

Double Pillar



This downloadable PDF tutorial explains this type of water splash photography, which I discovered in 2012.

To create such images, you need three independently adjustable valves. Precision is of the essence, as each of the outer valves triggers independently from the centre valve some milliseconds apart. This has to be very precise. I will get back to this later.

Let's first have a look at how such water splashes form :

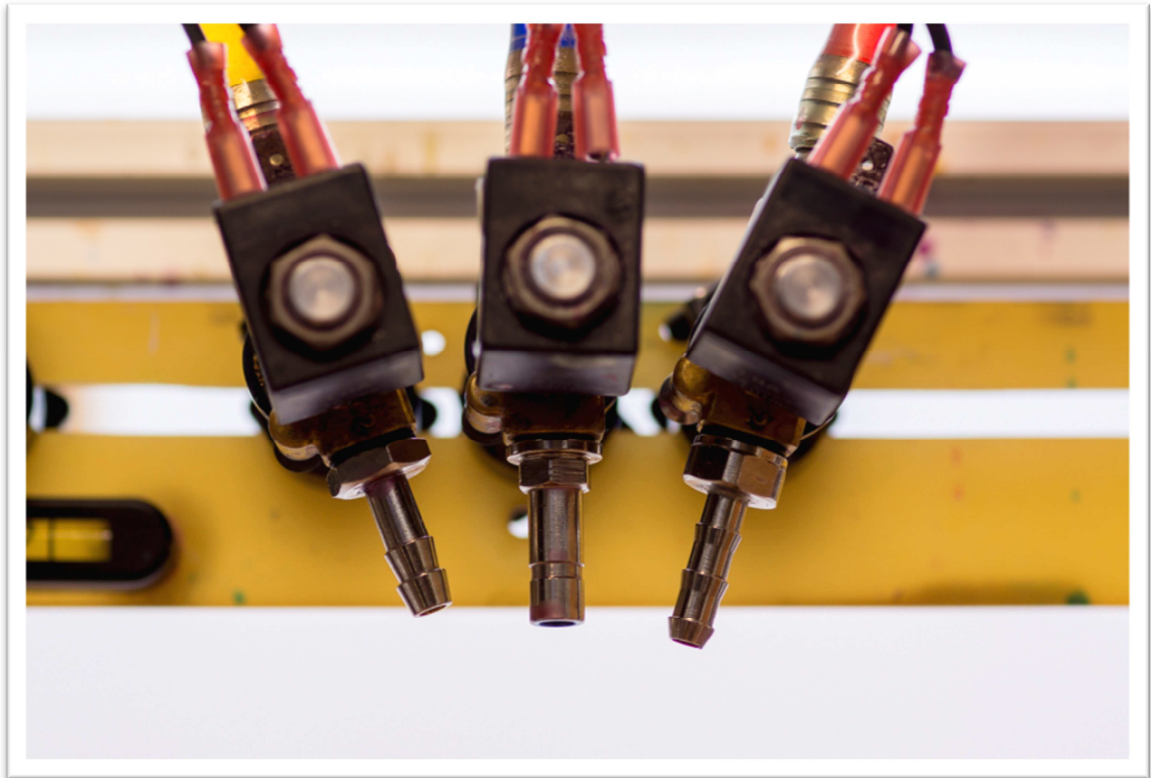
Two synchronized drops are triggered from two separate valves. The distance between those valves is very important and needs to be very precise. Get it right and the two pillars will meet. Once this happens, you can synchronize your trigger and place a third drop right on top. And this is how such water creations happen. Each collision is unique.

Why ? The impacting water drops each create a different turbulence under water (crater), directly influencing each other. This in turn will generate both pillars and structure their « way up ».



About the basics :

- Some of you asked me, how I configure and install the valves. Here are some images of my configuration. And it is this set up up which allows me to take images as the the following examples. However this image shows the outer valves at a slightly different angle, as my drop water mixture thickened too much - usually, the valve's angle of inclination is less important. (is not tilted so much)



- The drop water's viscosity is very important. The mixture for both outer valves is thicker compared to the centre valve. My reference is the viscosity of fluid cream. The mix of liquids I use resembles milk. I get best results with a slightly thicker mixture. It takes a lot of experimenting and the mixture makes a huge difference to the outcome.

Let's get to the practical bit of this tutorial :

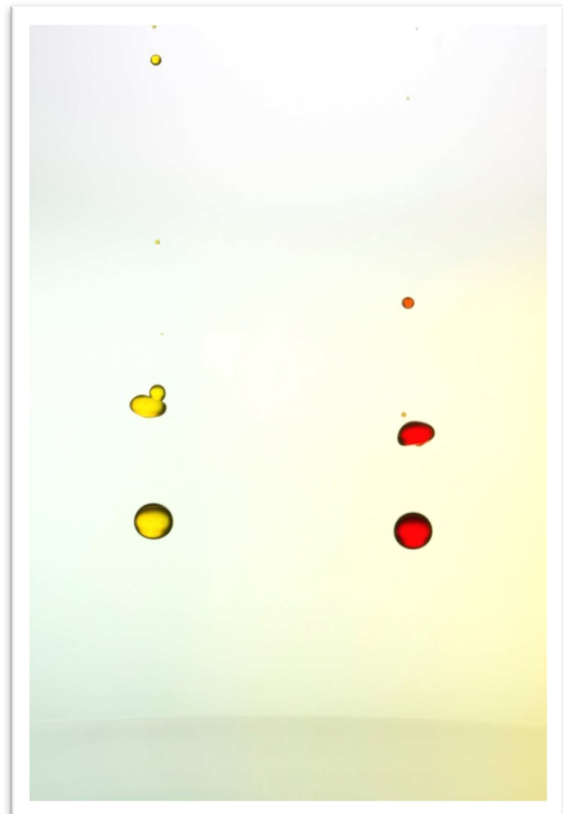
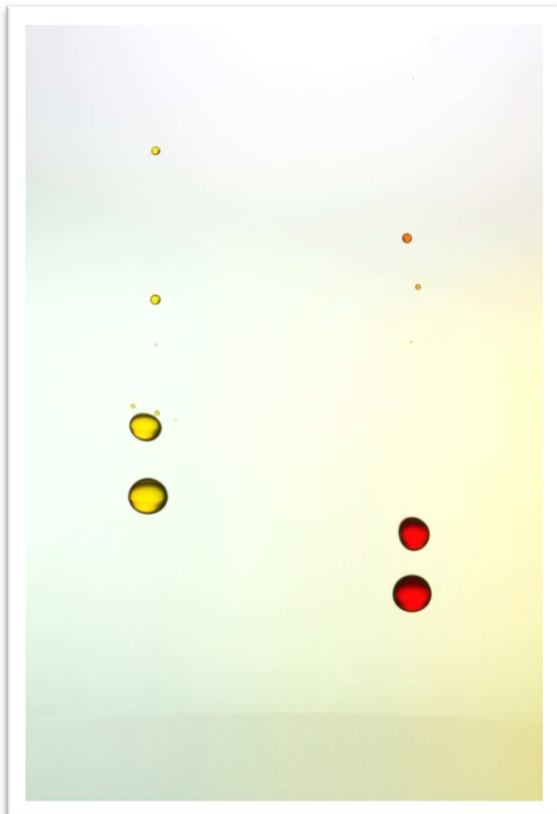
the exact calibration of the synchronised water drops. My valves are exactly the same, however, every mechanic part works different. You need to take into account the mechanical tolerance– you therefore need to calibrate each of the outer valves separately. Take a look at the following examples to understand my explanation.

Image on the left

Both valves are configured the same. (the valve triggers for 85 milliseconds). The image shows confirms my theory and you can easily see the difference between the right and left valve. This may only be a tiny difference of about 5-6ms, but this makes a lot of difference to the resulting pillars, which will not rise to the same heights at the right moment.

Image on the right

The right valve was set to trigger 5 ms later and the magic is done, we're getting closer to our desired result. Both water drops are at the same height. You can now start composing the image, as you can take direct influence on the synchronised water drops and their splash height. Take a closer look and you can see another change of settings. The interval between drops has been increased, thus forming a higher rebound. (the pillar grows to a greater height) And this will allow to form XXL-drop on drop collision. (XXL-TaTs)



Fine tuning the pillars' formation

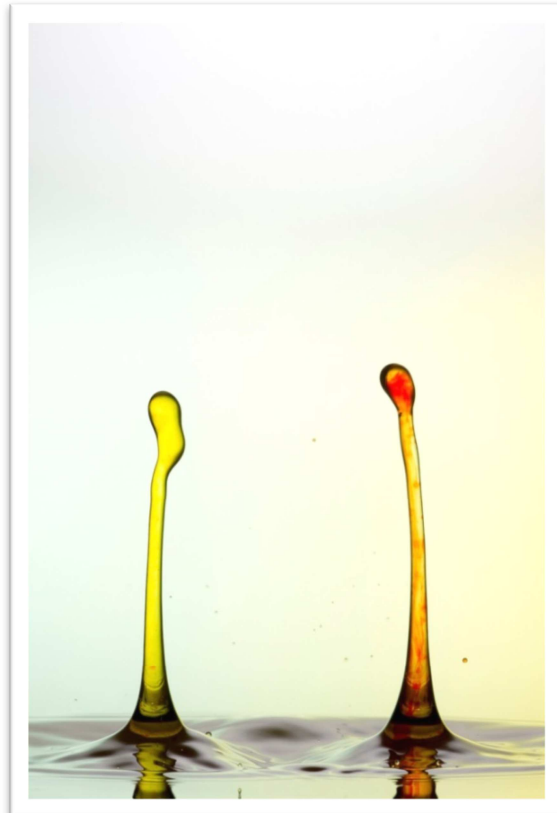
Once you have calibrated the outer valves, start taking a closer look at those pillars, as those need further fine tuning. It is very important to have both pillars ascent in perfect harmony. Take a look at the following images, they will explain how I achieve this.

Image on the left

Even when you have fine tuned the water drops, it still is possible, that one pillar grows to greater heights compared to the other. The right image is your reference. This is what it so should look like and you may need to further adjust the valves to get there.

Image on the right

Should your pillars look like this, you can skip the next part. If this is not the case, you should further fine tune the right valve. Its pillar needs to be taller : increase the valves trigger time, but only in very small steps (1-2milliseconds). In my example, I adjusted the trigger time by a mere 2ms to get the best of circumstances for our next step.



The marriage (fusion) of both pillars.

Once conditions are perfect, we can look at combining both pillars, make them fuse in midair. This is easily done. You need to bring both outer valves closer (by turning them inwards on their axis) to each other, but like before, in very small steps. I usually turn the valves no more than 2-3 mm. After each change, I test my configuration, take a photo and see where to go from here. Try not to make too many changes at a time, as often, you don't know any more what has been changed. This leads easily to confusion. If the distance between drops is too small, both pillars will merge too soon – the pillars may not be rising straight any more. Try to configure your set-up as close as my image shows. For this technique they really are nearly perfectly displayed.

Once you are happy with your pillars and their fusion, start thinking about the third drop and start your creations. However, it takes a lot of trial and error, before you get the perfect image. Often you end up with a lot of abstract images and only few are perfectly balanced. If you get those spot on images, congrats, everything is perfectly balanced.



Here are some images and I hope to have shed some light on my take on water drop photography and its set-up.

From here it is up to your imagination, as you can start using various objects. For instance, I used a little marble right in the drops' centre. It now looks as if my pillars start from there. Now it's up to you to fire up your imagination.



I have tried to combine 4 pillars using the same technique without success. My take on 3 synchronised pillars was successful. I still believe fusing 4 pillars is possible, especially after my set-up has gotten better over time.



As you can see, still a lot to discover ;)

Have fun chasing those unique water collisions and enjoy experimenting.

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