



TITANIUM POLISHING

Titanium polishing is a process to reduce the roughness, and thereby increase the brightness, of a metal surface made of titanium or titanium alloy.

The technology described here is a patented electrolytic method (electropolishing), and related technical know-how, to polish titanium to a high degree of surface smoothness - typically down to the nanometer level. CERN's titanium polishing method uses a chemical bath formed of sulfuric acid, hydrofluoric acid and acetic acid, which can be complemented with the addition of a cationic wetting agent - providing the benefits of better regulation of the electrochemical process, less metal dissolution, and lower power consumption.

The process is used at CERN primarily to polish electrodes, which require an ultra smooth surface to avoid sparks during operation. However, the chemical bath and electrolytic parameters could be optimised for other applications, with practically no limit on the size of the sample to be treated.

AREA OF EXPERTISE

- Material Science

IP STATUS

- Patented (PCT. WO0100906).

TECHNOLOGY READINESS LEVEL

- Available for licensing and partnerships.

CONTACT

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FEATURES

- The metal can be polished down to the nanometer level.
- Enables efficient detection of flaws in the surface.
- The process can be run with low power consumption.
- Creates a shining, mirror-like appearance.
- Provides easy maintenance of hygienically clean surfaces due to reduced particle adhesion.
- There is practically no size limitation on the item to be polished.
- Provides metallic purity and chemical passivity.

APPLICATIONS

- Vacuum technology.
- Medical industry: implants, tools.
- Jewellery, spectacle frames, watches.
- Aerospace: turbine blades.
- Electronics, storage discs.

