



भारतसरकार / Government of India
अंतरिक्ष विभाग / Department of Space
यू.आर. राव उपग्रह केंद्र / U.R.RAO SATELLITE CENTRE
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15.03.2023

विशेष प्रयोजन हेतु छिद्र करने वाले मशीन का विकास तथा आपूर्ति हेतु इच्छा की अभिव्यक्ति

[ईओआई] के लिए आमंत्रण

**Invitation for Expression of Interest [EoI]
for Development and supply of special purpose perforating machine.**

यू.आर. राव उपग्रह केंद्र (यू.आर.एस.सी.), भारतीय उपग्रहों की अभिकल्पना, विकास, संविचन और परीक्षण के लिए भारत सरकार के अंतरिक्ष विभाग के तहत भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) का अग्रणी केंद्र है। अंतरिक्षयान के ऊष्मीय नियंत्रण प्रणाली, अपने कार्य में सक्रिय तथा निष्क्रिय दोनों तरह के विविध घटकों का उपयोग करता है। इनमें से एक निष्क्रिय घटक में कुछ माईक्रॉन की मोटाईवाले अलुमिनाइज्ड पॉलियेस्टर के बहु परत, पॉलियेस्टर नेट तथा अलुमिनाइज्ड पॉलिमाइड उपयुक्त हैं। इनको संरचित करके अंतरिक्षयान के बाहरी सतह पर उपयोग किया जाता है।

U.R. Rao Satellite Centre [URSC] (Formerly known as ISRO Satellite Centre), of Indian Space Research Organization [ISRO] under Department of Space, Government of India is the lead Centre of ISRO for Design, Development, Fabrication and Testing of all Indian made Satellites. The spacecraft thermal control systems adopt various elements which are both passive and active in their functioning. One of the passive element used is the Multilayer Insulation Blanket which comprises multiple layers of aluminized Polyester, Polyester Net and Aluminized Polyimide which are of the thickness of few microns. These are fabricated and implemented on the external surface of the spacecraft.

भूमि पर, अंतरिक्षयान के अंदर वायु को बंधित किया जाता है। जैसे ही अंतरिक्षयान को अंतरिक्ष में प्रमोचित किया जाता है, तब बंधित वायु को बाहर निकलने के लिए मार्ग की आवश्यकता होती है। अतः वायु को निर्गत करने हेतु अलुमिनाइज्ड पॉलिमाइड तथा अलुमिनाइज्ड पॉलियेस्टर के इन तनु परतों को कुछ पैटर्न में छिद्र करना होता है। ये छिद्र उच्च परिशुद्ध तथा त्रुटिहीन छिद्र होने चाहिए

In ground, the air is trapped inside the spacecraft. As the spacecraft is launched to the space, the entrapped air needs path for venting. Hence, these thin layers of Aluminized Polyimide and Aluminized Polyester are to be perforated with certain pattern for the purpose of venting. These perforations should be of high precision and defect free holes.

हम ऐसे विक्रेता को देख रहे हैं जो छिद्रता की प्रौद्योगिकी का विकास तथा इसरो के लिए एक विशेष प्रयोजन के छिद्र करनेवाले मशीन का निरूपण तथा विकास करें।

We are looking for a vendor to develop technology of perforation, demonstrate and develop a Special Purpose Perforating Machine for ISRO.

यह प्रस्ताव यू.आर.एस.सी के लिए “विशेष प्रयोजन छिद्र करनेवाले मशीन के विकास तथा आपूर्ति” के लिए इच्छुक विशेष भारतीय उद्योग द्वारा इच्छा प्रकट करने के लिए आमंत्रण है।

The proposal is to invite Expression of Interest from exclusively Indian Industries who have or are interested for “Development and Supply of Special Purpose Perforating Machine” for URSC.

ई.ओ.आई. दस्तावेज को हमारे वेबसाइट www.isro.gov.in से डाउन लोड किया जा सकता है।

EOI documents can be downloaded from our website www.isro.gov.in

ई.ओ.आई को तकनीकी पैरामीटर के अनुपालन तथा तकनीकी सुविज्ञता, फर्मों की वित्तीय विश्वस्तता के आधार पर मूल्यांकन किया जाएगा।

The EOI will be evaluated on the basis of Compliance to the Technical Parameters & Technical Expertise, Financial soundness of the Firm[s].

आवश्यकता पड़ने पर ई.ओ.आई. की प्रक्रिया को रद्द करने / पुनः जारी करने या सूचना/ब्यौरों को आगे प्राप्त करने के अधिकार को यू.आर.एस.सी आरक्षित रखता है।

URSC reserves the right to cancel/re-issue the process of EOI if the necessity so arises or to seek further information/details.

यदि कंपनी/फर्म को किसी भ्रष्ट या कपटपूर्ण पेशे में भाग लेने के बारे में पाया गया तो उन्हें निविदा प्रस्तुत करने की प्रक्रिया से बहिष्कृत किया जाएगा और उनके ई.ओ.आई दस्तावेज पर विचार नहीं किया जाएगा।

Companies/Firms, if found to have indulged in any corrupt or fraudulent practices, will be debarred taking part in the Tendering process and their EOI Document will not be taken up for consideration.

“इच्छा की अभिव्यक्ति” के साथ आपूर्तिकार/फर्मों को निम्नलिखित सूचना को विस्तृत रूप में उपलब्ध करना होगा:

Along with “Expression of Interest” Suppliers/ Firm[s] should furnish the following information also in detail:

1. कंपनी के पंजीकृत पते के साथ फोन, फैक्स, ई-मेल, वेब विवरण आदि
Registered address of the Companies with Phone, Fax, Email, Web etc.
2. कंपनी/संगठन की स्थिति (स्वामित्व/भागीदारी/निजी/लोक लि. आदि) स्वामित्व, भागीदार, बोर्ड के निदेशक आदि का नाम व पता
Company/Organization Status (Proprietary/Partnership/Private/Public Ltd. etc.) with Name and Address of Proprietor, Partners, Board of Directors, etc.
3. सहयोगी: (क) भारतीय (ख) विदेशी
Associates: (a) Indian (b) Foreign.
4. पिछले तीन सालों में प्रमुख उपभोक्ताओं की सूची के साथ पूरा पता और उनके संपर्क व्यक्ति
List of Major Customers during the last 3 Years with full address and their Contact Persons.
5. अवसंरचना सुविधा का स्वामित्व / उपलब्धता के ब्यौरे
Details of Infrastructure Facilities owned / available.

6. कंपनी के प्रमुख शेयरधारी के नाम तथा पता और उनके शेयर पूँजी का प्रतिशत
Names and addresses of the major Shareholders of the Company and the percentage of their share capital.
7. पूँजी तथा पिछले तीन वित्तीय वर्षों की कुल बिक्री के साथ नवीनतम वार्षिक रिपोर्ट की प्रति Capital and Turnover for the preceding 3 Financial Years with copy of latest Annual Report.
8. उपलब्ध वित्तीय क्षमता/ ऋण सुविधाएँ
Financial Capacity/Credit facilities available.
9. बैंकों के नाम और पता
Name and Address of Bankers.
10. व्यापार संघ जिससे उद्योग संबंधित हैं
Trade Association to which Industry/ies belong to.
11. स्थापना बिक्री/सेवाकर पंजीकरण संख्या
Establishment/Sales/Service Tax Registration Number.
12. व्यवसाय का प्रकार
Nature of Business
13. अपने बैंकों द्वारा जारी की गई फर्म की शोधन / वित्तीय क्षमता
Solvency/Financial capacity of the Firm issued by their Bankers.
14. कोई अन्य सूचना जो उद्योग संगत समझें
Any other information the Industry/ies consider relevant.
15. अपने सामर्थ्य और कमियों को क्षेत्रों के स्पष्टतः उल्लेख करते हुए कंपनियों के प्रोफाइल
The Profile of the Company/ies clearly bringing out the areas of Strength and Weaknesses.
16. ई.ओ.आई में भाग लेने हेतु स्व-मूल्यांकन, तकनीकी और संगठनात्मक क्षमता
Self-Assessment Technical and Organizational Competence to take part in the EOI.

ई.ओ.आई.प्रतिक्रिया का समापन /Completion of the EOI Response:

- a. कंपनी / फर्मों को सलाह दी जाती है कि वे ई.ओ.आई .दस्तावेजों में निहित सभी अनुदेश; नियम व शर्तें; फॉर्मस; आवश्यकताएं तथा अन्य सूचनाओं को ध्यानपूर्वक पढ़ें। ऐसा माना जाता है कि ई.ओ.आई की प्रस्तुति को उसके आशय को पूरी तरह समझने के साथ ई.ओ.आई दस्तावेजों का ध्यानपूर्वक अध्ययन तथा परीक्षा के उपरांत ही किया गया है।
The Company/Firms are advised to study all the instructions; Terms and Conditions; Forms; Requirements and other information in the EOI documents carefully. The submission of EOI shall be deemed to have been done after a careful study and examination of the EOI documents with full understanding of its implications.

- b. इस ई.ओ.आई के लिए उत्तर ,संपूर्ण तथा सभी पहलुओं में पूर्ण होना चाहिए। ई.ओ.आई .दस्तावेज द्वारा आवश्यक सूचनाओं को न प्रस्तुत करने या सभी तरह से ई.ओ.आई .दस्तावेजों को पूरी तरह अनुक्रियात्मक न होने पर प्रस्तुत करना कंपनी/फर्मों के जोखिम पर होगा तथा इससे दस्तावेज की अस्वीकृति भी हो सकती है।
The response to this EOI should be full and complete in all respect. Failure to furnish all the information required by the EOI document or submission of proposal not substantially responsive to the EOI documents to every respect will be at the risk of the Company/Firms and may result in rejection of the document.
- c. प्रस्तुत ई.ओ.आई के सभी पृष्ठों पर संख्या लिखना है तथा प्राधिकृत हस्ताक्षरी द्वारा हस्ताक्षरित होना है।
All the pages of the EOI submitted must be numbered and signed by the authorized signatory.
- d. ई.ओ.आई के संबंध में प्रचार करना सख्त मना है तथा एजेंसी द्वारा प्रस्तुत ऐसे प्रचारित ई.ओ.आई अस्वीकृति के अधीन हैं।
Canvassing in connection with the EOI be strictly prohibited and such canvassed EOI submitted by the Agency are liable to be rejected.

उपरोक्त सभी सूचना सहित “इच्छा की अभिव्यक्ति” अधोहस्ताक्षरी को उपरोक्त संदर्भ संख्या को उद्धृत करते हुए निर्धारित दिनांक व समय तक पहुँचना चाहिए।
“Expression of Interest” with all the above information shall reach the address given below, quoting the above Reference Number on or before the due date & time.

प्रधान /क्रय व भंडार ,Head, Purchase & Stores

यू/राव उपग्रह केंद्र.आर. U R Rao Satellite Centre,

पोस्ट बॉक्स सं.1795 / ओल्ड एयरपोर्ट रोड ,Post Box No. 1795, Old Airport Road,

विमानपुर ,(पो)बेंगलूरु/Vimanapura Post, Bangalore – 560017, भारत/India

ईमेल /E-mail: psb@ursec.gov.in (कृपया यह नोट करें, यदि कोई स्पष्टीकरण हो तो उल्लिखित ई मेल पर भेजे। फिर भी, ई.ओ.आई के लिए उत्तर उपरोक्त उल्लिखित डाक पते पर ही भेजें।)

(Please note that, any clarifications shall be sent to Email mentioned herein. However, response to EOI has to be sent to above mentioned postal address only)

ई.ओ.आई प्रस्तुति की अंतिम तिथि

Last date for submission of EOI : **05.04.2023 at 14 Hours IST**

ई.ओ.आई.खोलने की तिथि व समय

Opening date of EOI : **05.04.2023 at 15 Hours IST**

उपरोक्त सभी सूचना सहित इच्छा की अभिव्यक्ति ,अधोहस्ताक्षरी को उपरोक्त संदर्भ संख्या को उद्धृत करते हुए **05/04/2023**. तक पहुँचना चाहिए।इस प्रस्ताव को पूर्व -ई.ओ.आई अर्हता के रूप में पहल किया गया है। बिना कारण बताएँ इच्छा की अभिव्यक्ति को स्वीकार या अस्वीकार करने का अधिकार यू.आर.एस.सी .आरक्षित रखता है।
“Expression of Interest” with all the above information shall reach the undersigned, Quoting above Reference Number on or before **05/04/2023**. This proposal is initiated as a Pre-EOI Qualification. URSC reserves the right to accept or reject all or any such “Expression of Interest” without assigning any reasons what so ever.

Sd/-

प्रधान, क्रय व भंडार/HEAD, PURCHASE & STORES

**EXPRESSION OF INTEREST (EOI)
FOR
DEVELOPMENT AND SUPPLY
OF
SPECIAL PURPOSE PERFORATING MACHINE**

CONTENT

1. Introduction
2. Scope of Work
 - 2.1 Technology of Perforation
 - 2.2 Requirements of the perforating machine
 - 2.3 Hole Details
 - 2.4 Film Details
3. Criteria for Selection of Vendor
4. Schedule
5. Payment Terms
6. Performance Warranty
7. Service Support

1.Introduction

The spacecraft thermal control systems adopt various elements which are both passive and active in their functioning. One of the passive element used is the Multilayer Insulation Blanket which comprises multiple layers of aluminized Polyester, Polyester Net and Aluminized Polyimide which are of the thickness of few microns. These are fabricated and implemented on the external surface of the spacecraft.

In ground, the air is trapped inside the spacecraft. As the spacecraft is launched to the space, the entrapped air needs path for venting. Hence, these thin layers of Aluminized Polyimide and Aluminized Polyester are to be perforated with certain pattern for the purpose of venting. These perforations should be of high precision and defect free holes.

We are looking for a vendor to develop technology of perforation, demonstrate and develop a Special Purpose Perforating Machine for ISRO.

2. Scope of Work

The machine should be capable of perforating continuously on the coated polyimide or polyester thin film, available in continuous roll form, precisely without any cuts, burrs, serration, edge defects. The schematic of the film feeding and punching is provided below and requirements of the machine are described below

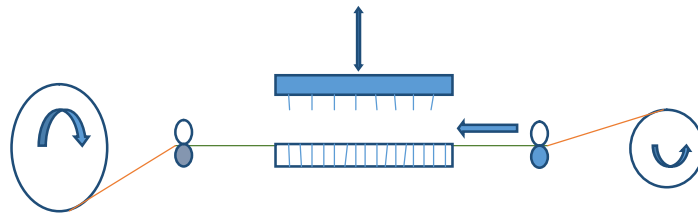


Fig.1: Schematic of the punching technique

2.1 Technology of Perforation

Vendor to develop a suitable perforating technique, either by using a set of mechanical punching system or any non-contact type techniques like Laser based technique.

2.2 Requirements of the perforating machine

- ❖ Suitable Plate or Head to hold a Die with punches or Laser source
- ❖ Supporting or backing platform for the film being fed
- ❖ A suitable tray below to collect the debris / punched materials (Similar to paper punching machine)
- ❖ Unwinding and winding rolls / spools / mandrel to facilitate continuous feeding of the film for perforation and to maintain the required tension for continuous operation.

- ❖ The film rolls to be held in a suitable mandrel and must accommodate variable inner diameter of the core.
- ❖ Suitable drive motor to pull the film and wind
- ❖ Suitable slave motor to unwind the roll
- ❖ The required tension in the film is to be provided suitably and must be adjustable.
- ❖ Punching plate / head may either be connected to a power source or can be driven by suitable cam / arm mechanism or pneumatic operation.
- ❖ The approx. space for the proposed special purpose perforating machine should be within 2.0 m x 2.0 m (Approx.)
- ❖ Punching / perforating rate, feed rate and die/platform size to be decided and optimised with techno-commercial aspects.

2.3 Hole Details

Hole Size	:	Diameter 1.2 to 1.6 mm
Pattern of holes	:	Scattered or Diagonal

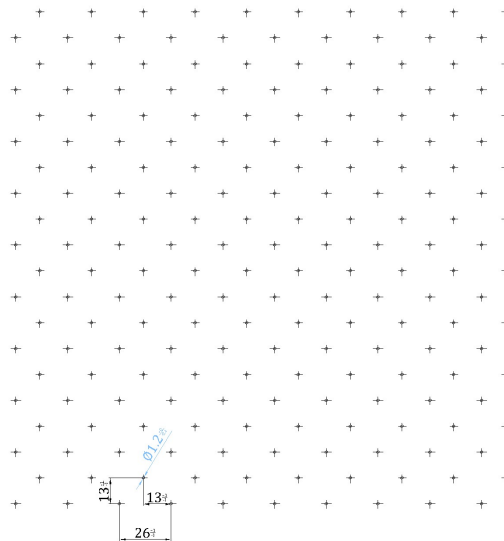


Fig.2: Schematic of the Perforation pattern

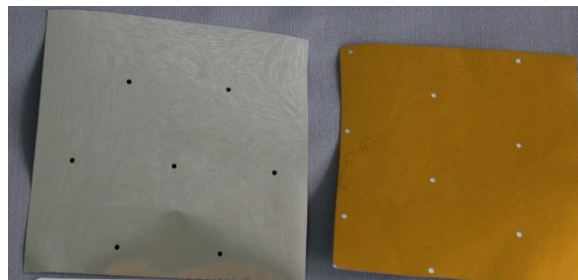


Fig.3 : Photograph of Perforation pattern

2.4 Film Details

2.4.1 Aluminized Polyester

Width of Roll	:	1200 mm to 1500mm
Thickness of film	:	6 to 8 micron
Length of Roll	:	1,00,000 meters
Approx. mass of Roll	:	150 kgs
Tensile Strength of film	:	15 to 20 kg/mm ²
Elongation of film	:	115%

2.4.2 Aluminized Polyimide

Width of Roll	:	1200 mm to 1500mm
Thickness of film	:	25 microns
Length of Roll	:	25,000 meters
Approx. mass of Roll	:	50 kgs
Tensile Strength of film	:	230 MPa
Elongation of film	:	72%

2.4.3 Plain Polyimide

Width of Roll	:	1200 mm to 1500mm
Thickness of film	:	25 to 50 microns thick
Length of Roll	:	25,000 meters
Approx. mass of Roll	:	50 kgs
Tensile Strength of film	:	230Mpa for 25 microns 235Mpa for 50 microns
Elongation of film	:	72 % for 25 microns 82% for 50 microns

Note:

- I. **The above roll comes with a hollow core of variable inner diameter say 25 mm to 200mm and outer diameter of roll 400mm (max)**
- II. **The material of core is either PVC or Hard card board.**

3. Criteria for Selection of Vendor

The vendor should submit their interest for developing this special purpose perforating machine with the following details

- Vendor address and factory details
- List of Facility available with the vendor
- List of similar and other Special Purpose Machines (SPM) built
- Expertise available to build this kind of machines.

The vendor will be reviewed with the above details provided, for consideration to participate in the meeting for discussion of techno commercial aspects.

As perforation technique is very crucial, the process is planned to be executed in three stages.

Stage I: Preliminary discussion

A meeting with those vendors who submitted their interest to develop the machine, shall be held. The date of such meeting shall be intimated by email with details of venue.

Based on the discussion the Request For Proposal (RFP) shall be generated and sent to only those suitable vendors among the participated vendors in the meeting.

Stage II: Development of Perforation Technology and demonstration

- The shortlisted vendors based on the above mentioned selection criteria, will be provided with sufficient numbers of A4 or A3 or any suitable size of the samples of the mentioned films as in para 2.4.
- Vendor need to develop the Perforating technology and demonstrate perforation on the supplied material and make trials of the punches/holes.
- Once punching technology is developed, the vendor need to demonstrate perforation on the supplied material.
- Those vendors, who successfully demonstrate the perforation, only will be considered for further evaluation.
- A committee comprising of ISRO Engineers shall assess the quality of the perforated film.
- The committee shall also visit the shortlisted vendor premises with required number of films. The vendor need to demonstrate the technology of perforation developed by them in their premises to the committee.
- Only those vendors, who satisfies and meets the specified quality parameters, will be qualified for the next stage / to participate in tendering / to quote for building the special purpose perforating machine.

Stage III: (Development and Supply of Special Purpose Perforating Machine)

- The recommended vendors by the committee shall be invited to participate in the two-part tendering process to submit their technical bid and commercial bid, separately, for the special purpose perforating machine.
- The lowest technically suitable vendor will be offered purchase order to build the machine.
- Once the machine is built, the committee shall visit the vendor premises for pre-delivery inspection.
- On satisfactory pre-delivery inspection, machine to be despatched to URSC for installation and commissioning.

4. Schedule

The schedule for the entire process

Stage I	:	60 days from release of EOI
Stage II	:	120 days from the release of RFP
Stage III	:	180 days from release of purchase order

5. Payment Terms

- Stage I: No payment
- Stage II: Equal Payment, as applicable, shall be paid to the shortlisted vendor
- Stage III: 30% along with the purchase order against bank guarantee.
60% on satisfactory pre-delivery inspection and despatch note.
10% on Installation and commissioning at URSC

6. Performance Warranty

Two-year performance warranty to be agreed by the vendor, from the date of installation and commissioning.

7. Service Support

Vendor to ensure minimum 10 years spares and service support, after warranty period of two years, to maintain the machine in good working condition.
