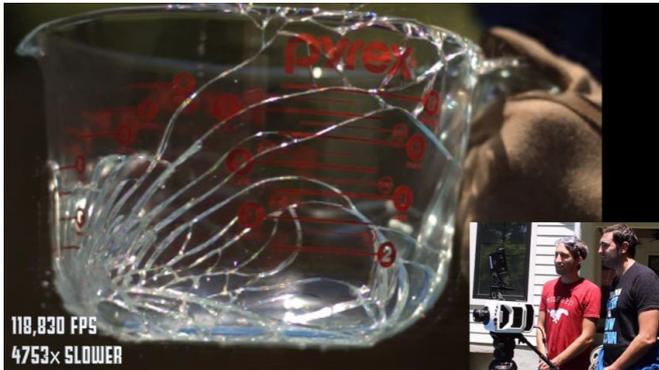


343,000 fps camera able to capture intricacies of glass shattering

20 July 2016, by Bob Yirka



(Tech Xplore)—As technology marches ever forward, devices that were once the province of high-tech labs slowly make their way into the hands of the general population. One such example is high-speed cameras. It is now possible to buy a camera such as the Phantom v2511, which captures action at up to 677,000 fps. Recently, a pair of British characters that host a YouTube series called "The Slow Mo Guys" filmed what happens when a Pyrex measuring cup is heated, then quickly chilled—it explodes. Their intent was to show not only how cool it looked in slow motion, but to highlight just how fast things can happen.

Before they begin, the pair note, as do several commenters on their post, that Pyrex is not always Pyrex anymore, at least in the U.S. It has been modified to bring the price down and thus shatters much more easily when exposed to extreme temperature changes.

In the video, the pair (Gavin Free and Daniel Gruchy) begin filming at the relatively slow rate of 28,000 fps. Daniel heats the cup with a small blowtorch while holding it in his gloved hand, while

also wearing a protective garment and face covering—Gavin meanwhile, runs the camera wearing a lab coat. When Daniel drops a bit of ice water into the cup, it explodes. Even at such a relatively slow speed the glass can be seen cracking in a way reminiscent of lightning spreading in the sky; then the pieces are pushed apart by the released energy, resulting in a very mild explosion.

The pair filmed several such episodes, slowly upping the frame rate, until they noticed that the handle of the cup appeared to dissolve during the explosions. To see what actually happens, they filmed at 343,000 fps, which revealed the handle suffering much smaller cracks throughout its body, resulting in many smaller parts being pushed apart.

To give viewers a better idea of the speed involved, the pair decided it would be a good idea to drop a small bit of water into one of Daniele's eyes and to film it at the same film rate, because most people can relate to the speed of the blink of an eye. They show the two videos side by side, and the entire handle can be seen cracking and shattering before Daniel's eye even begins to react to the water drop.

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