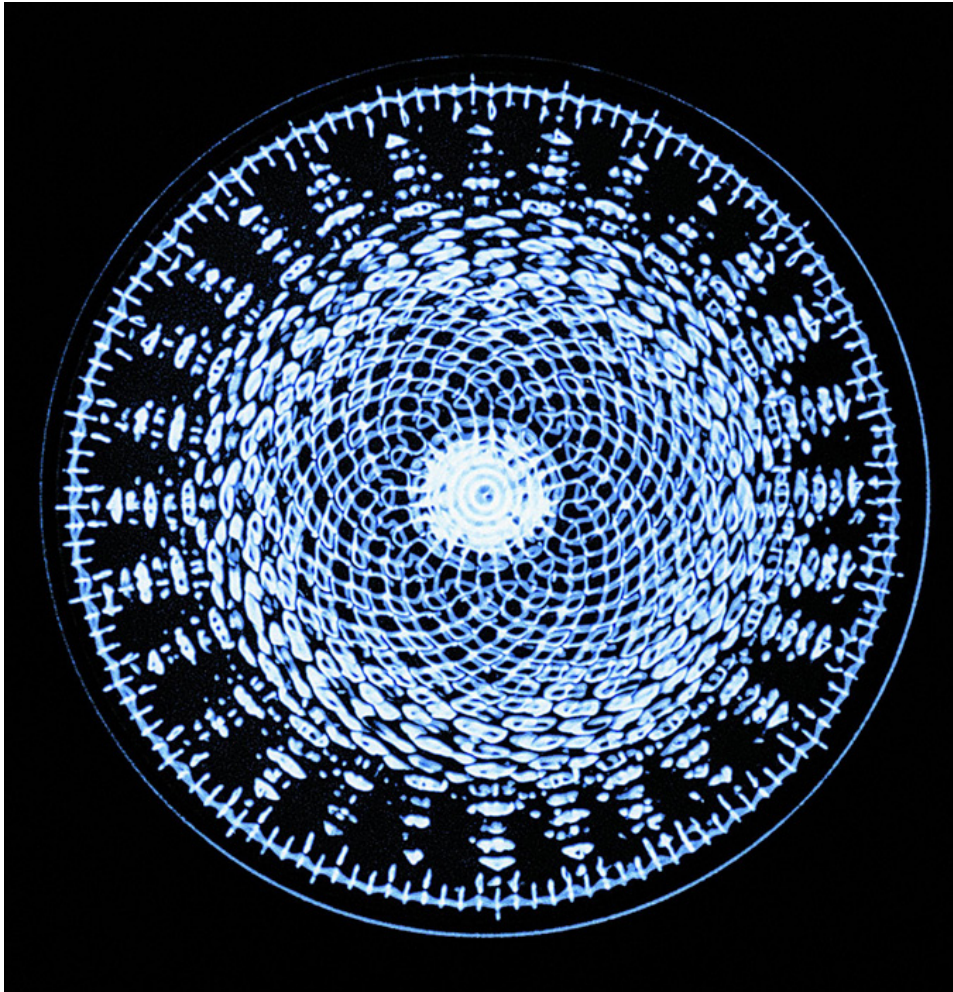
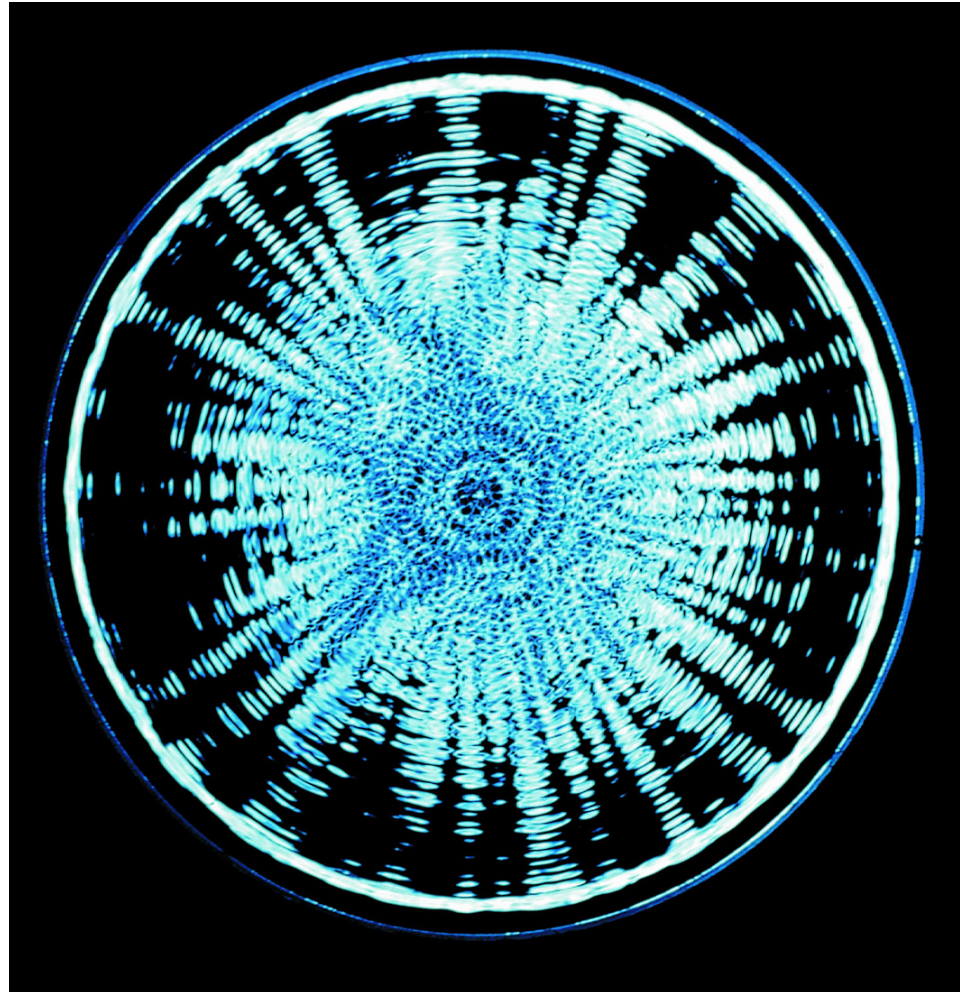


O O B L E C K | V I B R A T I O N S E N S I T I V E F L U I D
G R O U P 4 | B O I T O U Z E T T I M O T H E E A G A R O Z



Sound vibration on water | 36Hz

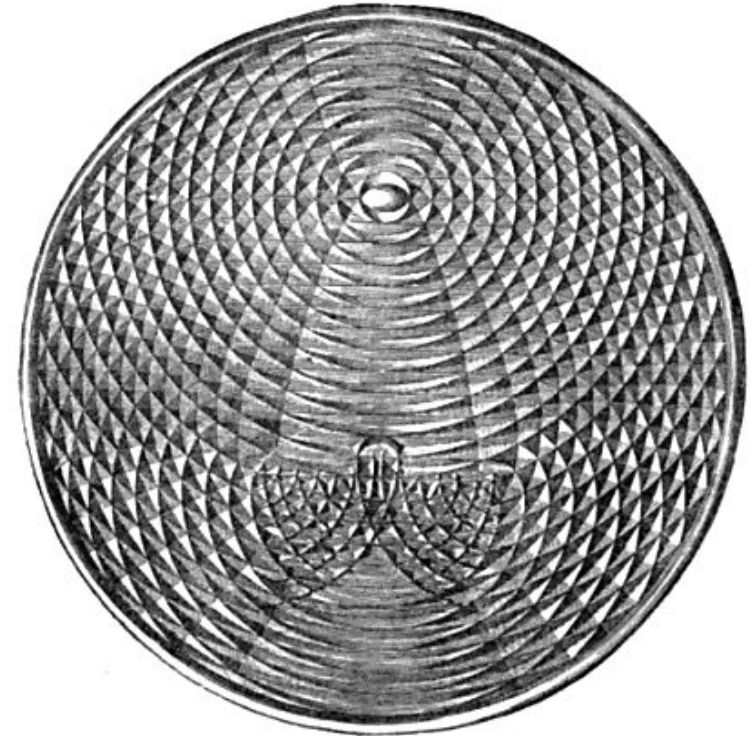


Sound vibration on water | 65Hz

What?

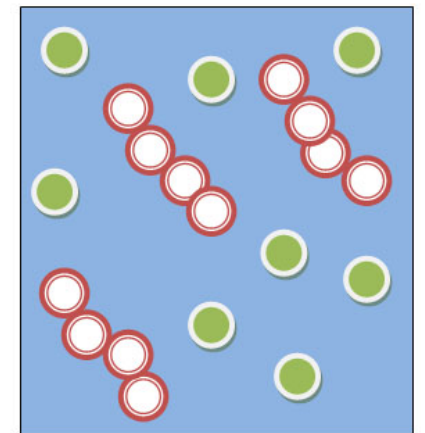
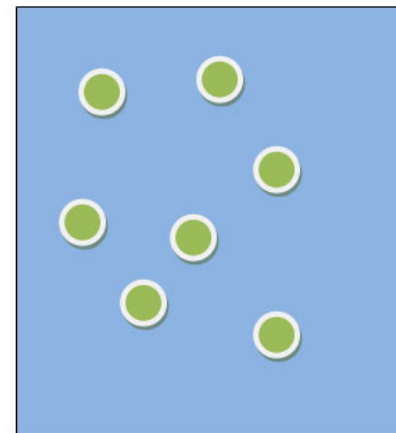
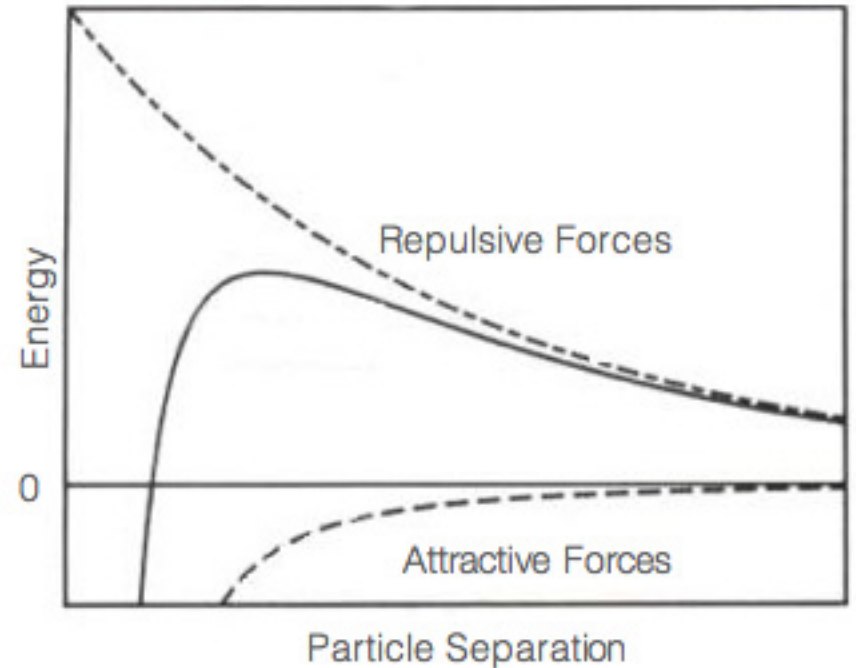
- Test the sensing limit of a non Newtonian fluid as a dilatant material.
- **Non-Newtonian fluid** = shear thickening fluid.
- **Dilantant** = material which viscosity increases with shear stress.
- **Stress crystallization** = the solution crystallizes under stress and behaves more like a solid than a liquid.
- **Parameter** = suspension particle size, shape, distribution.

FIG. 162.



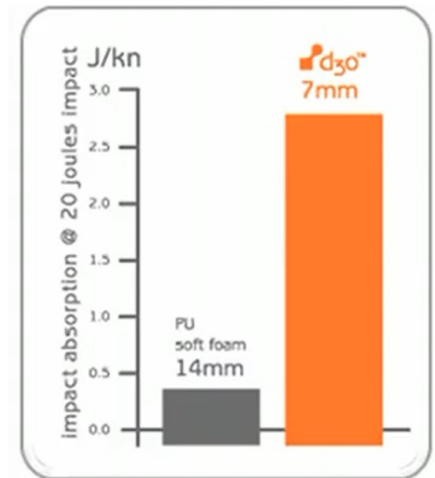
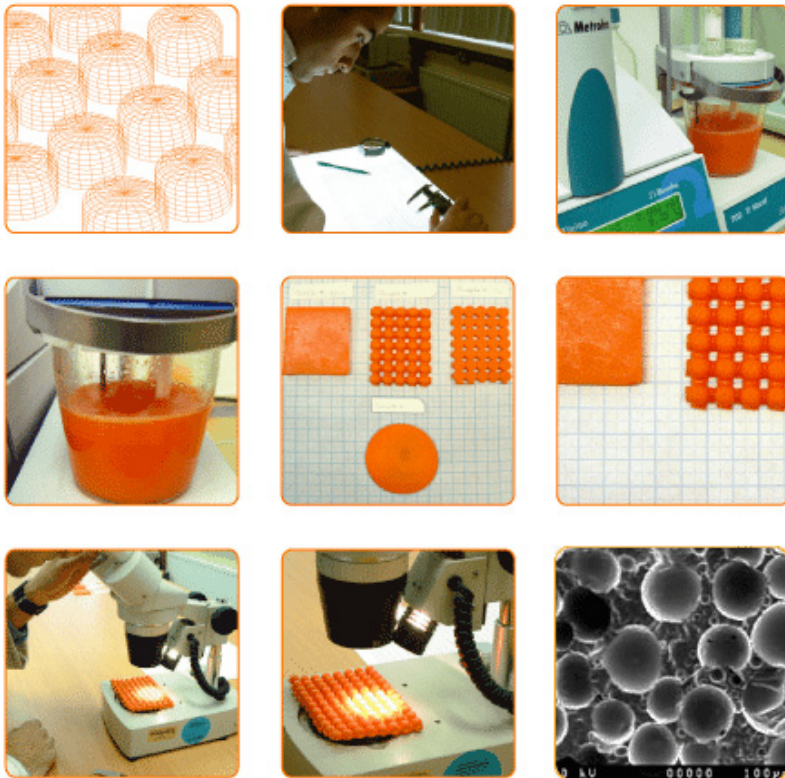
Why?

- **Dilatant behavior** = depends on the ration of interparticle forces.
- **Flocculation** = with stress, particles are no longer held in suspension; they start to behave like a solid. When stress is released, the particles spread apart
- **Hydrophilia / Hydrophobia** = reaction variation under stress.
- **Hydrocluster** = In its stable state, the solution displays small groupings of particles forming hydroclusters, increasing the viscosity.



Non-Newtonian Fluid examples and application:

- Body armor
- Di3O material



Creation of a Non-Newtonian fluid: Oobleck

Corn starch + water

Proportions 1.5parts CS + 1part W

Creation of a Non-Newtonian fluid: Oobleck

Corn starch + water + Oil + Iron Oxide

Proportions 1.5parts CS + 1part W + 0.5part O + 1.5parts IO