

SUBGRADE MODULUS(k)

APPLICABLE TO ATLAS GEOFOAM

The Modulus of Subgrade Reaction (k) of supporting materials is often a design consideration for concrete slabs supported by soil. The Modulus of Subgrade Reaction for soils is generally determined following ASTM D1196, "Standard Test Method for Nonrepetitive Static Plate Load Tests of Soils and Flexible Pavement Components, for Use in Evaluation and Design of Airport and Highway Pavements", where the Modulus of Subgrade Reaction is defined as:

$$\text{Modulus of Subgrade Reaction} = \text{Stress/deflection}$$

The use of Atlas Geofoam is often specified for use under concrete slabs and engineers request information with respect to the Modulus of Subgrade Reaction. There is no ASTM consensus on a test method for determination of Modulus of Subgrade Reaction for geofoam materials so other test methods must be reviewed.

Atlas Geofoam is manufactured in compliance with ASTM D6817 and meets specific requirements. The elastic portion of the stress vs. strain testing conducted for ASTM D6817 is of particular interest for determining the Modulus of Subgrade Reaction. An estimate of the subgrade modulus for Atlas Geofoam can be made by knowing both the stress (compressive resistance at 1%), strain, and the deflection that occurs when testing Atlas Geofoam. 2 inch samples are tested in accordance with ASTM D6817 and the deflection of a 2 in. sample at 1 % strain is 0.02 inches.

Therefore, the Modulus of Subgrade Reaction for 2 in. Atlas Geofoam can be calculated as:

$$\text{Modulus of Subgrade Reaction} = \text{Compressive Resistance at 1\% strain}/0.02 \text{ inch}$$

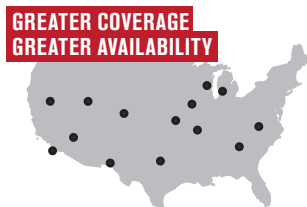
This bulletin uses ASTM D6817 properties to estimate the modulus of subgrade reaction. Research testing has also been conducted on samples of geofoam and additional information can be found in a research paper "Modulus of Subgrade Reaction for EPS Geofoam" by Negusse and Huang published by ASCE <https://ascelibrary.org/doi/10.1061/40866%28198%2921>

ATLAS GEOFOAM¹

GEOFOAM	MODULUS OF SUBGRADE REACTION (PCI)
EPS12	110
EPS15	180
EPS19	290
EPS22	365
EPS29	545
EPS39	750
EPS46	930

¹ Based on 2 inch thick Atlas Geofoam

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