# VISCOUS FLUID BEHAVIOR

EFFECTIVE VISCOSITY is a term describing the real effect of the viscosity of the ACTUAL fluid, at the SHEAR RATES which exist in the pump and pumping system at the design conditions.

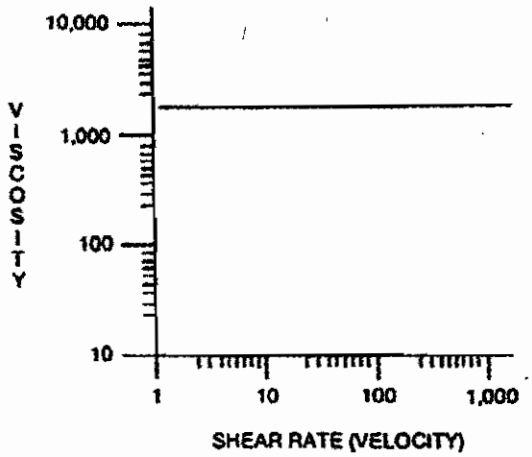
## NEWTONIAN

TYPE: Constant Viscosity at all Shear Rates.

*NEWTONIAN FLUIDS*

Viscosity is **constant** with change in **Shear Rate** or Agitation. Forces to cause motion increase proportionately as speed increases.

**Water**
**Most salt solutions in water**
**Light suspensions of dye**
**Kaolin (clay slurry)**
**High-viscosity fuels**
**Gasoline**
**Kerosene**
**Most motor oils**
**Most mineral oils**




## NON-NEWTONIAN

### PLASTIC, YIELD DILATANT

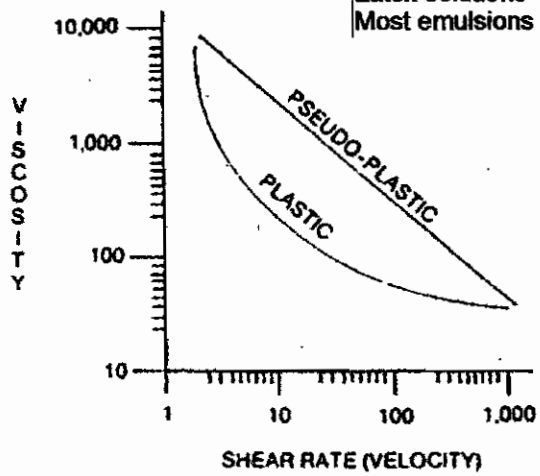
*PLASTIC FLUIDS*

This type of fluid always requires an initial force or stress which is called The Yield Point, before flow will start: With a Yield Point too high, flow may not start in a normal inlet system to the pump.

**Clay**
**Mud**
**Tar**
**Sewage sludge**
**Digested sewage**
**High concentrations of asbestine in oil**
**Thermoplastic polymer solutions**

### PSEUDOPLASTIC

*PSEUDO-PLASTIC FLUIDS*

Viscosity decreases as shear rate increases. At any constant flow rate or Shear Rate, viscosity stays constant and is independent of time.

**Sewage sludge**
**Paper pulp**
**Grease**
**Soap**
**Paint**
**Printer's ink**
**Starch**
**Latex solutions**
**Most emulsions**