Technical Specification of CVD Coatings – Diffusion

Chemical Vapour Aluminizing (CVA-Al), Isobaric Vapour Aluminizing (IVA-Al), Chromizing and Siliconizing

Applications

CVA-Al – used on internal and external surfaces, complex internal passages, allows better control over composition and thickness of coating.
IVA-Al – used on gas turbine components, complex shaped components.
Siliconizing – used to improve a materials resistance against high-temperature oxidation, hot corrosion, carburization and wear.
Chromizing – used to extend the service life of tools and components exposed to wear and corrosion.

Properties

Coating	CVA-Al	IVA-Al	Siliconizing	Chromizing
Purity (%)	n/a	n/a	n/a	n/a
Density (g/cm^3)	n/a	n/a	n/a	n/a
Flexural Strength (MPa)	n/a	n/a	n/a	n/a
Hardness (Kg/mm^2)	n/a	n/a	n/a	n/a
Thermal Expansion Coefficient (10^{-6}/°C)	n/a	n/a	n/a	n/a
Thermal Conductivity (W/mK)	n/a	n/a	n/a	n/a
Electrical Resistivity (Ωcm)	n/a	n/a	n/a	n/a
Standard Thickness	25-125µm	25-125µm	50-100µm	50-100µm
Oxidation Temperature (°C)	n/a	n/a	n/a	n/a
Friction Coefficient	n/a	n/a	n/a	n/a
Colour	Grey	Grey	Grey	Grey

CVD Methods

CVA-Al
Uses a flow of $AlCl_3$ vapor to convert the surface of a nickel alloy component into a diffusion layer of nickel aluminide. It is then passed over an aluminum source to increase concentration of aluminum monochloride.
1160°C, 50–300mBar

IVA-Al
Aluminum content of the layer can be adjusted by the process conditions and also by subsequent heat treatments
900-1150°C, 1–50mBar

Siliconizing
Gaseous medium containing chlorosilanes is reduced by hydrogen.
$SiCl_4 + 2H_2 \rightarrow Si + 4HCl$

Chromizing
$Cr + CrCl_3 \rightleftharpoons CrCl_2$
Chromium formed in equilibrium forms a carbide with the metal being chromized.

QAS INTERNATIONAL ISO 9001:2008 REGISTERED FIRM Certificate No. A13704

ATL CVD.CO.UK

Archer Technicoat Ltd.

Progress Road, Sands Industrial Estate,
High Wycombe, Buckinghamshire, HP12 4JD
Tel. +44 (0) 1494 462101 Fax +44 (0) 1494 463049
www.cvd.co.uk