TECHNICAL BULLETIN

NICKEL ALUMINUM CT5102-1

OVERVIEW

CT5102-1 is a Nickel Aluminum coating applied using the plasma spray process. The most common function of the coating is as a bond coat between the substrate metal and a top coating. During the spraying process the nickel alloys with the aluminum producing a nickel aluminide. This alloying process is exothermic, meaning that it gives off heat. The individual particles of the material get melted in the plasma flame and then use the exothermic heat to get hotter as they travel to the part. The individual particles then stick to the substrate through actual diffusion of part of the particles into the substrate like tiny spot welds. The Nickel Aluminum coating exhibits high structural integrity, with excellent bonding to a wide variety of part base materials.

TYPICAL PROPERTIES

Nominal Composition:	85 Ni, 15 Graphite
Bond Strength:	12,000 psi minimum average
Coating Porosity:	Approximately 15% by volume
Coating Hardness:	R15y 50-70
As-sprayed Surface Roughness:	1,000-1,200 Ra Nominal
Service Temperature:	Up to 900°F

FOR THE FOLLOWING APPLICATIONS

CT5102-1 is primarily used as a bond coat for a wide variety of coatings, including wear, thermal barrier, and corrosion resistant coating systems. The typical thickness is .003 - .006" when applied as a bond coat, and .015 - .025" when applied solely as a machinable build up layer. Nickel Aluminum can be used to build up worn or mis-machined parts, to resist fretting at various temperatures, also as an erosion or oxidation resistant layer in high temperature atmospheres.

FINISHING

Finish CT5102-1 by machining with conventional carbide tools.

SPECIFICATIONS

CT-5102 material meets the following specifications:

GE:	B50TF56
Rolls Royce:	9507/5
PWA:	1337
CPW:	247
Honeywell:	EMS57746
SNECMA:	DMR 33.011

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