Technical Data Sheet

CFIPAL

Edition May 2026 Revision 2

Product Name

Chrome Free Diffusion Coating

Product Description

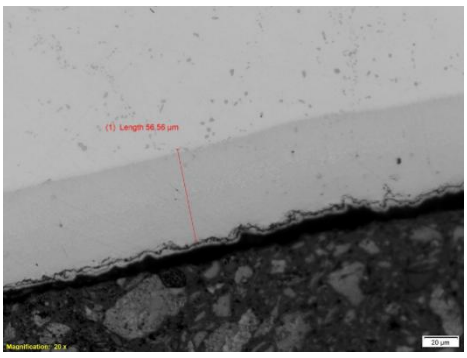
CFIPAL is a fully chrome-free, silicon-modified diffused aluminide coating developed to provide superior protection for gas turbine hot-section components operating at temperatures up to 1000°C. It is suitable for application on nickel-based turbine alloys, delivering excellent high-temperature oxidation resistance across aerospace, industrial, and marine gas turbine environments.

CFIPAL is supplied as an aluminium-rich slurry coating, designed for application using conventional spray equipment. Following application, the coating is diffused at high temperature (from 870°C / 1600°F) in argon or controlled atmosphere furnaces.

Recent product developments have resulted in enhanced performance to meet demanding aerospace industry requirements. Improvements include increased oxidation resistance, enhanced high-temperature stability and formation of cleaner diffusion layers.

The refined coating microstructure enables the production of clean, thin-film, and multi-layer coatings, optimising protective performance in service. A stable, pure aluminide oxide scale forms during operation, providing the primary protective barrier. The improved coating structure minimises defects, reducing the risk of oxidation ingress and extending component life.

CFIPAL coated part with example of a typical cut through



Typical diffusion - nickel based super alloy

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Registered in England: 1376995

Approvals and Specifications

- Rolls-Royce MSRR 1041
- NEW RR Overhaul
- OMAT 7/129B
- Siemens Energy UK 552213.

Performance Properties

Can successfully be diffused to 40 – 70 microns after successful correct application of the dried overlay coating of CFIPAL

Components

2 Part Kit supplied with mixing vessel.
Part A: Clear binder
Part B: Aluminium slurry
Empty 1 litre plastic bottle to allow mixing
240-micron filter

Application

Refer to IPAS for full detailed instructions.

Surface Preparation	- Surfaces must be clean and grease free. Degrease by thermal clean at 350°C for a minimum 30 minutes. - Preparation IAW required specification, Light blast with Alox blast media to prepare sub-straight is recommended	
Paint Preparation	1.	Ensure Part B is mixed prior to mixing with Part A. Minimum of 12 hours prior to mixing with part A, preferred 24 hours. Part A to be shaken before use.
	2.	Mix in a ratio of 1:1 Part A with Part B.
	3.	The mixed solution is required to be on a shaker or stirrer for approximately 90 minutes. If this is in a sealed container, check the unit for gassing and release the pressure build up after 10 minutes. Monitor the mixed material for the next 10 – 15 minutes as there may be a need to de-gas again.
	4.	Before using the mixed coating, ensure you pass it through the supplied sieve. This will prevent larger particles that have not broken down during the mixing time from entering the fluid nozzle of the spray gun.
	5.	Once this has been passed through the sieve the coating has a pot life of 6 hours.

Spray Guns

Our applications team have carried out extensive trials with several currently available spray guns, and we suggest one of the following guns be used for the application of CFIPAL:

Manufacturer	Model	Fluid Tip	Air Cap	Atomising Pressure
Anest-Iwata	LPH-80	1.2mm	PH80-E4	All guns: 20psi 1.4 bar
Anest-Iwata	W-300	1.2mm	W-300-WB1	
DeVilbiss	DV-1S	0.7-0.8mm	DV1-M1 Micro	
SATA	Jet 20B	0,8		
SATA	Minijet 4400B RP	RP 0,8	RP 0,8 SR	

Application Method

- Apply the first coat as a light mist layer, sufficient only to colour the component surface without build-up. Allow to flash off for approximately 15 minutes under ambient conditions.
- A second mist coat is then applied (this may start to "wet out" the part). Again allow 15 minutes flash off under ambient conditions.
- The third coat is applied as a wet but not heavy coat. Excess thickness and heavy wet film will result in runs and blistering. Allow 15 minutes flash off then use an intermediate cure of 15 minutes minimum at 350°C; this will give a film thickness of 25-30 microns; for a higher film thickness repeat the mist/mist/wet coating process.

The applied weight gain for CF IPAL is 11-17 milligrams per cm^2 resulting in 30-60 microns of diffused coating, once diffused at 870°C.

Drying and Curing

Intermediate cure:
- 350°C for 15 minutes minimum.

Final cure:
- 350°C for 30 minutes minimum.

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Liquid Technical Properties**

Supply Viscosity	Supplied as Kit
Flash Point	Refer to SDS section 9
Density	Refer to SDS section 9
VOC Content	Refer to SDS section 9
Colour	Grey
Gloss	Matt
Thinner	Demineralised water
Solvent/Clean Up	Demineralised water
Theoretical Coverage	2.2 m^2 at 100-micron pre-diffusion
Pack Size	2 L Kit, 1 litre Part A Clear Binder base, 1 litre Part B aluminium slurry
Pot Life	6 Hours

** - The values referenced are obtained from Batch testing using controlled Quality techniques.

Storage

Highly flammable liquid: store and use in accordance with the flammable liquid regulations

Shelf Life***: 12 months temperate; 6 months tropical

Before use, refer to Product Safety Data Sheet

*** - Indestructible Paint decline any responsibility deriving from improper storage of Product and its Catalyst.

Contact

For Safety Data Sheets or other Information please contact our sales Department:

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