

BENDER COATING REFERENCE	COATING TYPE AND/OR COMPOSITION	BOND STRENGTH (psi)*	HARDNESS**	POROSITY (average % volume)	COATING TEXTURE*** AND/OR SURFACE TEXTURE (microinches aa)	MAXIMUM COATING THICKNESS	MAXIMUM OPERATING TEMPERATURE	COATING CHARACTERISTICS	TYPICAL APPLICATIONS
BHS 100	PREMIUM TUNGSTEN CARBIDE COBALT	12000	1050-1225HV	<0.5%	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 fine surface finish.	Ball Valves, Pump Parts, Compressor Rods, Valve Parts, Cutting Dies, Screw Conveyors, Thread Guides, Fan Blades, Cams.
BHS 115	TUNGSTEN CARBIDE COBALT CHROMIUM	10000	68Rc	<1%	As Sprayed: 325 Ground: 2-4	.015"	850° F 440° C	Dense, hard, tough coating suited for sliding wear erosion, impingement, abrasion and fretting wear.	Oil Field Apparatus, Gate & Ball Valves, High Wear areas on down-hole Equipment, Compressor Rods, Hydraulic Cylinders, ID Fans, Paper Rolls.
BHS 316	HIGH GRADE STAINLESS STEEL	>7900	29Rc	<1%	Ground and Lapped: <2	.060"	1000° F 540° C	High bond strength 316 type stainless steel. Ductile, machinable, low porosity, with good corrosion and wear resistance.	Printing /Impression Cylinders, Diesel Engine Cylinder Liners, Exhaust Fans, Boiler Tubes, Food Processing Industry (General), Corrosion and Wear Resistance for Rollers, Cylinders, etc. in Printing, Glass, Rubber and Textile Industries, etc.
BHS 600	CHROMIUM CARBIDE NICKEL CHROMIUM	>10000	58-65Rc	<1.5%	As sprayed: 225-300 Ground: 1-4	.020"	1800° F 950° C	Replacement coating for hard chrome. Resistant to abrasion, solid particle erosion, cavitation and fretting wear. The NiCR matrix provides excellent corrosion resistance in a wide range of environments.	Nuclear Power Flow Control Valve Seats, Compressor and Turbine Blade Coating for High Temperature Oxidation, Feed Screws, Doctor Blades and Pump Casings, Impellers, Plungers and Sleeves, Food Industries.
BHS 601	CHROME CARBIDE/TUNGSTEN CARBIDE	7000	50Rc	.5%	As sprayed: 250-325 Ground: 2-4	.020"	1500° F 815° C	Spheroidal, agglomerated and sintered powder which generates coatings that provide high abrasion, sliding, wear and fretting protection.	Hard chrome replacement. Hydraulics. Boiler tubes. Pump Parts.
BHS 610A	SUPER C	8300	47Rc	<2%	As sprayed: 150-225 Ground: 2-4	.090	1900° F 1000° C	Extremely high corrosion resistance to oxidizing acids (Sulfuric and Nitric). Pore free Nickel base. Resistant to severe abrasion; metal-to-metal wear; Hot abrasion and Impact. Low co-efficient of friction.	Valve and Pump Parts, Boiler Tubes, Guide Rolls, Pumps Mill Digesters, Fan Blades, Charging Rams, Printing and Central Impression Cylinders (particularly where water-based inks are used).
BHS 800	TRIBALLOY T-800	>8300	55RC	<3%	As sprayed: 200-250 Ground: 2-4	.0030"	1500° F 815° C	Resistance to wear and galling, very low friction in contacts up to 1500°F. Excellent for metal-to-metal wear, corrosion resistance, abrasive wear. Use where lubrication starvation at high temperatures is likely.	Brakes, Screw Flights, Land based Turbines, Arbors, Aircraft Engines, Extruder Barrels, Bushings, Compressor Parts, Journal-Sleeve Bearings, Pumps, Seals and Valves, Magnetic Tape Heads.
BPS 101	ALUMINUM OXIDE (FINE)	4500	65Rc	3%	As sprayed: 100-150 Brushed: 13-30 Ground: 10	.020"	1500° F 815° C	Coating is dense, extremely smooth as sprayed. Resistance to wear by abrasive grains, hard surfaces, particle erosion, and cavitation. Use where surface finishing is not possible. High dielectric strength. Resists fiber and thread abrasion.	Slush Pump Piston Rods, Pumps Seals, Thread Guides Water Turbine Buckets.
BPS 105	WHITE ALUMINUM OXIDE	5500	60Rc	<2%	Lapped: 6 As sprayed: 200-600 Ground: 20-50	.070"	3000° F 1650° C	Dense coating resistant to wear by fibers, threads and erosion at high temperature. Use as thermal barrier and for electric resistance at high temperatures.	Draw Rolls, Rocket Nozzles, Machine Element Clearance Controls, Mechanical Seal Rings, Pump Shaft Inlays.
BPS 106	CHROMIUM OXIDE	5500	60-70Rc	<4%	As sprayed: 200-400 Ground: 15-25 Lapped: 4	.030"	1000° F 540° C	Excellent self-mating and anti-galling properties. Dense, hard and insoluble in acids, alkalis and alcohol. Low temperature resistance (below 1000°F) to abrasive grains, particle erosion and cavitation.	Textile Industry, Pump Seals, Exhaust Fans Wear Rings, Printing Rolls.
BPS 130	ALUMINA TITANIA COMPOSITE	4700	65Rc	2%	As sprayed: 200-400 Ground: 4-5 Lapped: 2-4	.025"	3250° F 1800° C	Extremely dense coating. Resists abrasive grains, hard surfaces, fretting, cavitation and particle erosion. Recommended for process equipment where product adhesion is a problem. Resists wetting of aqueous solution that other ceramics absorb.	GE aircraft engines, Allied Signal gas turbines auxiliary units, Pumps, Hydroelectric turbines.
BPS 131	TITANIUM DIOXIDE ALUMINA OXIDE	1500	49Rc	4%	As sprayed: 300-400 Ground: 15	.010"	4000° F 2535° C	Hard, smooth coating offers wear-resistance from cavitation, impact and abrasion.	GE aircraft engines, Allied Signal gas turbines auxiliary units, Pumps, Hydroelectric turbines.
BPS 201	ZIRCONIUM OXIDE COMPOSITE	5500	45Rc	3-6%	As sprayed: 250-400 Ground: 15	.050"	3000° F 1650° C	Dense costing resistant to thermal shock and particle erosion at high temperatures. Useful as thermal barrier coating.	Glass Manufacturing Rolls, Gas Turbine Parts, Jet Engine Parts Brazing and Heat Treatment Fixtures, Rocket Nozzles, Missile Nose Cones.
BPS 316	HIGH GRADE STAINLESS STEEL	6000	29Rc	<2%	Ground: 6-10	.050"	1000° F 540° C	High bond strength 316 type stainless steel. Ductile, machinable, low porosity, with good corrosion and wear resistance.	Printing /Impression Cylinders, Diesel Engine Cylinder Liners, Exhaust Fans, Boiler Tubes, Food Processing Industry (General), Corrosion/Wear Resistance for Rollers, Cylinders, etc. in Printing, Glass, Rubber and Textile Industries, etc.
BPS 447	SELF-BONDING MOLYBDENUM NICKEL ALUMINUM COMPOSITE	7000	43Rc	<3%	Machined: 30-40 Ground: 10-20 Lapped: 4-10	.045"	1400° F 760° C	Medium hard general purpose coating. Self-bonding, with high internal strength. Tough, erosion and impact resistant.	Wear Rings, Press Fits, Bearing Seats, Machine Bedways, Exhaust Fans, Worn and Mismachined Parts.
BAS 53	CHROME NICKEL BORON	7600	67Rc	4%	As sprayed: 400 Ground: 12-25	.060	1700° F	High bond, wear applications. Anti-Skid surfacing applications and corrosive environments.	Boiler Tubes, Yankee Dryer Rolls, Anti-skids, Fan Blades and Drill Blades, etc.
BAS 316	HIGH GRADE STAINLESS STEEL	4000	40Rc	NA	Machined: Excellent Ground: Good	.200"	>1000° F 540° C	General purpose type 316 austenitic stainless steel wire.	Bearing Seats, Pistons, Rams, Mismachined Parts.
BAS 420	STAINLESS STEEL WIRE NICKEL/CHROMIUM	4000	33-42Rc	NA	Machined or Ground: Good surface Finish	.200"	900° F 440° C	General purpose stainless steel. Ductile, wear-resistant. Fair corrosion resistance. Low shrink and high interparticle adhesion make these coatings ideal for bearing seatings, etc.	Bearing Seats, Pistons, Hydraulic Rams, Crankshaft Bearings, Cylinder Liners.
BAS 950	PROPRIETARY IRON-BASED HIGH CHROME ALLOY	5600	58Rc	<2%	As sprayed: 200-250 Ground: 12	.060"	1000° F 540° C	High hardness; wear-, corrosion- and abrasion-resistance. Excellent organic adhesion.	Compressors, Cylinders, Sour Gases, Yankee Dryers, Crepe Dryers, Receiving Dryers.
BAS 951	BENDER PROPRIETARY TRACTION COATING	5100	64-69Rc	3%	As sprayed: 250-400	.015" - .100"	1000° F 540° C	Excellent wear resistance and traction.	Paper Machinery, Winders.
BAS 952	AMORPHOUS ALLOY	10000	67Rc	5%	As sprayed: 300-400 Ground: 12-25	.070	1700° F	High bond, wear applications. Anti-Skid surfacing applications and corrosive environments.	Boiler Tubes, Yankee Dryer Rolls, Anti-skids, Fan Blades, Drill Blades, etc. and Hydraulic Ram Forge Presses.
BWFS 405	NICKEL/ALUMINUM BONDING COMPOSITE WIRE	4000	22Rc	NA	As sprayed: Coarse Ground: Fair	Bond Coat.007" up to .060A; Single C	1380° F 750° C	Exothermic bonding composite used as bond coat prior to application of further coating layers. Produces dense coatings with high bond strength. Resistant to oxidation, high temps and temp change. Can also be used as a single coating.	Underlay Bond for Stainless Steel 420.
BWFS 505	MOLYBDENUM COMPOSITE BONDING WIRE	2500	40Rc	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 abrasive conditions.	Ideal for building up Journals for use with Bronze Bearings, etc.
BWFS 605	BABBITT WIRE	NA	58Rc	2-5%	Machined: Excellent	.200"	LOW	High-grade tin-based babbitt.	Piston Wear Rings. High Speed Plain Bearing Applications.
BWFS 705	ALUMINUM BRONZE ALLOY WIRE	NA 3500 with bond coat	82Rc	5%	Machined: Good	.100"	LOW	Produces dense, low-shrink, high-tensile strength coatings which are easy to machine and have greater strength and hardness than other flame-sprayed bronzes. Excellent general purpose, wear-resistant bronze for machine element work.	Pumps Impellers, Bronze Castings, Armature Bushings, Plain Bearing Applications
BWFS 805	MONEL WIRE	NA	50Rc	3-5%	Machined: Good Ground: Good	.050"	1000° F 540° C	Copper/Nickel alloy wire, producing dense coatings suitable for machine element components subjected to corrosion.	Gland Casings, Tailshafts, Hydraulic Pump Parts, Pump Plungers, Shafts, Seal Rings, etc.

COATING REFERENCES

BHS - Bender Hypersonic Flame Spray
BPS - Bender Plasma Flame Spray
BAS - Bender Electric Arc Flame Spray
BWFS - Bender Wire Flame Spray

***BOND STRENGTH**

Bond Strength Values indicate stress required to break bond (in PSI) between the coating and various carbon steel substrates and surface preparations.

HARDNESS VALUES**

The various hardness test methods (Rockwell C, DPH, Vickers, etc.) are comparable but not exact. In addition, different metal/substrate properties prevent exact conversion. Please refer to back cover for approximate conversions.

COATING TEXTURE/SURFACE FINISH***

Texture/Surface Finish values quoted are microinches aa and are considered to be the best obtainable.