

High voltage anodizing treatment of titanium and its alloys aimed at modifying the oxide film composition and properties

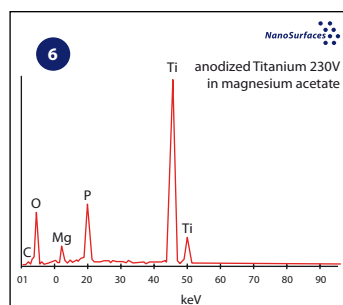
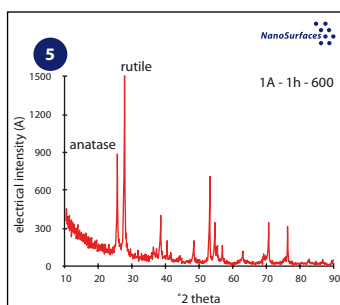
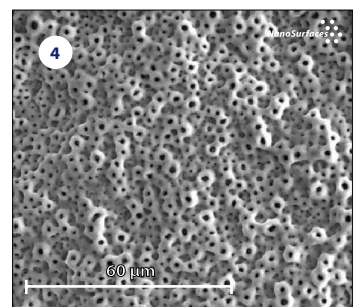
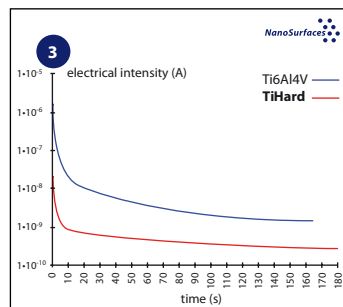
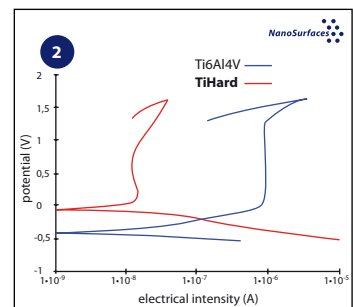
Anodic Spark Deposition is a particular anodizing technique which is realized on titanium and its alloys by imposing high feeding voltages (1-3).

The oxide layer generated by anodizing has insulating properties; if the applied tension is raised to high values, the film starts to crack and electric microarcs strike on the surface, which cause the **local melting** and subsequent quenching of the oxide (4).

This mechanism allows to incorporate into the film chemical **species** belonging to the anodizing electrolyte, which could possibly improve the **corrosion behaviour** of the material, or permit a slow release of substances (5-6).

Once the Anodic Spark Deposition treatment is completed, it is possible to perform mechanical treatments (rolling, shot-peening, sifting) in order to obtain a more compact oxide, hence enhancing its **corrosion behaviour** and decreasing its roughness to extremely low values. This determines

an increase in the mechanical properties of treated components due to improved resistance to fatigue, grip, wear and fretting corrosion (7).



	Ti6Al4V	TiHard™
HV (Vickers Hardness)	451 ± 29	967 ± 34