

SPRAYMET

Enabling Surface Performance

SPRAYMET SURFACE TECHNOLOGIES PVT LTD

Bangalore : A 413 , 9th Main , 2nd Stage , Peenya Industrial Area , Bangalore 560058 ,
E-mail : spraymet@gmail.com Contact No : 9916903701 , Phone No : 080 4377 0048

Pune : J 225, J Block MIDC , Bhosari , Pune 411026
E-mail : spraymetpune@gmail.com , Contact No : 8149046272

APPLICATIONS ACROSS ALL INDUSTRIES

**Automotive, Pump and Valve, chemical and Fertilizer, Power and turbine ,
Aerospace, Medical Implants and General Engineering**

AUTOMOTIVE :-

Pure Molybdenum coating on Gear
Shifter Fork & Synchronizer Cone

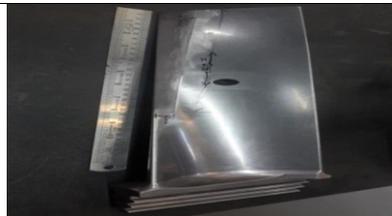


Pump parts Carbide or Ceramic
coated pump parts for severe service
applications in oil and gas, pulp ,
paper and general water applications



POWER SECTOR :-

Tungsten carbide coating on Steam
turbine blades & rotor



Control valve cage& Plug Coated
with tungsten or chrome carbide and
ground.ID coating and grinding
capability 125mm diameter onwards



API 6A Slab Gate & Seat Carbide
coated Gate (Slab and Split) and
Seat Assy, Carbide coated BOP Piston
Rod as per API Specifications



Metal seated Ball with HVOF coating of
Tungsten carbide chrome carbide, Cobalt
base alloys. Ground & match lapped with
Seat Ring and leak Tested. Supply
capability 1/2" to 16".



Plug Valve HVOF Coating of Cobalt alloy 6
or Tungsten carbide. Taper grinding to
match with the body.



AEROSPACE :-

Abradable coated Gas turbine
compressor casing &
Thermal barrier coating (YSZ) on
Exhaust Adapter of Gas turbines



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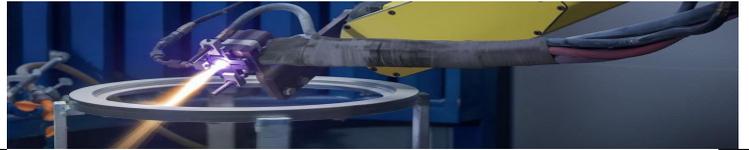
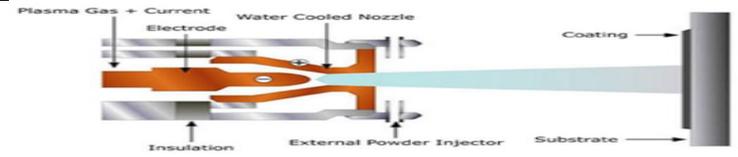
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THERMAL SPRAY PROCESS

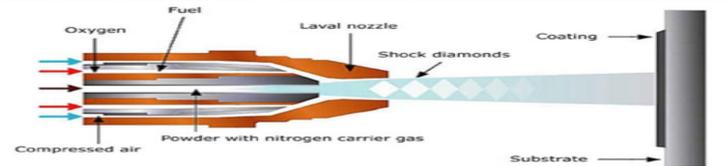
PLASMA SPRAY :-

Plasma spraying involves the injection of powders into a direct current plasma jet, where they are melted and accelerated and directing the stream of molten particles onto a substrate, where they form a coating as they spread and solidify



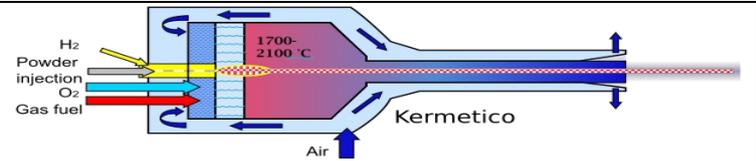
HIGH VELOCITY OXYGEN FUEL (HVOF) :-

HVOF coating is a thermal spray process in which a fuel and oxygen are mixed, fed into a combustion chamber, and ignited. The gas produced in the combustion chamber has an extremely high temperature and pressure and is ejected through a nozzle at supersonic speeds.



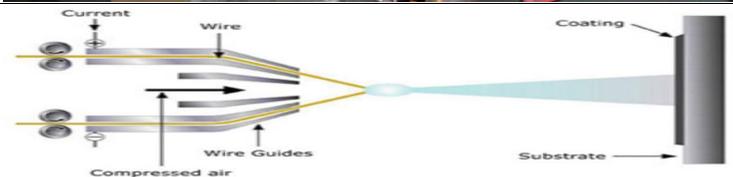
HIGH VELOCITY AIR FUEL (HVOF) :-

HVOF thermal spray process is characterized by a low combustion temperature (1,960-2,010°C | 3,560-3,650°F), high particle velocities (800 to over 1,000 m/s | 2,625-3,281 ft./sec.), resulting in low-oxidized, ductile, non-porous high-bond carbide and metal coatings. Spray rate up to 550 g/min (73 lbs./hr.) makes the process much faster, providing a significant advantage over HVOF



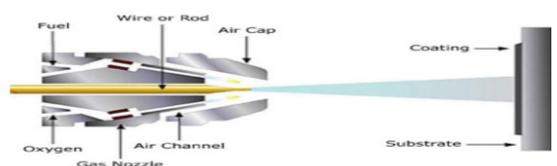
ARC SPRAY :-

The wire arc spray coating method is a Thermal Spray process in which two conductive wires are melted as they are acted upon by an arc. The arc produces such a temperature that it transforms the wires into a molten state.



WIRE/POWDER FLAME SPRAY

Wire/Powder flame spraying is a combustion process. The oxygen and fuel (propane or acetylene) flame melts the metal wire. Compressed air atomizes the molten metal and propels the particles onto the substrate. Main applications of wire flame spray include: Wear resistant coatings.



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Flash Carbide

A Greener Process Replacing Hard chrome plating

The best clean alternative method determined by HCAT was HVAF thermal spray for Hydraulic Actuators (Cylinder Rods)

The Flash carbide process utilizes supersonic spray technology and nano material in powder form propelled and deposited to form thin and dense coating.

The material softens in the flame and forms a dense coating on the substrate.

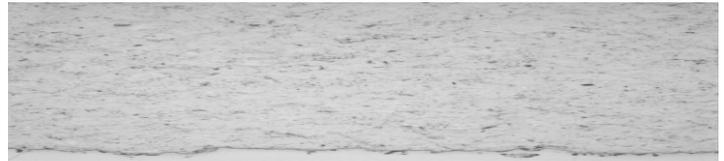
HARD CHROME PLATING v/s SPRAYMET FLASH CARBIDE:-

Charecteristic	Hard Chrome Plating	Flash carbide
Surface Hardness	60 Rc	72 Rc
Corrosion resistance	~ 150 Hrs salt spray	> 800 Hrs salt spray
~ Time required to coat 100microns On 1sq Mts	5 hours	1 hour
Work Piece Temp	60-80C	80-100C
Post Plating H2 Relief	200C 2-4 hours	Not required (No H2 embrittlement)
Surface Finish	0.4-0.8 um (16-32u in)	1.5 to 2 Ra and then direct polished to <0.4 Ra
Polishing	AlOx Belt polishing	Diamond belt polishing

TYPICAL MICROSTRUCTURES OF HARD CHROME & HVAF :-

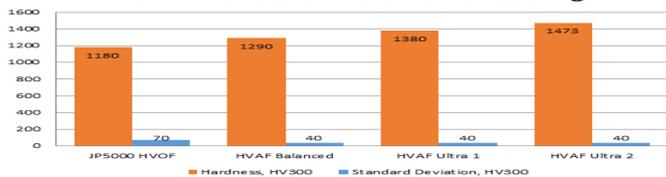


Chrome plating : microcracks in structure , main reason for corrosion . Corrosion resistance < 150Hrs



Flash carbide : No micro crack and through porosity. Corrosion resistance > 800 Hrs

Vickers Hardness of WC-10Co-4Cr Coatings



Young's Modulus E of WC-10Co-4Cr Coatings

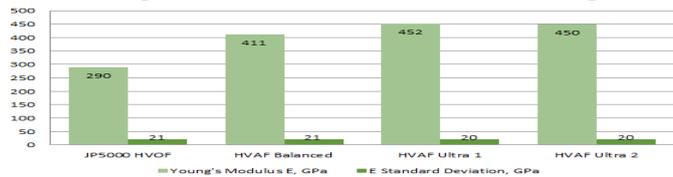


Fig : 1 - FLASH CARBIDE COATING ON HYDRAULIC ROD



GAS COMPRESSOR ROD



PROGRESSIVE ROTOR

Fig :2- FLASH CARBIDE COATED PART SUPERPOLISHED FOR SURFACE ROUGHNESS <0.15µ Ra

Technology from Kermetico Inc USA

KERMETICO

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Full range of Thermal spray Processes



Robotic Acoustical Spray Rooms

Process Capabilities

Thermal Spray :

- Wire Metallizing and Electric Arc Spray
- Powder Flame spray
- Robotic Plasma spray
- Robotic HVOF spray and Robotic HVOF Spray
- Finish Grinding, Honing Lapping, etc.

Hard Facing :

- Spray fuse , PTA and TIG hard facing
- Metallurgically bonded Ni and Co base alloy coatings

Manufactured components :

- Coated /Plated/ hard faced components for oil and gas, pump and valve and steam turbine

Wide Range of Coatings

Pure Metals and Alloys :

Ferrous and Non Ferrous, Molybdenum and its alloys

- SS, Ni, Mo, Zn , Al, Cu, bronze, Babbitt, etc.

Nickel and cobalt Base Alloys :

Inconel and Stellite family

Ceramic coatings :

Chrome Oxide (Cr_2O_3) , Alumina Oxide (Al_2O_3) , Zr_2O_3 (TBC)

Carbides :

Tungsten Carbides , Chrome Carbides , $Wc+NiCr$, $Wc-Co-Cr$, $Wc-Ni$, Wc/Co

Hardfacing Alloys :

Stellite 1, Stellite 12, Stellite 6 and Colmonoy 4, 5, 6, etc.

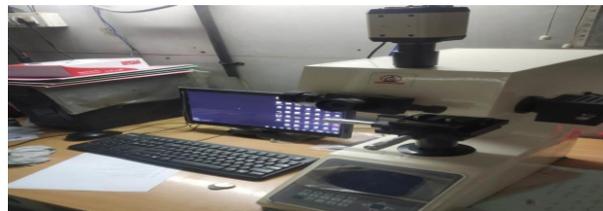
Quality meeting international and OEM standards

"We are an ISO 9001:2015 certified company meeting quality system of OEM industry specs like API 6A, NACE, ASTM, ASME etc."

Microstructure examination



Micro Vickers Hardness Tester



Our Esteemed OEM customers:-



beml
NEW FRONTIERS. NEW DREAMS



Mahindra

TVS

HALLIBURTON

**AM/NS
INDIA**



**Triveni
TURBINES**

TAFE



IMI CCI

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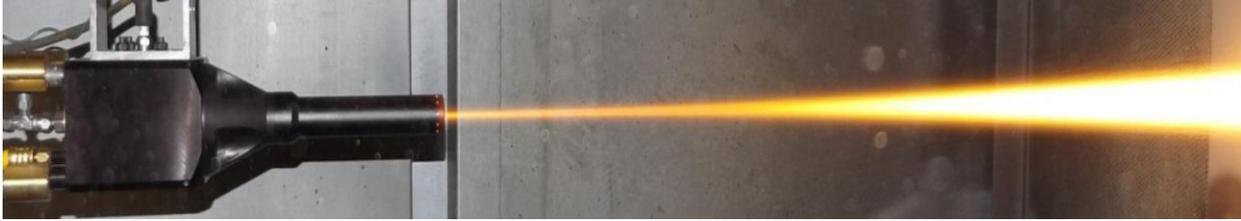
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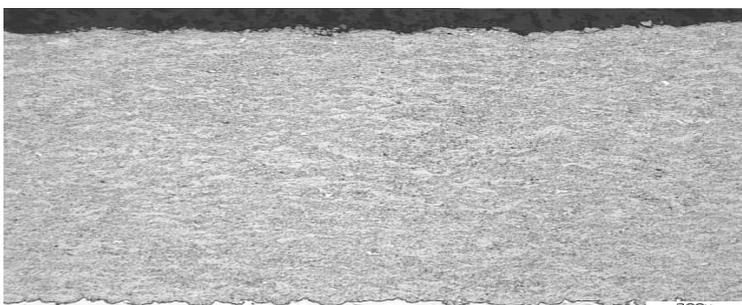
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WIDE RANGE OF COATINGS



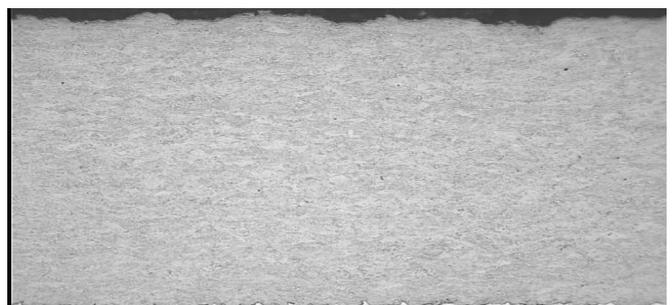
Coating Type	Process Options	Hardness Range	Nominal thickness	Coating characteristics / Main Coating functions
Ni Base Alloys	Cold*/ Hot			Resistance to :
Inconel 625/718/C22 etc	HVOF*	250BHN	Upto 500 Microns	Corrosion + Heat (800C)
" "	PTA/Laser	250BHN	1 to 5mm	Corrosion + impact+ heat
NiCrBSi colmonoy type coatings	HVOF*	45 to 60 HRC	Upto 500 Microns	Wear + corr + heat(650C)
" "	PTA/laser/ flame fused	45-60 HRC	1 to 3.0mm	Impact+Wear + corr + heat(650C)
Co base Alloys				
Stellites: 6,12,21	HVOF*	40/48/22RC	Upto 500 Microns	Wear + corr + heat(650C)
" "	PTA/	40/48/22RC	1 to 3mm	Impact+Wear + corr + heat(650C)
Molybdenum	Plasma/wire	450-850HV	100-350mic	Wear and anti scuff resistance
Non Ferrous	Plasma /Wire	50HRb to 90 HRB	Upto 3 mm	Al, Zinc, Al Bronze, Cu, Brass etc
Carbides				
Tungsten carbide/Cobalt	HVOF/HVAF*	1100 to 1400HV	Upto 300 Microns	Wear + abrasion upto 450C
Tungsten carbide/Cobalt/Cr WcCoCr	HVOF/HVAF*	1100-1400 HV	Upto 500 Microns	Wear + abrasion + corrosion upto 450C
Chromium carbide/CrC+NiCr	HVOF/HVAF*	700-900Hv	Upto 500 Microns	Wear + abrasion + corrosion upto 850C
Cast Tungsten carbide+NiCrBSi	HVOF/HVAF*	1050HV	Upto 500 Microns	Wear + abrasion + corrosion upto 450C (lower cost)
" "	PTA	68-70Rc	1mm-3mm	Impact+ Wear + abrasion + corrosion upto 450C
Ceramics				
Aluminum Oxide	Plasma Spray*	55 to 60 RC	Uto 250 Microns	Wear + corrosion upto 900C
Chrome Oxide	Plasma Spray*	60 to 65 RC	Upto 250mic	Wear + corrosion upto 900C
Zirconium Oxide	Plasma Spray*	45-50 RC	Upto 500 mic	Thermal barrier upto 1400C
Developmental				
FlexCarb (FxC)*	Ultra Sonic	1400HV	Upto 100mic	Hard chrome replacement : * Proprietary coating
Abradable	Plasma	Soft	Upto 5mm	Sacrificial coatings



11-0942-1D_#941-4_200x.

WC/ 10%Co-4%Cr

200x
50 mkm



15-0846-1D

1204-4

0.002 inch

TUNGSTEN CARBIDE (Wc-Co-Cr) COATING