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Get Wet Assignment
MCEN 4151
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Honey Viscous Flow

This image was taken for our Get Wet assignment. The purpose of this assignment is to capture a picture of any fluid demonstrating particular phenomenon. In this image, I was trying to demonstrate the viscous flow of fluids.

As can be seen in the picture, the fluid that was used to demonstrate the viscous flow is honey. Viscous flow is defined as a type of fluid flow in which there is a continuous steady motion of the particles where the motion at a fixed point always remaining constant. The reason the flow look like that is because honey has high resistance to deformation. In other words, the internal frictional force that develops between the different layers of honey as they are forced to move relative to each other causes the honey to be more sticky. The honey is moving downward due to gravity. The Reynold number can be approximated as (assuming the density is 1350 kg/m^3, velocity is 2 m/s, flow width is 0.5 cm, viscosity is 10 Pa.s):

$$Re = \frac{\rho v L}{\mu} = \frac{(1360\frac{kg}{m^3})(2\frac{m}{s})(0.005m)}{10(\frac{kg}{m.s})} = 1.36$$

Which means that the flow is laminar (less than 2300). The Reynold's number of honey will vary depending on the temperature, since temperature affect viscosity.

The image is taken using Canon Rebel T3i and was edited using Photos application. In the Photos application, I added a Vivid Cool filter to the image. Also, I increased the softness of the picture, which means that I decrease the difference between adjacent pixels. The lightning that I used for the image is a floor lamp. The honey that I used in this image is called Ambrosia Honey sold by Madhava Natural Sweeteners.

The size of the field of view 39.6, and the focal length is 50 mm. The distance from object to lens is 10 cm. The shutter speed is 1/40. The ISO is 3200. The image. before editing is shown below.

I really liked the focusing in this image and I think it is a good demonstration of the viscous flow of honey. Also, I liked the depth of field that is shown in it. What I dislike in this image is that it could be used to capture a more complex flow of honey. I think the goal of this image is fulfilled in general, but the complexity could be better.

References

PINARBAŞI , Ali . *Fluid Mechanics*. YILDIZ Technical University.