Osborn – Flow Visualization
Final Group Project
12/12/2007

1. Final group project, experimenting with Robert Blackstock's fluid. We ran it through a small channel, tubes and viewed it mixing it in a beaker. The fluid has very subtle changes in color viewed under polarized light, but has terrific indicators to show how flow is working.
2. The video was taken looking down and to the side of the fluid in a beaker with a stirrer bar creating a vortex. The patterns in the liquid reveal the flow of the liquid throughout the beaker.
3. 300ml of Blackstock liquid was poured into a beaker set on a stir motor. A magnetic stir bar was added and the speed was adjusted to create a slow vortex of the liquid. Lighting was a diffused 600W Omni from the side and top.
4. Video Info
    a. Field of View: Telephoto. Subject is 4" in diameter.
    b. Distance: about 24"
    c. Panasonic DVX100B (DV Video 720x480)
    d. Aperture: f2.8, Shutter: 1/48, Focal Length: 50mm (equiv)
    e. Edited to show stirring details.
5. One of the things of working in a group is the chance to observe how other people problem solve and structure their thinking. It is very clear that as an artist—perhaps as a professional artist also working on a grad degree—that my view on how to experiment with my environment is from a very different place than as an engineering student. I found the stuff we were working with absolutely fascinating and extraordinary. I think at one point someone likened it to, "pouring cream into coffee." Cream that never quite mixes in. The ideas on things to try with this are hard to ignore: what happens when poured into hot water? Cold? Salt? Alcohol? Is a big fat tube of this more reactive or less? How does flow look in a flume channel? If you introduce an object into a tank of this and shine a light through can you see the "cream" flowing around it?

    After having played with it I think it may be excellent for watching motions in a moving liquid with or without obstructions and excellent to view using a light through the liquid and perhaps using a sheet of light in a cross section. The fluid is not terribly reactive to sheer forces specifically – you can see some reaction under polarized light but not enough to quantify. One thing polarized light does well is allow you to see through the liquid (which is otherwise fairly opaque) and to see the suspension against the liquid more clearly (in fairly slow moving flows). Its real strength is as a marker suspended in a liquid that doesn't settle out.

    And here is the major difference in approach: I was unable to convince the team to try any of the above. The "goal" of our experiments was to "reveal the rainbow effect of sheer forces in a flow using polarized light" and nothing I said could convince the others in the group to change our mission statement or our approach.

So for me what was a astoundingly cool success (the liquid is way fun to stir up and watch) was taken by the rest of my group as a terrible failure.

The videos I took (and show) create a terrific motion view of how liquid moves when stirred in a round container – I presume air through a fan in a room would look similar. Given another experiment I'd start by using this liquid in a variety of shaped containers to see how the patterns change with a stirrer.