

Surface Hardening a Titanium Pen?

Mar 22, 2022

With the ambition of creating the ultimate fountain pen, combining innovative production methods with advanced materials, Capillaris reached even further by seeking Expanite's help with hardening the surfaces of the unique writing tool. The result is a fountain pen designed by aerospace engineer Zsolt Pataki, made from a solid titanium bar for the ultimate weight, look and feel, hardened by ExpaniteHard-Ti making it long-lasting and virtually unscratchable.

Hunting for the superior scratch resistance.



aerospace engineer Zsolt Pataki got a crazy idea; he wanted to create a unique fountain pen using his experience from aerospace in design, materials, and manufacturing. He chooses titanium grade 23 from the very beginning of the development process, but also knew that he wanted to go further. Mr. Pataki states: "In my search for increased wear resistance of the titanium, I was eager to avoid the hurdles of a coating; adding layers affecting the dimensions combined

with the risk of layers chipping off - as I preferred a monolithic design with the original titanium surface instead of a coating".

In the search for alternatives to coating, Mr. Pataki attended a webinar with Expanite presenting their unique hardening solution for titanium. "I soon realized that the ExpaniteHard-Ti process was the only matured and commercially available interstitial hardening technology for titanium. The webinar

combined with the details of the technology on their web site helped me to develop realistic expectations and I reached out to them”, Mr. Pataki continues.

The solution. The ExpaniteHard-Ti process provides highly effective protection against wear and scratches. The method is not a coating process, hence all the drawbacks of coatings, including the risks of chipping/spalling off and inconsistencies in layers are completely avoided. In fact, it is the surface of the material itself, which is hardened.



The ExpaniteHard-Ti process has a significantly greater level of protection against scratches than that afforded by the hardness of the base material and the hardened parts retains the design colour or as Mr. Pataki describe it: “I tried hard to scratch the pen after the process, but it is practically impossible – I made before and after comparison and the results are spectacular; the pen is now virtually unscratchable”!

Professional knowledge sharing. Through the dialogue with the Expanite team, the optimal solution to increase scratch resistance of the fountain pen was found – Mr. Pataki states: “Throughout the whole process, the Expanite team has been very supportive and open to discuss questions and possible issues ensuring that I got exactly the solution that suited my requirements for the pens and the fact that the results were much better than advertised in terms of case depth of the hardened zone!”