Technical Data

HA 8496

WC 21Cr 7Ni HVOF Powder

Product Code: 328496
Technical Data Sheet

Revision: 002
Dated: 02/01/14

HA 8496 POWDER CHARACTERISTICS

Typical Powder Morphology (SEM 200X)

HA 8496 is a fine grade reacted and crushed powder with an irregular shape. HA 8496 chemistry has been widely used for its excellent oxidation, corrosion, erosion and wear resistance particularly up to temperatures of 1,400ºF. HA 8496 has been specially formulated to be sprayed using HAI SUPERCote HV[4], JP-5000/JP-8000, Stellite Jet Kote and Metco Diamond Jet systems to provide a coating that competes head-to-head with the D-Gun LW-5 coatings. As HA 8496 is a fully reacted powder, coatings produced with HA 8496 are very dense and homogeneous throughout the entire coating structure; unlike Spray Dried/ Sintered powders which produce the undesirable Cobalt "Laking" effect within the coating. Additionally, recent independent studies showed that HA 8946 was 10+% higher in deposition efficiency than the customers incumbent Spray Dried/ Sintered powder.

SPECIFIC USES

HA 8496 is specifically designed for use in the Oilfield Machinery, Pump & Valve, Chemical Processing & Paper Industries.

- Mud Pump Rotors/Shafts/ Down Hole
- Rotating Pump Parts/ Wear Rings/ Impellers
- Ball Valves/ Gate Valves,
- Compressor/ Hydraulic Shafts
- Paper Rolls

PHYSICAL PROPERTIES

Melting Point [°F]/[°C]	2,300/1,260
Hall Flow [s/50g] ASTM B213	20 ± 3
Apparent Density [g/cm³] ASTM B212	4 ± 0.4
Coverage Rate	0.2 lbs/sq. ft./0.001"

CHEMICAL PROPERTIES

Element	Weight Percent
Tungsten [W]	Balance
Carbon (Total) [C]	6.90 - 7.50
Chromium Carbide [Cr_3C_2]	19.00 – 21.00
Nickel [Ni]	7.40 – 8.60
Cobalt [Co]	< 1.00
Iron [Fe]	< 0.40
All Others	< 1.00

COMPARABLE POWDERS

Praxair/TAFA 1356VM, WC 496

Stellite JK125, JK7175, JK7176

WOKA 3701, 3702, 3703, 3704, 3707

Diamalloy 5846

SM 5845,

Lineage LA-3085, LA-3385

Technical Data

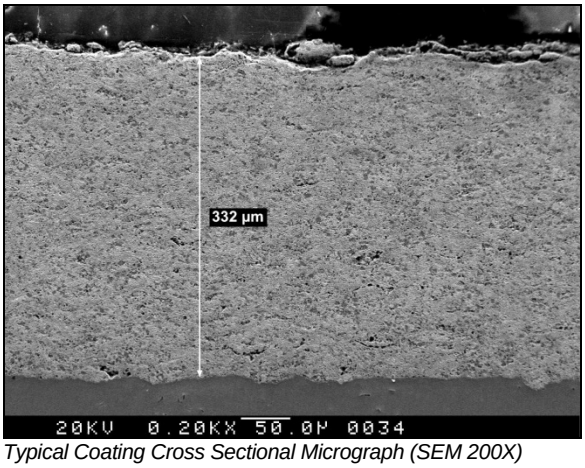
HA 8496

WC 21Cr 7Ni HVOF Powder

Product Code: 328496
Technical Data Sheet

Revision: 002
Dated: 02/01/14

HA 8496 COATING CHARACTERISTICS



Typical Coating Cross Sectional Micrograph (SEM 200X)

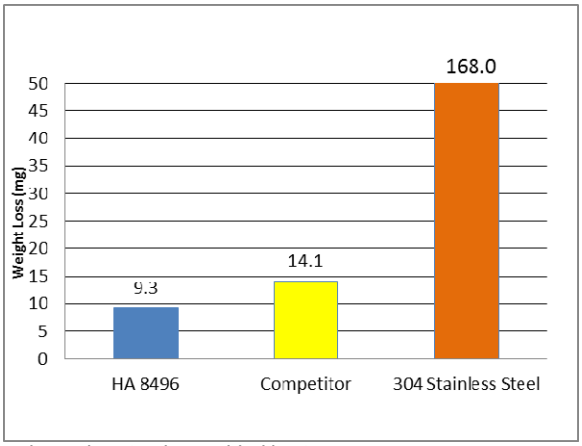
HA 8496 was specifically designed for HVOF spraying, it is a fully reacted powder, therefore, HA 8496 will retain more WC in the coating compared to Spray Dried/ Sintered or Agglomerated Sintered powders [1] and thus is useful in all Thermal Spray devices, including Plasma Spray, where hard, erosion & corrosion and wear resistance are required.

Spray Dried/ Sintered and agglomerated/sintered powders are convenient & economical powders to manufacturer thus they have become popular as more and more suppliers can create them easily. However, these powders are unreacted cemented WC powders and are in essence "glued" together at relatively low temperatures. So it is by design that spray dried powders must be processed and "reacted" using the spray device. Unfortunately, the end product is a coating that is dependent on all the variables of the operator and the spray device and undoubtedly lead to inconsistent coatings and/or devastating failures.

HA 8496 COATING PROPERTIES

Porosity [%]	<1%
Vickers Hardness [300g]	1,100
Rockwell Hardness [Rc]	68
Bond Strength [psi]	10,000+

HA 8496 ABRASIVE WEAR TESTING



Independent Study Provided by Customer

According to Rangaswamy and Herman [2] and based on the work of Nerz [3] sintered and crushed powders may be less sensitive to process variables, which is an advantage" for thermal spray processing.

For more information on Tungsten Carbide powders, WC phase structure, or technical information on tungsten carbide powders please contact technical@haiinc.com.

References:

[1][2] S. Rangaswamy and H. Herman, Metallugical Characterization of WC-Co Coatings, Advances in Thermal Spraying, Pergamon Press, 1986, p101 – 110.

[3] J.E. Nerz, B.A. Kushner, and A.J. Rotolico, Characterization of Tungsten Carbide Coatings as a Function of Powder Manufacturing and Deposition Techniques, High Performance Ceramic Films and Coatings, Vol. 67, Materials Science Monograph, 1991, p27 - 36.