. InsulFoam products are successfully used in Geofoam, marine and below-grade applications, as well as roofing applications.

The mechanical properties of the insulation are very important in adhered assemblies. The performance of the roof assembly depends greatly on the integrity and characteristics of the insulation. Typically, adhered single ply and built-up roofing systems will require a cover board. Insulfoam I may be used when a cover board is part of the system.

Finally, an additional factor to consider is the overall resiliency of InsulFoam products. The products not only have the ability to resist loads, but can also recover their original thickness once the load has been removed. This characteristic enables the InsulFoam products to deflect or elongate when exposed to forces such as roof-top traffic and deck or building movement from thermal expansion and contraction, and then return to their original configuration. Because InsulFoam easily accommodates irregularities in decks, substrates and existing roof systems, it provides a uniform and even base for new roofs.

## PHYSICAL PROPERTIES

The physical properties provided in this manual are average values determined by Insulfoam, Insulfoam raw material suppliers and independent testing agencies. Testing results were obtained under controlled laboratory conditions and do not represent minimum standards. Insulfoam is not obligated to manufacture its products per a designer's specifications or physical standards unless agreed to in advance by Insulfoam. It is the purchaser's obligation to ensure any purchased Insulfoam materials meet a specification's physical properties.

### Certification

Insulfoam must be notified at the time materials are ordered if product must be certified to meet an ASTM or other specification and/or must bear an Underwriters Laboratories, Inc (UL) or Factory Mutual (FM) label or marking. Insulfoam will perform the required tests and certify that materials meet specifications, with or without exception, upon acceptance of the order.

Typical Physical Properties of InsulFoam*					
Property	Type I	Type VIII	Type II	Type IX	Test Method
<b>Nominal Density</b> (pcf)	1.0	1.25	1.5	2.0	ASTM C303
<b>C-Value (Conductance)</b> BTU/(hr•ft <sup>2</sup> •°F)					ASTM C518 or ASTM C177
(per inch) @ 25° F	.23	.22	.21	.20	
@ 40° F	.24	.235	.22	.21	
@ 75° F	.26	.255	.24	.23	
<b>R-Value (Thermal Resistance)</b> (hr•ft <sup>2</sup> •°F)/BTU					ASTM C518 or ASTM C177
(per inch) @ 25° F	4.35	4.54	4.76	5.00	
@ 40° F	4.17	4.25	4.55	4.76	
@ 75° F	3.85	3.92	4.17	4.35	
<b>Compressive Strength</b> (psi, 10% deformation)	10 - 14	13 - 18	15 - 21	25 - 33	ASTM D1621
<b>Flexural Strength</b> (psi)	25 - 30	32 - 38	40 - 50	55 - 75	ASTM C203
<b>Dimensional Stability</b> (maximum %)	< 2%	< 2%	< 2%	< 2%	ASTM D2126
<b>Water Vapor Transmission</b> (perms)	2.0 - 5.0	1.5 - 3.5	1.0 - 3.5	0.6 - 2.0	ASTM E96
<b>Absorption</b> (% vol.)	< 4.0	< 3.0	< 3.0	< 2.0	ASTM C272
<b>Capillarity</b>	none	none	none	none	–
<b>Flame Spread</b>	< 20	< 20	< 20	< 20	UL 723
<b>Smoke Developed</b>	150 - 300	150 - 300	150 - 300	150 - 300	UL 723
Typical Physical Properties of R-Tech*					
<b>Compressive Strength</b> (psi, 10% deformation)	13	16	20	28	ASTM D1621
<b>Flexural Strength</b> (psi)	33	40	50	70	ASTM C203
<b>Water Vapor Transmission</b> (perms)	< 1.0	< 1.0	< 1.0	< 1.0	ASTM E96
<b>Absorption</b> (% vol.)	< 1.0	< 1.0	< 1.0	< 1.0	ASTM C272

\*Properties are based on data provided by resin manufacturers, independent test agencies and Insulfoam.