Subject: Fordite & Flame Blued Steel (Custom Dial Project in Process)
Posted by dpn on Fri, 02 Oct 2020 04:52:49 GMT
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For the past few months, I've been working on a custom dial project. I'm still not ready to show my first production examples, but the project has gotten to the point where I'm comfortable sharing my progress. I've been documenting this process, and am committed to sharing my process notes. I believe in open source information, and I've benefited immensely in watches (and in life generally) from the wisdom and experience of other people who have been willing to share what they know with me. My hope is that by sharing my process notes, I might be able to encourage other folks to take a risk and try to make something cool. I've never attempted anything like this, and even if this project is ultimately unsuccessful it has been a ton of fun.

I'm sharing my progress and process notes on this forum before I share them anywhere else because folks here have been incredibly friendly and patient with me. If you have any questions about my notes, please feel free to let me know and I'll try to explain things better.

Background: Seiko & ETA 6498 Custom Watches

My project started with customizing my own Seiko watches, and with assembling several custom ETA 6498 watches using available parts from Chinese sellers on eBay. I greatly enjoyed manufacturing my own ETA 6498-1 based "marine watch" using high quality components, and produced a watch that is nearly equal to the Stowa Marine Original I wanted but couldn't afford. I could have saved more money using lower-quality components, but instead assembled a watch using high quality components (heat-blued hands, an especially nice 41mm case with a sapphire crystal, an elabore-grade ETA 6498-1, etc.) that was significantly less expensive than the Stowa offering.

On the Seiko side of the house, I've built a couple of custom Seiko watches using some of the really amazing dial and hand combinations available from lots of internet sellers. (My favorite seller is called Lucius Atelier.) In browsing their offerings, I saw that some suppliers sold higher-end dials made out of meteorite, damascus steel, carbon fiber, and other neat things.

Knowing how much I enjoyed building my ETA 6498 watch, knowing how many people enjoy modifying their Seiko watches, and being generally fascinated by exotic dial materials, I realized that it might be possible to design my own watch dials. I enjoyed reading many articles on restoring dials using film-free decals, and thought a lot about using electrolytic-etching to customize brass dials.

It was at this point that I stumbled across fordite and fell in love ...

Fordite

Several months ago, I ran across a limited series of very expensive TAG Heuer watches that featured unique dials made out of "fordite". There's no way I'll ever be able to afford once of those watches, but I couldn't get the idea of working with fordite out of my head.

Fordite is also known as “Detroit Agate,” and it’s actual industrial waste. Back when car manufacturers used to spray paint cars by hand, they generated a lot of overspray. This overspray accumulated over the years, and hundreds of layers of overspray built up into large chunks of waste material. This stuff was repeatedly heat cured at the same time the painted cars were heat cured, and the resulting chunks of waste are durable and nice to work with. I don’t know the first time it was discovered that cutting open the waste chunks revealed beautiful and psychedelic patterns of paint, but for some years jewelers have been using lapidary techniques to create bizarre and fun jewelry with fordite. One of the things that I find particularly fascinating about this material is that it’s possible to source fordite from specific assembly lines. Consequently, one can obtain fordite in Jeep, Corvette, Cadillac, Peterbilt, and other colors. I’ve also obtained some fordite from the “Cadillac Ranch” in the Mojave Desert. It’s much softer and more fragile than “normal” fordite, but it also has a wider variety of colors and textures. In order to work with this specific soft fordite, I'm going to need to stabilize it using some cool lapidary techniques.

Heat-Blued Steel

I have been enchanted by heat-blued steel watch components for a really long time. I started researching how I might myself heat-blue steel with an eye towards designing and selling heat-blued steel watch hands compatible with Seikos and other watches. For quite a few reasons, this isn’t feasible (yet?), but I’ve enjoyed polishing and bluing steel pocket watch hands.
As my dial project progressed, I realized that it wasn’t practical for me to add applied hour indices, and there are some significant obstacles to using film-free decals on the dials I'm making. I realized that some manufacturers of exotic-dialed watches got around the problem by attaching a short chapter ring directly to the watch dial. This solution really appealed to me, so I set about designing a chapter ring that could be cut out of very thin (0.01” or 0.254 mm) high carbon steel, polished, and then glued to the dial face without risk of fouling any of the watch hands.

I worked with an engineer on Fiverr, who converted my really rough sketch of a chapter ring design into a DXF file. My first 20 carbon steel chapter rings are currently in production at a laser-cutting facility.

Initial Approaches

Fundamentally, I had to figure out a way of cutting fordite into very thin discs that could be mounted onto brass dial blanks. I did quite a lot of research into how stone-dialed watches are manufactured, and spent a lot of time browsing the stone watch dials that are available from Chinese manufacturers on Alibaba. I believe that the most common way that stone dialed watches are manufactured sidesteps the problem as much as possible; they don’t aim for a total dial height of 0.4mm, the normal Seiko and ETA 6498 standard, but instead cut thicker (but still quite

thin) stone dials and achieve a final height greater than 0.4mm. The large manufacturers are able to do this because they can use movements with higher-than-normal hand pinions, in cases that may be deeper than normal, with hands that have longer pipes than normal ("long post" or "long tube" watch hands), under crystals that are taller than normal. It is possible, if not inexpensive, to find hour wheel-cannon pinion sets for ETA movements that accommodate thicker dials. But finding a case and crystal combination that could accommodate this thicker dial and higher hands was going to be challenging.

After a great deal of thought, and teaching myself some basic lapidary skills, I realized that it might be possible to cut a thin fordite veneer and mount it on a brass dial blank. I then planned on soldering the dial feet onto the dial one-by-one.

The first process I was going to try to use was broken down as follows:
Cut rough fordite into roughly-round chunks.
Use a lathe and turn those chunks into cylinders with precise diameters.
Cut thin (but still relatively thick) discs out of those cylinders, and mount them on a precisely-cut brass dial template.
Use a lapping machine to polish/grind the fordite down to the final required height.
Hand-drill the center hole, using the brass dial template as a guide. This would require laser-cutting a thin brass sheet to the correct diameter and adding the necessary central hole.
Solder dial feet onto the fordite/brass dial sandwich.
Final polish and assembly.

At this point, this project was still a pipe dream. I had some fordite samples, but was still researching the lathe and lapping machines that would be necessary to do this work. I had some key breakthroughs, that significantly decreased the level of effort necessary to make these dials.