

भारत सरकार/**GOVERNMENT OF INDIA**
अंतरिक्ष विभाग/**DEPARTMENT OF SPACE**
विक्रम साराभाई अंतरिक्ष केंद्र/VIKRAM SARABHAI SPACE CENTRE
तिरुवनंतपुरम/**THIRUVANANTHAPURAM - 695 022**

विक्रम साराभाई अंतरिक्ष केंद्र (वीएसएससी), भारत सरकार, निम्न घनत्व ऐलुमिनोसिलिकेट टाइलों का विकासके लिए भंडारण सुविधा हेतु देश के अंदर के इच्छुक प्रतिष्ठानों से अभिरुचि की अभिव्यक्ति आमंत्रित करता है।

Vikram Sarabhai Space Centre [VSSC], Govt. of India invites Expression of Interest from interested firms within the country for Development of Low Density Aluminosilicate tiles.

विस्तृत तकनीकी विनिर्देशन तथा एवं शर्तें हमारे वेबसाइट www.isro.gov.in और www.vssc.gov.in पर उपलब्ध हैं।

Detailed Technical Specification and Terms & Conditions are available in our website www.isro.gov.in and www.vssc.gov.in .

इच्छुक प्रत्याशी निर्माता हमारे संदर्भ सं. **6084 2022 00 4002 01** का उल्लेख करते हुए **दिनांक 30.05.2023 को 2 बजे अपराह्न या उससे पहले** निम्नलिखित पते पर अपनी अभिरुचि की अभिव्यक्ति प्रस्तुत कर सकते हैं।

Interested prospective Manufacturers can furnish their Expression of Interest quoting our reference No. **6084 2022 00 4002 01 on or before 30.05.2023; Time : 2pm** to the following address.

वरि. क्रय एवं भंडार अधिकारी
Sr. Purchase & Stores Officer
क्रय यूनिट, एमएमई क्रय,
Purchase Unit V, MME Purchase,
आरएफएफ क्षेत्र, इसरो पोस्ट- 695 022
RFF Area, ISRO Post - 695 022
तिरुवनंतपुरम/Thiruvananthapuram

हस्ताक्षरित/Sd/-

वरि. प्रधान, क्रय एवं भंडार / Sr. Head, Purchase & Stores



Government of India
Department of Space
Vikram Sarabhai Space Centre
Indian Space Research Organization
Thiruvananthapuram-695022
Kerala

Date: 29-03-23

INVITATION FOR EXPRESSION-OF-INTEREST FROM INDIAN INDUSTRIES

DEVELOPMENT AND SUPPLY OF LOW DENSITY SILICA-ALUMINOSILICATE TILES FOR LAUNCH VEHICLE APPLICATIONS

A: Attention to bidders:

1. The Eol document shall be carefully read and all points shall be duly addressed.
2. Eol responses with incomplete / insufficient supporting data shall not be considered further. No further correspondence shall be entertained with respect to this.
3. Bidders can contact/visit VSSC/ISRO with prior appointment from Sr. Purchase & Stores Officer, Purchase Unit-5, MME purchase, Thumba P.O., Thiruvananthapuram - 695022 for any clarifications/discussions. Contact Phone No: 0471-2562831. Email id: spso_mme@vssc.gov.in

1. Introduction

Vikram Sarabhai Space Centre (VSSC) is the lead Centre of Indian Space Research Organization (ISRO). The Centre is actively pursuing research and development for ongoing and future space transportation systems of ISRO. To meet various programmes of ISRO, Vikram Sarabhai Space Centre is interested in developing vendors within the country for the development of "**LOW DENSITY SILICA-ALUMINOSILICATE TILES**" for Launch Vehicle applications.

This expression of interest is invited from vendors with previous experience in the field of processing of low density ceramic composites and technically competent, financially stable parties having necessary infrastructure/willingness to establish necessary facilities within 3 months to realize and supply these silica-aluminosilicate tiles.

Interested vendors having expertise and experience in low density ceramic composite processing with required infrastructure may please express their interest in accomplishing the task.

VSSC reserves the right to entrust the activity to a single vendor or more than one vendor.

2. Scope of Work

Scope of the work involves

1. Development, of low density silica-aluminosilicate tiles targeting the following properties

- Dimension: 300x 300 x 110 mm billets
 - Composition: Silica fiber (65-75 wt %), Aluminosilicate fiber (Cera fiber) (20-25 wt %), Boron oxide (8-11 wt %)
 - Density of the product : 0.2-0.26 g/cc
 - Compressive strength : 300 kPa (min.)
 - Flexural strength: 500 kPa (min.)
 - Thermal conductivity: <0.1 W/mK at RT
 - CTE < 1 $\mu\text{m} / \text{m} \text{ } ^\circ\text{C}$.
- Testing of above properties shall be done at VSSC. Party shall machine test-specimens from each batch of following dimensions from the billets and supply to VSSC for testing
- Compressive strength :25x25x20 mm (20 mm in thickness direction)-3 sample from one billet
 - Flexural strength: 25x20x100 mm (20 mm in thickness direction)- 3 sample from one billet
 - Thermal conductivity:150x80x22 mm (2no's) from one billet
 - CTE (5x5x10 mm)- 4 numbers from one billet

- Initial trials shall be done in batches. Minimum three sintering trials shall be done to optimize the process parameters. Minimum 30 tiles shall be realized in the developmental stage.
2. Realization and supply of 100 Nos. of billets of dimension 300x 300 x 110 mm with optimized process parameters meeting all the required specifications.
- Vendor qualification will be based on successful development, realization and supply of 100 nos. of Silica-aluminosilicate billets meeting all specification requirements.

3. Manufacturing Process (in brief):

I. Raw materials required:

1. *Silica fiber (Length: 4-10mm, Silica Content: 99% minimum, Fiber diameter: 8-16 micron).
2. Unlubricated bulk aluminosilicate fiber (Cera fiber) capable of withstanding 1260 °C
3. Boron trioxide (B₂O₃) (purity >98%)
4. Dispersant (Eg: Polyammonium acrylate, Polyvinyl acetate etc.)
5. Hydrochloric acid

**Silica fiber will be supplied as Free Issue Material from VSSC*

II. Processing steps in brief

- *Acid washing and water washing of both silica and aluminosilicate fibers to remove impurities.*
- *Uniformly dispersing required quantity of the silica fiber, aluminosilicate fiber and B₂O₃ in water with the help of dispersant with high speed mechanical stirrers.*
- *Vacuum molding of the fibers to realize the preform with desired size, (300x300xmm). Thickness shall be ~104 mm.*
- *Drying of the preform for the complete removal of water at 120 °C. -preform density required is 0.15-0.17 g/cc.*
- *Sintering of the preform in high temperature furnace (continuous or batch furnace) at temp of ~1320 °C with slow heating rates. Final density required is 0.2-0.26 g/cc.*
- *Test specimen machining.*

The vendor shall prepare a detailed manufacturing plan and submit for review and approval by VSSC. Manufacturing shall start only after approval of the same.

VSSC personnel should be allowed to witness any of the process stages if required.

4. Facility requirement:

- The vendors shall have necessary facilities or express willingness to establish the required facilities. A list of facilities required for the process is shown below:
 - Fiber dispersing units (Eg: Mechanical stirrer).
 - Molding unit of desired size (300x300) to accommodate the required preform with vacuum suction for water removal
 - Drying ovens: Working temperature range: 120-250 °C.
 - Sintering furnace with temperature capability above 1400 °C (continuous or batch furnace) with slow heating rates shall be required.
 - Diamond coated machining tools
- Party should mandatorily possess all the above items at their own site or express willingness to establish the required facilities at their own cost. Outsourcing of any of these activities by the party is not allowed.
- The party / vendor shall submit a list of facilities presently available at the time of responding to EOI including the detailed specifications. Party shall mention the plan and time line by which all the essential facilities can be established within their premises.

5. Schedule

Entire development and qualification activities shall be completed within 6 months from the date of placement of purchase order.

6. Other Terms and Conditions

6.1. Confidentiality: All documents, information and any items related to product that are received from VSSC shall be kept confidential and shall not be altered with or disclosed to third parties without explicit written permission from VSSC/ISRO.

6.2. Safety: Party shall follow all safety stipulations

6.3. Security: Party shall comply with the security regulation stipulated by VSSC.

7. Criteria for scrutiny of EOI proposals

7.1. Vendors having facilities for fabrication/willing to set up the facility in India will only be considered.

- 7.2. Vendors should have prior experience in development and supply of lightweight ceramic components. A brief description has to be submitted by the vendor stating the length of experience in this domain.
- 7.3. Vendors having prior experience and 100% facilities in-house mentioned in section 4 shall be given 10 marks. Parties shall be given proportional marks out of 10 based on percentage availability of essentials facilities (in-house) while screening. Bidders with in-house R&D facilities and man power shall get added advantage. Details shall be provided in the EoI.
- 7.4. If any facility is not available currently, party can indicate the procurement plan in the EoI which shall be duly considered. However, this shall not affect the development and supply schedule (max. 6 months).
- 7.5. Party shall submit the EoI with all technical details duly filled in the Compliance Matrix attached with the EoI. Incomplete/insufficient data in the Compliance Matrix shall be considered as a disqualification. In addition, if the technical details provided were found incorrect at a later stage, the party shall get disqualified.
- 7.6. For parties who have executed VSSC contracts/ other government contracts previously, necessary documentary evidences shall be attached with the EoI. This shall have due weightage.
- 7.7. The party should be financially stable to undertake the proposed project and shall provide supporting documents.
- 7.8. All information provided by the vendor shall be supported with documentary evidence. Brochure/documents detailing the vendor profile may be submitted. Copy of the previous similar purchase/work orders executed by the vendor also may be appended.
- 7.9. EOI shall also contain the following details
 - Copy of valid manufacturing license.
 - Copy of last 3 years filed tax returns
 - Details of Registration no., PAN card, GST, TIN, NSIC, MSME registration, etc
 - The address/es registered site works / workshop etc.
- 7.10. Party shall provide a comprehensive presentation to VSSC Thiruvananthapuram covering all the above points.
- 7.11. Technical competence will be evaluated by a committee constituted by VSSC which will short list the qualified bidders based on the inputs (Annexure -1: Compliance Matrix) submitted by the party and the presentation provided to

VSSC team. If required a visit to the facility may be conducted by VSSC team for assessment and evaluation. The final evaluation of the responses will be based on (1) inputs furnished against our criteria (2) assessment based on vendor's facility evaluation by the department if required (3) feedback from customers and (4) overall assessment.

7.12. Short listed bidders from the EoI shall be allowed to participate in further tendering procedures through wherein technically suitable, lowest offer will be considered for development and supply of low density Silica-Aluminosilicate tiles.

7.13. The decision of VSSC shall be final and binding, based on inputs furnished by parties backed up with documentary evidence, assessment based on facility visits (if required) and discussions at VSSC.

Vendors who are meeting the requirements as specified in clause 7 of the EOI and are interested in associating with ISRO for Development and supply of Low density silica-aluminosilicate tiles for launch vehicle applications may submit their interest in writing along with copies of supporting documents for verification/evaluation at VSSC. **Qualified Vendors will be shortlisted and detailed proposals from such vendors only will be solicited through a Request for Proposal (RFP).** This qualification process shall be valid for one year.

A checklist (Annexure -1) for the supporting documents to be submitted by the vendor along with the EOI is enclosed.

Annexure - I

Checklist for the supporting documents

(Filled checklist to be submitted by the vendor along with the Expression of Interest)

Sl.	Document/ Proof	Attached or Not-attached with EOI	Remarks
1.	Company registration details (GST Nos. to specify)		
2.	Proof for previous experience in the area of processing of low density ceramic composite		
3.	Certified copies from chartered accountant for balance sheet showing profit/loss for the last 3 years.		
4	Acceptance of mandatory conditions such as BG towards SD/FIM etc.		
5.	Copy of previous purchase orders executed with ISRO/Defense/Aerospace sectors		
6.	Company profile (capability, capacity, licensing requirements, management structure and human resources and their experience, etc. Necessary photographs to be attached		
7.	Company brochure		
8.	Copies of similar purchase/work orders executed by the company		

Annexure II – Facility requirements

Sl.	Equipment	Available/Willing to establish	Remarks
1.	Fiber dispersing units (Eg: Mechanical stirrer).		
2.	Molding unit of desired size (300x300) with vacuum suction for water removal		
3.	Drying ovens: Working temperature range: 120-250 °C.		
5.	Sintering furnace with temperature capability above 1400 °C (continuous or batch furnace) with possibility of slow heating rates		
6.	Diamond coated machining tools		

Compliance Matrix for EoI – Development of silica-Aluminosilicate tile (Please Tick relevant option)				
1	Experience in realization of light weight ceramic materials	Yes	No	If Yes, duration (no. of year of experience) to be indicated:
2	Availability of raw materials (silica fibre, Cera fibre)	Yes	No	
3	Availability of fiber dispersing and moulding units (300x300 mm) and high temperature sintering furnace (>1350 °C)	Yes	No	
4	Availability of space required to set up the equipments	Yes	No	Applicable of if Ans to 3 is No.
5	Agreement to provide Bank Guarantee (or any other mode of surety, mutually agreeable to VSSC and the party) for the consumables if provided	Yes	No	
6	Availability of space for storage raw materials and realized tiles	Yes	No	
7	Safe disposal/returning practice for the expired consumables and process residues	Yes	No	
8	Availability of Quality system and certification	Yes	No	
9	Availability of flame proof electrical fitting conforming to IP-55 Class 2A	Yes	No	
10	Statutory clearance for the facility	Yes	No	
11	The work force employed are adequately covered under prevailing labour laws	Yes	No	

Note: Documentary evidence to be provided to support the response in above compliance matrix. Also, if any augmentation in the existing facility is required to meet the requirement, details of the same to provided with time frame of completion.

Eligibility Criteria Table – Development of silica-alumina tile

Criteria	Weightage	Break-up of Weightage (on 100 scale)
Past experience of the firm for lightweight ceramic material development and realization	A	30
Financial strength of the vendor - Turnover figures of the last three years	B	20
Quality accreditations, Licensing requirements	C	10
Raw material (fibers) availability and In-house facility for the realization of ceramic tiles	D	15
Availability of quality system and certification	E	15
Storage Practice and Traceability system	F	10

Note: Documentary evidence to be provided to support the response in above Eligibility Criteria Table.

Pre-qualification criteria

1. The bidder shall provide
 - (a) A brief description of the background and organization of your firm/entity.
 - (b) The turnover of the company on the basis of the audited accounts of the previous three years.
 - (c) Copy of the last three years Income Tax returns shall be provided.
 - (d) GST No.
2. The bidders shall provide valid authorization certificate from the manufacturer that they are the authorized dealer / distributor /agent for the items in our locality.
3. Your previous experience:
Copies of Purchase Orders awarded to you by any Government/PSU's shall also be attached.
4. Only Class I and Class II Local suppliers as per Make in India Policy are eligible to participate in the bid.
5. Foreign vendors are not permitted to quote
6. The percentage of Local content should be specifically mentioned in the offer, with break-up and location details without which it will be summarily rejected.
7. Preference will be given to Class I Local Supplier and in their absence, Class II Local Suppliers will be considered.
8. Validity Period of Empanelment is 15 years.