

## Standards Compliance

When applied in accordance with code requirements, Falcon Foam Insulation meets or exceeds ASTM Specification C578 Types I, VIII, II, IX. Falcon Foam is third party, quality assurance inspected and is listed with ICBO ES No. 4059. Falcon Foam complies with HUD/FHA "Use of Materials Bulletin No. 71", as well as the requirements of BOCA, ICBO, and SBCCI. Falcon Foam Tapered Roof Insulation is an approved component in U.L. Class A roof systems. Falcon Foam is a U.L. classified fire rated foam plastic up to 6" thick. (\*flame spread less than 25, smoke development less than 450).

*\*Flame spread and smoke development ratings derived are not intended to reflect hazards under actual fire conditions. Falcon Foam Tapered Roof Insulation contains a fire retardant to inhibit accidental ignition but must be considered combustible and may constitute a fire hazard if improperly used or installed. If required it must be separated from an internally occupied area by 1/2" gypsum board or equivalent. See I.C. listing for additional physical properties.*

## FALCON FOAM — Specifications

### Section 1; General

#### 1.1 System Description

Falcon Foam is EPS (molded expanded polystyrene) roof insulation suitable for use in single-ply membranes, modified bitumens, and conventional BUR roof systems, either loose laid and ballasted, adhered or mechanically attached. Falcon Foam is a custom designed and factory cut, labeled and packaged system designed for positive drainage for any roof decks. Shop drawings showing the placement of specially marked tapered panels are provided with all Falcon Foam systems.

#### 1.2 Quality Assurance

The roof insulation system will be a Falcon Foam system manufactured by Falcon Foam. The manufacturer will have a third party quality assurance program complying with applicable building code requirements. The manufacturer must be capable of supplying a 20 year thermal performance warranty when requested.

#### 1.3 References

Falcon Foam must comply with ASTM C 578 (superceding Federal Specification HH-1-524C) and all major model building codes.

#### 1.4 Submittals

Falcon Foam will submit customized shop drawings for approval of all tapered systems. Falcon Foam will provide manufacturer's literature describing material and recommended practices.

### Section 2; Products

#### 2.1 Materials

All Falcon Foam EPS must comply with ASTM C 578, Type I; 0.90 pcf \_\_\_\_, Type VIII; 1.15 pcf \_\_\_\_, Type II; 1.35 pcf \_\_\_\_, or Type IX; 1.80 pcf \_\_\_\_. Thickness shall be \_\_\_\_ inches. R-value shall be \_\_\_\_.

Falcon Foam shall have a minimum thickness of \_\_\_\_. The tapered system shall be factory fabricated with a slope of \_\_\_\_. The tapered system shall provide an average R-value of \_\_\_\_\_. All Falcon Foam panels will be clearly marked to correspond with Falcon Foam provided shop drawing.

Related Materials: Coverboards, when required, shall be a minimum 1/2" wood fiberboard meeting ASTM C 208 and ASTM C 209, or a minimum of 1/2" perlite meeting ASTM C 728-82.

In metal deck construction, a thermal barrier such as 1/2" gypsum or 3/4" perlite may be required. Local building codes must be followed regarding the use of EPS in metal deck construction.

### Falcon Foam® contains no chlorofluorocarbons (CFC's)



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### Section 3; Execution

#### 3.1 Preparation

Falcon Foam must be applied to a sound, clean and moisture-free deck surface. The deck shall be sufficiently rigid to support the roofers and mechanical equipment without deflection that will strain or otherwise rupture any of the roofing components or deform the deck.

#### 3.2 Installation

Apply Falcon Foam Insulation in accordance with roof insulation catalog recommendations or as required by local building codes. The decision to use a vapor retarder and the details thereof rest solely with the building architect, designer, building owner or their designated representative.

Application to Deck: (For built-up roofs, modified bitumen systems and fully adhered single-ply systems).

A. Concrete Deck: The primed deck shall be solidly mopped with steep asphalt at an application rate of 25lbs./square. Allow it to cool to 225° F - 250° F and embed the EPS roof insulation. Each EPS insulation board shall be "walked in" as it is embedded in hot asphalt.

B. Steel Deck: The thermal barrier (if required) shall be mechanically fastened to the steel deck. The thermal barrier shall be solidly mopped with steep asphalt at a rate of 25lbs./square. Allow to cool to 225° F - 250° F and embed the EPS roof insulation. Each EPS insulation board shall be "walked in" as it is embedded in the hot asphalt.

Never apply asphalt to any polystyrene insulation at a temperature which exceeds 250° F. Do not apply flame directly to EPS insulations when installing a modified bitumen roof system.

#### 3.3 Limitations

Falcon Foam EPS is manufactured with a fire retardant; however, it will burn upon exposure to an adequate source of heat or flame. EPS should be kept away from any open flame or source of ignition. Do not install or use EPS with coal tar pitch or highly solvent extended mastics without adequate separation.

#### 3.4 Protection

Installed insulation shall not be left exposed to the weather. Install no more than can be completely covered by the complete roofing system on the same day. Installed insulation which has become wet shall be removed and replaced with dry insulation. Protect installed roof insulation and membrane from roof traffic damage.

Caution: Combustible. Falcon Foam Insulation will ignite if exposed to fire of sufficient heat and intensity.

Notice: We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions or for other than the intended use. Our liability is expressly limited to replacement of defective goods. Any claim shall be deemed waived unless made in writing to us within thirty (30) days from date it was or reasonably should have been discovered.

Trademark: FALCON FOAM is a registered trademark of Atlas Roofing Corporation.

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# BUILD WITH CONFIDENCE. SPECIFY FALCON FOAM®

Exterior Walls  
Roof Insulation  
Wall and Foundation Insulation  
Door Core Insulation  
Cold Storage Insulation

Void Filler  
Pattern Foam  
Flotation Foam  
Foam Packaging & Custom  
Fabrication

FALCON FOAM Insulation is a light-weight rigid EPS insulation that offers cost-effectiveness and energy-efficiency. FALCON FOAM Insulation's thermal and mechanical properties make it the preferred insulation for residential, commercial and industrial applications where high R-value, permanence and moisture resistance are critical.

Available in a full range of densities, in standard and custom-cut sizes, FALCON FOAM Insulation meets the specific needs of architects, contractors and building owners. FALCON FOAM Insulation offers a smooth, non-abrasive surface for safe, easy handling and requires no special tools or construction techniques. Falcon Foam Insulation meets appropriate ASTM Standard Specifications and building requirements.

### Long-Term Insulation Value

Type I EPS insulation (1.0 pcf) provides a typical R-value of 3.85 per inch (K factor = 0.26) at a mean temperature of 75° F and a manufactured density of 1 pcf (R = 4.17 per inch at 40° F). The R-value of EPS insulation is permanent because the cellular structure of EPS contains only stabilized air. Its R-value will not decrease as it ages.

### Permanence

EPS insulation is an inert, organic material. It provides no nutritive value to plants, animals or micro-organisms. It will not rot, and is highly resistant to mildew.

### Temperature Cycling

EPS is able to withstand the abuse of temperature cycling, assuring long-term performance. In a series of tests conducted by Dynatech Research and Development Co., Cambridge, Mass., core specimens removed from existing freezer walls, some as old as 16 years, proved that EPS withstands freeze-thaw cycling without loss of structural integrity or other physical properties.

### Moisture Resistance

A study by the Energy Materials Testing Laboratory (EMTL) has shown that EPS insulation installed in well-constructed roofs does not absorb appreciable moisture, even under conditions characteristic of prolonged cold, damp winters. The small amount of moisture absorbed (an average of 0.2% by weight) has little or no effect on the compressive or flexural strength, and the EPS insulation retains between 95% and 97% of its thermal efficiency.

Though it has low water vapor transmission, EPS is not a vapor barrier. Rather it "breathes", and therefore needs no costly venting as do some other relatively impermeable insulation materials which could otherwise trap moisture within walls and roof assemblies.

### Recyclable — Contains No CFCs or HCFCs

Neither Falcon Foam Insulation, or its manufacturing process, emits CFC's or HCFC's into the atmosphere. What's more, FALCON FOAM Insulation may be recycled through EPS collection sites located throughout the country.

## Thermal Conductivity — Definitions/Formulas

### K-value Factor

Thermal conductivity, the quantity of heat (BTUs) which will flow through a one-foot section of a one-inch thickness of a homogeneous material, during a one hour period when there is a 1° F difference in the hot to cold side temperature.

$$\text{Thus, } K = \frac{\text{BTU}}{\text{hr.} \times \text{sq. ft.}} \times \frac{1^\circ \text{F}}{\text{in.}}$$

Where BTU (British Thermal Unit) is the amount of heat required to raise the temperature of 1lb. of water 1° F.

K-values are determined by either of two tests: ASTM C177 and ASTM C518.

### C-value Factor

Thermal conductivity of K-value when the material being tested is either non-homogeneous or less than 1 inch, but a specified thickness.

Thus,  $C = K/\text{thickness in inches.}$

C-values are determined in the same fashion as K-values.

### R-value Factor

Thermal resistance is an index of material's resistance to the flow of heat. It is the reciprocal of the K or C-value.

$$\text{Thus, } R = \frac{T}{K} \quad \text{or} \quad \frac{1}{C}$$

The higher the R-value, the better the resistance to the flow of heat (BTUs) and the better the insulation.

R-values are usually reported for 1-inch of thickness and are not necessarily per inch of thickness.

### U-value Factor

Overall coefficient of heat transmission, or the quantity which will flow through a specific building section composed of a number of materials one square foot in area during one hour when there is hot or cold side temperature difference 1° F.

$$\text{Thus, } U = \frac{1}{R_1}$$

Where  $R_1 = \text{Sum of all the R-values in the section including air space and film. } (R + R + R + R = R_1)$

## Falcon Foam® Physical Properties

(Specification Reference: ASTM-C578-92a)

Property	Units	ASTM Test	Type I	Type VIII	Type II	Type IX
<b>Density, Nominal</b>	(pcf)	C303 or D1622	1.00	1.25	1.50	2.00
<b>Thermal Conductivity</b>	at 25°F BTU/(hr.)	C177 or	0.23	0.22	0.21	0.20
<b>K Factor</b>	at 40°F (sq. ft.)	C518	0.24	0.235	0.22	0.21
	at 75°F (F/in.)		0.26	0.255	0.24	0.23
<b>Thermal Resistance Values</b>	at 25°F per inch		4.35	4.54	4.76	5.00
	at 40°F thickness	—	4.17	4.25	4.55	4.76
	at 75°F		3.85	3.92	4.17	4.35
<b>Strength Properties</b>						
Compressive 10% Deformation	psi	D1621	10-14	13-18	15-21	25-33
Flexural	psi	C203	25-30	30-38	40-50	50-75
Tensile	psi	C1623	16-20	17-21	18-22	23-27
Shear	psi	D732	18-22	23-25	26-32	33-37
Shear Modulus	psi	—	280-320	370-410	460-500	600-640
Modulus of Elasticity	psi	—	180-220	250-310	320-360	460-500
<b>Moisture Resistance</b>						
WVT	perm. in	E96	2.0-5.0	1.5-3.5	1.0-3.5	0.6-2.0
Absorption (vol.)	%	C272	<4.0	<3.0	<3.0	<2.0
Capillarity	—	—	none	none	none	none
<b>Coefficient of Therm. Expansion</b>						
	in./(in.)(F)	D696	0.000035 for all densities			
<b>Maximum Service Temperature</b>						
Long-term	°F	—	167°F	167°F	167°F	167°F
Intermittent		—	180°F	180°F	180°F	180°F
<b>Flame Spread</b> up to 6" thickness		E84	Less than 25 for all densities			
<b>Smoke Development</b> up to 6" thickness		E84	Less than 450 for all densities			

## Resistance Factor (R) of Common Building Materials, Air Spaces and Films

Building Board		R-value	Insulation Materials	R-value
Gypsum Board	1/2"	0.45	Insulation Board—	
	5/8"	0.56	FALCON FOAM® @ Type I/75°F	3.90
Plywood	1/4"	0.31	FALCON FOAM® @ Type VIII/75°F	4.20
	3/8"	0.47	FALCON FOAM® @ Type II/75°F	4.40
	1/2"	0.62	FALCON FOAM® @ Type IX/75°F	4.40
	3/4"	0.94	Extruded Polystyrene @ 75°F	5.00
Hardboard, Underlayment	1/4"	0.31	Polyurethane/Polyisocyanurate Aged @ 75°F	5.60
	1"	1.24	Insulation batts:blankets	
			Mineral Wool Per Inch/75°F	3.66
<b>Building Paper</b>			Insulation Loose Fill	
Permeable Felt, 15lb.		0.06	FALCON FOAM®	3.40
Plastic Film		Neg	Cellulosic/Inch	3.1-3.7
			Perlite, Expanded/Inch	2.2-2.9
			Vermiculite, exfoliated/inch	2.1-2.3
<b>Masonry Materials</b>			<b>Air Spaces (3/4")</b>	
Concrete blocks, three oval cores			Heat Flow Up	
Cinder aggregate	4" thick	1.11	Non-reflective	0.75 (Summer)
	12" thick	1.89		0.87 (Winter)
	8" thick	1.72	Reflective, one surface	2.22 (Summer)
Sand and Gravel Aggregate	8" thick	1.11		2.21 (Winter)
Lightweight Aggregate	8" thick	2.00	Heat Flow Down	
	4" thick	1.50	Non-reflective	0.85 (Summer)
Gypsum Mortar or Plaster	1/4"	0.05		1.02 (Winter)
	1/2"	0.10	Reflective, one surface	3.29 (Summer)
	1"	0.20		3.59 (Winter)
Gypsum Plaster (Perlite)	1"	0.64	Heat Flow Horizontal	
Gypsum Plaster (Vermiculite)	1"	0.59	Non-reflective	0.84 (Summer)
Brick, per inch		0.20		1.01 (Winter)
Fake brick, per inch		0.11	Reflective, one surface	3.24 (Summer)
Stucco, per inch		0.20		3.46 (Winter)
<b>Roofing Materials</b>			<b>Surface Air Films, Inside (Still Air)</b>	
Asbestos Cement Shingles		0.21	Heat Flow Up	
Asphalt Roll Roofing		0.15	(through a horizontal surface)	
Asphalt Shingles		0.44	Non-reflective	0.61
Built Up Roofing	3/8"	0.33	Reflective	1.32
Wood Shingles		0.94	Heat Flow Down	
			(through a horizontal surface)	
			Non-reflective	0.92
			Reflective	4.55
			Heat Flow Horizontal	
			(through a vertical surface)	
			Non-reflective	0.68
			<b>Moving Air Surfaces</b>	
			Any Position or Direction	
			15 MPH Wind (Winter)	0.17
			7.5 MPH Wind (Summer)	0.25