

F140-13 Vector Aerospace Engine Repair

### **Thermal Spraying Equipment Providing Engineering Coatings**

Thermal sprayed coatings have been a recognised and trusted solution for engineering coatings in the aerospace industry for many years. Metallisation has been providing thermal spraying advice, training, support, equipment and consumables to a diverse range of industries around the world, including the aerospace industry, since 1922.

Stringent requirements in the aerospace industry result in demands for high quality coatings, combining accuracy, repeatability and above all safety, which is what Metallisation and its equipment regularly and consistently delivers.

Vector Aerospace is an industry leader in the global aerospace maintenance, repair and overhaul market with repair facilities in Canada, the United States, France, the UK, South Africa and Australia. At its Fleetlands - Gosport site it has a state-of-the-art engine repair service facility fitted out with Metallisation thermal spray equipment.

Vector Aerospace repairs and overhauls engines for Rolls Royce, Pratt and Whitney and Honeywell. Vector Aerospace took ownership of the thermal spray cell, originally purchased by Pratt and Whitney Canada UK, in 2000. The facility included a sound attenuated thermal spray booth, robot, tilt and turn turntable, Plasma and Arcspray systems.



The system was originally designed to produce aerospace certified coatings, including wear resistant and thermal barrier coatings (TBC's) and was perfectly suited to Vector Aerospace's needs. A brand new extraction system was installed to meet the latest environmental requirements and ensure the highest quality coatings. Metallisation was involved in the re-commissioning of the system and has continued to provide ongoing support through its annual calibration service and its bi-annual servicing.

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Vector Aerospace has been so pleased with the equipment that in 2012, to complement the existing facility, they purchased an additional system from Metallisation, in the form of an automatic powder flame spray system. The new MK74-PC Flamespray system enabled them to produce abradable coatings and enhance its engine repair service. The MK74-PC Flamespray system was delivered, installed and commissioned by Metallisation's experienced engineers. The unit is fully automated, mass flow and PC controlled and has distributed I/O to maximise reliability and repeatability of the system. The touch screen HMI allows very simple operator control.



The thermal spray cell enables Vector Aerospace to apply a full range of coatings including, metallic bond coats, repair materials, ceramics and abradables. The cell primarily incorporates the Metallisation PS50M mass flow controlled Plasma system and the Metallisation 140/S250 Arcspray automatic system. The tilt and turn turntable provides an additional two axes to the six axis robotic manipulator, ensuring that all areas of the component are accessible for the coating.

In a typical metal spray application 0.004" – 0.008" of Ni/Al bond coat would be sprayed at around 0.002" per pass using the Arcspray system. A topcoat of up to 0.014" chromium carbide alloy would then be applied at around 100µ per pass to provide wear resistance to the engine component, using the plasma system.

Abradable coatings have a thin bond coat of Ni/Al Arcspray coating applied before a Nickel/Graphite 85/15 topcoat is applied with the new MK74-PC powder Flamespray equipment. The Mark 74-MC pistol is useful for applying a wide range of coatings for thermal barriers, wear resistance and as a dielectric. This pistol utilises an oxygen and acetylene fuelled gas mixture, which means it is capable of spraying ceramic coatings, as well as all the full range of metal powders. Since thermal spraying processes produce, as a by-product, noise, dust and radiant energy, it is necessary to contain the equipment in an extracted soundproofed area. The Metallisation thermal spray cell has interlocked extraction to meet the needs of the application and local environmental regulations. With environmental and safety pressures upon

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industrial processes, this form of thermal spraying cell provides an opportunity to produce high quality coatings in a manner which is simple, clean and safe for the staff operating the system and is also environmentally friendly.

Chris Prior, Repair Services Manager at Vector Aerospace Engine Services UK, says: "We, at Vector Aerospace, have enjoyed a friendly and professional customer/supplier relationship with Metallisation which I am confident will continue in the future. We can always rely on them for immediate response to technical enquiries, and the hardware is still robust and reliable after 13 years of service."

Metallisation's equipment and after sales service commitments have continually proven to be of value to its customers. The combination of precision manipulation and tried and tested thermal spraying equipment meets the exacting requirements expected in the aerospace industry. Stuart Milton, Sales Director at Metallisation, says: "We pride ourselves on providing good quality equipment and delivering the best customer service available. We are really pleased, but not surprised, that the original thermal spray booth and spraying equipment are still performing to such high standards. It's been great to work on the upgrade of this long standing spray cell to include the functionality of the M74-PC system. Technical support and the after sales and service we provide, are all key to the success of our relationship with Vector Aerospace. "

For more information please contact Stuart Milton, Sales Director, +44 (0) 1384 252 464 or visit [www.metallisation.com](http://www.metallisation.com)

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