



Ion Nitriding Titanium Alloys

Titanium use continues to increase across many industries and applications due to its excellent properties, light weight, high temperature strength-to-weight ratio and excellent corrosion resistance.

In spite of the positive characteristics, titanium has poor abrasion resistance and is susceptible to fretting and galling when in contact with mating components. A high coefficient of friction often limits its use.

Ion Nitriding

UltraGlow® Ion Nitriding can eliminate galling and fretting, thus improving/increasing its use across many industries. It is not a coating, subject to peeling or spalling, but a true diffusion process that strengthens the base metal and provides a high surface hardness around 1500 Vickers. UltraGlow Ion Nitrided titanium products present a nice gold color, as shown in the photo above.

Titanium Applications

While titanium use in aerospace has long been recognized, non-aerospace civilian market applications continue to increase. Typical uses include:

Firearms	Barrels, suppressors, compensators, bolt carriers, slides, upper receivers, gas blocks, firing pins
Medical	Orthopedic and spinal implants, hip stems, femoral knees, dental implants, cardiovascular implantable blood pumps, drug delivery implants, reconstruction plates, bone screws, wheelchair axles
Marine/Seawater	Pump components, valves, yacht hardware, bolts, fasteners, offshore drilling equipment, crankshafts, spring retainers
High Performance Racing	Connecting rods, valves, break pins, spring retainers, fasteners, racing half shifts, linkage rods, sway bars, hydraulic fittings
Recreational Equipment	Bicycle componentry, fasteners, golf clubs, hiking gear, cook wear, sprockets, bike pedal shafts, axles, pins, bushings, bike bearing races
Aerospace	Hydraulic fittings, vanes, shafts, fasteners, fuel nozzles, gears, crankshafts, engine valves, high and low press turbines, brackets, rotors, connecting rods

For a detailed metallurgical discussion of nitriding titanium alloys, see "Nitriding of Titanium Alloys" by Dr. Edward Rolinski, Advanced Heat Treat Corp. ASM Handbook Volume 4E.

UltraGlow® Nitriding is offered in Iowa, Alabama and Michigan. Visit www.ahtcorp.com or contact your AHT representative to learn more.