SPACE PROPULSION SYMPOSIUM (C4)
Propulsion Technology (3)

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DEVELOPMENT OF A FUEL OXIDISER COMPATIBLE DIAPHRAGM

Abstract

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The satellite propulsion system requires a gas free propellant to the thrusters. Currently the main reliance is on the use of Propellant Management device PMD's This method becomes more complex with the complexity of the mission requirement and with high accelerations.

A simpler method is to use a Positive expulsion device (PED) which provides constant flow / gas free propellant. This enables flexible manoeuvres and Attitude Orbital Control (AOC) tasks and has the advantage of a reduced sloshing effect and a better control of the C of G.

Whilst the technology for a PED application for mono propellant propulsion systems is well developed, currently there is no European, ITAR free PED available. In addition the technology for bi-propellant propulsion systems is not so well developed and no European source exists. It is envisaged that once the material is developed the material is adaptable to be used in a diaphragm or bladder configuration.

MT Aerospace Satellite Products Limited is developing a material for use in Bipropellant systems compatible to oxidiser propellants as well as for monopropellants.

The development will cover the qualification of a suitable material including compatibility trials with the oxidiser fuel, compatibility with operational and test media. In addition, the development will include testing to ensure no deterioration of the material as a results of exposure to the environment.