



**NEVADA THERMAL  
SPRAY TECHNOLOGIES**

4842 Judson Ave. Suite 115  
Las Vegas, NV 89115

Phone: 702-408-2371  
Fax: 702-920-8113  
E-mail:  
[chris@nevadathermalspray.com](mailto:chris@nevadathermalspray.com)

[www.nevadathermalspray.com](http://www.nevadathermalspray.com)

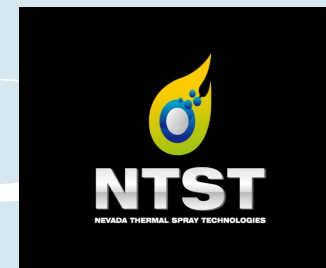
**Product/Service  
Information**

**Wear Coatings**

**Coating Design  
and  
Manufacturing**

## Our Mission

Nevada Thermal Spray Technologies centers on a core competency of superior customer service. The highly technical nature of ceramic and metal coatings often places our customers in unfamiliar territory, and it is our mission to guide the client through the process of defining the problem, identifying a range of solutions, and ultimately manufacturing a world class custom coating. Our dedication to combining materials engineering with an economical focus sets us apart from the competition. We take the time to listen to customers' needs in order to develop unique coating solutions that lower ultimate lifecycle costs at the most diminished lead times in the industry.



# Thermal Spray Overview

Thermal spray is a generic term for a versatile group of processes for depositing metallic and nonmetallic coatings. These processes include flame and HVOF (combustion), plasma, electric arc, and nozzle aspirated. Probably the most outstanding feature of thermal spray coatings is their diverse applicability, due to an almost unlimited materials selection that can be applied to practically any substrate. Coating materials include all types and combinations of ceramics, carbides, metals, composites, and plastics available in powder, wire, or rod form.



**Tungsten Carbide Cobalt**

Thermal spray coatings are used to improve the overall performance characteristics and extend the service life of industrial components, and also help meet design requirements for original equipment manufacturers. The number of applications for the thermal spray processes is rapidly increasing, and the coatings are widely used in over 46 industries including the aircraft, aerospace, chemical, electronics, and transportation industries for many, varied applications.

## Applications for Industry

NTST's product portfolio includes the most widely used coatings for these applications including carbides (e.g. tungsten carbide-cobalt, chromium carbide, zirconium carbide, boron carbide), ceramics (e.g. chromium oxide, alumina, zirconia) and metals (e.g. iron and steel alloys).

## Wear Coatings

NTST wear coatings are dense, hard, and wear resistant. The coatings have excellent self-mating and anti-galling properties. These coatings are used for resistance to wear by abrasive grains, hard surfaces, and particle erosion. Applying a wear coating is economically beneficial and increases lifetime. NTST takes pride in developing and manufacturing quality, ready to use coatings from initial design, to the spraying of material, to precision grinding and finishing.

NTST routinely sprays coatings of chromium oxide on pump mechanical seals. Cr2O3 coatings are dense, hard, and wear resistant. The coatings also have excellent self-mating and anti-galling properties. Cr2O3 coatings are used for resistance to wear by abrasive grains, hard surfaces, particle erosion, and cavi-

tation. The coatings are insoluble in acids, alkalis, and alcohol.

## Materials Characterization and Performance Evaluation

Coating:	Hardness	Porosity %	Bond Strength psi	Ra as-sprayed Smoothness microinches
B4C Boron carbide	Mohs 9.5 Vickers 1541	2	6148	375
B4C-Ti Boron carbide-Ti cermet	Mohs 9.2	2	6500	331
Cr2O3 Chromium oxide	Mohs 8.7 Rc 72 Vickers 1250	2	3500	225
WC-Co Tungsten carbide /cobalt	Mohs 7.5 Rc 60 Vickers 975	2	9000	150

## WC-Co Wear Coatings

NTST routinely sprays coatings of tungsten carbide-cobalt for wear applications. WC-Co coatings are hard and dense, with a smooth as-sprayed finish, which, for many applications, do not require finishing. These coatings can be ground and lapped to an excellent finish.



316 Stainless Steel Shaft with Tungsten Carbide coating sprayed and finished to original OD



Chromium Oxide Coated Mechanical Seals



Chromium Oxide Coated Sleeve

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