

H60 and H63 chrome carbide hardface coating for better wear resistance

Hardface coatings, particularly HVOF (High Velocity Oxygen Fuel) chrome carbide coatings, have multiple applications in all types of turbomachinery. HVOF chrome carbide coatings are effective in combatting most wear such as solid particle erosion, fretting, abrasion, and cavitation, as well as potentially reducing repair intervals for your coated component.

H60/H63

H60 and H63 are chrome carbide coatings in a 20% and 25% nickel-chromium matrix. The thermal expansion of these coatings is approximately $9.8 \times 10.6 \text{ m/m}^\circ\text{K}$, which closely matches iron ($\sim 12 \times 10.6 \text{ m/m}^\circ\text{K}$) and nickel ($\sim 13 \times 10.6 \text{ m/m}^\circ\text{K}$), which cover most materials that accept hardface coating.



- Higher wear resistance
- Increased lifetime
- Lower cost



Pump part	H60	H63
Composition	Cr3C2-20 (Ni-20Cr)	Cr3C2-25 (Ni-20Cr)
Macrohardness	> 60 HRc	> 60 HRc
Bond strength	> 830 bar (12'000 psi)	> 830 bar (12'000 psi)
Surface profile as sprayed as ground	3.9 – 6 $\mu\text{m Ra}$ (100 – 150 $\mu\text{in Ra}$) < 0.4 $\mu\text{m Ra}$ (10 $\mu\text{in Ra}$)	3.9 – 6 $\mu\text{m Ra}$ (100 – 150 $\mu\text{in Ra}$) < 0.4 $\mu\text{m Ra}$ (10 $\mu\text{in Ra}$)

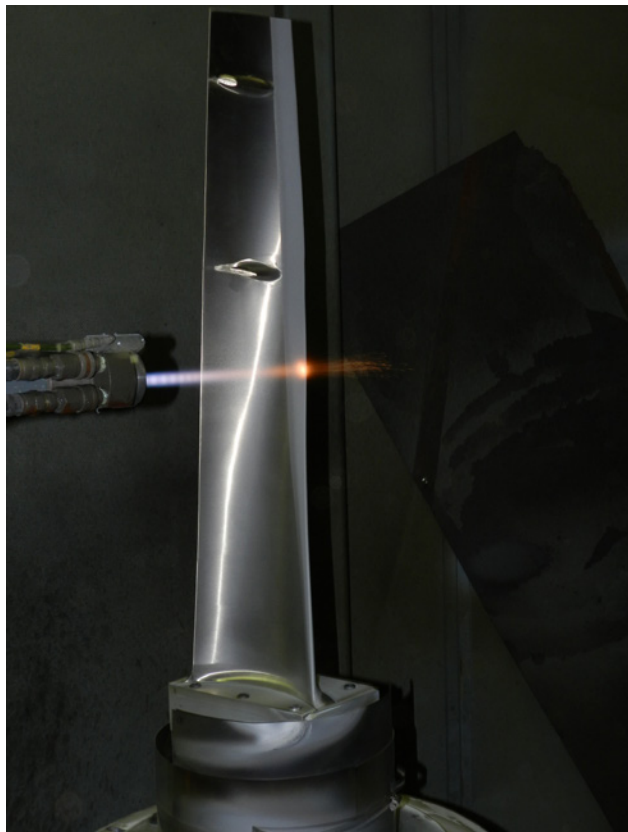
Characteristics

Chrome carbides in a nickel-chromium alloy are very oxidation and corrosion resistant. They are rated to the highest temperature of all carbides and maintain hardness to 870°C (1'600°F). Above this temperature, in the presence of oxygen, the chrome carbides will start to oxidize and soften. H60 and H63 are very similar coatings. However, H63 meets GE B50F268 specification and is a slightly denser coating, while H60 is a harder coating. Both coatings exceed 60 HRc hardness. H63 is highly recommended for higher temperature wear, erosion and cavitation.

Components

Applications for this coating include contact surfaces of

- Designated wear surfaces on gas turbine combustion components
- Expander blading
- Steam turbine blading
- Steam turbine diaphragms



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