BENCHMARK FOAM INC.
Quick response is our guarantee.

Phone: 605-886-8084
Toll Free: 800-658-3444
Fax: 605-886-8099

401 Pheasant Ridge Drive
Watertown, SD 57201
www.BenchmarkFoam.com

Roofing Insulation

Easy Installation and Low-Cost Quality

Benchmark Foam's tapered roofing system provides effective drainage for flat roofs in either commercial or residential buildings. High-quality Expanded Polystyrene (EPS) insulation is easy to handle and offers superb performance. With custom design and easy-to-follow installation markings and shop drawings, your installation crew can save time and money.

Benchmark Foam is a certified manufacturer for Direct to Deck roof insulation. The ICC-ES Evaulation Report ESR-3412 approves Benchmark's EPS roof insulation products to be applied directly over steel roof decks without a thermal barrier in the roof system, giving contractors and roofers added value with reduced materials and labor costs.

Custom-designed Drainage

Eliminate ponding water in either new or re-reroofing applications. Each Benchmark Foam system conforms to design requirements and is custom designed to drain efficiently.

Benchmark's Recycled eps360® as Roofing Insulation

Satisfy green building requirements with eps360®, a 100% recycled rigid foam board that retains all the integrity of a non-recycled EPS product. Created from clean, dry, post consumer EPS, this product was recently installed in a 35,000-square-foot roofing project.

MADE IN THE USA

FOR MORE INFORMATION:
800-658-3444 I 800-658-3444

EPS is a lightweight, versatile, economical, recyclable material that can be tailored to meet changing and complex requirements.

Standard 4 X 4 or 4 X 8-foot insulation boards are:

- Manufactured to specified thicknesses – no need to build up with "fill" layers
- Lightweight and easy to handle
- Clearly marked according to design drawings
- Able to be laid in a predetermined pattern
- Capable of retaining stable, permanent thermal performance
- Naturally moisture and mold resistant
- Compatible with all major roofing systems and warranties

Retain the structural and economic advantages of a flat roof deck and achieve the slopes necessary for drainage with a Benchmark Foam tapered roofing insulation system. This cost-effective, environmentally sound, high-quality insulation system provides easy handling during construction and efficient drainage after installation.

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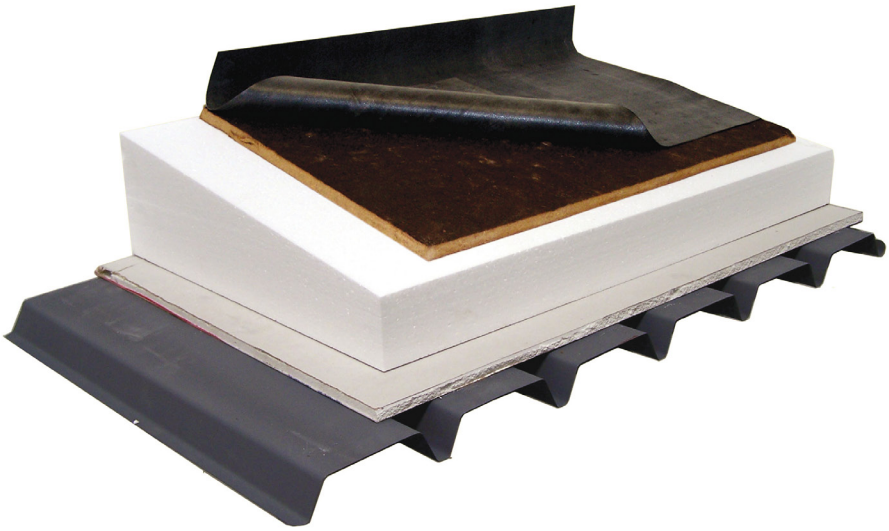
SUPERIOR SERVICE & QUALITY
FOR OVER 35 YEARS

Customized System

You provide building dimensions, drain locations and thermal requirements of the proposed roofing system. Benchmark Foam will help customize your system and submit shop drawings of all tapered insulation projects for your approval before shipping the order.



Customized Accessories

Benchmark Foam's customized tapered roofing system includes specialized design elements like hips, valleys, crickets and saddles.

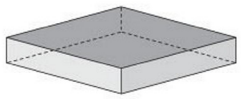
Factory-cut Hips and Valleys

- 45-degree factory-cut hips or valleys fit roof corners without waste
- One-piece hip and valley panels simplify installation

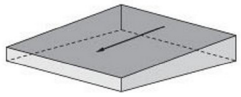
Tapered Crickets and Saddles

Use to:

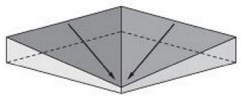
- Divert water around rooftop units or obstructions
- Correct differential heights of adjacent roof decks
- Structurally slope roof decks to provide positive drainage to roof scupper and internal drains



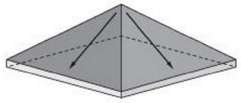
COMPOSITE



TAPERED



VALLEY



HIP

Quality

We adhere to the strictest industry standards for each phase of our organization: raw materials, manufacturing processes and finished products. If industry standards are not good enough, we create our own.

On-Time Guarantee

We know your business depends on our product arriving on time. Our service response is so dependable we back it with our On-Time Guarantee.

Your product will be shipped and arrive on the agreed-to arrival date or we will discount your invoice 10 percent.

We work to accommodate customer needs, giving you confidence when you place an order, even if it needs to be rushed. And we do not have truckload quotas, so no matter how large or small, your order will ship on time.

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PHYSICAL PROPERTIES

All types of EPS have specific minimum density requirements. Densities are given in pounds per cubic foot as follows: Type I (1#): .9 pcf; Type II (1 1/2#): 1.35 pcf; Type VIII (1 1/4#): 1.15 pcf; Type IX (2#): 1.8 pcf. See the following table for other physical and thermal values pertaining to specific types of EPS.

TYPICAL PHYSICAL PROPERTIES OF EPS INSULATION

Specification Reference ASTM C578-06				*Type I*	*Type VIII*	*Type II*	*Type IX*
Property		***Units***	***ASTM Test***				
Density, nominal				1#	1 1/4#	1 1/2#	2#
Density, minimum		(pcf)	C303 or D1622	0.90	1.15	1.35	1.80
Thermal Conductivity KFactor	at 25F	BTU/(hr.)	C177 or	0.238	0.227	0.217	0.208
	at 40F	(sq. ft.) (F/in.)	C518	0.250	0.238	0.227	0.217
	*at 75F			0.277	0.263	0.250	0.238
Thermal Resistance Values (R)	at 25F	at 1 inch		4.20	4.40	4.60	4.80
	at 40F	thickness	–	4.00	4.20	4.40	4.60
	*at 75F			3.60	3.80	4.00	4.20
Strength Properties							
Compressive 10% Deformation		psi	D1621	10.0	13.0	15.0	25.0
Flexural		psi	C203	25	32	40	55
Tensile		psi	D1623	16	17	18	23
Shear		psi	D732	18	23	26	33
Shear Modulus		psi	–	280	370	460	600
Modulus of Elasticity		psi	–	180	250	320	460
Moisture Resistance							
WVT (vater vapor transmission)		perm in	E96	2.0-5.0	1.5-3.5	1.0-3.5	0.6-2.0
Absorption (vol.)		%	C272	less than 4.0	less than 3.0	less than 3.0	less than 2.0
Capillarity		–	–	none	none	none	none
Coefficient of Thermal Expansion		in./(in.) (F)	D696	0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature		°F	–				
Long-term				167	167	167	167
Intermittent1				180	180	180	180
Flame Spread		UL®	E84	20	20	20	20
Smoke Develop.		UL®	E84	300	300	300	300

All values based on data available from Flint Hills Resources, NOVA Chemical Company, and BASF Corporation.
*Federal Trade Commission ruling: Use the 75° R-value when calculating R-values for residential construction (fact sheets available upon request).

DESIGN AND INSTALLATION CONSIDERATIONS

How to specify EPS tapered roof systems: Roof insulation shall be Expanded Polystyrene (EPS) as manufactured by Benchmark Foam. EPS "Type" (I, II, VIII, IX), minimum thickness, and average R-value shall be specified according to ASTM C578-06.

Reduce thermal leaks: Apply EPS board in multiple layers with staggered joints to reduce thermal shorts.

Flammability: EPS is combustible and should NOT be exposed to flame or other ignition sources. Current building code requirements should be met for adequate protection or separation from occupied areas.

Ultraviolet exposure: Prolonged exposure of EPS to sunlight will cause a slight discoloration and surface dusting. Insulating properties will not be significantly affected under normal use. Surface dust should be removed before application of adhesives or finishes. For outdoor storage, protect with a light-colored opaque tarp.

Vapor retarders: Each roofing application should be evaluated to determine the need for a vapor retarder to control internal condensation. NRCA/MRCA studies show that vapor retarders are less critical with EPS than other rigid insulation types.

Solvent exposure: EPS is subject to attack by petroleum-based solvents and adhesives, and coal tar pitch products. Care should be taken to prevent EPS direct contact with these products and their vapors. Use only adhesives approved for EPS applications.

Moisture exposure: At the end of each day during installation, temporarily seal all insulation from moisture exposure. Replace any wet insulation or allow it to dry thoroughly before resuming roof application.