

CeraFuse™ Ceramic Restructuring

Ceramic Coating for Titanium Components

Introduction

CeraFuse™ is a hard, dense ceramic surface that can be created on titanium substrates providing corrosion and wear resistance as well as dielectric properties. Since the titanium is restructured as opposed to mechanically coated, it will not delaminate. The work piece exhibits only minimal dimensional change (approximately 25% of the ceramic layer thickness).

A typical **CeraFuse™** ceramic can reach a thickness of 60 microns on this substrate.

The hardness of the ceramic layer varies only slightly with the alloy being processed. Coatings on titanium are consistently in the range of 500 to 600 Kn₁₀₀.

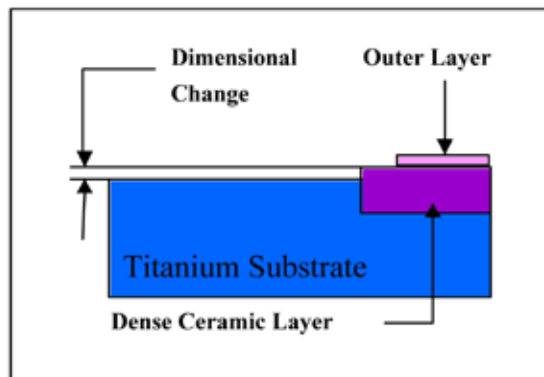
CeraFuse™ restructuring of light weight, high strength titanium provides an attractive alternative to more expensive materials.

The CeraFuse™ Process

Micro-arc oxidization technology (MAO) was developed in Russia nearly thirty-five years ago and is an offshoot of DC anodizing. MAO creates a plasma discharge between the titanium substrate and the electrolyte. Even though local temperatures are very high, the substrates are maintained below 60°C.

As the process initiates, a granular layer forms on the surface. As it continues, a hard, dense inner layer of titanium oxides transitions inward.

Typical Microarc Ceramic Surface



For some applications, buffing, tumbling or other means are used to remove the outer surface before the parts are put into service. Surface finishes as low as 16 Ra can be achieved with diamond lapping or honing techniques.

CeraFuse™ provides a superb surface for subsequent application of polymeric coatings paints and lacquers. The electrolyte utilized in the process is environmentally benign. A 40 - 60 μ coating offers surface coating a is in itself and excellent corrosion inhibitor, as well as providing dielectric protection from galvanic corrosion.

Whyco Finishing Technologies, LLC

Whyco Finishing Technologies, LLC is a leader in micro-arc oxidization technology and is equipped to process a wide variety of components in our state-of-the-art facility.

We are dedicated to customer satisfaction and in meeting ever-changing surface engineering requirements, including developing the ability to resurface magnesium and other alloys.

Whyco's design, manufacturing and quality assurance systems are based on conformance to both QS 9000 and military standards.

For more information and assistance with your application, contact us at: (860)-283-5826

Visit our Website: www.whyco.com

Technical Characteristics

Hardness	500 – 600 Kn _{100g}	Testing Performed at Quali-Tech, Inc.
NSS Corrosion Resistance	600+ Hours no corrosion products, Testing was discontinued NSS performed per ASTM B-117 at IMR Laboratories	
Dielectric Properties	Coating is not conductive at 150 V. (Testing at higher Voltages was not done)	