Cavitation and Abrasion Resistant Coatings for Hydro Plants

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kermetico.com
Erosion Resistant Thermal Spray Coatings Cannot Resist Cavitation

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We have developed a new type of HVAF thermal spray equipment.

The Central Power Research Institute (CPRI) of India have compared our coatings with HVOF and steel.

The results were published in 2016: R.K. Kumar, M. Kamaraj, S. Seetharamu, T. Pramod, and P. Sampathkumaran “Effect of Spray Particle Velocity on Cavitation Erosion Resistance Characteristics of HVOF and HVAF Processed 86WC-10Co4Cr Hydro Turbine Coatings”

Even more advantages of HVAF were found in a recently finished thorough 3-years long research of a large hydro turbine vendor.
Results of the CPRI Cavitation Test

WC-10Co-4Cr coatings:
- AF1 – HVAF Ultra 1
- AF2 – HVAF Ultra 2
- AF3 – HVAF Balanced
- HVOF – JP5000 HVOF
Results of the Cavitation Test

Images of the eroded surfaces of the AISI 316 stainless steel (top) and the WC-10Co-4Cr Kermetico AK coating (bottom) after 720 minutes of cavitation test (the insert images are the surfaces of the cavitation samples)

Source:
Qun Wang, Zhaoxi Tang, and Limei Cha, “Cavitation and Sand Slurry Erosion Resistances of WC-10Co-4Cr Coatings”, 2015
Results of the CPRI Silt Erosion Test

Cumulative Weight Loss of WC-10Co-4Cr Coatings During Silt Erosion Test, mg
HVAF tungsten carbide coatings are **harder** and **stronger** than HVOF ones, yet they are **ductile**. These are the reasons why they resist wear and cavitation combined.
We make better equipment

✓ One system – many guns, from 3.15” ID
✓ Productive – up to 73 lbs./hour
✓ Environmentally safe – no fumes in the process
✓ Simple and inexpensive
✓ Mobile – no oxygen or water cooling needed
We Have Proven Field Results

- Russia, a set of Francis runners and wicket gates HVAF sprayed in 2012, in service since January 2013 (the title page photo shows the uncoated gate from the same hydro plant after a season)

- China, a set of seats and needle valves HVAF sprayed in January 2014, in service since the summer 2014 – 2 years and counting

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Give Us a Try

✓ We spray hundreds of parts in our shop in East Bay, California, each year since 2006 – for oil, power and military – and we have lots of exceptional results

✓ We design, manufacture and sell HVAF and HVOF thermal spray equipment (60 systems at work worldwide)

✓ We spray metals and carbides onto parts up to:
  o 10 ton weight
  o 10 feet diameter
  o 40 feet length

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