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Case Study: A Process Slurry Pump

Background: A little over a year ago we were asked to coat a slurry pump backing plate to protect it from the abrasive slurry passing through the pump. The slurry consists of gypsum, aluminum oxide and water. The impeller came from the manufacturer already coated with tungsten carbide presumably by an HVOF process. The pump housing was uncoated, and the customer didn't want the housing coated as in previous experience with this pump in this application the backing plate was the only part adversely affected by the pumped slurry.

Results: Here is the backing plate with the as applied HVAF tungsten carbide coating after one year of service.



After measuring the coating thickness, we found that the thickness after one year of service was identical to the originally applied coating thickness.

As we began to examine the backing plate we found an interesting area seen below.



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The backing plate seal to the housing wasn't absolute, and some erodent made it past the coated surface of the backing plate and eroded material from under the coating. It is hard to see in the photo, but the coating is undercut and is still intact forming a sharp overhang of the coating. Here is a close up of the eroded area.



The other main parts of this slurry pump didn't fare as well. The impeller shown below lost much of the applied coating and the blades were wearing away fast. If the pump didn't begin leaking, the impeller would have failed after little additional service. Here is a look at the impeller.



In the close-up view, you can see where the HVOF coating is completely gone.



In those areas where the coating is worn away the metal is being worn away quickly as those blades are significantly shorter than the adjacent blades that still have coating remaining on the surface. This can be seen using a straight edge and a little back lighting.



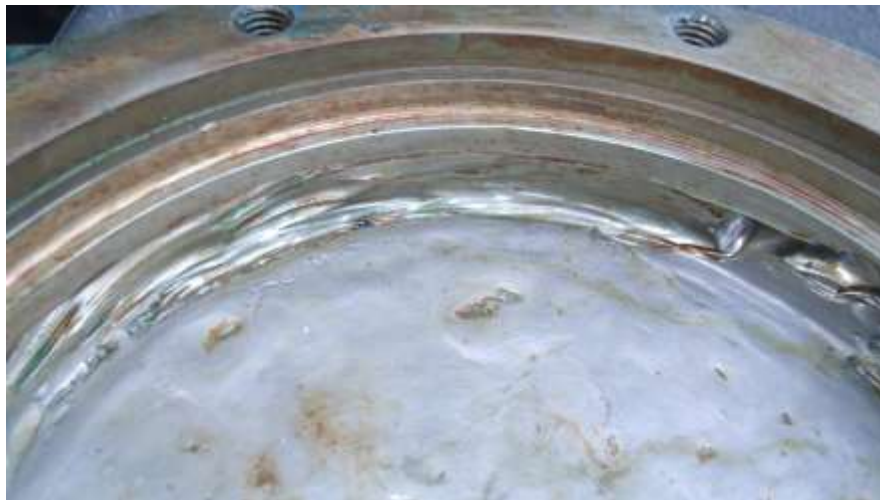
The pump case didn't do well either. Here is a look at it as received.



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The damage is readily apparent.

In these close-up views, the extent of this damage can be seen.



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The plan: Our customer has decided that the best course of action is to coat everything with Kermetico's HVOF 86-10Co-4Cr tungsten carbide coating. We wholeheartedly agree with his decision.

For more information simply contacts us at your convenience, or visit our webpage at kermetico.com.