KERMETICO

Thermal spray coatings to protect refinery equipment from corrosion wear

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A Quick Case Study

- Chevron brought us a set of plungers on October 4, 2011 for coating
- They had a fused coating applied by others. (NiCrBSi)
- The plungers had been in service for only one year

KERMETICO

Fused coating damage after only one year

The damage was caused by erosive particles trapped under the packing

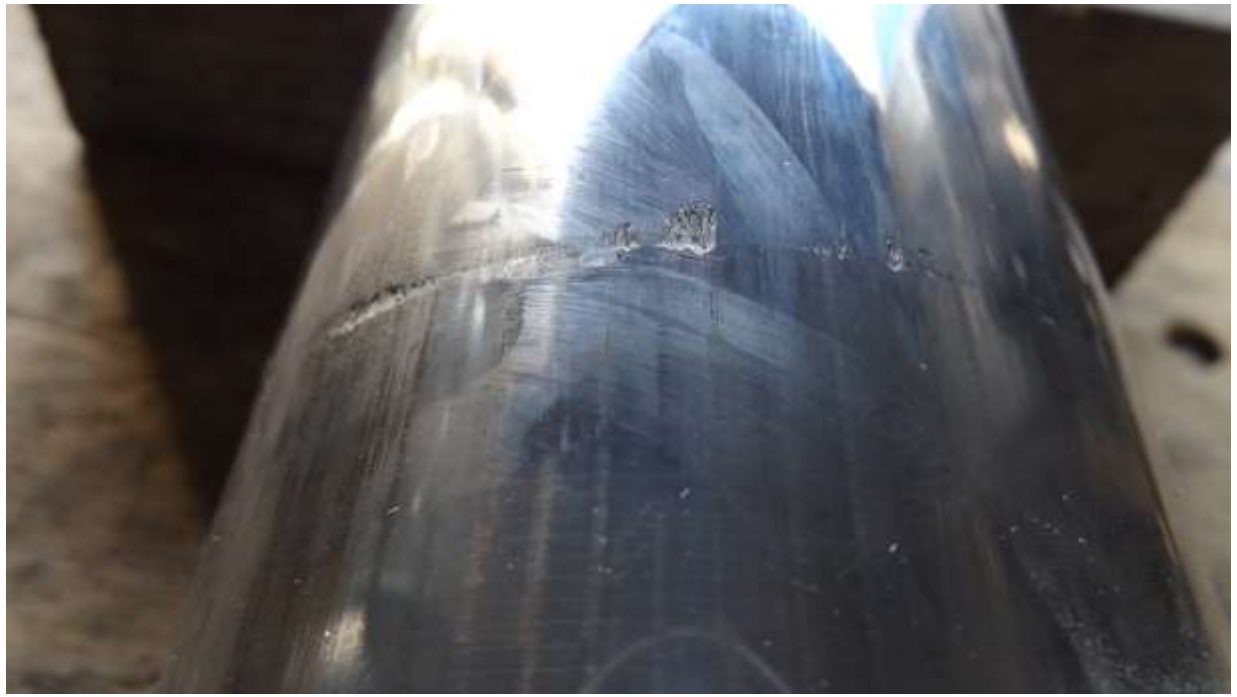
We ground off the old coating and sprayed the plungers with tungsten carbide (86-10Co-4Cr)

Here's one of the three being sprayed

Three Plungers ready to go back into service

And that was the last time we saw them until. . .

March 24, 2016 > 4.5 years later



So went wrong and why do we only have two? What happened to #3?

- Lubricant supply to plunger #1 was interrupted
- This caused severe overheating of the coating and the loss of coating integrity
- Some time later lubricant supply to #2 was interrupted, and the seal began leaking causing “water jetting” which eroded the coating. This is when they noticed the problem
- Plunger #3 never lost lubrication and is still in service
- The ruined plungers were **exactly the same size** as when they left our shop.

The Case of “The Three Hot Pumps” and the Wear Rings

- The pumps were externally heated to 750° F.
- Three pumps were repaired with installation of impeller wear rings with Stellite 1 coating and Case rings with Stellite 6 coating.
- One of the three pumps failed in 3 months: the wear rings had welded themselves together when the pump was stopped. Appeared, the same phenomena was persistent in this particular pump with previously applied PTA weld overlays of Stellite 1 and Stellite 6.
- Our solution: Apply Tungsten Carbide to one ring and Stellite 6 to the other. When the clearance is not sufficient between the rings upon the heating, the Tungsten Carbide layer “grinds” away the Stellite layer to “needed” size. This pump has been in service for the last four years.

Piping and vessel erosion and wear protection Hastelloy “C”

Vessel nozzles are coated with rotating ID guns

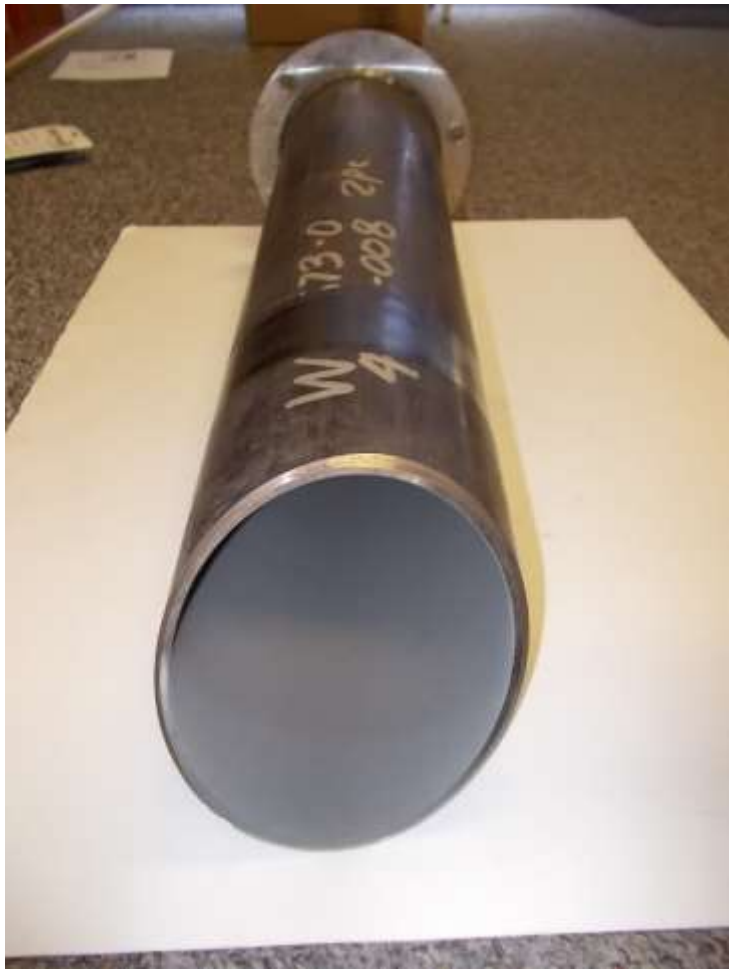
We protect internal surfaces of pressure vessels from sulfur-induced corrosion since 2010

We have a versatile ID coating capability

AK5 Rotating HVAF Gun

Tungsten Carbide coating from both ends

We also do “simple” ID Coatings

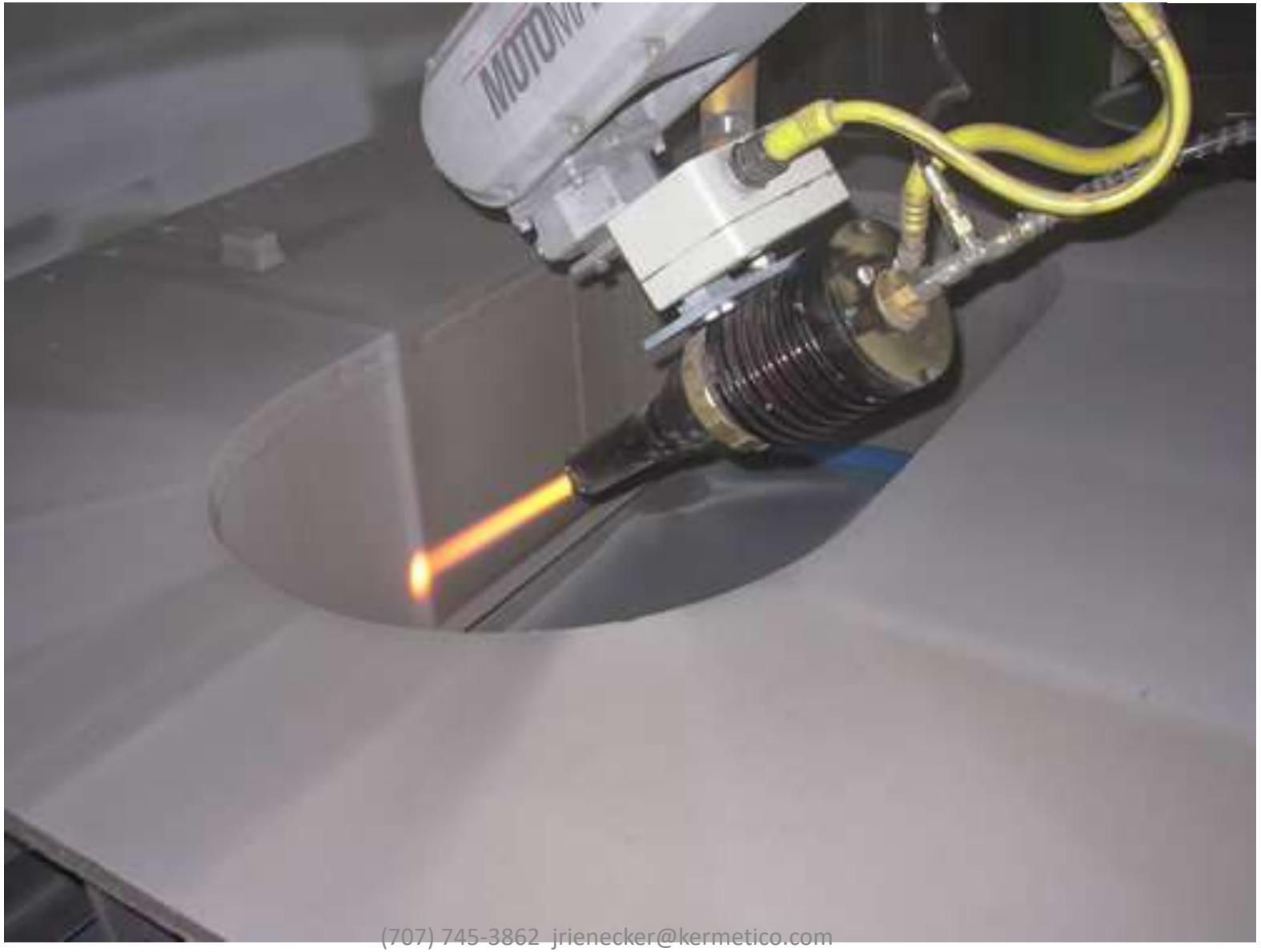


5” ID

3.5” ID

3.5” ID Ground

Tungsten Carbide on a Slide Gate Orifice



Tungsten Carbide on Part 2 of a Slide Gate Orifice

Performance Verified by Third Party Testing

Schlumberger

Test Results

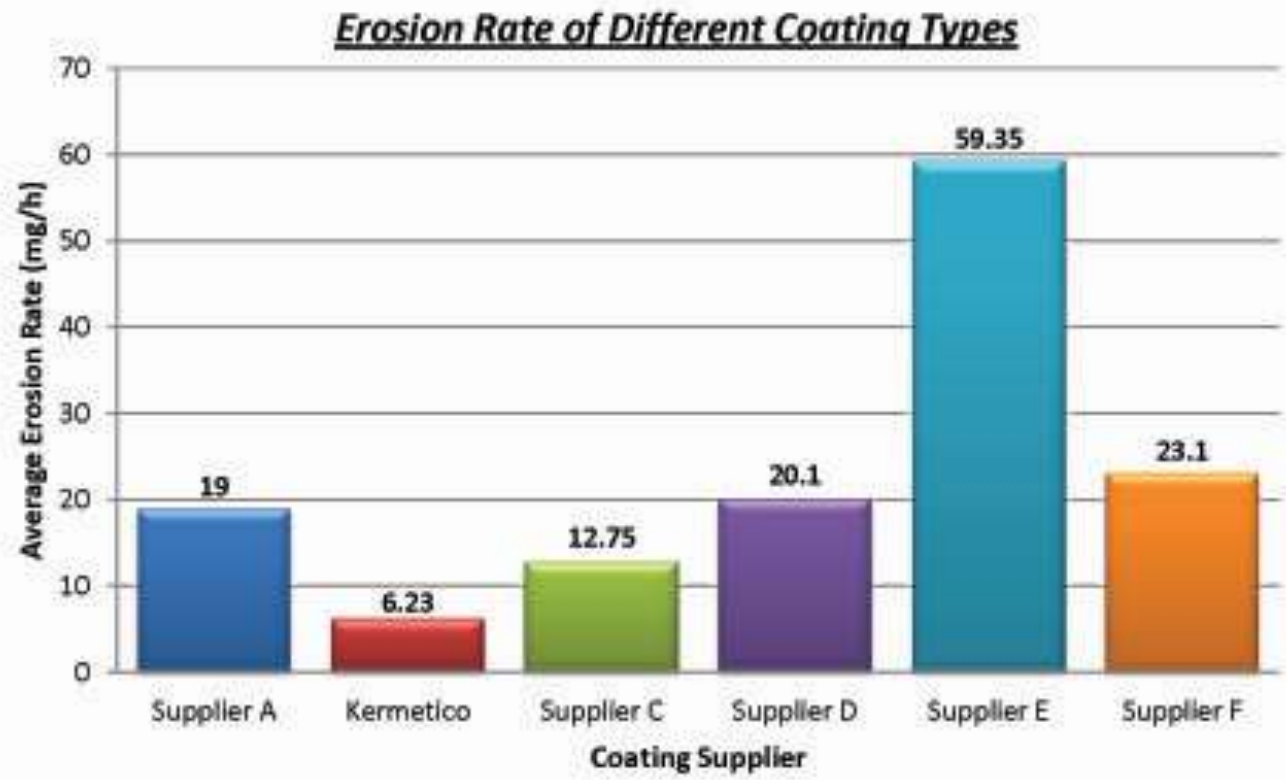


FIGURE 5 - EROSION RATE OF DIFFERENT SUPPLIER COATINGS

Superior Hardness and Consistency

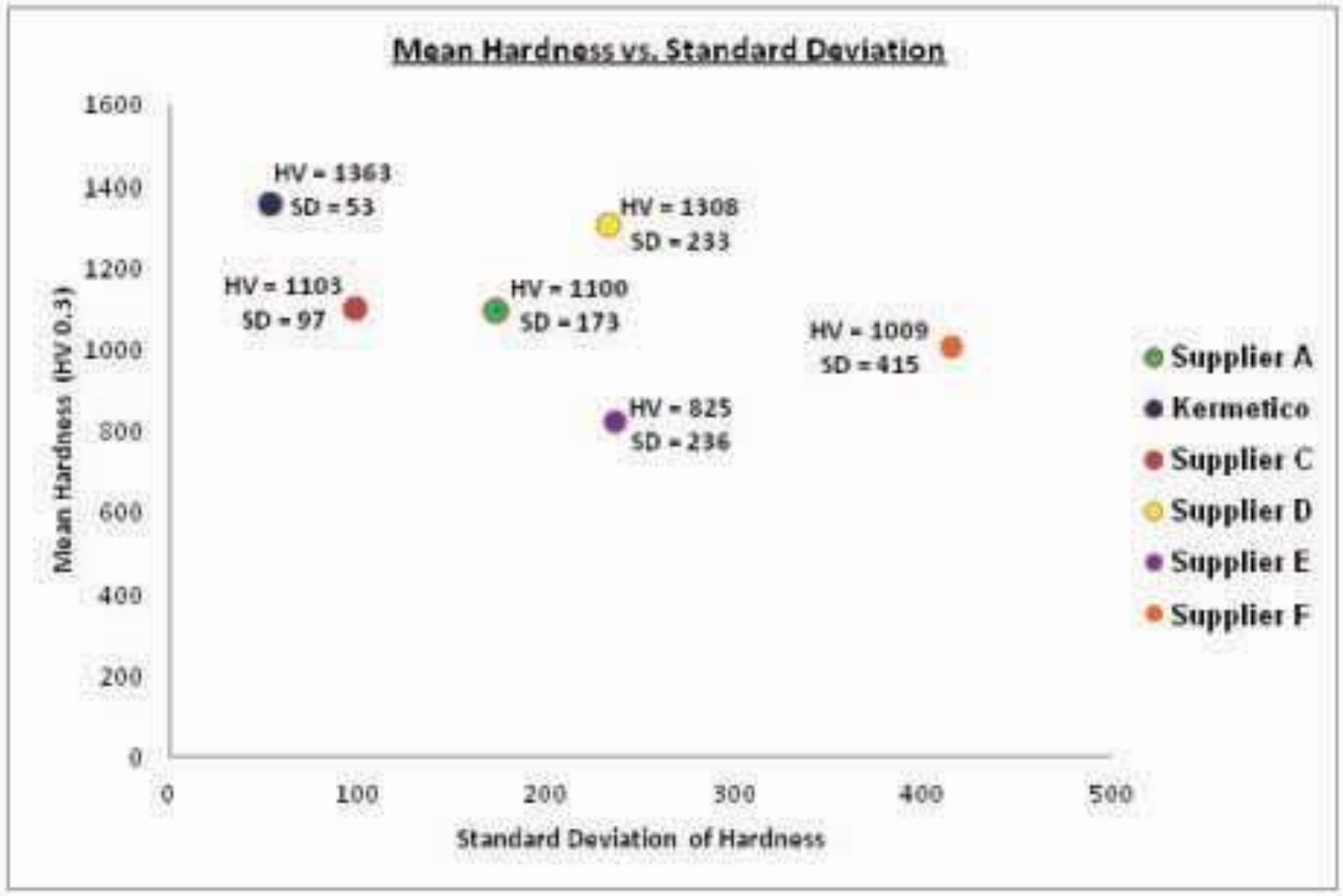


FIGURE 3 - MEAN COATING HARDNESS VALUES AND STANDAD DEVIATION

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Each of our developers has more than 30 years of coating experience. We design and produce our equipment in California, USA, since 2006.

More than 60 systems work worldwide, 20 of them are in Universities and Labs; more than 100 academic papers published showing HVAF superiority over HVOF. We and our partners sprayed thousands different customer parts with no rejection.

Visit our job shop and watch the process:

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Watch our videos

or read more at our website

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