

# Drew Expanded PolyStyrene Insulation & Flotation

EPS is a resilient, light-weight, foamed plastic which has a density range between 1.0 and 3.0 pcf for most construction applications. Within that range, EPS can be molded to achieve varying densities, providing the mix of strength and insulating properties to meet specific application requirements at minimum cost.

EPS has a successful thirty-year history of efficient use in construction for industrial, commercial, residential and low-temperature buildings. In Europe, where energy efficiency has long been a primary design consideration, architects have made EPS the dominant thermal insulation.

#### Long-term insulation value.

EPS insulation (1.0 pcf) provides a typical R value of 3.9 per inch (K factor = 0.26) at a mean temperature of 75°F (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.

#### Cost efficiency.

EPS insulation typically costs less than other commonly used materials when compared on the basis of R value.<sup>1</sup>

#### Moisture resistance.

A new study by the Energy Materials Testing Laboratory (EMTL)<sup>2</sup> 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 that may be absorbed (an average of 0.2% by weight) has little or no effect on the compressive or flexural strength, and EPS insulation will retain between 85% and 97% of its thermal efficiency.

#### 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, prove that EPS withstands freeze-thaw

cycling without loss of structural integrity or other physical properties.

#### Strength characteristics.

EPS insulation with a minimum 1.0 pcf density provides the dimensional stability and compressive strength necessary to withstand light roof traffic and equipment weight at reasonably high surface temperatures. Compressive strengths up to 25 psi are available. Consult the EPS manufacturer for recommendations.

#### 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.

#### Fabrication and installation ease.

EPS insulation can be installed quickly and easily. It can be cut to shape with ordinary tools to assure a tight fit and to eliminate heat loss channels. And its light weight allows easy handling and storage.

#### Additional information.

Additional information on EPS insulation can be obtained by contacting manufacturers listed with Sweet's Buylines 800.

#### Flammability.

Like many construction materials, EPS is combustible. It should not be exposed to flame or other ignition sources. Applicable building codes must be met for adequate protection.

#### Solvent attack.

EPS is subject to attack by petroleum-based solvents. Care should be taken to prevent contact between EPS and these solvents or their vapors.

#### Ultraviolet degradation.

Prolonged exposure to sunlight will cause a slight discoloration and surface dusting of EPS insulation. The insulating properties will not be significantly affected under normal usage. EPS stored outside should be protected with a light-colored, opaque tarp.

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### Buoyancy Nominal Density 1 pcf

Volume of Expanded Polystyrene	Buoyancy	
	lbs.	kg.
1 Cubic Foot	61.4	27.85
1 Cubic Meter	2,170	984.52

### Water Vapor Permeability ASTM C-355

Nominal Density, pcf	Fusion	Perm-In.		Perm-Cm.	
		Plaques	Blocks	Plaques	Blocks
1.0	Optimum	0.8-2.0	1.5-2.8	1.34-3.34	2.5-4.68
1.4	Optimum	—	1.5-2.5	—	2.5-4.17
2.2	Optimum	0.5-1.4	1.3-2.4	0.83-2.34	2.17-4.01
2.5	Optimum	—	1.0-2.4	—	1.67-4.01
1.0	Minimum	1.5-3.0	1.6-3.5	2.5-5.01	2.67-5.84
2.3	Minimum	1.0-2.0	1.0-2.8	1.67-3.34	1.67-4.68

Property	Units	ASTM Test	Density (pcf)				
			1.0	1.25	1.5	2.0	
Thermal Conductivity K Factor	at 25F	BTU/(hr.)	0.23	0.22	0.21	0.20	
	at 40F	(sq. ft.) (F/in.)	0.24	0.235	0.22	0.21	
	at 75F		0.26	0.255	0.24	0.23	
Thermal Resistance Values (R)	at 25F	per inch	4.35	4.54	4.76	5.00	
	at 40F	thickness	4.17	4.25	4.55	4.76	
	at 75F		3.85	3.92	4.17	4.35	
Strength Properties	Compressive 10% Deformation	psi	D1621	10-14	13-18	15-21	25-33
	Flexural	psi	C203	25-30	32-38	40-50	55-75
	Tensile	psi	D1623	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
Moisture Resistance	WVT	perm. in.	C355	1.2-3.0	1.1-2.8	0.9-2.5	0.6-1.5
	Absorption (vol.)	%	C272	less than 2.5	less than 2.5	less than 2.0	less than 1.0
	Capillarity	—	—	none	none	none	none
Coefficient of Thermal Expansion	in./in. (F)	D696	0.000035	0.000035	0.000035	0.000035	
Maximum Service Temperature	Long-term	°F	—	167	167	167	167
	Intermittent			180	180	180	180