

ADVANCED TECHNOLOGIES FROM ISRO

Silicone polymer based thermal protection system : PC-10 TPS (red) and (White)

Pc-10 thermal protection systems are silicone polymer based filled compounds, which are good ablative thermal insulators. These compounds are room temperature curing systems which can be applied by brushing, spraying and putty blade. The remarkable features of the system include good thermal, chemical and ageing resistance and compatibility with wide variety of substrates. Indian Space Research Organisation (ISRO) at its Vikram Sarabhai Space Centre (VSSC) has developed a technology for processing and application of different types of silicone polymer based thermal protection systems with tailored properties to meet various mission/application requirements.

The processing involves incorporation of selected quality fillers and ingredients in specific type of silicone polymer resin and use of suitable curatives to achieve desired thermo-physical properties.

Salient Features

- Simplified and cost effective technology for processing premium quality ablative thermal protection systems.
- Over night, room temperature curing system.
- Flexibility with respect to application procedure such as spraying, brushing or putty application.
- Compatibility with wide variety of substrates including metals, composites, glass etc.

- Excellent ageing behaviour and hydrophobicity, making it suitable for long term application with no deterioration of properties for more than 5 years.

Applications

- Useful for high quality ablative thermal protection system for temperatures up to 350⁰C direct exposure with reasonable stability and capability to retain properties. The system also has good moisture resistance and good age resistance. The system can be applied to desired thickness depending upon the thermal environment envisaged. Reasonable mechanical strength and adhesive properties with large number of substrates has been demonstrated by the system. Ability to retain properties at temperatures up to 150⁰C and low temperature flexibility are other highlights of the system owing to the low glass transition characteristics associated with silicone polymers.
- The products can be used for thermal protection application for protecting rocket hardware from aerodynamic heating and launch pad components from flame impingement and also as moisture / water impermeable coating etc.
- The system can be tailored for use as corrosion protection coating on metal substrates for outdoor use.

TECHNOLOGY TRANSFER FROM ISRO

ISRO is willing to offer the knowhow of this technology to suitable entrepreneurs / industries in India. Capable manufacturing industries interested in acquiring this knowhow may write with details of their present activities, requirements and plans for implementation, infrastructure and technical expertise available with them, their own market assessment, if any, and plans for diversification to the address given below.

For further details, please contact:

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