

## **Light Weight Thermally Insulating Microwave Absorbing Structures**

ASL Hyderabad has developed a technology for fabrication, qualification of composite component having low density, high insulating capability (thermal conductivity  $\sim 0.1\text{W/m-k}$ ) with broadband microwave absorbing properties. Composite component manufactured using this process is stable up to  $330^{\circ}\text{C}$ . The primary constituents of these components are silicone resin, ceramic fabric, milled carbon fibres/chopped carbon fibres. The said composite, having density between  $0.33$  to  $0.4$  g/cc, can also show good structural rigidity required for mechanical handling, cutting grinding etc. It can be made in to any shape having moderate curvature. This composite act as insulation liner behind airframes. Besides this, it also provides additional functionality in terms of electromagnetic wave absorbing performance. Typical Fabrication Process involves realising composite through match die moulding wet layup process.

### **Essential Infrastructure requirements:**

- (i) Large size ovens of the size of minimum  $1.5 \times 1.5$  m x 1 meter (height) working area.
- (ii) Carbon fibre chopping machines.
- (iii) Ball milling machines for milling the carbon fibres.
- (iv) Working area with elevated work benches of 2meters x 1.5 meters (min 3 nos.)
- (v) Aluminium dies of suitable size (to be custom made as per the component. Approximately 1.3 meter long with 800mm wide)
- (vi) Facilities to handle large size dies which weigh around 500Kgs to 600Kgs
- (vii) Weighing balances.

**Following infrastructure need to be built (or to be tied up with firms which can extend the following facilities)**

- Frees space material measurement setup to generate Electromagnetic properties of Materials.
- SEM for measuring the averaging length of the fibres/BET for surface area measurement
- UTM to generate mechanical property data.

**Industry Partner Qualification Criterion:**

- (i) Should have minimum 10 years of experience in fabrication and delivery of Aerospace grade materials with the approvals of MSQAA / CEMILAC.
- (ii) Should have a minimum manpower of 50 employees with at least 5 Engineering graduates or Post graduates in Sciences.
- (iii) Should have a minimum yearly turnover of 10 crores in last three consecutive years.

Interested Industries are requested to forward their Expression of Interest (EoI) to Director ASL, Hyderabad (with attachments of supporting documents) with a copy of Director DIITM, DRDO HQ (without attachment) on following address:-

**Director****Advanced Systems Laboratory (ASL)**

Kanchanbagh P O

Hyderabad - 500058

Ph.No: 040- 24188400

Fax: 040-24343779

**Email: [director\[dot\]asl\[at\]gov\[dot\]in](mailto:director@asl.gov.in)**

Copy to

**Director****Directorate of Industry Interface & technology Management (DIITM)**

Room No. 447, DRDO Bhawan, DRDO HQrs, Rajaji Marg, New Delhi-110011

Phone: 011-23013209/23015291

Fax: 011-23793008

**Email: [diitm\[dot\]hqr\[at\]gov\[dot\]in](mailto:diitm@hq.gov.in)**

**List of Support documents to be attached with EoI**

- a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- b) Certificates of registration as a manufacturing unit, if any.
- c) Audited Balance Sheet for the preceding three years.
- d) Income Tax returns for the preceding three year period

- e) Details of shareholding/ownership pattern especially foreign partners/ shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt of India policies and regulations on Foreign Direct Investment (FDI)/DIPP norms as applicable.
- f) Annual budget for R&D during last three years.
- g) Numbers and details of IPR or patents, etc., held by the company.
- h) Number of technically or professionally qualified personnel.
- i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise.
- k) List of Testing and Support equipment's
- l) ISO/ ISI certification or any other certification
- m) Relevant clearances from the authorities/ ministries (if any)
- n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- o) Capacity/capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- p) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc (if applicable).
- q) Under taking form company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- r) Details of the industrials license for defence manufacturing be provided by the industry seeking ToTs.