



HYT PRESS REVIEW
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MANUFACTURE

HYT WATCHES LABORATORY VISIT
Posted on Oct 18, 2013 1 Comment


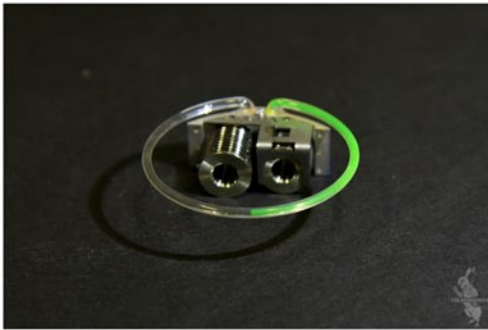

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A couple of weeks ago I showed you HYT's [H1 Azo Project](#), the latest variation of their award-winning hydro-mechanical timepiece. This year HYT has been nominated for a second time at the Grand Prix d'Horlogerie de Genève for the "Innovation Watch" of the 2013 prize with their super-cool H2. Clearly, HYT is a hi-tech horological force to be reckoned with!

But all the critical acclaim and recognition isn't for nothing. Yes, the fluid indication is visually striking and amusing to behold, but there's so much more technology behind it than meets the eye. I decided to educate myself a little bit and visit the home of HYT watches.

When I arrived at the HYT head office in the town of Bienne, I instantly knew that this wasn't going to be the typical watch manufacture tour I'm accustomed to. I immediately got the sense that I was in a laboratory and not a watch manufacture or atelier. This shouldn't come as a surprise, as HYT and its team comprised of many PhD in science per capita, responsible for the research and development as well as the production of the micro-fluid system, share the same office space.

Here's how the liquid display works: at the 6 o'clock part of the movement you have two reservoirs, each filled with different fluid. From the dial side, the left reservoir contains the aqueous fluorescent fluid, while the right reservoir contains transparent oil. Since the two liquids are immiscible, a meniscus is formed which acts as the hour indicator. The hour indication advances by means of hydraulic force from two piston-driven bellows made of a flexible electro-deposited alloy. The piston compresses the left bellow from 06:00 to 18:00, while the right bellow expands at the same times. This causes the fluorescent liquid to be gradually pushed into the capillary tube while the transparent oil retreats to the reservoir. Then at 18:00 through a retrograde action, the left bellow expands and draws back in the fluorescent fluid while the right bellow retracts and fills the capillary with the transparent oil, restarting the 12-hour cycle. This retrograding action requires less than a minute to complete. It's important to note that the capillary tube's interior requires several different coatings and surface treatments to ensure that no residue is left on the walls as the fluids ebb and flow.

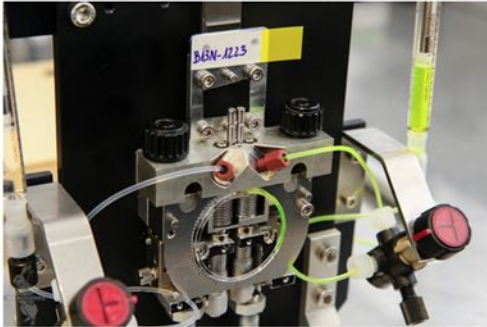
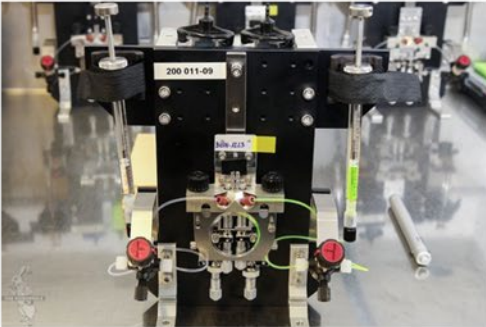


The HYT movements are composed of two separate parts: the "traditional" watch movement portion (which I'll take you through in a later post), developed with the movement manufacturer Chronode, and the liquid display portion produced by HYT.

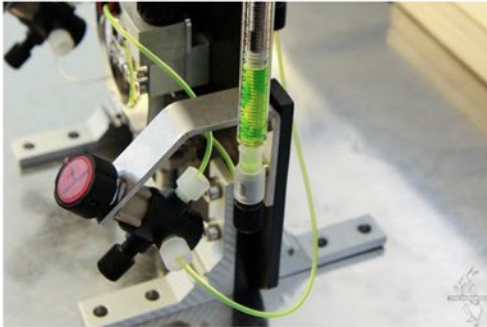
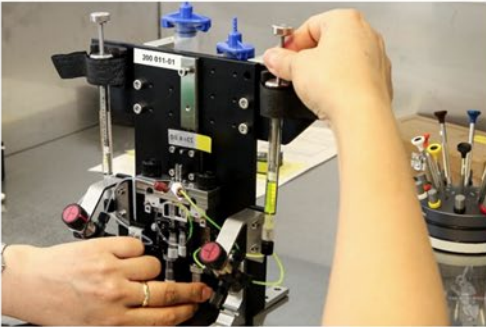
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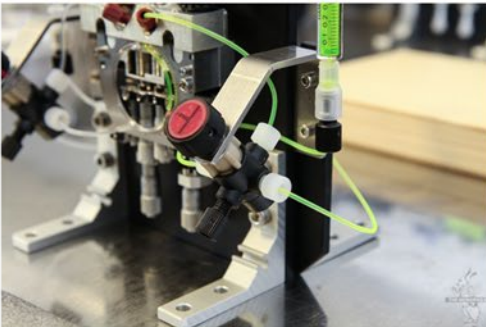
What you have to keep in mind is that as this technology is still quite new and completely alien to the world of watchmaking, specialized machinery and tools had to be developed specifically to test and make the micro-fluid devices. As if that wasn't complicated enough, the technicians working on these have to go through specialized training to operate them. Like I said, this isn't your average watchmaking workshop.



Filling the reservoirs with the two fluids is a painstaking process, as this requires injecting two liquids with very different properties into the reservoirs in the correct volumes.




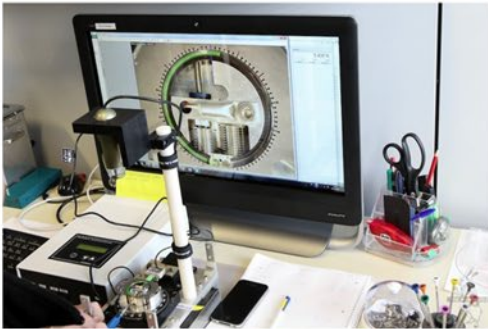


Once the reservoirs are filled, the capillary unit goes through a fine-tuning process, where intense magnification is used to ensure that the liquids are present in the correct volumes and that the display (meniscus) is in the precise location.




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Once the fine-tuning process is complete, the capillary goes into testing to ensure a regulated, linear performance. The fluidic part of the movement is set to run and retrograde several times, making sure that each fluid remains in its correct position and thus accurately giving the correct hour.



I hope I've been able to shed some light on what makes HYT's hydro-mechanical movement (emphasis on the "hydro" part) so special, and you can look forward to learning more about HYT in the coming months right here on The Horophile!

More information on www.hywatches.com

One of the biggest challenges with creating a micro-fluid system like HYT's is the way fluids behave under different temperatures. I've often wondered how extreme climate conditions (like the 50°C+ summers back home in Saudi Arabia) would affect the HYT movement. Thanks to an integrated thermo-regulating system and the fact that the wrist constantly releases heat and remains in a certain temperature range, the issue of temperature is eliminated; at least when the watch is strapped on. Still, HYT test the capillary units under different temperatures to make sure that there aren't any major deviations in the fluids' positions.

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