Team Second

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Flow Visualization: 4151-4200-001

The image depicted for my second team assignment is that of dry ice fog wafting off a landscaping glove. Its purpose was to demonstrate the natural flow of fog over complex objects such as the glove, as well as demonstrate that dry ice can produce fog in general. I captured this image with the help of Lara Buri, Cara Medd, Michael Johnson, and Madison Emmett.

Figure 1: Original Picture

Dry ice is the solid form of carbon dioxide. To solidify this gas, it needs to reach temperatures of -109.3 degrees Fahrenheit. Once dry ice comes into contact with the air that resides around room temperature, the carbon dioxide will sublimate (convert from solid directly into a liquid). This sudden shift in temperature will cause the water in the air around dry ice to condense into a fog, explaining why the fog is thicker when water is poured on the dry ice. This fog is in turn colder and denser than air which makes it sink when it is created. This phenomenon is shown in Figure 1 (Helmenstine).

Figure 2: Supplies used in taking the picture

As shown in Figure 2, this experiment was performed in a study room near the William's Village dining hall. 5 pounds of dry ice were bought from a local grocery store. The landscaping gloves were used in both the handling of the dry ice and the picture. A single iPhone light was used to light the picture from about a yard away above and to the left of the glove, other than that the room had no other light sources. In the taking of the picture, the dry ice was broken with a hammer and 4 small pieces were placed in the glove. Then a tablespoon of water was poured over the dry ice in order to make the fog more visible. All of this was placed up against a black background giving the pictures some nice negative space.

This image was taken with a Canon EOS 5D Mark II camera with a 28-75 mm, 1:2.8 lens. The exposure time was 1/30 sec, the f-number was f/2.8, and the ISO was set at ISO-1000, as shown in Figure 3 along with the base picture adjustments during post-processing. The camera was set 1 foot away from the glove holding the dry ice. The field of view of the original image, shown in Figure 1, was 1.5 feet from end to end. The original picture's size was 5616 by 3744 pixels, but after editing and cropping that size was cut down to 4432 by 2912 pixels. The final touch on the picture was the color balance adjustment which is shown in Figure 4.

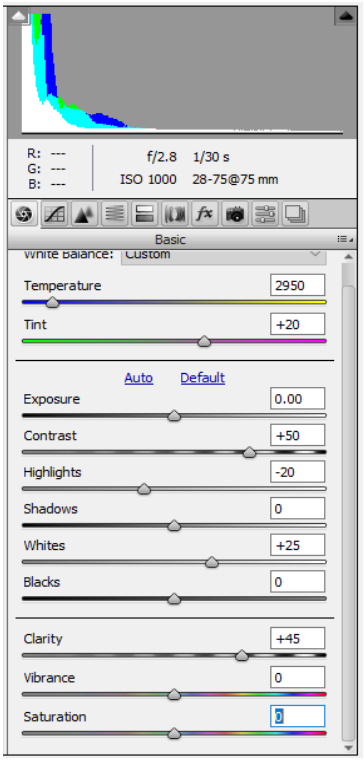

Figure 3: Adjusted Settings

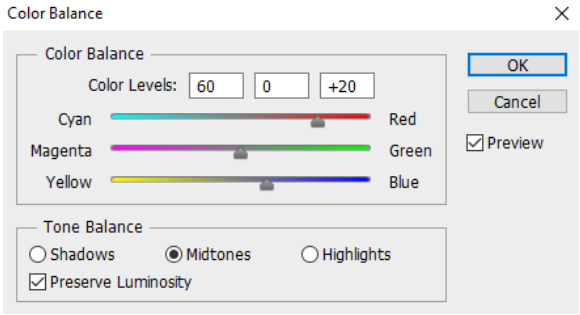

Figure 4: Adjusted Color Balance

In the end, this picture demonstrated many of the properties found in dry ice fog. I enjoy the color scheme and how it was a cooling effect along with how the orange compliments the blue of the ice. If I was to improve this image it would have something to do with increasing how much fog was visible. This being said dry ice can definitely be used in a multitude of ways that I would like to explore in the future.

Sources:

Helmenstine, Anne Marie, Ph.D. (2018, January 31). Why Dry Ice Makes Fog. Retrieved from https://www.thoughtco.com/why-dry-ice-makes-fog-606404