

Compressibility, Definition of Bulk Modulus

At high pressures, Clearco Silicone Fluids are much more compressible than comparable organic fluids. Among silicone fluids, the low viscosity grades exhibit the greatest compressibility. At 20,000psi for example, PSF-0.65cSt silicone fluid may be compressed to 12.1% whereas the same pressure produces a compression of 9.1% in a 100cSt silicone fluid.

“Bulk Modulus” can be defined as follows: From The International Dictionary of Physics and Electronics, p. 114. “Bulk modulus (or Modulus of Volume Elasticity).....the application of pressure to a material’s medium changes its volume. The bulk modulus for an elastic medium is defined as

$$B = \frac{\Delta P}{\Delta V/V_0}$$

where:

ΔP is the increase in pressure
 ΔV is the decrease in volume and
 V_0 is the original volume

The modulus may be defined and measured under adiabatic, isothermal or other specified conditions.

It should be noted that the coefficient of compressibility of a substance is the reciprocal of its bulk modulus.