ABSTRACT
The performance of increasingly capable and sophisticated high performance space systems – sensors, imaging optics, thermal control, attitude control, and others can be adversely affected by various types of contamination. The lengthy mission times and the requirements for long term ground storage contribute to the importance of the contamination issues. To meet these requirements there is a demand for materials which are functionally excellent and which make no contribution to contamination risks under the storage and operational conditions.

The sources of contamination are many, including, among others: molecular contamination (MOC), particulate contamination (POC), outgassing and trace elements.

Acktar coatings excel in their cleanliness as well as being “top of class” in their optical properties. Acktar coatings are most often used in space optical systems where contamination released under operational space conditions might be deposited on optical surfaces or baffles leading to a deterioration of system imaging quality and/or sensor signal to noise ratios. These conditions include extreme temperatures and in some cases extreme temperature cycles, vacuum, radiation, atomic oxygen, vibrations, etc.

The basis for the cleanliness of Acktar coatings is in their completely inorganic nature. The coatings do not incorporate any organic components nor are organic materials which might leave traces used in the Acktar vacuum coating processes.

Acktar coatings can point to an extensive “space heritage” demonstrating both the functional performance of the coatings in orbit and the complete absence of any performance threatening contamination. Acktar coatings have been extensively tested and qualified for space service by major players in the space industry.

For illustrative purposes, the EnMap and MTG programs are examples of highly sensitive to contamination spacecraft projects.

Following extensive investigation of Acktar Fractal Black for MOC, POC and outgassing carried out in the framework of the above mentioned projects we can present data as follows:

- POC below 10 ppm
- MOC below 10^-9 g/sq.cm
- outgassing of 1.32 E-13 mbar*l/(s*cm²)