

AI-1820

Description and Applications

Made exclusively for Arc Spraying, **AI-1820** produces coatings, which resist corrosive gases and oxidation temperatures up to 982°C. A coating of this material can also be used to resist heat and prevent oxidation scaling of conventional low alloy steels. These coatings have also been used as an oxygen barrier under sprayed coatings of ceramic. The coating is machineable. The material can be sprayed with any Arc Spray gun.

Applications: **AI-1820** is used to produce oxidation and heat resistant coatings and oxidation resistant bond coatings for ceramics. When applied 0.25mm thick, it will retard or prevent heat oxidation of carbon steels and low alloy steels to temperatures of 982°C. At 0.125mm coatings used as a bond coat for ceramics have been found to retard or prevent heat oxidation of the base material. Thicknesses of 0.025mm to 0.05mm are adequate for bonding ceramic coatings to an oxidation-resistant base material. The material has also been used as an excellent bond coat with bond strengths considerably higher than stainless steels.

It has been found through experiments that corrosion can occur under ceramic coatings directly applied to iron alloys, stainless steels and alloys of aluminium and nickel. Both salt and other chloride atmospheres accelerate this corrosion phenomenon. Currently, inadequate information is available to determine whether this corrosion phenomenon may apply to other corrosive atmospheres as well when ceramic coatings are applied directly to a metal substrate, which develops passive oxide films. It is felt that this corrosive condition comes about because of the loss of protective oxide films during the grit blasting operation prior to ceramic coating. The corrosion can be identified in some cases by observing the ceramic coating, which has failed, and noticing the characteristic red iron oxide or white aluminium oxide. In the case of salt environments, it appears that some electrochemical reactions are accelerated. It has been found in laboratory investigations that the corrosion is significantly inhibited when the **AI-1820** is used. The procedure in this case is to apply 0.05mm - 0.125mm of the barrier coat with coatings on the thinner end of the tolerance used where fine sprayed surface finishes are required and the thicker end when a coarse ceramic powder is utilized.

Typical Analysis

Cr	Ni
20.00	80.00



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Properties

	As sprayed
Wire Diameter	1.6mm
Deposit Efficiency	70%
Melting Point	1,315°C
Bond Strength	48 MPa (7000 psi)
Coating Tensile Strength	165.5 MPa (24,000 psi)
Macro-hardness	92 Rb
Coating Density	7.2 gm/cm ³ **
Coating Weight	0.038 lbs/ft ² /mil
Shrink	0.001cm/cm
Finish – Machined	Fair
Ground	Good

Spray Parameters

	Volts	Amps	Air	Distance
Bond Pass	29-31	150	345 kPa (50psi)	100-125mm
Build Up	29-31	150-350	414-621kPa (60-90psi)	150-175mm

Finishing

AI-1820 is usually finished by machining or grinding with machining giving a fair finish and grinding giving a good finish.

Disclaimer

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