3. Pseudo-plastic, dilatant, and thixotropic fluids

Pseudo-plastic, dilatant, and thixotropic fluids are all types of non-Newtonian fluids, meaning their viscosity changes depending on the applied shear stress or time. Pseudo-plastic fluids decrease in viscosity with increasing shear stress (thinner when shaken), dilatant fluids increase in viscosity with increasing shear stress (thicker when agitated), and thixotropic fluids decrease in viscosity over time under constant shear stress.

Pseudo-plastic (Shear-thinning):

- Viscosity decreases as shear stress increases.
- Example: Ketchup, mayonnaise, nail polish, and paints.
- These fluids are often described as "shear-thinning" because they become more fluid (less viscous) when subjected to a force (like shaking or stirring).

Dilatant (Shear-thickening):

- Viscosity increases as shear stress increases.
- Example: Wet sand, some types of mud, and certain industrial slurries.
- These fluids are often described as "shear-thickening" because they become more viscous (thicker) when subjected to a force.

Thixotropic:

- Viscosity decreases over time when subjected to constant shear stress.
- Example: Ketchup, paints, some lotions, and dental impression materials.
- Thixotropic fluids become more fluid (less viscous) when they are subjected to a force for a period of time (e.g., shaking or stirring).
- Once the shear stress is removed, these fluids will return to their original viscosity over time.