

## **G-TEC**<sup>TM</sup> *Elasticized Expanded Polystyrene*

### GEOTECHNICAL PROTECTION FOR CONCRETE STRUCTURES

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#### BACKGROUND

Straw bales, cardboard products, expanded polystyrene (EPS) and other foam products have been used to reduce or eliminate geomechanical stresses to concrete structures. However, the ability of many materials including foam plastics to reduce loads against these structures may be limited to a small range of useful activity. A cost effective material that provides predictable compressibility over a wider range is, in many cases, highly desirable.

#### PRODUCT DESCRIPTION

G-TEC is manufactured from inert closed cell expanded polystyrene (EPS) that has been modified to produce improved stress/strain/time behavior for geotechnical applications. The extended range of flexibility increases the design safety factor against seismic, freeze/thaw and earth pressure failure. G-TEC has been elasticized in a special process which improves the useful response to soil movement. The product permits mobilization of compacted soil shear strength which allows vertical or horizontal arching of the soil structure.

G-TEC has excellent resistance to freeze/thaw and has low moisture absorption properties. It is not biodegradable. It has no pest nutrient value. Because it is an excellent insulating material, the effect of strain from freeze/thaw may be reduced or eliminated.

#### APPLICATIONS

G-TEC is designed to be used to protect retaining walls, foundations, culverts, buried pipes, abutments and other concrete structures that may be affected by earth loads, freeze/thaw stresses, seismic or other dynamic loads.

Concrete retaining walls and other structures should generally be designed to permit earth pressure deflection of at least 0.5% of the wall height. This is a standard criterion for reducing compacted earth pressure from 'at rest' to 'the active state'. G-TEC will provide full elastic strain compensation (and complete rebound) for this amount of deflection if installed between the structure and the earth fill at a thickness of 5% of structure height in contact with soil. A 2-meter high wall would therefore require G-TEC panels of 100mm thickness installed on the face of the wall.

G-TEC will also absorb a relatively large amount of soil creep over a lengthy time period. This provides an additional safety factor for the long-term protection of structures.

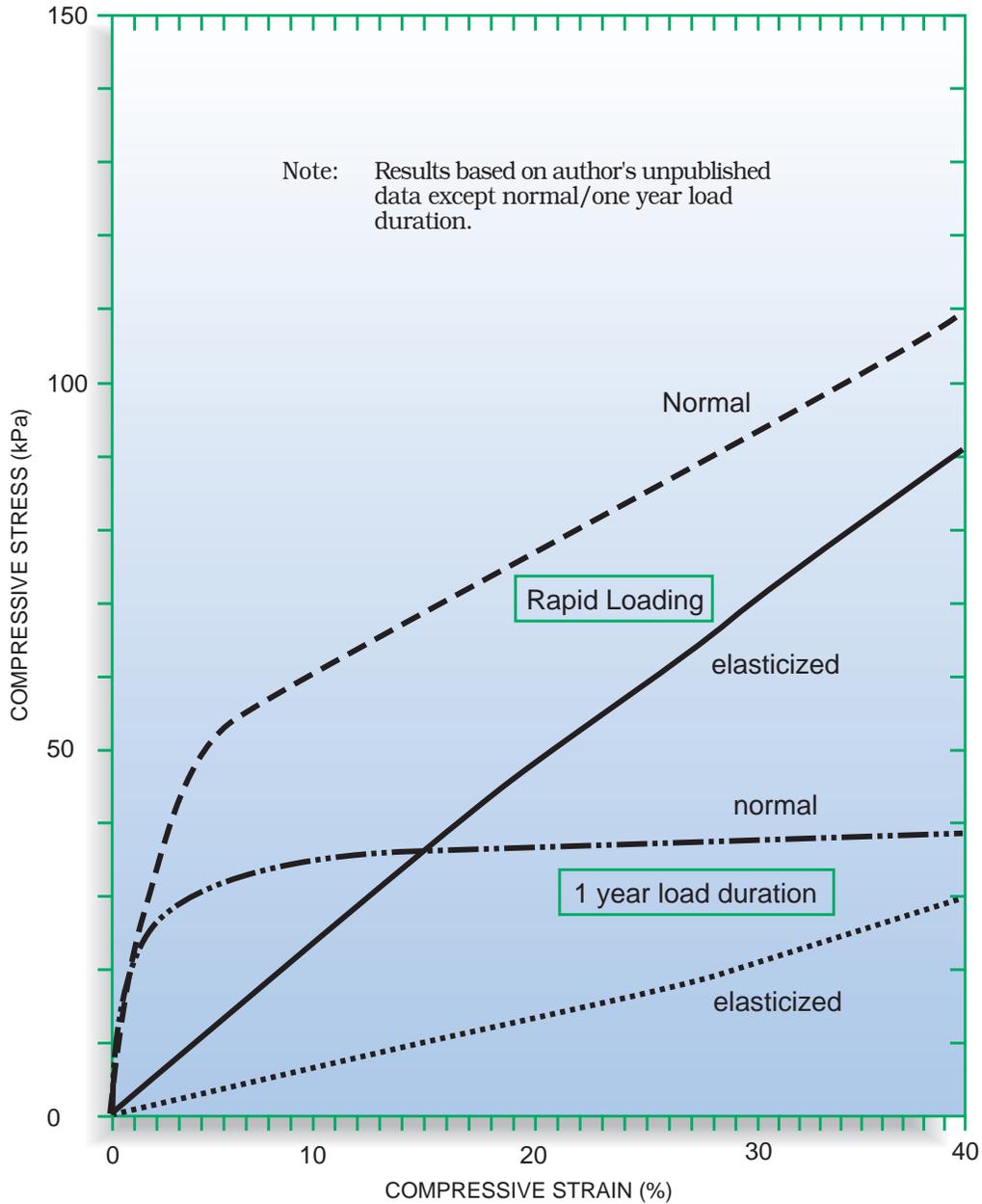
A full geotechnical evaluation of soil type, compaction levels, wall geometry and other factors could produce a site-specific recommendation for the use of G-TEC.

#### QUANTITY/SIZES

G-TEC is available in 4' x 4' / 1220mm x 1220mm panels, in the required thickness.

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**STRESS-STRAIN CURVES FOR EPS and EEP**  
**Rapid and 1 Year Duration Testing**



Effect of load duration on the stress-strain behavior of normal (EPS) and elasticized (EEP) expanded polystyrene block in unconfined axial compression.

J.S. Horvath, (1998) *The Compressible-Inclusion Function of EPS Geofoam: Analysis and Design Methodologies*, Research Report CE/GE-98-2, Manhattan College, Bronx, New York

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