The Torsional Shear Strength of Pyrophyllite Under Increasing Confining Stress to Approximately 70 Kilobars.

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Abstract

Pyrophyllite disks 1.27 cm dia x 0.254 cm high have been subjected to torsional shear at room temperature under steadily increasing confining stress to 70 ± 3 kilobars. The recently developed Abey-Stromberg apparatus was used. The maximum shear strength is found to increase smoothly at an overall rate of about 0.16 kilobar per kilobar of confining stress, and reaches a strength of approximately 11 kilobars at 70 kilobars. The coefficient of sliding friction at low confining stress is close to 0.1. The Coulomb coefficient of internal friction increases from about 0.13 at low confining stress to about 0.16 at 70 kilobars. A change in rate of applied torsional strain from 10^{-3} to 10^{-4} radians per second produced no significant change. Contrary to many materials under high pressure dynamic shear, pyrophyllite does not display "stick-slip" or other types of discontinuous or variable behavior.