

# Stellite



JK<sup>TM</sup> 576 POWDER  
STELLITE<sup>R</sup> 6 Powder

TECHNICAL NOTE  
DATE: 1/31/92  
SUPERSEDES: 9/06/88  
NO: C-008  
PAGE: 1 of 4

## DESCRIPTION

JK 576 powder, STELLITE 6 powder is a cobalt-chromium alloy recommended for high temperature applications where resistance to abrasive grains, hard surfaces fretting, or particle erosion is encountered. JK 576 powder can be used at temperatures up to 1500°F.

## COMPOSITION, Wt. %

## MESH SIZE

Carbon	1.15
Chromium	27.75
Cobalt	Balance
Iron	3.0*
Manganese	1.0*
Molybdenum	1.0*
Nickel	3.0*
Silicon	1.15
Tungsten	4.50

270/Down

\* Maximum

## COATING CHARACTERISTICS

The parameters that follow are to be considered as a starting JET KOTE<sup>R</sup> parameters. The following coating properties are representative of results of coatings obtained from commercially available JK576 powder. Typical range of coating properties have not been established for set B conditions. (Due to the few repeat runs made to date.)

	<u>SET A</u>	<u>SET B</u>
Microhardness, DPH [300g]	496	579
Macrohardness, 15N (Rc)	81.7 (43)	86.3 (51)
Bond Strength, PSI (Per ASTM 633)	10,500	Unknown
Estimated Coverage, Lb/Ft <sup>2</sup> /.010"	.5	.45
Est. Surface Finish, Microinch AA		
-As Sprayed	280-420	Unknown
-Ground	5-10	Unknown
Maximum Coating Thickness, Inches	.030	.045
Maximum Service Temperature, °F	1500	1500
Coating Density, G/Cm	7.37	Unknown
Abrasive Wear Resistance, MM <sup>3</sup> Loss	22.8	Unknown
30 Lb Load, 500 Revolutions (ASTM G65)		

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FINISHING

Coatings of JK576 must be finished by WET grinding:

Grinding:

Wheel Type, 220 SiC Vitriified Bond (Friable)  
H Hardness  
.035" - .075" Crossfeed/Pass  
40-65 Ft./Min. Surface Speed  
.0005" - .001" Infeed/Pass

Substitutions for wheel specifications may be required if coarse grinding is desired.

POLISHING AND LAPPING:

SiC or diamond media is recommended. Aluminum Oxide media does not cut stock properly. Do not lap coatings dry. Use a lubricant as recommended for the particular media used in each step. Remove debris, wash and dry the coating surfaces prior to proceeding to the next grit size. Avoid contamination of the lapping surfaces by cleaning prior to application of fresh media.

Recommended grit size progression after grinding:

320, 400, and 600 - U.S. Screen Sizes

Superfinishing is best done with diamond media and recommended progression is as follows:

15 or 9 Micron - Paste Or Slurry  
6 or 3 Micron

SET A OPERATING PARAMETERS<sup>(1)</sup>

Fuel Gas	Propylene (C3H6)
Powder Carrier Type	Nitrogen (N2)
Nozzle	5/16 x 6
Injector	#50

<u>Console Type</u>	<u>JKII</u>	<u>JKIIA</u>
<u>Manifold Pressures, PSI</u>	(2) (7)	(3)
Oxygen	120	100
Main Fuel Gas	80	80
Carrier Gas	100	80
Hydrogen	25	100
<u>Console Pressures, PSI</u>		
Oxygen	75-85	62-72
Main Fuel	60-65	54-64
Carrier	65	52-62
<u>Console Flows<sup>(4)</sup></u>		
Oxygen	980-1020	980-1020
Main Fuel	56-60%	127-137
Carrier	30-35	67-77
<u>Console Settings</u>		
Oxygen		54.4-56.7
Main Fuel		42.3-45.7
Carrier		67.0-77.0
<u>Cooling Water<sup>(5)</sup></u>		
°F IN	80-90	80-90
°F OUT	115-120	115-120
<u>Powder feed Settings</u>		
Dial Set (Approx.)	215	215
RPM (Approx.)	3.0	3.0
Feed Rate <sup>(6)</sup> , Grams/Min.	50-55	50-55
<u>Spray Distance, Inches</u>	7-9	7-9

NOTES:

1. Pressures shown are running pressures with power feeding.
2. Manifold pressures for JKII system are critical, manifold regulators must be located at factory supplied hose ends.
3. Manifold pressures too low will not allow enough flow, too high and controller will pulse upon start up.
4. JKII system does not correct flow due to change in temperature or gas pressures at meters, JKIIA system compensates and flow display is true STANDARD cubic feet per hour (SCFH): (T=0°C, 1ATM=14.7 PSI).
5. Heat exchanger to control the water inlet temperature to the gun is recommended. Recommended operation range 80-85°F inlet adjust water flow to achieve 115-120°F outlet temperature. Water temperature may affect coating and gun performance.
6. Powder feed rate must be checked with powder flowing through lit gun. Powder Feed rate (PFR) = (Powder Weight (g) Initial - Powder Weight (g) Final / Powder Feed Time (min)) Powder feed time must be greater than 1 min. PFR is linear to RPM of feeder. To change RPM to achieve required PFR:  

$$\text{RPM (NEW)} = \frac{\text{PFR (REQUIRED)} \text{ RPM (ORIGINAL)}}{\text{PFR (CALCULATED)}}$$
7. JKII flowmeter requires change for specific gas use:  
 H<sub>2</sub> - Part #972915      C<sub>3</sub>H<sub>6</sub> - Part #972763

Set B OPERATING PARAMETERS (1)

Fuel Gas		Hydrogen (H2)
Powder Carrier Type		Argon (Ar)
Nozzle		1/4 x 9
Injector		#40
<u>Console Type</u>	<u>JKII</u>	<u>JKIIA</u>
<u>Manifold Pressures, PSI</u>	(2) (7)	(3)
Oxygen	120	90
Main Fuel Gas	120	90
Carrier Gas	100	80
Hydrogen	25	90
<u>Console Pressures, PSI</u>		
Oxygen	46-50	43-47
Main Fuel	70-73	59-62
Carrier	49-51	49-51
<u>Console Flows<sup>(4)</sup></u>		
Oxygen	400-425	425-450
Main Fuel	1200	1150-1160
Carrier	30-35	62-66
<u>Console Settings</u>		
Oxygen		23.6-25.0
Main Fuel		63.9-64.1
Carrier		44.3-47.1
<u>Cooling Water<sup>(5)</sup></u>		
°F IN	80-90	80-90
°F OUT	115-120	115-120
<u>Powder feed Settings</u>		
Dial Set (Approx.)	162	162
RPM (Approx.)	2.0	2.0
Feed Rate <sup>(6)</sup> , Grams/Min.	30-35	30-35
<u>Spray Distance, Inches</u>	6-7	6-7

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$$\text{RPM (NEW)} = \frac{\text{PFR (REQUIRED)} \times \text{RPM (ORIGINAL)}}{\text{PFR (CALCULATED)}}$$
7. JKII flowmeter requires change for specific gas use:  
H<sub>2</sub> - part #972915      C<sub>3</sub>H<sub>8</sub> - part #972763