Geofoam No. 5001

Subject: **Understanding ASTM Standards for Geofoam**

Date: **January 2003 (Revised January 2019)**

ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam" was published by ASTM late in 2002. This standard was developed through the ASTM consensus process with input from researchers, third party agencies, users, general interest members, and manufacturers of geotechnical products.

ASTM D6817 addressed the need for a standard which is suitable for geofoam applications. Until this standard was issued, specifiers of molded polystyrene products for geotechnical applications had to rely on ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation." ASTM C578 provides information on thermal insulation and not geotechnical applications. Of particular note, the compressive resistance in ASTM C578 is listed at 10% deformation, a level that is not suitable for geotechnical load bearing applications.

ASTM D6817 provides the compressive resistance at 1% deformation for Geofoam. The compressive resistance at 1% deformation is often used in the design of geofoam projects. ASTM D6817 also includes the non mandatory 5% and 10% compressive resistance values as some specialty applications are designed to deform under loading.

ASTM D6817 provides a standard on which to specify the performance of geofoam.

The attached table outlines a few key physical properties of PowerFoam R-Control Geofoam in accordance with ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam" compared to PowerFoam R-Control insulation in accordance with ASTM C578, "Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation".

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Product		PowerFoam GEOFOAM 12	PowerFoam GEOFOAM 15	PowerFoam GEOFOAM 19	PowerFoam GEOFOAM 22	PowerFoam GEOFOAM 29	PowerFoam GEOFOAM 39	PowerFoam GEOFOAM 46	PowerFoam GEOFOAM 50	PowerFoam GEOFOAM 100	PowerFoam GEOFOAM 130	PowerFoam GEOFOAM 150	PowerFoam GEOFOAM 250	PowerFoam GEOFOAM 400	PowerFoam GEOFOAM 600
ASTM D6817[1] Compliance, Type		EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46							
ASTM C578[2] Compliance, Type									XI	I	VIII	II	IX	XIV	XV
Density[1,2], min., ASTM C303	lb/ft³ (kg/m³)	0.70 (11)	0.90 (15)	1.15 (18)	1.35 (22)	1.80 (29)	2.40 (38)	2.85 (46)	0.70 (12)	0.90 (15)	1.15 (18)	1.35 (22)	1.80 (29)	2.40 (38)	3.0 (48)
Compressive Resistance @1% deformation[1], min., ASTM D1621	psi (kPa)	2.2 (15)	3.6 (25)	5.8 (40)	7.3 (50)	10.9 (75)	15.0 (103)	18.6 (128)							
Compressive Strength @10%[2], min., ASTM D1621	psi (kPa)								5 (35)	10 (69)	13 (90)	15 (104)	25 (173)	40 (276)	60 (414)
R-value[2], Thermal Resistance, per inch, ASTM C518	°F·ft²·h/Btu (°K·m²/W)								3.2 (0.56)	3.9 (0.68)	3.9 (0.69)	4.2 (0.73)	4.4 (0.77)	4.4 (0.77)	4.5 (0.78)
Flexural Strength[1,2], min. ASTM C203	psi (kPa)	10 (69)	25 (172)	30 (207)	35 (240)	50 (345)	60 (414)	75 (517)	10 (69)	25 (173)	30 (208)	35 (242)	50 (345)	60 (414)	75 (517)
Oxygen Index[1,2], min.	vol. %	24	24	24	24	24	24	24	24	24	24	24	24	24	24

[1] Please refer to ASTM D6817 specification for complete information.
[2] Please refer to ASTM C578 specification for complete information.

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