

ABBREVIATED LISTING OF COMMONLY USED COATINGS

BACKGROUND

Brodeur Machine Co., Inc. is a third generation full line fabrication and machining facility with an integrated thermal spray coating division. Under this unique umbrella the High Technology Coating division can handle the complete coating job - from prep machining through finish turning, grinding and superfinishing.

CUSTOMERS

Industries served include a broad spectrum in the chemical, petrochemical, refining, power generation, marine, pulp/paper, printing, food, plastics, textile, wire/strip and general metalworking.

EQUIPMENT

• **Hypervelocity oxy-fuel (HVOF)** - Produces coatings equivalent to or better than detonation gun. Used for some pure metals, alloys and carbides. Gives highest possible bond strength. Propels gases up to 4500 ft./sec. at 5200° F.

• **Plasma** - Nontransferred arc system. Used principally for ceramics but has capability to apply some pure metals, alloys and carbides. Propels gases up to 2000 ft./sec. at 30,000° F.

• **Wire Arc** - Twin wire system. Used for heavier build-up of pure metals and alloys. Propels gases up to 1100 ft./sec. at 10,000° F.

BENEFITS

Design Possibilities/Improvements

- Utilization of surface design engineering
- Extending operating range of equipment
- Manufacture of parts impossible by other means
- Improvement in manufacturing methods
- Introduction of novel manufacturing methods
- Use of less dense base material - lower inertia

Coating Designation	Material	Hardness	Tensile Bond Strength psi	Maximum Operating Temp (°F)	Principle Features
UNILLOY (Pure Metals)					
CEA-110	Aluminum	Rh 40	4,500	400	Good corrosion resistance, heat and electric conductor
CPC-112	Copper	Rh 38	7,000	500	Good electric conductor. RFI/EMI shielding
CMM-117	Molybdenum	Rc 40	8,000	1800	Primarily bond coat. Hard wear resistant
CMN-121	Nickel	Rh 58	8,000	1000	Used where dense nickel required
CEZ-126	Zinc	Rh 20	3,000	400	Good atmospheric and freshwater corrosion EFI/RFI shielding
CPT-135	Tantalum	Ra 70	4,000	550	Excellent acid corrosion resistance
MIRALLOY (Alloys)					
CMC-205	Stellite 6*-type formulation	Rc 48	10,000	1500	Good resistance to wear
CEF-215	Aluminum Bronze	Rn 15 58	3,000	500	High tensile, low shrink, dense, wear resistant
CEF-225	80 Carbon Steel	Rc 38	4,000	600	Hard, low shrink, wear resistant and low cost
CMN-231	Hastelloy C**-type formulation	Rc 39	10,000	1400	Excellent corrosion resistance
CEF-233	304 Stainless Steel	Rc 24	8,000	1200	Build up repair for corrosion
CEF-238	316 Stainless Steel	Rc 24	8,000	1300	Build up repair for corrosion
CPN-239	Monel-type formulation	Rc 42	6,000	1300	Good resistance sea water corrosion
CEF-244	420 Stainless Steel	Rc 33	8,000	1200	Good wear resistance, dimensional restoration
CMN-248	Nickel/Aluminum	Rn 15 41	9,900	800	Good resistance to oxidation at high temp
CMN-251	Nickel/Chrome/Boron	Rc 50	4,500	800	Good wear resistance - particle erosion and cavitation high/low temp
CPN-256	Nickel/Chrome/Aluminum	Rh 85	9,500	900	Good wear resistance, dimensional restoration, bond coat
CMN-259	Ni Chrome	Rc 36	10,000	1800	High temp corrosion in non-sulphurous atmosphere, bond coat
CMC-283	Cobalt/Molybdenum/Chrome	Rc 56	9,000	2000	High temp, corrosion, erosion, abrasion, fretting, self lubricating
WEARALLOY (Carbides)					
CMC-422	Chrome Carbide/Ni Chrome	Rc 64	10,000+	1800	Good resistance abrasion, erosion and fretting wear
CMW-445	Tungsten Carbide/9% Cobalt	Rc 72	10,000+	1000	Excellent wear resistance
CMW-450	Tungsten Carbide/12% Cobalt	Rc 71	10,000+	1000	Excellent wear and improved shock resistance
CMW-460	Tungsten Carbide/17% Cobalt	Rc 70	10,000+	1000	Excellent wear and improved shock resistance
CMW-463	Tungsten Carbide/Chrome Carbide/Nickel	Rc 70	8,000+	1400	Excellent wear and improved corrosion resistance
CMW-475	Tungsten Carbide/Cobalt/Chrome	Rc 69	10,000+	1000	Good wear and corrosion resistance
CERMEX (Ceramics)					
CPA-601	Aluminum Oxide	Rc 70	9,000	1800	High dielectric strength and low temperature wear
CPT-610	Titanium Dioxide	Rc 53	6,600	1000	Hard, dense, wear resistant by abrasive grains
CPC-616	Chrome Oxide	Rc 71	9,000	1300	Resistant particle abrasion, erosion and cavitation
CPZ-640	Zirconium Dioxide	Rc 30	6,500	2400	High temperature thermal barrier
CPZ-660	Ytria Stabilized Zirconia	Rc 30	6,500	2200	High temperature thermal barrier and wear
CPZ-670	Magnesia Stabilized Zirconia	Rc 25	7,500	1800	High temperature wear by particle erosion, thermal shock
CPA-701	Alumina/Titania	Rc 60	8,000	1300	Resistant to low temperature abrasion, fretting and particle erosion

Direct Cost Savings

- Increase in life of component
- Reduction in maintenance costs
- Decrease in equipment downtime
- Increase in operating efficiency
- Use of less costly material for bulk of component

Miscellaneous

- Improvement in product consistency and quality
- Recovery of mis-matched parts
- Increase in life of mating parts

NOTES: 1) All data is nominal and should not be used in firm design work but rather on a comparative basis.
 2) Tensile bond strength determined by ASTM method C633-79 modified.
 3) All of these materials can be applied to almost any substrate.

* Registered trademark of Stellite Coatings Division of Thermadyne

** Registered trademark of Haynes Corp.

Abbreviated Applications by Industry

Chemical

- Augers
- Catalytic Crackers
- Centrifuges
- Compressor Parts
- Concentrators
- Evaporators
- Fan Parts
- Nozzles
- Precipitators
- Pump Parts
- Rolls

Power Generation

- Air Foils
- Boiler Tubes
- Clinker Shafts
- Crusher Rolls
- Eductors
- Fan Blades
- I.D. Fan Housings
- Nozzles
- Piston Rods
- Pump Parts
- Strainers
- Turbine Parts
- Valve Parts

Food

- Bread Slicing Guides
- Canning Spindles
- Perforator Blades
- Wear Plates/Bars

Printing

- Anilox Rolls
- Blanket Rolls
- Ink Rolls
- Journals

Marine

- Hulls
- Piping
- Pump Parts
- Propeller Shafts
- Rudder Parts
- Superstructures
- Tanks

Pulp & Paper

- Corrugated Rolls
- Dryer Rolls
- Mixing Rotors
- Pump Parts
- Pressure Rolls

Petroleum

- Compressor Rods
- Gate Valves
- Mechanical Seals
- Pump Plungers
- Rotor Shafts
- Valve Balls

Textiles

- Crimper Rolls
- Draw Rolls
- Finish Applicator Rolls
- Friction Discs
- Guide Pins
- Guide Rolls
- Pump Plates
- Separator Rolls
- Staple Draw Rolls
- Take Up Rolls

Plastics

- Dicers/Bed Knives
- Extruder Screws
- Injector Screws
- Pelletizers
- Rolls
- Slitter Blades

Wire/Strip/Sheet

- Billy Rolls
- Bridle Rolls
- Capstans
- Delivery Rolls
- Journals
- Mandrels
- Roller Guides
- Sheaves