

## **TITANIUM BOTTLES 400/650 LTRS (SEAMLESS)**

1. **Objective.** To design and develop seamless Titanium (Ti) bottles with capacities of 400 and 650 liters for critical applications requiring lightweight, high-strength, and corrosion-resistant pressure vessels. These bottles will cater to the needs of defense, aerospace, marine and other high-performance sectors.
2. **Background.** Pressure vessels are essential for storing and transporting high-pressure gases in various industrial and defense applications. Traditional materials such as steel and aluminum are often heavier and less resistant to corrosion in harsh environments. Titanium, with its exceptional strength-to-weight ratio and corrosion resistance, offers an ideal solution for creating durable, seamless bottles suitable for demanding conditions.
3. **Problem Statement.** Existing pressure vessels are often bulky, prone to corrosion, and require frequent maintenance, which increases operational costs and limits efficiency. Seamless Ti bottles are needed to address these challenges, offering lightweight and long-lasting alternatives for high-pressure applications while reducing logistical and operational burdens.
4. **Proposed Solution.**
  - (a) **Seamless Design:** Develop high-precision, seamless Ti bottles to ensure structural integrity under extreme pressure conditions.
  - (b) **Lightweight Construction:** Leverage Titanium's high strength-to-weight ratio to create bottles that are easier to handle and transport.
  - (c) **Corrosion Resistance:** Utilize Titanium's natural resistance to harsh environmental conditions to extend the service life of the bottles.
  - (d) **Scalability:** Establish a production framework for manufacturing bottles in 400L and 650L capacities to meet diverse operational requirements.
5. **Expected Outcome.**
  - (a) Lightweight, durable, and corrosion-resistant Ti bottles suitable for high-pressure applications.
  - (b) Reduced maintenance costs and enhanced operational efficiency in defense, marine and aerospace sectors.
  - (c) Deployment-ready prototypes for testing and validation.
6. **Key Deliverables.**
  - (a) Functional prototypes of 400L and 650L seamless Ti bottles.
  - (b) Validation reports demonstrating performance under high-pressure and harsh environmental conditions.

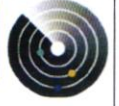
- (c) Manufacturing guidelines and operational manuals for large-scale production.
- (d) Integration plans for specific defense and industrial applications.

7. **Strategic Relevance.** The development of seamless Ti bottles will enhance India's self-reliance in advanced material manufacturing and support critical applications in defense, marine and aerospace. It aligns with the nation's indigenization goals and provides opportunities for export in global markets. The project also paves the way for innovation in lightweight and high-performance materials for a wide range of industries.

8. **Future Expectations.** The seamless Ti bottles will revolutionize high-pressure storage by providing lightweight, durable, and corrosion-resistant solutions for critical defense, marine and aerospace applications. They will reduce operational costs through extended service life and minimal maintenance requirements. The technology's scalability will enable its adoption across industries like medical, energy, and automotive sectors. Indigenization of this advanced material technology will strengthen India's self-reliance and reduce dependency on imports. Additionally, the innovation has significant export potential, positioning India as a leader in high-performance material manufacturing.



## TECHNOLOGY DEVELOPMENT FUND (TDF) SCHEME



### **FEASIBILITY CUM RFI RESPONSE FOR THE PROJECT REQUIREMENT UNDER TDF SCHEME (PROFORMA)**

1. **Name of the Institute** (Industry/Academia):
2. **Contact details:**
  - a. Email
  - b. PoC
  - c. Address
3. **Title of the project requirement:**
4. **Project Description** (Define broad understanding of the project requirement and proposed solution under the project).
5. **Briefly detail the proposed technical solution in terms of subsystem/submodule levels.**
6. **Road map for achieving the proposed outcome (Development Plan Phase wise -Max 5 phases).**
7. **Development and production Estimates:**
  - i. Estimated time required for development of the proposed technology /product (In Months).
  - ii. Estimated cost required for the for development of the proposed technology /product (BQs of submodules/subsystems if any pls attach).
  - iii. Estimated production cost of the end product after successful development ( per unit or batch cost).
  - iv. Whether the industry has already done any Suo moto design and development of the proposed product/technology at Technology Readiness Level – Yes/No
  - v. Details of Suo moto design and development done if marked Yes in previous question (within 250 words).
  - vi. Essential infrastructure required for development of the proposed product/technology for which funding is required.
8. **Technical strength in terms of manpower.**
9. **Relevant Work Experience.**
10. **Any other relevant information**

Queries if any and the reply in PDF FORMAT to be submitted online addressing to;

TO,

**THE DIRECTOR TDF, DRDO**

**DRDO BHAWAN, RAJAJI MARG, NEW DELHI 110011**

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