# *Pulsed HVOF and Thermospray Applications*

Sputtek
ADVANCED METALLURGICAL COATINGS

High Velocity Oxy-Fuel (HVOF) spraying is a thermal process that produces extremely dense, high-bond-strength coatings with low porosity by spraying semi-molten particles at supersonic speeds. It utilizes fuel (gas or kerosene) and oxygen to create high-kinetic-energy, lower-temperature coatings, ideal for wear-resistant applications used in variety of industries including automotive, aerospace, mining, pulp and paper, defense and much more.

***Thermal Spray – Pulsed HVOF Detonation***

Particles velocity-speed, Ultrasound: over 1200 m/s
Coating porosity: 0.50%, Thickness: 50-500 µm

***Deposited Materials***

Metals and alloys
Ceramics – $Al_2O_3$
Composites – WC/Co
CrC – Based Powder
Ti, Ni, Cr, Mo, Cu, Zr, Si, B … based materials
Combinations of above materials are also available.

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***Material Properties and Technical Data:***

- WC-based coatings with hardness of up to 1,300 HV
- Al2O3-based coatings with hardness of up to 1,300 HV
- Ti-based coatings with hardness of up to 1,000 HV
- Coating porosity typically below 0.5%
- Low compressive residual stresses in coatings
- Negligible oxide content in coatings

| POWDER | CUT | VELOCITY | D.E. | SPRAY RATE |
|---|---|---|---|---|
| WC-based powders | -30+10 µm<br>-25+5 µm | 600 - 800 m/s | 80-90% | 1,2 kg/h max |
| CrC-based powders | -25+5 µm | 600 m/s | 70-80% | 1.2 kg/h max |
| $Al_2O_3$ – based powders | -20+5 µm | 600 m/s | 70-80% | 1.2 kg/h max |
| $ZrB_2$-$MoSi_2$– based powders | -15+5 µm | 1000-1200 m/s | 50-60% | 0.6 kg/h max |
| $ZrSiO_4$ - based powders | -20+5 µm | 1000-1200 m/s | 60-70% | 0.8 kg/h max |
| Metal (Ti,Ni,Cr,Mo,Cu...) – base powders | -45+5 µm | 800-1000 m/s | 80-90% | 2-3 kg/h max |