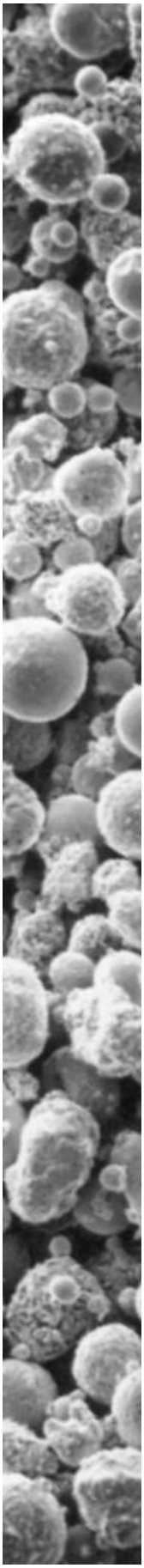


STELCAR® JET KOTE® 112
PREMIUM QUALITY HVOF COATING

JK®112 powder is manufactured by the agglomeration, sintering and densification of fine particles of tungsten carbide and cobalt. JK®112 is similar in composition to Praxair D-Gun® LW-1N30 coatings. Highly polished surface finishes are possible because of the fine size and homogeneous distribution of the WC particles.

Typical Applications

JK®112 has excellent resistance to abrasion, low angle erosion and sliding wear. The extremely high abrasion resistance is associated with lower toughness when compared to JK®117 or JK®120H, both of which contain a higher proportion of metallic binder. JK®112 outperforms hard chrome plating in most wear situations, and is often used as a hard chrome substitute. It is especially recommended for applications where a fine coating surface finish is a major requirement. JK®112 is used for the coating of compressor rods, pump casings, pump plungers, pump sleeves, mechanical seal faces, feed screws, gate valves, valve trim, thread guides, paper cutting and slitter knives and fan blades. It is also used for various chemical and petrochemical parts.

Sliding Wear Resistance of JK®112 HVOF Coatings

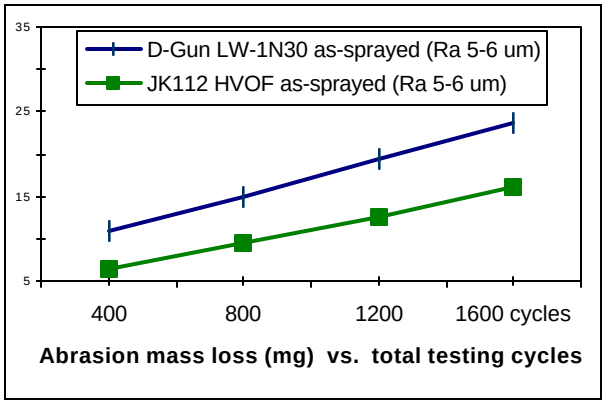
In a cross cylinder wear test, where a 0.5" (12.7mm) diameter WC-6%Co cutter blank slid against the coating surface with a 15lb (6.8kg) load for one hour, the JK®112 HVOF coating exhibited no measurable wear. A nitrided surface in the same test lost 0.7 mm^3 material, chrome plating lost 1.6 mm^3.

Superior Abrasion Wear Resistance of JK®112 HVOF Coatings

The mass loss (mg) of JK®112 vs. Praxair D-Gun® LW-1N30 coatings was measured in an independent abrasion test[1] conducted according to JIS H8615. The coatings were abraded by 320 grit SiC paper at an applied load of 3.25kg. The results are illustrated schematically at right, and indicate that the mass loss of JK®112 is only 60-70% that of D-Gun® LW-1N30, reflecting the superior abrasion resistance of JK®112.

Above: Typical coating microstructure, as obtained using JK®112 Parameter Set B

When both coatings were tested after surface finishing to R_A ~ 0.2µm, the mass loss of both coatings was much lower, of the order of 2 mg for JK®112 and 4.5 mg for D - Gun® LW-1N30 after 1600 cycles. After 4000 cycles in the same test, a polished JK®112 coating (R_A ~ 0.2 µm) exhibited a mass loss of below 5 mg. Hard chrome had a mass loss greater than 26 mg, over five times higher than JK®112.



Abrasion Wear Resistance Test Results

Nominal Powder Properties

Mass composition:	88%WC 12%Co
Nominal size:	-53+10µm (-270 mesh+10µm)
Production method:	Agglomerated, sintered and densified

1. Results published courtesy of Tocalo Ltd., Japan, http://www.tocalo.co.jp

Coating Properties

	Par. Set A (propylene fuel)	Par. Set B (propylene fuel)
Microhardness	960 - 1150 DPH [300g]	1015 - 1120 DPH [300g]
Macrohardness	90 - 91 R15N (equivalent to 66HRC)	89 - 93 R15N (equivalent to 65-68 HRC)
Bond strength * (ASTM C633)	> 75.9 MPa (> 11 ksi)	> 75.9 MPa (> 11 ksi)
Est. Porosity	< 1.5%	< 1.0%
Density (approx.)	12.5 g/cm^3	> 13 g/cm^3
Max. Coating thickness *	0.38mm (0.015")	0.25mm (0.010")
Max. Coating thickness **		0.38mm (0.015")
D.E. approx.	58%	53%
Powder feed	50-60 g/min.	50-60 g/min.
Coverage (estimated)	325 g.m^{-2}.100µm^{-1} (1.7 lb.ft^{-2}.0.1in^{-1})	345 g.m^{-2}.100µm^{-1} (1.8 lb.ft^{-2}.0.1in^{-1})
Surface finish as-sprayed AA	4.7 - 7.6 µm (185 - 300 µ-inch)	3.8 - 6.3 µm (150 - 250 µ-inch)
Surface finish ground/lapped	< 0.025-0.050 µm (below 1-2 µ-in.) AA	
Service temp.	Up to approx. 540 °C (1000°F)	

* Approximate, when sprayed onto flat surfaces.

** Approximate, when sprayed onto cylindrical parts.

Customer Specifications

JK®112 powder and/or coating are similar to BPS 4463, B50TF27 CL.B, F50TF80 CL.B, EMS 57736 Type 2, EMS 52544 Type 2, AMS 7880, RR9507/58, Mil-P-83348 Comp J Type II CL.I, BAC 5851, and ISO 14232 Code 11.12.

Similar Powder Products

- Deloro Stellite GmbH JK®7112
- Sulzer Metco® 72F, Sulzer Metco® 5812, AMDRY® 927 and Diamalloy® 2004
- TAFA Praxair 1342VM
- Amperit® 518

Corrosion Resistance of JK®112 Coatings

JK®112 has acceptable corrosion resistance in a number of environments, especially if sealed, As for all coatings, if the substrate is not resistant to the environment the coating should be sealed, especially at the edges of the coating and base material.

The potential for cobalt to leach out in aqueous conditions, due to crevice or galvanic corrosion, can significantly reduce the usable life of JK®112 coatings in certain service conditions. JK®112 is not recommended with solutions containing amines. JK®120H WC-Co-Cr is recommended for applications where corrosion resistance is a primary requirement.

Spraying of JK®112 HVOF Coatings

Although the use of the Jet Kote® HVOF system with a carbon based fuel such as propylene is recommended, JK®112 powder can also be deposited using other HVOF systems. JK®112H is recommended for systems using hydrogen as main fuel.

JK®112 HVOF Coating Applied to Gate Valves

Finishing of JK®112 HVOF Coatings

JK®112 coatings are typically finished to 6-14 µ-inches by wet diamond grinding. They can be super finished using diamond-lapping compound to below 1-2 µ-inch (0.025-0.050µm) if required.

Coolant must be flooded onto part and wheel during grinding. The coolant may not contain Amines, which can attack and pit the cobalt matrix.

Spraying and grinding/finishing parameters for JK®112 are available on request.

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