

Nevada Thermal Spray Technologies (NTST)
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Titanium Nitride (TiN) Coatings

General Information:

Titanium nitride (TiN) is an extremely hard ceramic material, often used as a coating on titanium alloys, steel, carbide, and aluminum components to improve surface properties by a factor of three. To our knowledge, NTST is the first to fabricate thermal spray coatings of TiN.

NTST can fabricate TiN coatings which are 500 times thicker than thin films. TiN is extremely difficult to fabricate as a coating due to its tendency to sublime at high temperature. NTST TiN coatings possess an ideal combination of hardness, toughness, adhesion, and inertness. The coatings have a high service temperature, are electrically conductive, non-oxidizing, and resistant to most chemicals. TN can be used in applications to eliminate galling, fretting, wear, and low friction.

Figure 1 illustrates typical NTST TiN coatings. Extensive characterization is currently being conducted on this coating.

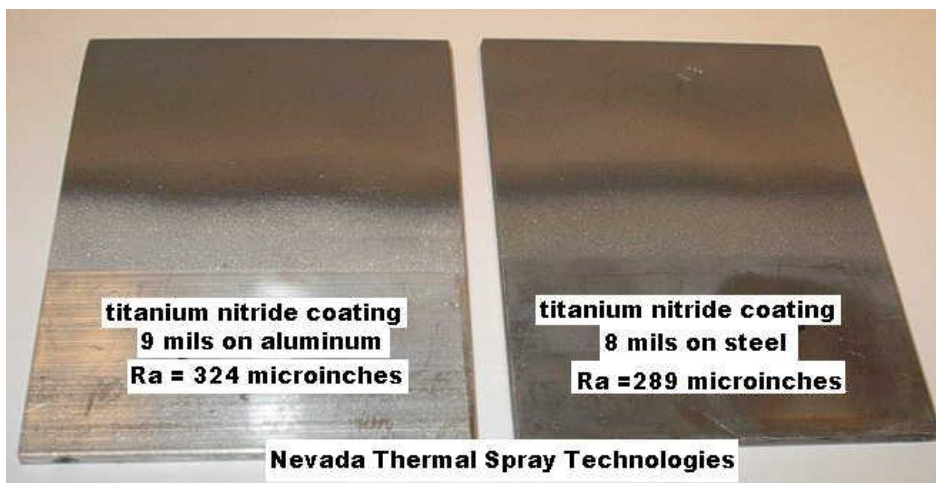


Figure 1. NTST TiN coatings.

TiN Applications:

A well-known use for TiN coatings is for edge retention and corrosion resistance on machine tooling, such as drill bits and milling cutters. TiN is extremely hard and mitigates galling and fretting in industrial applications. Titanium nitride films (TiN) have been applied to many components from pumps to sporting goods. The coatings are ideal for applications for the military and aerospace (e.g., components on the space shuttle and International Space Station). TiN is non-toxic, meets FDA guidelines and has been used in medical devices (e.g., scalpel blades, implants).