ABT FOAM® Advanced Building Technologies Inc. Strength. Design. Innovation.

EPS Insulation

Product Data Sheet
Expanded Polystyrene (EPS) Insulation

EXPANDED POLYSTYRENE (EPS) INSULATION

Expanded polystyrene (EPS) is an innovative building material that lends to design and structural integrity of many building projects.

Since the 1950's EPS has been recognized as a mainstream insulating material but, over the past two decades new applications using EPS have exploded. It now serves as a powerful design element. And, EPS is an ideal choice for green building designs offering tangible environmental advantages that can maximize energy efficiency, provide indoor environmental quality and enhanced durability. ABT Foam uses highly sophisticated processes and technologies to manufacture the highest quality and cost-effective EPS products in the industry.

EPS foam insulation has been used in a wide variety of construction applications such as roofing, wall insulation, cold storage, stucco, sheathing, siding backing and many others. EPS is the most versatile insulation product because of the availability and made to order sizes and densities of foam. EPS is ideal for new construction and retrofit.

EPS FOAM INSULATION

Expanded polystyrene (EPS) is a closed cell, light weight, resilient foamed plastic insulation. EPS is able to withstand the abuse of temperature cycling and assuring long term performance.
EPS foam insulation is manufactured in accordance with ASTM C578. EPS is manufactured in a wide range of densities from the lower cost effective 1.0# (0.90 pcf density) and up to the high performance 2.0# (1.8 pcf density) meeting the demands of new construction and retrofit.

EPS foam insulation sizes are the most versatile in the industry. EPS foam insulation sheets are manufacturing by hot wire cutting from billets measuring 36" thick x 48" wide x 192" long. With this size billet, almost any size sheets are available.

VAPOR BARRIERS

Although EPS provides a high level of moisture resistance and breathability, recommended design practices for walls and foundations should be followed in the selection of vapor and moisture barriers for severe exposures.

Each roof application should be studied to determine the need for a vapor retarder to control internal condensation. Based on NRCA / MRCA sponsored studies, vapor retarder placement for EPS insulated roof system is less critical than for other types of roof insulations.

EPS ENVIRONMENTAL IMPACT

EPS insulation is an inert, organic material produced from petroleum and natural gas by-products. EPS insulation does not contain CFC's, HCFC's, adhesives or formaldehyde. EPS foam insulation provides no nutritive value to plants, animals, or microorganisms. It will not rot and is highly resistant to mildew and mold resistant (Tested in accordance with ASTM C1338 "Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.

LONG TERM INSULATION VALUE

R-value means the resistance to heat flow. The higher the R-value the greater the resistance to heat flow. The thermal performance of EPS insulation, as with any insulation product, depends upon the correct installation using good building practice. When properly installed, the R-value of EPS insulation remains constant for the life of the application. This is because the closed cell structure of EPS only contains air. As a result, the R-value of EPS insulation provided for each product type may be used as a design value without any adjustment for age.

TEMPERATURE CYCLING

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

BUILDING AND FIRE CODES

Install in accordance with Local, state or federal building and fire code requirements for EPS insulation.

STORAGE

Must be stored flat on the original shipping runners or pallet. The material must be elevated above floor, roof or ground level. If stored outdoors, must be covered with UV and waterproof covering. Do not store close to open flame.

FEATURES AND BENEFITS

- EPS sizes up to 36" thick x 48" wide x 192" long
- EPS densities range from 8 psi up to 33 psi
- EPS is made with film laminate options
- EPS can be custom profile cut
- EPS is free of CFC's, HCFC's, adhesives and formaldehyde
- EPS does not adversely affect indoor air quality
- EPS mold resistance tests favorably in accordance with ASTM C1338
- EPS R-values may be used without adjustment for aging

TYPICAL PHYSICAL PROPERTIES OF EPS INSULATION

Specification Reference: ASTM C578					1.0# Density	1.25# Density	1.5# Density	2.0# Density
Property		**Units**	**ASTM Test**	**Type XI**	**Type I**	**Type VIII**	**Type II**	**Type IX**
Density, Min.		(pcf)	D 303 or D 1622	0.75	0.9	1.15	1.35	1.8
Density Range				0.70	0.90-1.14	1.15-1.34	1.35-1.79	1.80-2.20
Thermal Conduct.	at 25 F	BTU/(hr.)	C177 or C518		0.23	0.22	0.21	0.20
K Factor	at 40 F	(sq. Ft.)(F/in.)			0.24	0.235	0.22	0.21
	at 75 F				0.26	0.255	0.24	0.23
Thermal Resistance	at 25 F				4.35	4.54	4.76	5.00
R-Value*	at 40 F			3.30 - 3.43	4.0 - 4.17	4.20 - 4.25	4.40 - 4.55	4.60 - 4.76
	at 75 F			3.10 - 3.22	3.6 - 3.85	3.9 - 3.92	4.0 - 4.17	4.20 - 4.35
Strength Properties								
Compressive 10% Deformation		psi	D 1621	5.0	10 - 14	13 - 18	15 - 21	25 - 33
Flexural		psi	C 203	10.0	25 - 30	30 - 38	40 - 50	50 - 75
Tensile		psi	D 1623		16 - 20	17 - 21	18 - 22	23 - 27
Shear		psi	D 723		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.	E 96	5.0	2.0 - 5.0	1.5 - 3.5	1.0 - 3.5	0.6 - 2.0
Absorption (vol.)		%	C 272	4.0	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)	D 696		0.000035	0.000035	0.000035	0.000035
Maximum Service Temperature		Deg. F						
Long-term Exposure				167	167	167	167	167
Intermittent Exposure				180	180	180	180	180
Oxygen Index		%		24.0	24.0	24.0	24.0	24.0
Flame Spread				less than 25	less than 25	less than 25	less than 25	less than 25
Smoke Developed				less than 450	less than 450	less than 450	less than 450	less than 450

Physical Properties chart and information is reprinted with the permission by The Society of the Plastics Industry, Inc.

Caution: Expanded Polystyrene (EPS) contains a flame retardant. However, it should be considered flammable and should not be exposed to any source of combustion. EPS insulation should be covered with a thermal barrier or otherwise installed in accordance with applicable building code requirements.

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 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 tarpaulin.

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