Plastifoam
High performance packaging solutions

Typical Physical Properties of EPS Insulation

Property		Units	ASTM Test	Density (pcf)			
				1.0	1.25	1.5	2.0
Thermal Conductivity K Factor	at 25F	BTU/(hr.) (sq. ft.) (F/in.)	C177 or C518	0.23	0.22	0.21	0.20
	at 40F			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 thickness	—	4.35	4.54	4.76	5.00
	at 40F			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		°F	—				
Long-term				167	167	167	167
Intermittent				180	180	180	180

All values based on data available from American Hoechst Corporation and ARCO Chemical Company.

Insulating Properties Definition of Terms

"K" — Thermal Conductivity:

The measurement of heat flow through one-inch thickness of any single material per hour × square foot × °F. K = BTU/(hr.) (sq. ft.) (°F/inch).

"C" — Thermal Conductance:

The measurement of heat flow through any single material that is more or less than one-inch thick. C = K/thickness.

"R" Factor — Thermal Resistance:

Reciprocal of the materials "C". R = 1/"C".

"U" Factor:

The measurement, in BTU of heat flow, per hour-square foot (°F) through a combination of materials. U = BTU/(hr.) (sq. ft.) (°F) U = 1/R.

Long-Term Insulation Value

EPS Insulation (1.00 pcf) provides a typical R value of 4.17 per inch (K factor = 0.24) at a mean temperature of 40° F. Unlike that of many other insulation products, the R value of EPS insulation is permanent because the cellular structure of the EPS contains only stabilized air. Aging has no effect upon the performance of EPS.