

Notice for inviting Expression of Interest (EOI)

Disclaimer

Rail Wheel Factory (hereinafter referred to as "RWF") has prepared this Expression of Interest (EOI) document solely to assist prospective bidders in deciding whether to submit a bid or not.

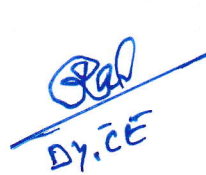
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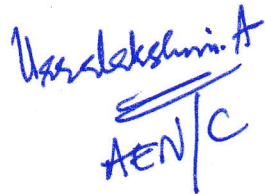
This document is not intended to be exhaustive, and interested parties are encouraged to conduct their own independent investigations, including site visits, as necessary, to assess the feasibility of their participation in the EOI process.

The information provided herein is non-binding on Rail Wheel Factory, its authorities, officers, employees, Rail Wheel Factory reserves the right to:

1. Discontinue the EOI or bidding process at any stage without providing reasons.
2. Alter the timeline specified in this document.
3. Modify the process or procedures outlined in the EOI.
4. Refuse to engage in discussions about this EOI with any party submitting an application.

Rail Wheel Factory will not be liable for any costs or expenses incurred by parties in connection with the preparation, submission, or discussion of their EOI submissions, including any inquiries or site visits. No reimbursement of costs of any kind will be provided.


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**Subject: Alternate/sustainable use of heterogeneous mix of Fume dust,
Phenolic Coated moulding sand & used Refractory bricks at RWF**

1.0 Introduction

Rail Wheel Factory (RWF), under the Ministry of Railways, is a premier production unit engaged in the manufacturing of wheels, axles, and wheelsets. Committed to sustainable and eco-friendly practices, RWF actively explores innovative solutions for utilizing industrial by-products.

Fume dust, Phenolic Coated moulding sand & used Refractory bricks are by-product generated in substantial quantities during the steel manufacturing process at RWF, represents an underutilized resource with potential applications. Traditionally considered waste, Fume dust, Phenolic Coated moulding sand & used Refractory bricks can be repurposed to promote sustainability and resource efficiency in the construction sector.


The fume dust from both the **Primary Fume Extraction System (PFES)** and **Secondary Fume Extraction System (SFES)** at RWF primarily consists of:

- **Iron oxides (Fe_2O_3)**
- **Calcium oxide (CaO)**
- **Magnesium oxide (MgO)**
- **Manganese oxide (MnO)**
- **Silicon dioxide (SiO_2)**
- **Alkalies ($\text{Na}_2\text{O} + \text{K}_2\text{O}$)**
- **Aluminium oxide (Al_2O_3)**
- **Sulphur and phosphorus**

In addition, the heterogenous mixture also contains Phenolic Coated moulding sand & used Refractory bricks. This composition offers significant potential for use in developing innovative, eco-friendly construction materials such as paver blocks, CC blocks and any other innovative products.

Purpose of calling this EOI	Through this Expression of Interest (EOI), RWF invites proposals from reputed organizations, research institutions and individuals with expertise in the development of construction products or practices to explore alternate/sustainable uses of heterogeneous mix of Fume dust, Phenolic Coated moulding sand & used Refractory bricks for the internal use and also for developmental of commercial product.
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2.0 Scope of Work: Use of heterogeneous mix of Fume dust, Phenolic Coated moulding sand & used Refractory bricks in Construction Products

1. Material Study and Feasibility Analysis

- **Sampling and Testing:** Conduct detailed sampling of heterogeneous mix of Fume dust, Phenolic Coated moulding sand & used Refractory bricks available at RWF to analyse its physical and chemical properties, assessing its suitability for construction applications.
- **Material Behaviour Investigation:** Study the interaction of heterogeneous mix of Fume dust, Phenolic Coated moulding sand & used Refractory bricks with other construction materials such as cement, sand, and aggregates to determine the most effective combinations.
- **Strength Evaluation:** Experiment with different mix proportions to evaluate the strength of heterogeneous mix of Fume dust, Phenolic Coated moulding sand & used Refractory bricks -based construction products (e.g., paver blocks, tiles, bricks).

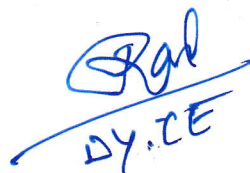
2. Product Development and Testing

- **Manufacturing of Construction Products:** Manufacturing construction products (e.g., paver blocks, tiles, bricks) at RWF
- **Utilization of Lab Facilities:** RWF will extend access to its lab facilities for the testing of the products free of cost.
- **Product Testing:** Evaluate the durability, strength, and environmental safety of the manufactured products using standardized testing protocols, including:
 - **Workability:** Assess the ease of mixing and handling the fume dust-based mixture.
 - **Segregation and Bleeding:** Test for separation of components and excessive bleeding in the mixture.
 - **Compression Test:** Evaluate the compressive strength of the products.
 - **Flexural Test:** Assess the flexural strength to determine the bending resistance.
 - **Water Absorption Test:** Measure the water absorption rate of the products to assess durability.

3. Environmental and Economic Impact Assessment

- **Environmental Benefits:** Quantify the environmental benefits of reusing the by-product, including waste reduction.
- **Cost-Effectiveness and Scalability:** Assess the cost-effectiveness of the proposed solution and evaluate its scalability for large-scale production of construction products.

4. Regulatory and Safety Compliance


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- **Adherence to Standards:** Ensure compliance with construction industry standards, environmental regulations, and safety protocols.

5. Documentation and Reporting

- **Reporting of Findings:** Provide a comprehensive report that includes methodologies, findings, test results, and recommendations for large-scale implementation of by-product-based construction products.

6. Setting Up Lab Facilities

- **Lab Setup by Agency:** If required, the agency shall establish the necessary lab facilities at RWF premises to carry out the required tests and product evaluations.

7. Utilities

- **Free Provision of Water and Electricity:** Water and electricity will be provided free of cost for the R&D Activity such as moulding of various test specimens.

3.0 Eligibility Criteria

Interested parties must meet the following criteria:

1. Proven expertise in developing sustainable construction materials or handling industrial by-products.
2. A track record of successful projects in waste management, materials research, or related fields.

4.0 Evaluation Criteria

Proposals will be assessed based on:

1. Innovation, feasibility, and technical soundness of the proposed solution.
2. Environmental and economic benefits offered by the solution.
3. Applicant's expertise and relevant experience.
4. Scalability and practicality of implementation.

5.0 General Terms and Conditions

1. Submission of an EOI does not guarantee selection or funding.
2. RWF reserves the right to accept, reject, or request modifications to proposals.
3. Selected applicants may be invited for detailed discussions or presentations.
4. Intellectual property rights for developed solutions will be governed by mutual agreement.

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Composition of fume Dust

1.	The constituents of Fume dust are	Constituents	PFES	SFES
		% Fe ₂ O ₃	74.66	66.72
		% CaO	4.99	8.89
		% MgO	3.72	7.59
		% MnO	8.98	6.88
		% SiO ₂	5.00	5.31
		% Alkalies (Na ₂ O + K ₂ O)	1.17	1.63
		% Al ₂ O ₃	0.17	0.61
		% Sulphur	0.070	0.380
		% Phosphorus	0.030	0.040
2.	Sieve Analysis of heterogeneous mix (Phenolic coated Moulding sand & Fume dust)	To be ascertained by the firm		
3	Time period required to submit a detailed report.			

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