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2/8/2010

Get Wet Image Report

The purpose of this project was to gain experience with photography and to demonstrate the ability to perceive fluid flow as art. This project would prove to be a difficult, but rewarding first encounter with flow visualization photography. The first step I took to create this image was the collection of ideas during a brainstorming session. I came to the conclusion that I wanted to work with paint as the fluid and gravity as the driving force of the flow. The primary reason for this choice was the ability to control the color schemes of the fluid. The original plan was to pour watery paint through holes on a flat surface and let the paint fall through the air. This idea proved to be outside of my personal photography capabilities and I was forced to revise my original method.

To make the fluid easier to photograph, I decided to let the paint fall on the side of a black board. I experimented with various arrangements of thick paint placed on the black board and chose to pour thinner paint through a stationary thicker paint. This resulted in a nice mixing effect between the two paints. The image I chose involved a z-shaped white stationary section with two streaks of thinner red paint running through the z. The method of how this flow was created is more clearly illustrated in figure 1 below.

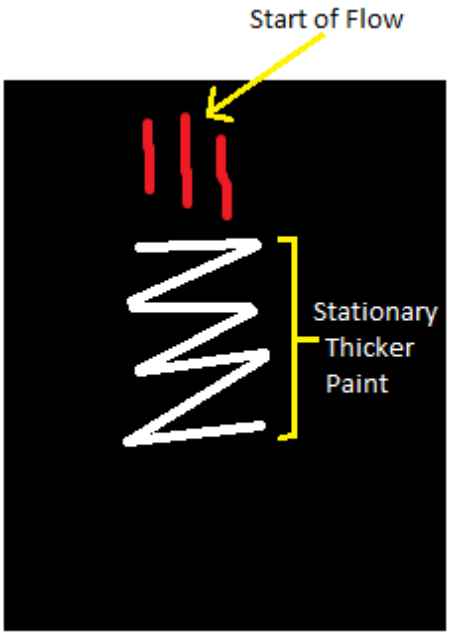

Figure 1

The z-shaped white section of the image was allowed to sit for around three minutes so that gravity could pull some of the fluid downward toward the ground. The scale of the image is approximately 4”x 4”. While gravity was the main driving force that the image illustrates, the effects of mixing and friction are also visible. The friction forces are greater on the thicker white paint allowing it to relatively stay in place, while the red paint experiences less of this adhesive friction force. This allowed the red paint to run through the white paint because of the high water content in the red paint.

At the top right of the image you can clearly see the effects of fluid friction. The red paint causes a drag to occur with the white paint in the opposing direction of the motion. In fluid dynamics, drag (sometimes called fluid resistance) refers to forces that oppose the relative motion of an object[1]. The white paint is resisting the motion of the red paint so it is pulled downward with the red paint, which is can be clearly visualized. Since the speed of fluid flow is low, the paint has a low Reynolds number. The red paint was travelling at approximately 6 inches/second while the white paint was travelling at < 1inch/minute.

The materials used for this image were purchased at McGuckin's Hardware and included, acrylic paint, mixing cups, and black poster board. Additional supplies included water and newspaper. The image was done in a cold (about 50 degrees Fahrenheit) garage at night using only electric light from household lamps. The lights were placed above the board and slightly in front of the board as well. It should be noted that the board was rested against a table at an angle around 75 degrees. This lighting allowed a nice shadow along the bottom edge of the white paint.

This image was shot with a Canon EOS Digital Rebel. The camera was approximately 2.5 feet from the fluid. An exposure time of 1/40 of a second was used to allow enough light into the lens. A higher shutter speed was not necessary because of the slow motion of the fluid flow. A medium aperture was chosen (f/5), but a higher aperture would also be sufficient. An ISO number of 1600 was used to allow great detail to be photographed. I failed to record the focal length I used for the photograph, but I think I used a small amount of zoom and focused the image manually. The image was cropped from the original photograph and has a final resolution of 966x954. Other photoshop revisions included small changes to contrast and a shift to the color curve. This shift made the darker colors of the image closer to black.

When I selected the section of the image that I cropped, I chose it because it had a very graphic, appealing look to it. I especially like the contrasting colors of black and white, complete with two vivid red streaks. The image illustrates multiple different mixing effects based on fluid resistance. Another aspect of the image that I particularly like, is the dark shadow on the white paint. One of my concerns with the photo was my inability to totally eliminate the light reflection off of the poster board. In the future, I would have possibly used a different material as the surface or rearranged the lights. Overall, I am pleased with my image, even though it was not my original idea.

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1. http://en.wikipedia.org/wiki/Drag_%28force%29