

JKTM347 NistelleTM POWDER
Nickel-Aluminum-Molybdenum Alloy

DRAFT COPY
DESCRIPTION

TECHNICAL NOTE

DATE: 8/11/95
SUPERSEDES: NEW
NO: C-054
PAGE: 1 of 3

Nistelle JK347 powder is similar in composition to Metco's 447 powder. This powder is produced by gas atomization. This material often is used for bond coats for ceramic coatings or for filling in grooves, pits or other miss-machined surfaces. JK447 can be used for undercoat of other coatings, including other JET KOTE^R applied coatings.

JK347 powder applied by JET KOTE thermal spray process has better bond strength than similar compositions applied by single or twin wire arc spray or by plasma spray.

JK347 coatings are soft so they may be filed, finish machine with single point tools or polish to desired surface finish and dimension.

APPROXIMATE COMPOSITION, WT %

MESH SIZE

Aluminum	5.5	230/D
Nickel	Balance	
Molybdenum	5.0	

APPLICATIONS

Bond coats for ceramics coatings or build up coats for other coatings or for restoration of undersized components.

COATING CHARACTERISTICS:

	<u>SET A</u>	<u>SET B</u>
Average Bond Strength, PSI	8,000	7,500
Microhardness, DPH [300g]	332	336
Macrohardness, 15N (Rc Conversion)	78.1 (35)	75.3 (30)
Estimated porosity, %	<3	<1
Maximum Coating Thickness, Inches	Unknown	Unknown
Est. Maximum Service Temperature, °F	800	800
Est. Deposit Efficiency, %	Unknown	Unknown
Estimated Coverage, Lb/Ft ² /.010"	.5	.6
Est. Surface Finish, Microinch AA	200-300	120-150
As-Sprayed		

The above data, in no way, constitutes a specification.

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SET A OPERATING PARAMETERS⁽¹⁾

Fuel Gas	Propylene (C ₃ H ₆)	
Powder Carrier Type	Nitrogen (N ₂)	
Nozzle	5/16 x 6	
Injector	#50	
Carbide Insert	.052" or .080"	
<u>Console Type</u>	<u>JKII</u>	<u>JKIIA</u>
<u>Manifold Pressures, PSI</u>	(2) (7)	(3)
Oxygen	120	90
Main Fuel Gas	80	75-80
Carrier Gas	100	85
Hydrogen (Pilot)	25	90
<u>Console Pressures, PSI</u>		
Oxygen	79-85	65-75
Main Fuel	62-65	54-65
Carrier	56-62 (.052")	56-62 (.052")
	46-52 (.080")	46-52 (.080")
<u>Console Flows⁽⁴⁾</u>		
Oxygen	1000-1050	980-1020
Main Fuel	58-60%	130-137
Carrier	30	66-77
<u>Console Settings</u>		
Oxygen		54.4-56.7
Main Fuel		43.3-45.7
Carrier		66.1-77.1
<u>Cooling Water⁽⁵⁾</u>		
°F IN	80-90	80-90
°F OUT	110-120	110-120
Approx. Flow, GPM	8-9	8-9
<u>Powder Feed Settings</u>		
Dial Set (Approx.)	183-210	183-210
RPM (Approximate)	2.4-2.9	2.4-2.9
Feed Rate ⁽⁶⁾ , grams/Min.	45-55	45-55
<u>Spray Distance, Inches</u>	7-9	7-9

NOTES:

- Pressures shown are running pressures with powder feeding.
- Manifold pressures for JKII system are critical, manifold regulators must be located at factory supplied hose ends.
- Manifold pressure too low will not allow enough flow. If the pressure is too high the controller will pulse upon start up.
- JKII system does not correct flow due to change in gas temperature or pressures at the meters. The JKIIA system gas flow is displayed as true **Standard Cubic Feet per Hour (SCFH)**: T = 0°C, P = 14.7 PSIA
- A heat exchanger to control the water inlet temperature to the gun is required for best results. Adjust water flow to achieve outlet temperature. Water temperatures may affect coating quality and gun performance.
- Powder feed rate must be checked with powder flowing through lit gun. Powder Feed Rate (PFR) = (Powder Weight (g) Initial - Powder Weight Final (g)) / Powder Feed Time (min.) Powder feed time must be greater than one minute. PFR is linear to RPM of the feeder. To achieve required PFR, change RPM as follows:

$$\text{RPM (NEW)} = \frac{\text{PFR (Required) RPM (Original)}}{\text{PFR (Calculated)}}$$

- JKII flowmeter requires change for specific gas use:

H₂ - Part #972915 C₃H₆ or C₃H₈- Part #972763

SET B OPERATING PARAMETERS⁽¹⁾

Fuel Gas	Hydrogen (H ₂)	
Powder Carrier Type	Nitrogen (N ₂)	
Nozzle	1/4 x 6	
Injector	#40	
Carbide Insert	.052" or .080"	
<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	85
Hydrogen (Pilot)	25	90
<u>Console Pressures, PSI</u>		
Oxygen	56-62	53-59
Main Fuel	66-73	65-72
Carrier	60-65 (.052")	60-65 (.052")
	50-55 (.080")	50-55 (.080")
<u>Console Flows⁽⁴⁾</u>		
Oxygen	450-475	460-470
Main Fuel	1100	1150
Carrier	30	66-77
<u>Console Settings</u>		
Oxygen		25.6-26.1
Main Fuel		63.9
Carrier		66.1-77.1
<u>Cooling Water⁽⁵⁾</u>		
°F IN	80-90	80-90
°F OUT	110-120	110-120
Approx. Flow, GPM	9-10	9-10
<u>Powder Feeder Settings</u>		
Dial Set (Approximate)	162-194	162-194
RPM (Approximate)	2.0-2.6	2.0-2.6
Feed Rate ⁽⁶⁾ , grams/Min.	35-45	35-45
<u>Spray Distance, Inches</u>	9-11	9-11

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