

## Aerospace & Gas Turbines

### Aero-Turbines

Monitor Coatings Limited has supplied coating solutions for some of the most demanding applications in the Aerospace industry for over 30 years.

In a sector of industry where the performance of critical parts is reliant on the quality of the coatings and its application, Monitor Coatings Limited has an unsurpassed record for high quality.

Customer approvals have been issued by some of the prime companies in this industry sector and Monitor also has the highly sought after NADCAP approval.

### Gas Turbines (Land Based)

Monitor provides a similar service to land based Gas Turbine Manufacturers. Monitor also coat blades, blisks, rings and other components exposed to environments similar to Aero based turbines.

Examples of coatings applied in the Aerospace and Gas Turbine Industry are

Abradable Coatings

Corrosion Resistant

Thermal Barrier Coatings (TBC)

Wear Resistant Coatings

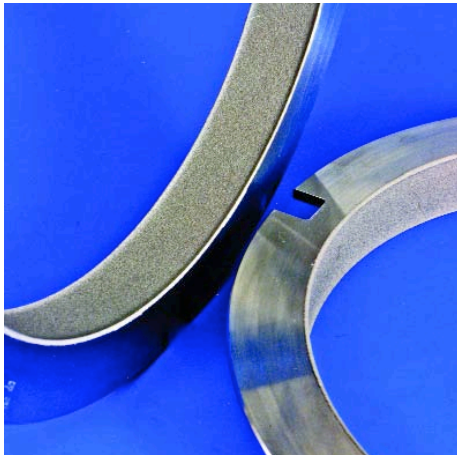
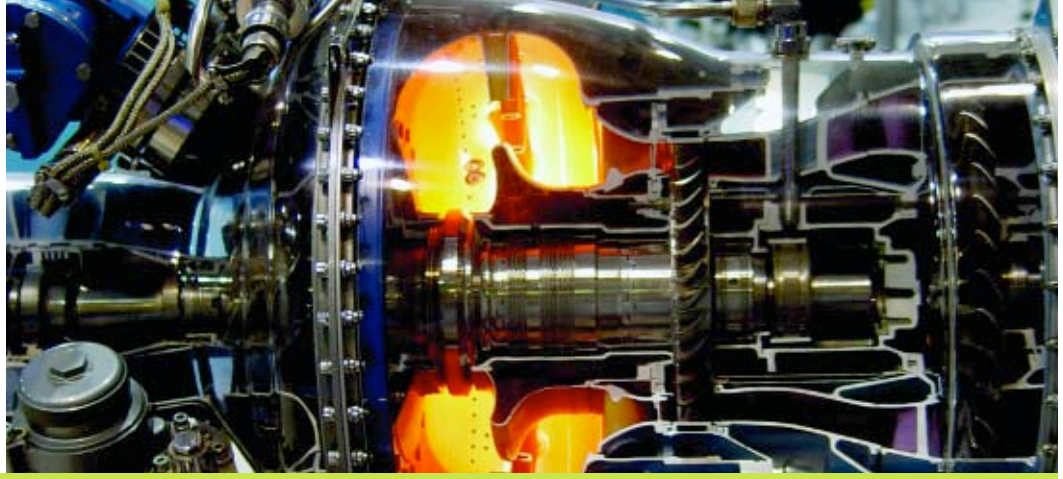
Solid Particle Erosion Resistant Coatings (SPER)

Hard-Face Coatings

Failure of aerospace and gas turbine components generally results from high-temperature oxidation, corrosion, erosion, or combinations of these procedures. To overcome these limitations, Monitor employ the latest functional coatings in the aerospace and turbine industries to increase the life of turbine components.

Thermal spray processes have long been used to apply solutions such as high-temperature thermal barrier coatings to improve the life of turbine components. These processes continue to meet the increased demand by the aerospace and turbine industries to obtain higher engine temperatures and increased life enhancement.

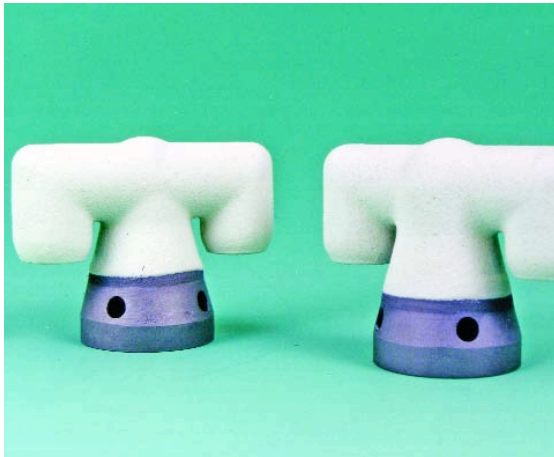
The continual development of the coating and processes for use on additional engine types will allow Monitor to access new markets and apply the process to new practices. For aerospace components, traditional plating such as chromium and cadmium is increasingly being replaced by environmentally friendly processes such as HVOF. Original equipment manufacture and repair coatings for engine and main frame components remain Monitor's key focus in the aerospace and gas turbine industries.



## Abradable Coatings

Abradable coatings are specially formulated for clearance control applications in gas turbines. By allowing the tips of rotor blades or labyrinth seals to machine a path in the relatively soft but erosion resistant coating deposited in this case, housing or shroud, a close tolerance seal is produced.

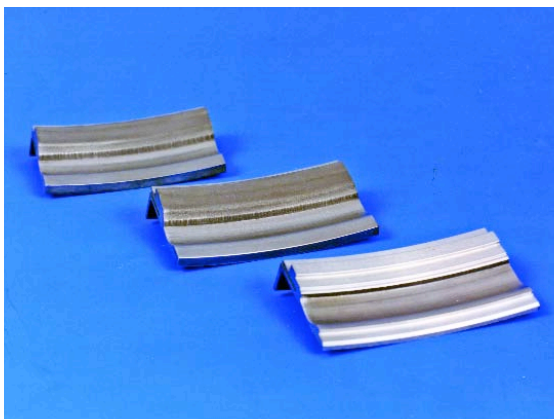
The coating applied to the seal rings shown opposite is a plasma sprayed aluminium-graphite composite for use at 315° -425°C



## Thermal Barrier Coatings

Thermal barrier coatings (TBC's) are widely used in the hot sections of gas turbines to enhance the life of combustors, vaporisers, nozzle guide vanes, etc which are exposed to high temperature oxidation and sulphication attack.

TBC's are normally applied to the platform surfaces of nozzle guide vanes as shown here and a typical coating specification would be an MCrAlY bond coat deposited by Low Pressure Plasma Spraying (LPPS) and a top coat of zirconia partially stabilised with yttria deposited in air by Robotic Plasma Spraying.



## Rub Tolerant Coatings

MCrAlY coatings are also specified for high temperature clearance control applications in gas turbines.

The coating is applied to the static components, usually liners or shroud segments as shown here and the turbine rotor blades are allowed to cut a path into the rub tolerant coating, which plastically deforms at engine operating temperatures to form a close tolerance seal.

**Surface Engineering** in extreme environments