

Australian Government Department of Defence Science and Technology

DST

IR Signature Management Coatings

"If you can't cover or cool it, then coat it."

Infrared based weapons and surveillance systems are a continually evolving threat to both military and civilian aircraft. Typical aircraft self-protection measures include IR countermeasure systems and IR Signature Suppression (IRSS) systems. Regular IRSS systems which try to cover up and cool down visible engine surfaces can be expensive, heavy and most importantly difficult to retrofit.

Initial Development

DST Group has been investigating the application of Low IR Emissivity (Low-E) Surface Coatings which can significantly reduce the emissions from high temperature surfaces. For example a typical exhaust surface may have an IR emissivity of 0.95-0.99, compared with a coating emissivity of 0.1-0.2.

State of the art Low-E coatings can withstand temperatures of up to around 800K (~527° C), and can hence be applied to most jet engine exhausts.

Key Features

The Low-E coatings are very thin, have negligible weight, and can be applied easily and cheaply to most engine exhaust surfaces. A reduction in IR emissions results in an associated decrease in the distance at which a surveillance system can detect an aircraft, as well as improving the effectiveness of any IR countermeasures.

Commercial Potential

The coatings could be widely applied, but the main focus is military aircraft without IRSS systems incorporated in their initial designs.

Stage of Development

- There are ranges of coating formulations under consideration stretching in maturity from Technology Readiness Level (TRLs) 2 to 8.
- Current Coating Capabilities: Emissivity: 0.1-0.2 in 3-5 µm spectral band.
- ► Maximum Operating Temperature: ~800K.
- Corrosion resistant: Yes.
- Cleanable: Yes.

Partnering Opportunities

DST is looking for an innovative partner to work collaboratively on investigating the application of Low-E coatings on ADF platforms.

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