TANTALINE®
Solutions for Conquering Corrosion.

UNDER DEVELOPMENT

Tantaline treatment of titanium

"We inspire innovations with our treatment"

INDUSTRIAL APPLICATIONS

- **MEDICAL - SURGICAL IMPLANTS**

Tantaline treatment of Titanium is opening up new opportunities in the production of next generation surgical implants by combining the light weight and mechanical strength properties of titanium with the surface properties of tantalum.

MAIN PURPOSE

The main purpose of our research was determining if it is possible to treat Titanium with Tantaline, successfully create a diffusion layer between the two metals and deposit a functional layer thickness

CONCLUSION

- The diffusion layer between Ta and Ti is present, creating a metallurgical bond between these two metals. The depth of the diffusion layer is determined using EDX line scan to be approximately 2-3 µm, consistent with that observed in 316SS stainless steel (*Figs. 1,2 & 3*)

- Based on several measurements a thickness of the Ta layer is about 15µm in a standard batch with an estimated tolerance +/- 5µm. This thickness is adequate for fully covering the titanium substrate with tantalum (*Figs. 4,5*)

QUESTIONS?

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All testing to EN 10088-1 and 2

Carried out by Danfoss Technology Centre, Denmark.

TEST RESULTS:

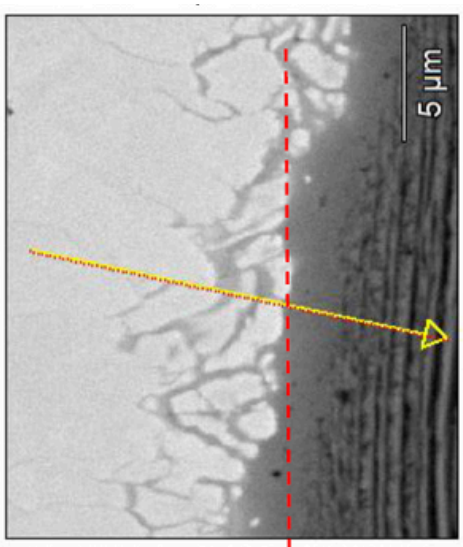

Fig.1 *SEM image showing diffusion layer*

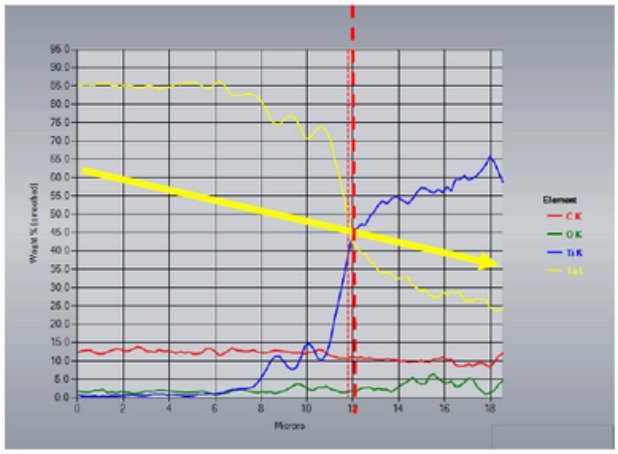

Fig. 2 *EDX line scan analysis; diffusion layer between tantalum and titanium*

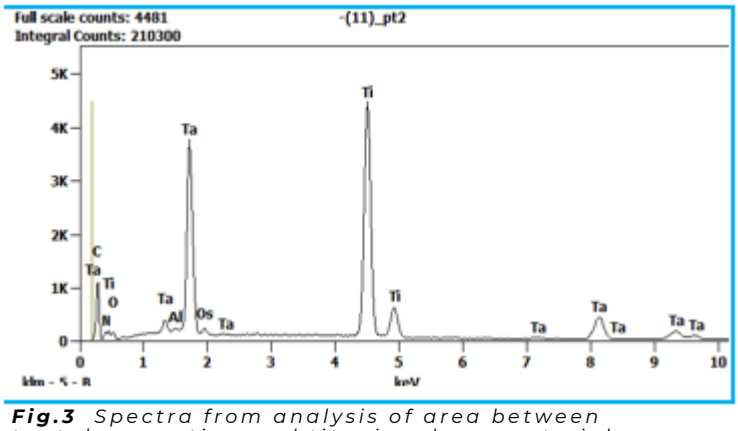

Fig.3 *Spectra from analysis of area between tantalum coating and titanium base material; tantalum and titanium are "mixed" in this area*

- **DIFFUSION LAYER BETWEEN TANTALUM AND TITANIUM IS APPROXIMATELY 2-3 MICRONS**
- **THE TANTALUM LAYER THICKNESS IS APPROXIMATELY 16 MICRONS**

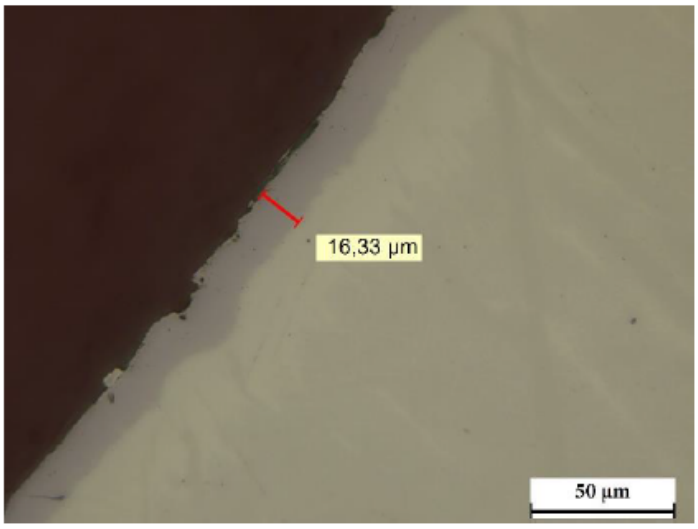

Fig.4 *Image showing tantalum layer on titanium*

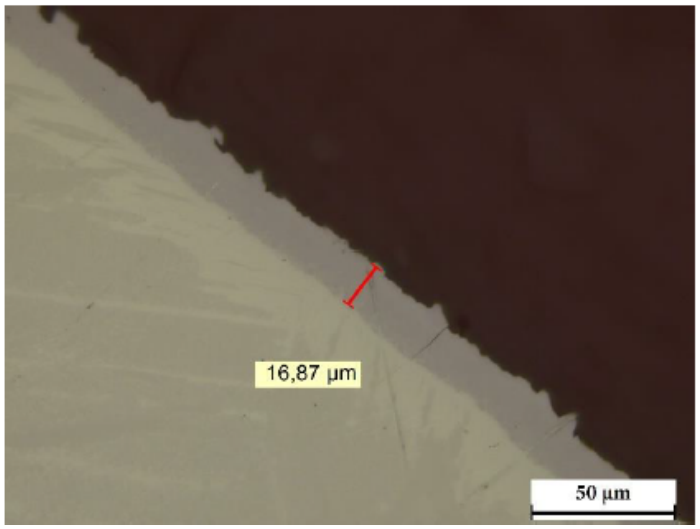

Fig.5 *Image showing tantalum layer on titanium*