

# MEC



## THERMAL SPRAY FACILITIES

AUTOMATIC SYSTEMS for HVOF, PLASMA, FLAME SPRAY, ARC SPRAY & ROD SPRAY



### XPOJET<sup>®</sup> - 5000

High Pressure - High Velocity Oxy-Liquid Fuel (HP-HVOLF) Spray System

## HP-HVOLF COATINGS PROCESS

The MEC XPOJET-5000 uses an elegantly simple and effective design to produce High Pressure – High Velocity Liquid-oxy Fuel Coatings of superior quality.

The Coating benefits include :

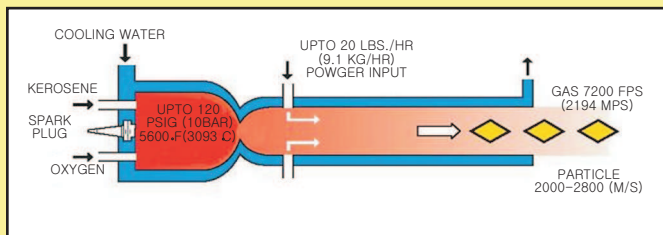
- High coating density ( <1% porosity)
- High coating hardness ( >72 HRC)
- Coating thickness upto 12 mm (depends on powders)
- Smoother as-sprayed finish
- High bond strength ( >10000 psi)

In addition to the outstanding coating quality, the XPOJET-5000 delivers spray rates four times higher than typical HVOF systems. This dramatic increase in spray rate and productivity places the XPOJET-5000 System in a new category of HVOF equipment.

## WORKING PRINCIPLE

Fuel (kerosene) and oxygen mix and then atomize after passing through orifices into a combustion chamber, thereby creating stable, clean and uniform combustion. The combustion chamber pressure is monitored to assure proper combustion mode and constant pressure.

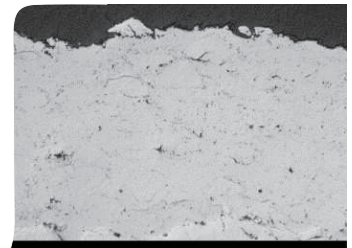
The Particle velocity is directly related to chamber pressure. The unique, cover / diverging exit nozzle of the combustion chamber is sized and shaped to create a supersonic jet that maintains a low-pressure area where the powder is radially injected through multiple ports. The XPOJET HVOLF Gun uses a radial powder injection system as opposed to the axial systems of other HVOFs.



The radial injection has several benefits :

- ◆ Less powder feed pressure is required because the powder injected into a low pressure area created by the converging/diverging nozzles.
- ◆ Powder velocity and temperatures are evenly distributed across the spray.

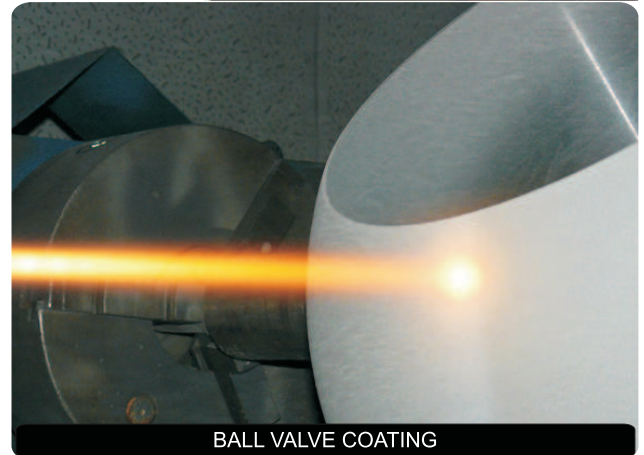
Once injected, the powder mixes with the gas and is accelerated to near maximum velocity as it leaves the barrel and is carried along at constant velocity to impact the substrate.



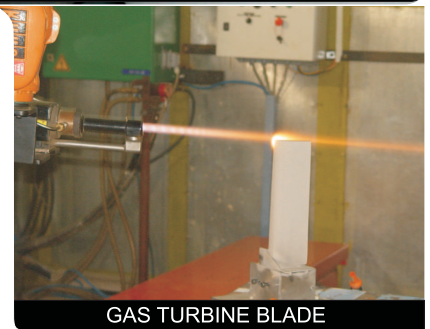
NiCoCrAlY COATING



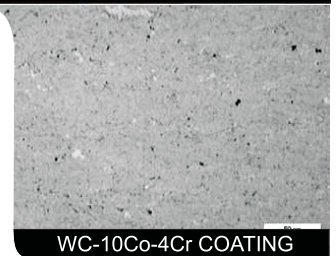
COATING ON ROLLS



BALL VALVE COATING



GAS TURBINE BLADE



WC-10Co-4Cr COATING



# XPOJET-5000 SYSTEM



XPOJET-5000 HP-HVOLF System consists of :

1. Model XPOJET Gun
2. Model DF-2210 PLC Controlled Automatic Control Console.
3. Model PF-3350-A Powder Feeder
4. Model HC-5000 Supplies Package (Standard hose & cables of 10 m length)
5. Model ONR-5000 High Pressure Regulator Kit
6. Model SP-KIT (Set of Recommended Spares)

Our standard Power Supply :220V / 1 P / 50 Hz

## OPTIONAL ACCESSORIES :

- A) Industrial Heat Exchanger / Chiller
- B) Gas Manifold for Oxygen Cylinders
- C) AJ Air Blast Cooler (For Job cooling)
- D) MJP-6000 Angular Gun (with 45 & 70 deg. angle ; Patent applied)



MJP-6000 GUN FOR ID COATING



XPOJET HP-HVOLF GUN



HVOF COATING ON SCREW



SINGLE CANISTER

DUAL CANISTER



CE COMPLIANT PANEL

## MODEL XPOJET HP-HVOLF GUN

The XPOJET HP-HVOLF Gun is the heart of the system. The powder is injected downstream of the combustion nozzle. Injection into this lower pressure area promotes better powder mixing, more even heating, less oxidizing and more uniform, higher particle velocities. The particles impact with a higher kinetic energy and have lower, but more consistent temperature compared to other HVOF guns.

The XPOJET's unique combustion design generates an exceptionally high combustion chamber pressure of over 150 PSIG (10 bar) (vs. 30 – 60 PSIG) (2–4 bar) in other HVOFs and superior gas velocities 7200 fps (2,190 m/s) for XPOJET vs. 4,800–5,900 fps (1460–1800 m/s) in others. This translates into higher coating hardness and better coating integrity.

The design features allow powders with a larger particle size to be used. In many cases, this can decrease the powder cost when compared with systems that require smaller particle sizes. A key benefit to using larger particle sizes is that the larger particles have less surface area, a fact which reduces oxidation and produces less oxygen in the coating. Despite the larger size, unmelted particles in the coating are virtually eliminated due to the uniform particle heating in the barrel and the high velocity at which the coating impacts the substrate.

## MODEL PF-3350-A POWDER FEEDER

MEC's unique, time tested PF-3350-A powder feeder operates on a volumetric feed principle that directly controls the powder feed rate by speed of a pick-up wheel. When the powder feeder is in operation, holes in the variable-speed wheel are filled with powder by gravity. The carrier gas, and rotation of the wheel work in conjunction to deliver the powder to the gun. One advantage of this type of powder feeder is that it is not sensitive to gun back-pressure.

## MODEL DF-2210 CONTROL CONSOLE

The Model DF-2210 Control Console for the XPOJET-5000 system is a semi-automatic, rotameter-controlled console that is engineered for ease of use and consistency. This single unit controls all the operating parameters including cooling water, powder, carrier gas, oxygen, and fuel flow via, clear, easily readable gauges. Rotameters and digital meters let you set consistent spray parameters that yield repeatable results.

Automatic start-up and shut-down sequences ensure safe operation of the system. Once the flows are set on the rotameters, one-button operation lets you start the system and spray consistent coatings every time. The console can be controlled through a pendant or another cell controller.



# PROJECTS & SERVICES



## COATING CELLS

HVOF generates high noise (> 135 dBA). To reduce it to permissible norms, MEC also offers fully automated spray cells that combine the XPOJET with the ultimate in computer control. These spray cells provide flexibility and throughput that help you get the most from your HVOF equipment.



## SPARE PARTS

MEC provides a complete line of spare parts. From original equipment components for our MEC spray systems, to key spare parts for competitors' guns, MEC offers "one stop shopping" for all of your thermal spray consumables.

As the world's premier manufacturer of flame spray, rod spray, powder spray, arc spray, plasma spray, and HVOF systems, MEC makes all standard & other critical components that maximize equipment up-time. Utilizing the most advanced CNC machining technology and a practical understanding of the importance of careful workmanship, our spares outperform the competition. Plus, we maintain a sizeable inventory of the most critical spares to help you keep your equipment running, producing coatings, & making money.

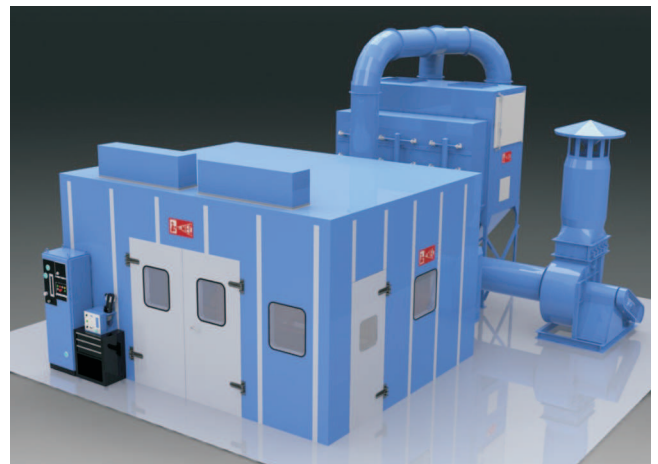
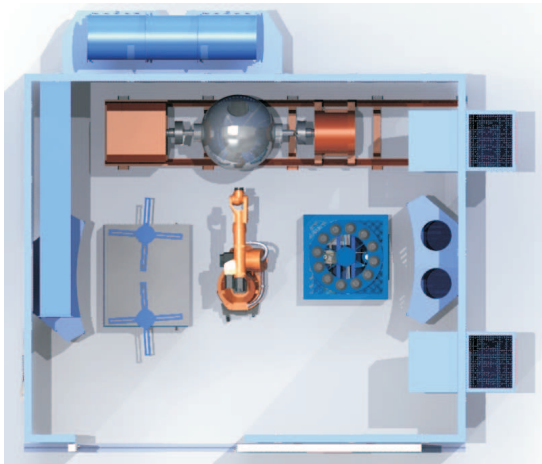
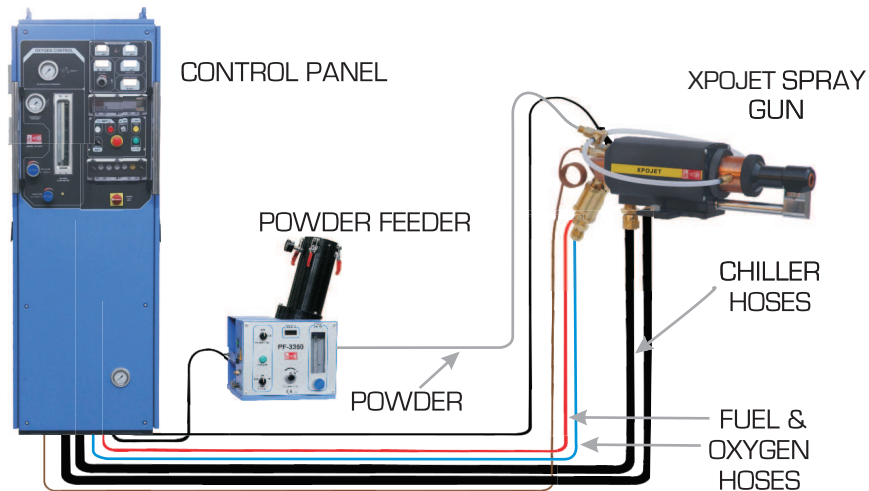


## FEED STOCK MATERIAL

MEC stocks a wide variety of powders optimized for use with XPOJET-5000 system. Each powder is carefully analyzed and tested by our metallurgists before it is approved for use. This rigorous quality control is your assurance of the highest coating quality available. Ask for separate literature.



# HVOF PROJECT LAYOUT & OPTIONS



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