TECHNOLOGY TRANSFER

Interest Exploratory Note

Benzoxazine Polymer

Indian Space Research Organisation at its Vikram Sarabhai Space Centre has developed Benzoxazine Polymer, a matrix resin suitable for thermal insulations, adhesive formulations and encapsulant in PCB industry.

Polybenzoxazine is a suitable candidate matrix resin for high density ablative composites and also for light weight foam composites in aerospace applications due to excellent thermal and thermo-oxidative stability, high char yield, good chemical inertness, abrasion resistance and flame retardancy. It also finds application as an encapsulant in electronic industry.

Thermal stability	>250 °C.
Shelf life	1 year
Storage	Ambient temperature, moisture-free environment
Approximate Production cost	Rs.1000/kg

Salient Features

- Excellent flame retardancy
- Easily processable (solventless process, moderate temperature)
- Good thermal stability

Typical Properties / characteristics

Raw materials	Bisphenol A, Aniline and Para-Formaldehyde
Method	Solventless process
Reaction temperature:	120 °C
Product appearance	Yellowish orange powder
Solubility	Soluble in acetone, chloroform etc
Curing temperature:	210 °C/3 hrs
Polymerization temperature (°C)	200/ 2 hours

Department of Space has authorised NSIL for Technology Transfer of Benzoxazine Polymer to suitable entrepreneurs/ Industry in India. Interested Parties may please fill the enclosed form and send by email to contact-nsil@isro.gov.in