Seven Reasons Why Maintenance Managers Choose HVTS vs. HVOF

1. Market Recognition

IGS is a market leader in on-site application with over 500,000m² applied over 20 years with its proprietary HVTS technology. IGS has deep experience with all boiler types of many licensors:

- PC-Fired
- CFB & BFB
- Grate
- Coal
- Biomass
- WtE (EfW)

2. Porosity & Oxides Level

These could be very different in the lab and on the waterwall. HVOF companies tend to show dense and homogenous cross sections created under ideal conditions. When we repair boilers, damaged with on-site HVOF, we frequently collect oxidized, porous, and overstressed coating samplesas HVOF is known to be highly sensitive and extremely difficult to apply under real-world field conditons.

IGS HVTS is a set of non-permeable layers that prevent boiler aggressive environment from reaching the substrate at high-temperature conditions.

3. Production Rate

HVTS can deploy many more systems in a boiler or vessel, spraying tens of square meters per day, with an average project time of less than one week. HVOF is a relatively slow application process that also builds up high heat in the environment and on the surface limiting application rates.

4. Variable Thickness

Maximal HVOF coating thickness is limited – spraying higher than 200 microns leads to cracking. HVTS was created to build up thickness as needed. In the high-erosion environment, we spray up to 3 mm of the stress-free coating. When you operate mixed fuel coal, biomass CFB boiler. What would you choose to eliminate the erosion challenge?

5. Refurbishability

A coating is applied to protect pressure parts, not outlive them. That means it should be repairable on-site. Some of HVOF coatings are impossible to repair – if it is damaged, the HVOF coating should be removed and replaced. Others can be repaired by stripping the coating down and reapplying.

IGS HVTS cladding is designed to be refurbishable. If it is worn down locally, we do not need to replace the full area – we profile the surface and build up the cladding to the required thickness.

6. On-site Safety, Quality, and Environment Protection

Our prime job is on-site, where our specialists spend 150-180 days per year. Each of our employees is trained and certified as a thermal spray technician, certified at major safety programs, and cares of the cladding quality by heart.

7. Project Management

IGS uses both HVOF (for specific applications) and HVTS for on-site coating. 2500 successful projects leave us with enough evidence of higher reliability of HVTS in the boiler environment. HVTS technology and our scalable team of seasoned professionals let us provide the customer with safe on-time projects.

What is HVOF?

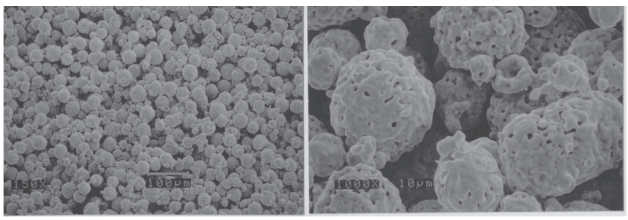
HVOF, High Velocity Oxygen Fuel, is a popular Thermal Spray process with first applications dated the early 1960s. Designers use the HVOF process for the following industrial applications:

- Bond layer for Thermal Barrier Coatings (TBC) for turbine blades
- Wear resistance coatings for abrasion protection of shafts, actuators, hydraulic rods, wing flaps, and other highly loaded airplanes and helicopter parts
- Molds and rolls for hot and cold rolled steel

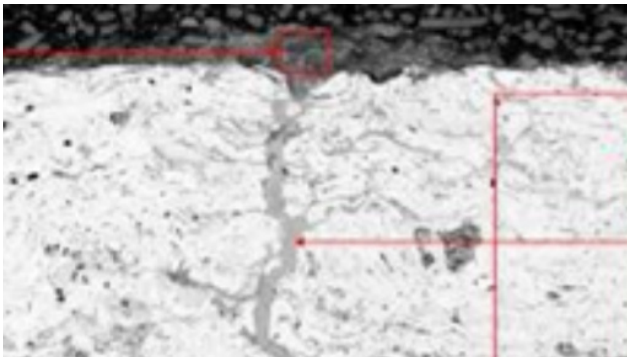
HVOF is developed for robotic operations with PLC control: it works perfectly in a clean shop environment with a precise distance from the gun to the target at a 90 deg spray angle.

Despite a respectful benefits list, we can hardly meet HVOF in boilers. Why? Liquid fuel HVOF, mainly used in the shops, is too cumbersome and dangerous for field application. Field HVOF technology burns gases (usually hydrogen or propane with oxygen) to apply a coating.

An excess amount of oxygen (usually 3:1) frequently leads to oxidized coatings.



Whatever alloy is sprayed, there is a problem of inflight oxidation: molten particle oxidizes ~100 times faster than a solid one. Another problem is heat concentration: HVOF spray spot should be small to assure adhesion, and a small spot means high stress of the coating. These high stresses inherent to HVOF means that precise thickness and surface preparation control is needed to prevent the coating cracking.



What is HVTS?

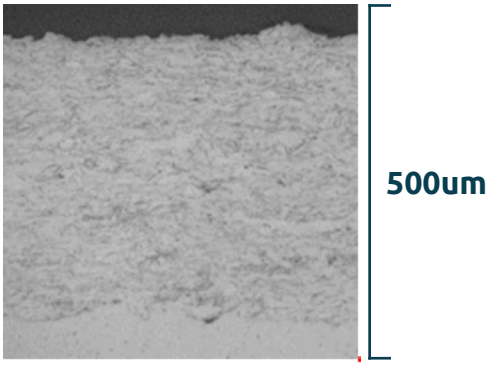
High Velocity Thermal Spray is a proprietary technology developed by IGS inc. specifically for on-site application in boilers and pressure vessels in the early 2000s.

HVTS℠
an IGS Service

Features of the technology:

- High velocity – reduces in-flight particle time
- No flammable gases utilized to ensure the safety
- Built-in technological flexibility allows spraying a variety of angles (45-135 deg) and distances.

Since its development, IGS HVTS used to protect 2000+ boilers and 500+ vessels around the world.



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