

Titanium Electro Polishing

Inventors/Technical Experts:

Name: Leonel Ferreira
E-mail: Leonel.Ferreira@cern.ch
Department/Group: TE/VSC
Phone: 72053/ +41 22 76 72053

Technical Description:

CERN has developed a novel technology to polish titanium that easily obtains a high degree of surface smoothness. The technology was developed based on an internal demand at CERN related to vacuum technology and cryogenics, but the process is expected to have a number of commercial applications as well. The polishing method is based on an electrolytic process known from other surfacing technologies where material is removed from the surface by a chemical reaction powered by a low voltage. The novelty is represented by the chemical composition of the bath required by the electrolytic process, together with the process itself.

Pros:

- Less power consumption.
- Can polish complex structures as well as large objects.
- Roughness can easily be controlled down to 1 nanometer.

Cons

- Produces HF gases that need to be extracted.

IP Status:

Technology maturity: Ready for licensing.
Patent status and reference: Both the chemical bath and the method for use are patented. Publication number: FR27954333. Also granted in other countries: Europe, China, Russia, US. WO 01/00906.
Accessibility: License available from CERN

Market/Application suggestions:

There are a number of different applications for this surface technology, ranging from high tech industrial products to attractive and shiny jewelries. Examples of application of electro polished titanium are medical industry- implants, tools, vacuum technology – tubes, surfacing, aerospace – turbine blades, chemical industry, automotive industry, cryogenic equipment, jewelry manufacture, spectacle frames and watches.