

COMPANY PROFILE

Curtiss-Wright Surface Technologies (CWST) is a single source solution for all your surface treatments. We can reduce your turnaround times and costs through our network of 65 worldwide facilities.

Our proven surface treatments meet industry demands for lighter materials, improved performance and life extension in key markets such as Aerospace, Automotive, Energy, Military and Industrial. We can prevent premature failures due to fatigue, corrosion, wear, galling and fretting.



Surface Technologies is a Division of Curtiss-Wright (NYSE:CW) a global innovative company that delivers highly engineered, critical function products and services to the commercial, industrial, defense and energy markets. Building on the heritage of Glenn Curtiss and the Wright brothers, Curtiss-Wright has a long tradition of providing reliable solutions through trusted customer relationships.

Nano-Carbide Coatings with Superior Performance

Industry has been striving to implement an environmentally friendly, economically viable and performance-enhancing surface coating as an alternative to hard chromium plating. The leader of the pack is a high-velocity oxy-fuel (HVOF) applied carbide hardface coating, known as nano-carbide coating at Curtiss-Wright Surface Technologies (CWST).

Curtiss-Wright Surface Technologies (CWST) proprietary small particle High Velocity Oxygen Fuel (so called "SP-HVOF") nano-carbide coatings offer a lower surface roughness, tighter and more uniform thickness, as well as

improved corrosion, wear and erosion-resistance. This advanced proprietary SP-HVOF process is capable of producing ultra-smooth and dense carbide-based cermet coatings for better aero-dynamics, wear and corrosion resistance, as well as to provide lower manufacturing cost by reducing necessary coating thickness and the post finishing operations. This option of hardface surface treatment and smooth surface finishing enables customers to create near net-shape and high-performance components for specialized products in the aero turbine and other industries.



APPLICATIONS

CWST SP-HVOF nano-carbide technology can impart properties unobtainable by base metal selection alone or conventional carbide coatings on various products including:

- Fan, compressor and rotor blades
- Valve stems and seat area
- Transmission shifter, shafts and plungers
- Forks, joints, gears
- Pumps and valves housing, hydraulic cylinder IDs and ODs
- Piston rings, rods, stems and plungers

SP-HVOF PROCESS ADVANTAGES

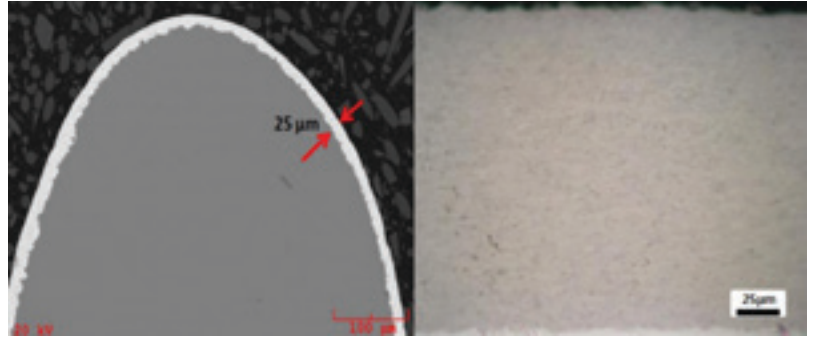
CWST SP-HVOF process delivers superior value as compared to conventional HVOF processes:

- **High deposition efficiency**
- **Capable of applying coatings at thin and uniform thicknesses, and near a net-shape layer on airfoils**
- **A more cost-effective solution by eliminating grinding for surface finish**
- **Capability of applying coating onto OD and ID surfaces**

BENEFITS

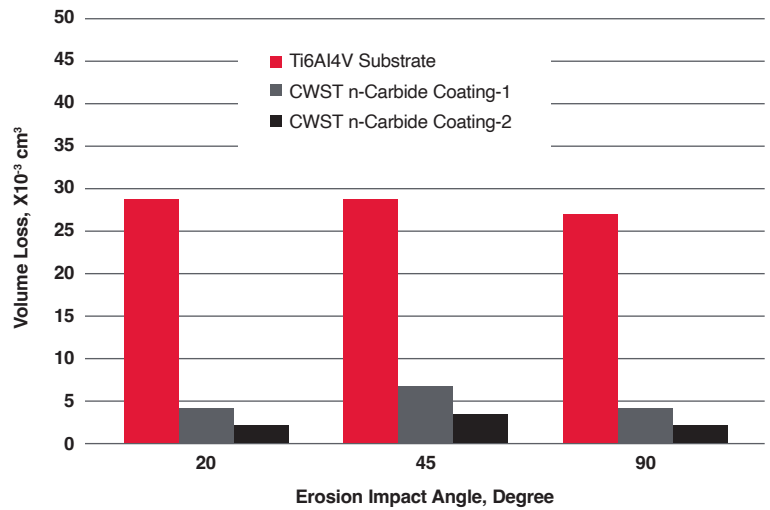
CWST SP-HVOF nano-carbide coating technology has various benefits compared to conventional carbide coatings, on products such as aero-turbine compressor blades including:

- **Outperformed corrosion resistance**
- **Superior wear, abrasion and erosion resistance**
- **Tough, hard and uniform**
- **Smooth, thin and near net-shape**
- **No negative impact on substrate properties**
- **Improved life performance over time**
- **More cost-effective**



Typical aero-turbine compressor blades coated on leading edge areas with as-sprayed smooth and thin wear/erosion resistant coating

Typical Microstructure of High Velocity Oxygen Fuel (HVOF) tungsten carbide coating with a full density and smooth surface coating



Nano-WC-CoCr Coating Characteristics

Description	SP-HVOF Process	Conventional HVOF Process
Macrohardness (Rc)	> 70	> 65
Microhardness (DPH 300)	> 1200	1,000-1,200
Bond strength	> 12,000*	> 12,000*
Porosity	< 0.5%	1-3%
Coating thickness limit (in)	0.002 - 0.020"	0.005-0.020"
Surface finish (Ra, µin)	< 80	> 120
WC size (µm)	0.1 - 0.5	> 1

* Results exceed strength limit of epoxy needed for tensile test