

 CASE STORY /

EXPANITE GOES TO SPACE

Expnate - –the Danish pioneer specializing in surface hardening of stainless steel & titanium and ENPULSION the world leading manufacturer of electric propulsion systems for nano-and microsatellites collaborates successfully in solving wear and galling challenges in the production line at ENPULSION.

The Enpulsion Field-emission Electric Propulsion (FEEP) technology is an advanced electrostatic propulsion concept of an ion engine that uses liquid metal –indium –as a propellant. A FEEP drive system consists of an emitter and an accelerator electrode. A potential difference in the order of kV is applied between the two, creating a strong electric field at the top of the metal surface which extracts ions from the apex of the cone and accelerates them to high speeds. The IFM Nano Thruster is used as a compact pre-qualified building block in order to provide customized propulsion solutions for nano-and microsatellites. By clustering the proprietary indium ion emitters, a scaled-up thruster –the IFM Micro Thruster –is created to target the even larger market of small and medium size space crafts.

*Challenged by galling*

Before Enpulsion started using the Expnate hardening process they were challenged by galling of threads on the housing which caused serious issues in the production line. Enpulsion contacted Expnate to find a better solution. “We contacted Expnate since their anti-galling SuperExpnate treatment seemed convincing in combination with the flexible production lines. We were very excited to work with the highly motivated expert team at Expnate, who supported us throughout our testing of the Expnate hardening process”, says Mr. Roman Hörbe, Supply Chain Manager at Enpulsion.

“Our target was to use a treatment that prevents galling and retains corrosion properties of the austenitic stainless steel part, while maintaining the manufacturing tolerances and guarantee good weldability of the final part. Thus, a conventional coating or surface treatment was simply not an option”, says Expnate Area Sales Manager, Dr. Holger Selg.

The result already after first test trail proved overwhelmingly convincing on all parameters, and most importantly, the galling phenomenon disappeared completely. “There has been no records of damaged parts ever since”, says Mr. Roman Hörbe, Supply Chain Manager at Enpulsion.

About Enpulsion

The company is based in Wiener Neustadt, Austria and has a business development office in Silicon Valley, CA. In its own semi-automated production facility ENPULSION is manufacturing the IFM Thruster family, including the IFM Nano Thruster –the only compact, scalable, and modular electric propulsion system worldwide. With today ENPULSION is producing and delivering nine IFM Nano Thrusters per month to its international B2B customers

About Expnate

Expnate was founded in 2010 by leading experts in material and surface hardening whose research dates back to 2000. The company is headquartered in Hillerød near Copenhagen and has treatment centers in the USA, Germany, Korea and China. Expnate's solutions are flexible and can be tailored to the customer's own product line within the framework of a license agreement

