Thermal Sprayed Surface Coatings
Technical Specifications and Applications

Thermal Spray Solutions

COATING TYPE AND/OR COMPOSITION	BOND STRENGTH (psi)*	HARDNESS **	POROSITY (average % volume)	COATING TEXTURE AND/OR SURFACE	MAXIMUM COATING THICKNESS	MAXIMUM OPERATING TEMPERATURE	COATING CHARACTERISTICS	TYPICAL APPLICATIONS
HVOF (High Velocity Oxygen Fuel) Applied Coatings								
TUNSTEN CARBIDE COBALT NICK	12000	65 Rc	<1%	As Sprayed: 225-300 Ground: 2-4	.025"	1000 F 540 C	Highly resistant to abrasion, particle erosion, fretting, and corrosion with good impact resistance. Excellent surface finish. Hard Chrome Replacement.	Ball Valves, Pump Parts, Compressor Rods, Valve Parts, Screw Conveyors, Cutting Dies, Fan Blades, Cams, Hard Chrome Replacement on Hydraulic Cylinder Rods, Rudder Posts, for Marine, Pulp & Paper, Oil & Gas, Tobacco Industries, etc.
TUNSTEN CARBIDE COBALT CHRC	10000	68 Rc	<1%	As Sprayed: 325 Ground: 2-4	.015"	850 F 440C	Dense, hard, tough coating suited for sliding wear, erosion, impingement, abrasion and fretting wear.	Valve Components, Hig Wear Areas On Down Hole Equipment, Compressor Rods, Hydraulic Rods, ID Fans, Rolls Fof A Variety Of Industries.
HIGH GRADE STAINLESS STEEL	>7900	29 Rc	<1%	Ground & Polished <2	.060"	1000 F 540 C	High bond strength, 316 stainless steel Ductile, machinable, low porosity, with good corrosion and wear resistance.	Exhaust Fans, Boiler Tubes, Food Processing Industry, Tobacco Industry, Corrosion and Wear Resistance for Rollers, Cylinders, etc. in Printing, Glass, Textile Industries, etc.
CHROME CARBIDE NICKEL CHRO	>10000	55-65 Rc	<1.5%	As Sprayed: 225-300 Ground: 2-4	.020"	1800 F 950 C	Replacement coating for hard chrome. Resistant to abrasion, solid particle erosion, cavitation The NiCr matrix provides excellent corrosion resistance.	Nuclear Power Components, Compressor and Turbine Blade Coating for High Temperature Oxidation, Feed Screws, Pump Casings, Impellers, Plungers, Hydraulic Rods
TUNSTEN CARBIDE CHROME	>10000	55-65 Rc	<1%	As Sprayed: 225-300 Ground: 2-4	.020"	1000 F 540 C	Replacement coating for hard chrome. Resistant to abrasion, solid particle erosion, cavitation, and fretting. Provides excellent corrosion resistance.	Marine Industry Components, Seal Liners, Hydraulic Rods, Steering Gear Rams, Rudder Posts, etc.
CHROME CARBIDE TUNGSTEN CA	7000	50 Rc	5%	As Sprayed: 250-325 Ground: 2-4	.020"	1500 F 815C	Spheroidal, agglomerated and sintered powder wich generates coatings that provide high abrasion, sliding wear, and fretting protection.	Hard Chrome Replacement, Hydraulic Rods, Boiler Tubes, Pump Parts, etc.
NICKEL CHROME BORON	>10000	55-60 Rc	<1%	As Sprayed: 300-400 Ground: 2-4	.020"	1000 F 540 C	Coatings are dense, metallurgically hard and essentially devoid of oxides which are characteristic of most coatings. Wear resistant. Hard Chrome Replacement.	Piston Rings, Exhaust Fans, Forging Tools, Hydraulic Rods
NICKEL CHROME BORON (Sprayed & Fused)	Metalurgical	55-60 Rc	0%	Ground: 2-4	.050"	1000 F 540 C	Resistant to abrasion, solid particle erosion, cavitation, and fretting. Provides excellent corrosion resistance.	Metalurgical Bonding Provides Excellent Wear Resistance For Pump Components, Rotors & Shafts Operating In Extremely Harsh Environments.
Twin Electric Arc-Wire Applied Coatings								
ALUMINUM CHROME IRON WIRE	>7000	35-40 Rc	<1%	Machined: Excellent Ground: Good	.150"	>1000 F 540 C	General purpose wire used to restore parts having most common steels as the substrate.	Mis-Machined Parts, Shafts, Bearing Fit Areas, Rolls, Journals, And Build-Up In Areas Of Deep Wear Prior To The HVOF Application Of A Carbide Topcoat.
HIGH GRADE STAINLESS STEEL WIRE	4000	40 Rc	NA	Machined: Excellent Ground: Good	.0200"	>1000 F 540 C	General Purpose Austhenitic Stainless Steel Wire.	Bearing Seats, Pistons, Rams, Mishmachined Parts, etc.

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ALUMINUM BRONZE ALLOY WIRE	NA 3500 w/Bond Coat	35 Rc	5%	Machined: Good	.100"	Low	Produces dense, low-shrink, high tensile strength coatings which are easy to machine. Excellent general purpose, wearresistant coating.	Pump Impellers, Bronze Castings, etc.
MOLYBDENUM COMPOSITE BOND WIRE	2500	40 Rc	Fair	Ground: Fair	.030"	650 F 340 C	Self-bonding, High Bond Strength. Produce hard, long wearing coatings. Excellent load bearing capacity when subjected to low temp conditions.	Ideal For Building Up Journals For Use With Bronze Bearings, etc.
NICKEL ALUMINUM COMPOSITE BOND WIRE	4000	22 Rc	NA	As-Sprayed: Course Ground: Fair	.007"	1380F 750 C	Self-bonding composite only used as bond coat prior to application of further coating layers. Produces dense coating of high bond strength.	Underlay bond coat forcarbon steels, hardened alloy steels, stainless steels, aluminum, nickel, cast iron, titanium, etc. Not self-bonding to copper based allys or tungsten.
PURE ALUMINUM WIRE	1000	60 Rb	5-15%	Machined: Good	.200"	1100 F 590 C	Excellent resistance to corrosion therefore used extensively in marine applications. Also resistant to sulfur dioxide.	Pump Casings, Boiler Tubes, Structural Components such as Water Tanks, Bridges, Communication Towers, Wind Turnbine Towers, and Offshore Oil Platforms, etc. Shipboard U.S. Navy Applications Aare Extensive.
BABBITT WIRE	NA	58 Rc	2-5%	Machined: Excellent	.200"	Low	High grade tin-based babbitt	Babbitt Bearing Applications
MONEL WIRE	NA	50 Rc	3-5%	Machined: Good	.050"	1000 F 540 C	Copper Nickel alloy wire, producing dense coatings suitable for machine element components subject to corrosion.	Gland Casings, Tailshafts, Hydraulic Pump Parts, Shafts, Seat Rings, etc.
Plasma Applied Coatings								
ALUMINA TITANIA COMPOSITE	2250	63 Rc	<1%	As-Sprayed: 250-300 Ground: 10-20	.025"	1000 F 540 C	Very dense, hard, low porosity coating with good corrosion resistance to alkalies. Good non-conductive electrical properties.	Bearing Surfaces On Rolls, Shafts, And Rotors. Pump Components, Exhaust Fans, Non-Conductive Coating On Submarine Cable Connectors
CHROME OXIDE	5500	60-70 Rc	<4%	As-Sprayed: 200-400 Ground: 20-50 Superfinished: 4	.030"	1000 F 540 C	Excellent self-mating and anti-galling properties. Dense, hard, and insoluble in acids, alkalis, and alcohol. Low temp abrasion resistance (<1000 F).	Rolls Coatings For Textile, Printing, Pulp & Paper Industries, etc. Pump Seals, Exhaust Fans, Wear Rings, Pump Sleeves, Ball Valves, Seal Liners, etc.
ZIRCONIUM OXIDE	5500	49 Rc	3-6%	As-Sprayed: 250-400 Ground: 15	.050"	3000 F 1850 C	Dense coating resistant to thermal shock and partical erosion at high temps. Useful as thermal barrier coating.	High Temperature Turbine Parts, Engine Parts, etc.
YTTRIA STABILIZED ZIRCONIUM	5000	60-70 Rc	Varies greatly depending on production method	As-Sprayed: 250-400 Ground: 15	.080"	3000 F 1850 C	Dense coating resistant to thermal shock and partical erosion at high temps. Useful as thermal barrier coating.	Reacing Engine Components, Fuel Cells, Jet Engine Components, Gas Turbines, Mssile Diffusers, etc.

***BOND STRENGTH**
Bond Strength Values indicate stress required to break bond (in PSI) between the coating and the substrate.

HARDNESS VALUES**
Hardness Values indicated are shown in the Rockwell Scale.

COATING TEXTURE/SURFACE FINISH
Texture / Surface Finish Values may vary depending on the surface finishing equipment available.

NOTE: There are literally hundreds of thermal spray coating materials available on the market today. We work with many of the major coating material suppliers and the coatings included here are a sample of the ones we most commonly use. In addition to the standard coatings available, we also have proprietary coating materials manufactured for us for specific Customer applications.

Give us a call today to discuss your coating application !

Thermal Spray Solutions, Inc.
1105 International Plaza, Suite B
Chesapeake, VA 23323
Phone: (757) 673-2468
Fax: (757) 673-3128
www.thermalsprayusa.com