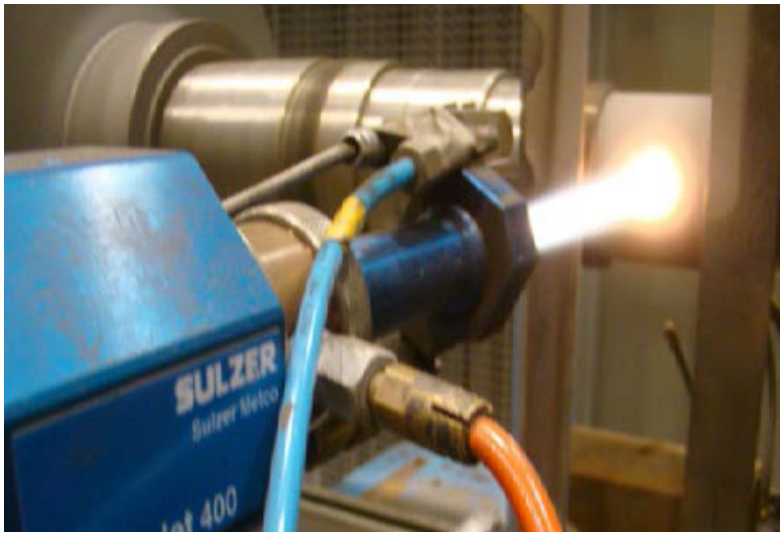
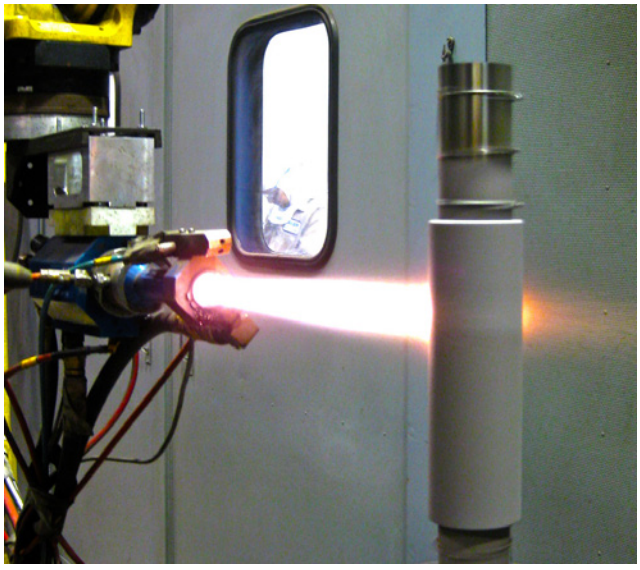
HL75 hardfacing coating

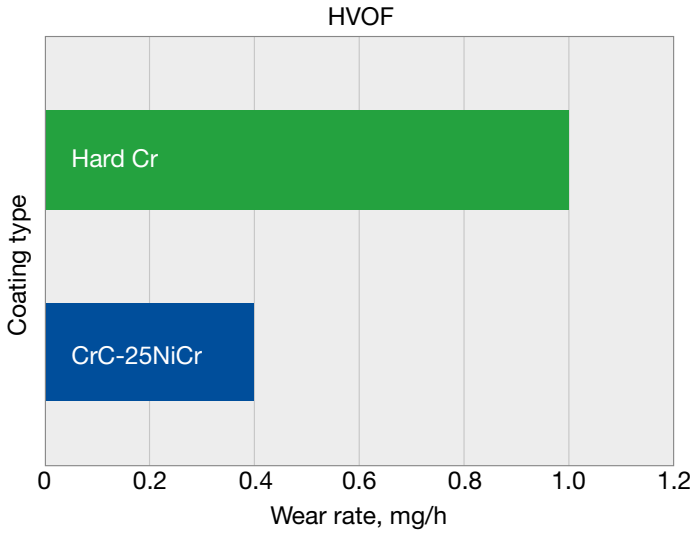
Hardface coatings, particularly chrome carbide, have multiple applications for all types of turbo machinery, pumps, and rotating equipment. High Velocity Oxy-Fuel (HVOF) and high velocity liquid- fueled (HVLF) are popular methods of hardfacing applications. Hardface coatings are used to reduce solid particle erosion (SPE), fretting, abrasion, and cavitation. Hardface coatings are also used for metal restoration where hardness and excellent wear properties are needed.

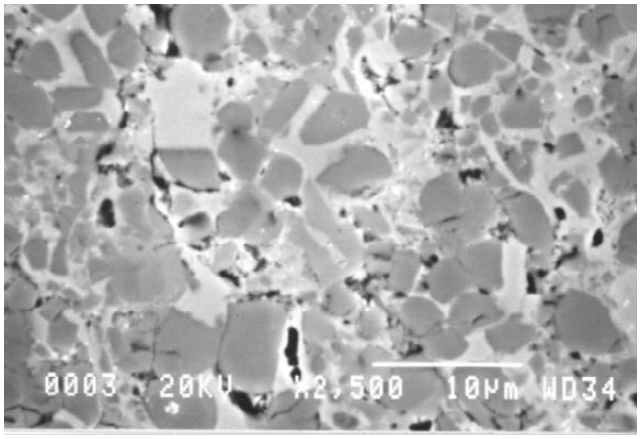
Chrome carbide has several advantages over other types of hard facing used for turbo machinery. One major advantage is its maximum operating temperature of 1560°F. A second advantage of chrome carbide coating is improved corrosion and oxidation resistance. Finally, chrome carbide coatings are usually recommended because their thermal expansion coefficient (9.8x10^-6m/m/°K) closely matches iron (12x10^-6m/m/°K), nickel (13x10^-6m/m/°K), and cobalt (12x10^-6m/m/°K). Most metals used in turbo machinery that may require hard facing are based on these elements . Tungsten carbide in comparison has maximum operating temperature of only 900°F, lower corrosion resistance, and lower thermal expansion coefficient (6x10^-6m/m/°K). Also, tungsten carbide coatings are only slightly harder than chrome carbide coatings.



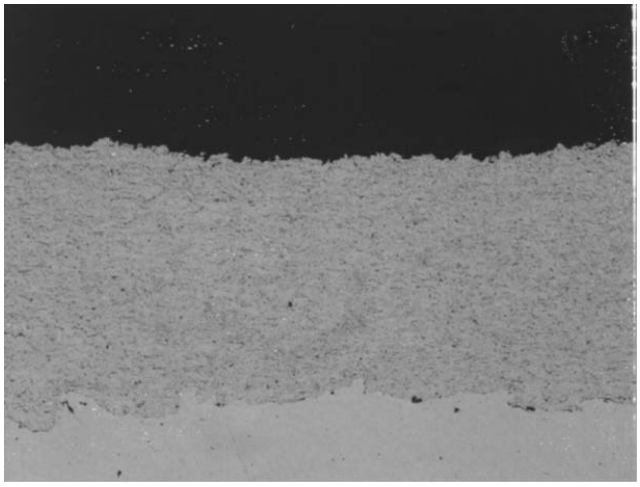


Typical coating properties		
Macrohardness (Rc)	62 - 68	
Microhardness (DPH300)	min. 975	max. 1’200
Bond strength (psi)	> 12’000	
Surface profile (min Ra)	As sprayed 100 – 150	As ground < 10
Thickness	Bearing journals up to 0.050“ on dia.	Seal areas up to 0.080“ on dia.

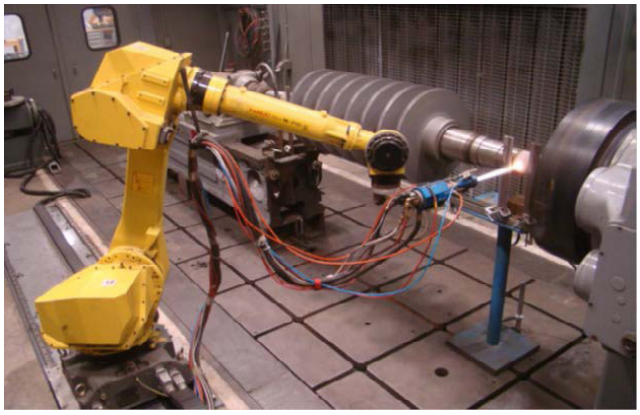




SEM of HL75



HL75 at 200x



HL75 applied to bearing journal

Sulzer Turbo Services Houston now offers HVLF-applied HL75,. This is a chromium carbide (75%) in a nickel chrome (25%) matrix. HL75 provides excellent abrasion and fretting resistance while withstanding temperatures up to 850°C (1560°F) and providing good oxidation and corrosion resistance. HL75 is an excellent choice for most rotor and shaft restoration of bearing journals, seal areas, and impeller OD fits. In most cases coatings are a cost effective method of restoring worn areas instead of welding. Coatings are low heat, at less than 260°C (500°F), which eliminates possible distortion. Figure 1 shows thickness limitations, but Ni/Al coating may also be used for buildup under HL75 on some seal area applications above .080”.

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