GEOFOAM NO. 5009

SUBJECT: GEOFOAM FRICTION

DATE: MARCH 2011 (REVISED JANUARY 2019)

R-Shield® Geofoam is manufactured in conformance to ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam." This standard covers the material properties of Geofoam that are most often required for project design. However, R-Shield Geofoam is often used in applications which require additional information of the friction resistance between layers of Geofoam blocks.

Various researchers have conducted tests following the general procedures of ASTM D5321, "Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method" to determine the friction coefficient/friction angle for Geofoam.

The range of friction coefficient values generally reported for Geofoam to Geofoam range from 0.7 to 1.0[1].

The range of friction angle values generally reported for Geofoam to Geofoam for peak and residual shear resistance range from 32 to 48 degrees and from 27 to 35 degrees respectively.

There is a large variability in results since there is no industry standard testing conditions for sample size, surface roughness, displacement rate, and normal stress levels.

Based upon these results, researchers generally recommend an Geofoam/Geofoam friction coefficient of approximately 0.6 or an equivalent friction angle of 31 degrees for preliminary design.

References

1. http://geofoam.syr.edu/GRC_i15.asp

2. NCHRP Report 529, "Guideline and Recommended Standard for Geofoam Applications in Highway Embankments", Transportation Research Board, 2004