JK®586
Deloro® 60 Powder
Nickel-Chromium-Silicon-Boron
Self Fluxing Alloyed Powder

Technical Note
DATE :12/13/94
SUPERSEDES: NEW
NO : C-047

DESCRIPTION

JK®586, Deloro® 60 powder for JET KOTE® surfacing systems, produces coatings that are similar in composition to Deloro® 60 spray and fuse coatings. The as-sprayed coating may be fused to obtain a metallurgical bond with the substrate, with the resulting coating having a bulk hardness of approximately 59-62 Rc. Fusion of the coating may be performed with similar techniques of conventional spray and fuse (S/F) compositions. Applications, general use and chemistry of JK®586 coatings are similar to JK®587 and JK®588 coatings, with difference of coatings' as-sprayed properties and resistance to corrosive environments.

APPROXIMATE COMPOSITION, Wt.%

Boron	3.10
Carbon	0.70
Chromium	15.0
Iron	4.00
Nickel	Balance
Silicon	4.30

MESH SIZE

270/D

APPLICATIONS:

Hardfacing of wire drawing capstans, pump casings, pump impellers, pump plungers, pump sleeves, mechanical seal faces, feed screws, plastic and glass molding equipment parts.

Estimated Solidus Temperature: 1762°F
Estimated Liquidus Temperature: 1838°F

Fusion of the coating may be achieved by oxy-fuel torch, induction heating, or by furnace fusion.

COATING CHARACTERISTICS

Approximate properties of JK586 coatings produced by JKII and JKIIA units follow. Properties in parenthesis are for deposits that have been fused, all other properties are for as-sprayed coatings. Fusion of the coating forms a metallurgical bond with steel substrates, and is recommended.

	SET A	SET B
Avg. Bond Strength, PSI (per ASTM 633)	4,200 (12,000+)	8,458 (12,000+)
Avg. Microhardness, DPH [300g]	700 (750)	775 (750)
Avg. Macrohardness, 15N	90.7 (91.3)	91.6 (91.3)
Estimated Porosity, As-Sprayed	2%	1%
Maximum Coating Thickness, Inches As Sprayed, Flat or Irregular Shapes	.020	.025
Maximum Coating Thickness, Inches Fused on Cylindrical Shapes	Unknown	Unknown
Est. Maximum Service Temperature, ^{o}F	600	600
Est. Deposit Efficiency, %	55	52
Estimated Coverage, Lb/Ft/.010"	.6	.7
Est. Surface Finish, Microinch AA	150-250	125-200
Abrasive Wear Resistance, MM^3 Loss Per ASTM G65-80, Fused Coating, 30 Lb. Load, 2000 Revolutions	11.0	11.0

The above data, in no way, constitutes a specification.
Stellite Coatings may make changes without notification.

CORROSION RESISTANCE:

See corrosion data bulletin 461-6004 for guidance.

SPRAY TECHNIQUE:

Following de-greasing and an aggressive grit blast preparation, preheat the parts to approximately 300-400^{o}F if possible. Protect the part surface to be coated from oxidation by heating the part slowly and by preventing the part from being overheated. During the application of the coating it is important not to over cool or over heat the coating. For best results, do not let the part cool more than 150^{o}F during the application of the coating.

Fusion of the coating is recommended.

Allow the part to slow cool when finished with application or following fusion of the coating.

FINISHING

GRINDING Wet Grinding is the preferred method of finishing JK586

Method #1
Wheel Type : 60-220 SiC Vitrified or Resinoid Bond of H to R Hardness
Cross-Feed Per Pass : .035" -.075"
Part Surface Speed : 40-65 Feet Per Minute
In-feed Per Pass : .0005" -.001

Method #2
Wheel Type : 100-240 Mesh Resinoid Bonded Diamond Wheel of L, P or R Hardness and Concentration of 50
Cross-Feed Pass : .035" - .050"
Part Surface Speed : 40-50 Feet Per Minute
In-feed Per Pass : .0005"

Note: Diamond wheels must be dressed periodically to achieve proper cutting and to avoid damage to the coating.

Polishing and Lapping

SiC or diamond media is recommended. 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 surface 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 paste or slurry, and recommended progression is as follows:

15 or 9 Micron
followed by
6 or 3 Micron

SET A OPERATING PARAMETERS(1)

Fuel Gas	Propylene (C_3H_6)
Powder Carrier Type	Nitrogen (N_2)
Nozzle	5/16 x 6
Injector	#50
Carbide Insert	.052" or (.080")

Console Type	JK® II	JK® IIA
Manifold Pressures, PSI	(2) (7)	(3)
Oxygen	120	100
Main Fuel Gas	80	80
Carrier Gas	100	80
Hydrogen (Pilot)	25	100
Console Pressures, PSI		
Oxygen	75-80	62-74
Main Fuel	53-58	50-57
Carrier	52-62 (40-48)	52-62 (40-48)
Console Flows(4)		
Oxygen	960-980	980-1000
Main Fuel	50-52%	105-115
Carrier	30-35	77
Console Settings		
Oxygen		54.4-55.6
Main Fuel		35.0-38.3
Carrier		77.0
Cooling Water(5)		
^oF In	80-90	80-90
^oF Out	115-120	115-120
Powder feed Settings Dial Set (Approximate)	167-183	167-183
RPM (Approximate)	2.1-2.4	2.1-2.4
Feed Rate (6), grams/Min.	35-40	35-40
Spray Distance, Inches	8-9	8-9

NOTES:

1. Pressures shown are running pressures with powder feeding.
2. Manifold pressures for JK®II system are critical, manifold regulators must be located at factory supplied hose ends.
3. Manifold pressure too low will not allow enough flow. If it is too high the controller will pulse upon start up.
4. JK®II system does not correct flow due to change in gas temperature or pressures at the meters, JK®IIA system compensates and flow is displayed as true Standard Cubic Feet per Hour (SCFH) :
   T = 0^oC, P = 14.7 PSIA
5. A heat exchanger to control the water inlet temperature to the gun is recommended. Adjust water flow to achieve outlet temperature. Water temperatures may affect coating quality 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 Final (g)/ Powder Feed Time (min.) Powder feed time must be greater than 1 min. PFR is linear to RPM of the feeder. To achieve required PFR, change RPM as follows:

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

7. JK®II flowmeter requires change for specific gas use: H_2 - Part #972915 C_3H_6 - Part #972763

SET B OPERATING PARAMETERS (1)

Fuel Gas	Hydrogen (H_2)
Powder Carrier Type	Nitrogen (N_2)
Nozzle	1/4 x 9
Injector	#40
Carbide Insert	.052" or (.080")

Console Type	JK®II	JK®IIA
Manifold Pressures, PSI	(2) (7)	(3)
Oxygen	120	90
Main Fuel Gas	120	90
Carrier Gas	100	85
Hydrogen (Pilot)	25	
Console Pressures, PSI		
Oxygen	52-55	53-60
Main Fuel	78-85	70-85
Carrier	52-62 (40-48)	52-62 (40-48)
Console Flows(4)		
Oxygen	450	480
Main Fuel	1350	1300
Carrier	30	77
Console Settings		
Oxygen		26.6
Main Fuel		72.2
Carrier		77.0
Cooling Water(5)		
^oF In	80-90	80-90
^oF Out	110-120	110-120
Powder feed Settings		
Dial Set (Approximate)	167-194	167-194
RPM (Approximate)	2.1-2.6	2.1-2.6
Feed Rate (6), grams/Min.	40-50	40-50
Higher spray rate may be possible		
Spray Distance, Inches	8-10	8-10

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