NATIONAL ALUMINIUM COMPANY LIMITED (NALCO)

invites

EXPRESSION OF INTEREST (EOI)

for

Inviting consultants in the field of Aluminium casting / Rolling for ensuring better quality of products and increasing efficiency of the processes being practiced at its Cast house & FRP.

EOI Document No: NBC/R&D/87/2863 **Dated: 19.05.2026**

EOI Submission By Date: 09.06.2026

National Aluminium Company Ltd.

NALCO Bhavan, P/1, Nayapalli,
Bhubaneswar, Odisha -751013, India

Contents

Page

1. Background & Objective

National Aluminium Company Limited (NALCO), a 'Navratna' CPSE of Govt. of India, was established on 7th Jan' 1981, with its registered office at Bhubaneswar, Odisha in India. It is one of India's largest integrated complexes in the aluminium value chain having bauxite mining, alumina refining, aluminium smelting including power generation and coal mines.

The Company operates:

- 6.825 million TPA Bauxite Mine and a 2.1 million TPA Alumina Refinery located at Damanjodi, Koraput district, Odisha.
- 0.46 million TPA Aluminium Smelter, a 1,200 MW Captive Power Plant and 4.0 million TPA Utkal D&E Coal mines at Angul, Odisha.

NALCO is registering strong growth in its performance year on year. Recently, in FY 2024-25, the Company achieved its highest ever revenue of Rs 16,788 crore and highest ever net profit of Rs 5,325 Crore.

The Company has a vison "*To be a Premier and Integrated company in the Aluminium value chain with strategic presence in Mining both domestic & global, Metals and Energy sectors*".

NALCO Smelter Plans:

The present capacity of smelter is 4.60 lakh TPA. Alumina is converted into primary aluminium through a smelting process by using electrolytic reduction. From the pot-line, the molten aluminium is routed to either the casting units, where the aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips and alloy ingots, or to RP where the molten aluminium is rolled into various cold-rolled products or cast into aluminium strips. Aluminium products are sold in the domestic market and also exported through Kolkata, Paradeep & Vizag ports.

In order to achieve better quality of products and increasing efficiency of the processes being practiced at its Cast house & FRP, NALCO intends to enter into a partnership with a consultant in the field of Aluminium. This EOI seeks technical/ process consultancy in the areas as mentioned below.

- **Enhancement of Elongation & electrical Conductivity properties of Aluminium Wire rod**.
- **A Decrease in Aluminium Billets homogenizing time & cooling cycle time of billets after homogenizing.**
- **Reduction of Annealing cycle time for Flat cold rolled Products with same Mechanical Properties.**

The **objective of this EOI** is to identify competent consultants with expertise in Aluminium casting and Rolling. The selected parties will subsequently be invited to participate in a detailed Request for Proposal (RFP) process for finalizing the working mode.

The objective of this assignment is to optimize process parameters, reduce cycle times, improve product quality to enhance plant performance in the areas related to:

- Wire rod elongation & electrical conductivity properties.
- Billet homogenization & cooling
- Annealing cycles for Flat cold Rolled Products

Annexure (I-III) provides an insight into the areas of improvement in consideration.

2. Indicative Scope of work

The scope of work for the 3 improvement areas proposed above shall include, but not limited to

2.1 Improvement of elongation & electrical Conductivity properties of Aluminium Wire rods.

To improve wire rod elongation to a 24% minimum from 22% & electrical conductivity from 61.8% to the 62.2% IACS. the scope shall include

i. **Process Audit -** for studying current parameters to identify variables impacting elongation & electrical conductivity in wire rods.

ii. **Gap Identification-** To Pinpoint specific deviations in the current workflow that prevent reaching target.

iii. **Optimization & Trial -** For recommending process modifications, followed by trial runs to validate the improvements maintaining the UTS in the range of 9 to 11.5 Kgf/mm^2.

2.2 Reduction in Billet Homogenization Time & Cooling Cycle Time after Homogenization

To optimize homogenization time to 6 hours and decrease the cooling cycle time to 30 minutes maintaining metallurgical properties, the scope may include

i. **Process Audit:** for studying current parameters to identify variables impacting the homogenization cycle time & the cooling cycle time.

ii. **Gap Identification:** To Pinpoint specific deviations in the current workflow that prevent reaching target.

iii. **Validation Trials:** For recommending process modifications, followed by trial runs to validate the improvements.

2.3 Reduction in Annealing Time for Flat cold Rolled Products

To optimize the annealing process and reduce it to 6-hour cycle time from present 12 hour cycle time, the scope shall include

i. **Process Audit:** Analyze the current annealing cycle, focusing on furnace heat transfer and coil loading patterns.

ii. **Gap Identification:** To Pinpoint specific deviations in the current workflow that prevent reaching target.

iii. **Cycle Optimization:** Recommend rapid annealing techniques and improved furnace utilization strategies to shorten ramp-up and soaking stages.

iv. **Validation Trials:** Conduct test runs to confirm that the faster cycles consistently meet all physical and metallurgical specifications.

Note:- This collaboration shall be instrumental in optimizing operational efficiency, reducing operational costs & enhancing performance at the existing facility with short term deadline of around 1 year (for each area of improvement).

Interested parties will be invited to submit a detailed proposal and may be requested to provide presentations.

3. Deliverables & Expected Outcomes.

The deliverables shall include:

- Gap analysis report for each area of improvement
- Process optimization plan for each area with cost benefit analysis.
- Trials reports with results along with updated SOPs.

Expected Outcomes from these improvement projects shall be:

- Improvement in wire rod properties:
- Elongation to ≥ 24%
- Conductivity to ≥ 62.2% IACS
- Decrease in Homogenization time by around 50%
- Decrease in Homogenization Cooling time to around 30 minutes
- Reduction in Annealing cycle time by around 60–70% (FRP)

4. Pre-Qualification Criteria for selection

The prospective Consultant must meet all of the following minimum qualifying criteria:

a) The Consultant must have provided technical consultancy for Aluminium casting and Rolling & should possess a rich knowledge of primary aluminium casting facilities similar/ comparable to that of NALCO. Details to be provided as per Annexure-IV.

b) The participating Consultant need to submit the filled in form in Annexure-V.

c) Documentary evidence, such as copy of work order, completion certificate and other relevant documents (notarized) to demonstrate compliance with the above criteria must be submitted.

OR

a. The consultant must have experts in Primary Aluminium Cast House operations. The experts should be Graduate Engineers in Metallurgy, Chemical, or Mechanical Engineering possessing rich working experience of minimum 10 years in Primary Aluminium Cast House operations for various products such as Wire Rod Mill, Billet Casting, and Cold Rolling Mill. The expert should also be involved in above mentioned quality improvement projects.

b. The details of the experts, along with their experience, shall be provided in the following format:

Serial No	Name of Expert	Name of Industry Where Expert has worked	Nature of Plant/Operation	Duration

c. Towards documentary evidence, for above interested bidders has to submit self-certified CV of expert and countersigned by authorized representative of the bidder to be furnished.

5. Submission Requirements & Format

The EOI submission must include the following, duly signed by the authorized signatory of the applicant:

a) Profile of the Consultant – Including organizational structure/chart, core areas of expertise, details of global presence, and relevant project case studies with contactable client references.

b) Compliance Statement – A point-wise statement confirming fulfilment of each Minimum Qualification Requirement as specified in Section 4, along with supporting documentary evidence.

Note on Submission Format:

- Language: All submissions shall be in English. Supporting documents in any other language must be accompanied by an authenticated English translation.
- Authorization: All pages of the submission must be signed and stamped by the authorized signatory of the applicant.
- Completeness: Submissions with incomplete information, missing annexures, or without required documentary evidence are liable to be summarily rejected.
- Confidentiality: All information submitted will be treated as confidential and will be used solely for the purpose of the EOI.

6. Timeline for submission

All submissions must be received by date 09.06.2026. Late submissions will not be considered.

7. Terms & Conditions

7.1 Confidentiality & NDA

NALCO reserves the right to sign a mutual Non-Disclosure Agreement (NDA) with shortlisted respondents prior to sharing site-specific data, DPR details or to facilitate site visits and deeper technical discussions.

7.2 Clarifications

Any clarifications may be requested in writing to Shri Ananyaja Khuntia, DGM(Met.) at the Email address: ananyaja.khuntia@nalcoindia.co.in and Mobile: +91- 8260355814 by 06.06.2026. NALCO may issue clarifications that will be shared with all prospective respondents.

7.3. Disclaimer on no Commitment

This EOI is for information gathering only. It does not constitute a commitment by NALCO to proceed with any licensor or to issue an RFP. NALCO reserves the right to accept/reject any or all submissions without assigning reasons.

7.4 General Conditions

i. No EMD is required to be submitted by the Party.

ii. NALCO shall not be liable for any mistake or error by the Party in respect of the submissions.

iii. NALCO will not be responsible for any related loss to the parties due to delay/

cancellation etc. of this EOI process.

iv. The Party shall bear all costs associated with the preparation or delivery of its EOI.

v. NALCO reserves its right to call for original of the supporting documents for verification if so deemed fit and also cross-check for any details as furnished by the Party from their previous clients etc. The Party shall have no objection in this regard.

vi. NALCO will examine the EOIs for its completeness, whether the documents have been signed, complete in all respect and the details furnished are generally in order. NALCO if desires may seek feedback from other customer to authenticate the submissions and performance feedback.

vii. The parties may note that mere submission of EOI shall not entitle automatic qualification/selection of the Party for the technology licensing agreement.

viii. NALCO reserves the right to accept or reject any EOI and to annul the invitation of EOI process and reject all EOIs at any time without thereby incurring any liability to the affected Party/Parties(s) or any obligation to inform the affected Party/Parties(s) of the grounds for the NALCO's action.

ix. This EOI is not a commercial offer and is issued with no commitment. NALCO reserves the right to withdraw the EOI in the best interest of the organization and change or vary any part thereof at any stage. NALCO also reserves the right to disqualify any bidder, should it be so necessary at any stage.

x. Timing and sequence of events resulting from this EOI shall ultimately be determined by NALCO

xi. No oral conversations or agreements with any official, or employee of NALCO shall affect or modify any terms of this EOI and any alleged oral agreement or arrangement made by a bidder with any department, official or employee of NALCO shall be superseded by the definitive agreement that results from this EOI process. Oral communications by NALCO to bidders shall not be considered binding on NALCO, nor shall any written materials provided by any person other than authorized person from NALCO.

xii. Neither the bidder nor any of the bidder's representatives shall have any claims whatsoever against NALCO or any of their respective officials or employees arising out of, or relating to this EOI or these procedures (other than those arising under a definitive service agreement with the bidder in accordance with the terms thereof).

xiii. Bidders may seek any clarification from NALCO before submitting their proposal in writing/ through email only, from the authorized person.

xiv. For all the bids received before the last date and time of bid submission, the proposals and accompanying documentation of the proposal will become the property of NALCO and will not be returned after opening of the pre-qualification proposals.

xv. By submitting a proposal, each bidder shall be deemed to acknowledge that it has fully understood the requirements of Nalco and informed itself as to all existing conditions and limitations.

8. Instruction to bidders

i. Bidders are expected to examine carefully the contents of all the documents provided. Failure to comply with the requirements of EOI will be at the Bidder's own risk.

ii. It would be deemed that prior to the submission of the application, the bidders:
   - Made a complete and careful examination of requirements and other information set forth in this EOI request document.
   - Received all such relevant information as it has requested from NALCO.

iii. NALCO shall not be liable for any mistake or error by the applicant in respect of the above.

iv. The bidder shall not disclose confidential information to any third party without prior written approval of NALCO.

v. The applicant shall submit an undertaking that there is no pending court cases or otherwise on them by the Govt. or Govt. Depts. / Statutory authorities' which might infringe upon their rights to participate in such empanelment with a CPSE.

vi. NALCO reserves the rights to make use of available data for evaluation of the application that have been submitted against this request.

vii. The applicants may note that mere submission of application shall not entitle automatic qualification of the EOI application.

viii. Telefax/ E-mail/ CD may not be accepted unless accompanied by formal signed documents. NALCO takes no responsibility for delay, loss or non-receipt of document sent by Post/Courier.

ix. NALCO reserves the right to accept or reject any application and to annul the EOI process and reject all applications at any time without thereby incurring any liability to the affected bidder(s) or any obligation to inform the affected bidder(s) of the grounds for the NALCO's action.

x. The application for EOI complete in all respect should be sent to the office of the
Contact Person: Shri Ananyaja Khuntia, DGM(Met.)
NALCO Bhavan, P/1, Nayapalli,
Bhubaneswar, Odisha -751013, India
Email: ananyaja.khuntia@nalcoindia.co.in
Mobile: +91- 8260355814
On or before 09.06.2026, 5:00 PM IST.

xi. Any bidder requiring any clarification on the terms and conditions for this EOI request document may notify NALCO in writing or e-mail. The applicants must send their queries at least 7 days prior to the last date for submission of application only in the address mentioned at clause (x). Correspondence sent to any other person/address may not be accepted.

Annexure-I

OVERVIEW OF THE PROPERZI WIRE ROD MILL AT NALCO IN CAST HOUSE

The Process:-

The "Properzi" method consists of Wheel and Belt casting system. In this process the mill is designed to convert molten aluminium directly into wire rods in a single, continuous process.

Casting: Molten aluminium is poured into a groove on a rotating copper wheel, which is sealed by a moving steel belt. Water sprays cool the metal, solidifying it into a continuous "cast bar."

Rolling: The hot cast bar is immediately fed into a multi-stand rolling mill. NALCO's mill typically uses the 3-roll technology which applies pressure from three sides simultaneously. Emulsion oil is used as lubricant.

Coiling: The finished rod is cooled and wound into large coils.

Key Technical Specifications of Wire Rod Mill:

Technology Provider: Continuus-Properzi , Spa, Italy.
No. of Mills: 2 (WRM-1 and WRM-2)
Process Type: Continuous Casting and Rolling (CCR).
Input Material: Molten aluminum directly from the smelting pots (potline).
Primary Product: 9.5 mm and 12mm diameter aluminum wire rods.

Product Range

NALCO produces several grades of wire rods using this mill, primarily targeted at the electrical and conductor industries.

The broad product grades currently manufactured are detailed below:

Sl.	Product	Product Code	Electrical Conductivity % IACS
1	EC Wire Rod in Coil form (9.5 mm dia)	**WE 10**	≥ 61.50
2	EC Wire Rod in Coil form (9.5 mm dia)	**WE 20**	61.000 to 61.499
3	CG Wire Rod in coil form (9.5 mm dia)	**WC 10**	< 61.00
4	EC Wire Rod in Coil form (11.95 mm dia)	**WE 12**	≥ 61.50
5	EC Wire Rod in Coil form (11.95 mm dia)	**WE 22**	61.000 to 61.499
6	CG Wire Rod in coil form (11.95 mm dia)	**WC 12**	< 61.00

Sl.	Product	Product Code	Electrical Conductivity % IACS
7	EC Flipped Wire Rod in Coil form (9.5 mm dia)	**WF 10**	≥ 61.50
8	EC Flipped Wire Rod in Coil form (9.5 mm dia)	**WF 20**	61.000 to 61.499
9	CG Flipped Wire Rod in coil form (9.5 mm dia)	**WF 30**	**<** 61.00
10	EC Flipped Wire Rod in Coil form (11.95 mm dia)	**WF 12**	≥ 61.50
11	EC Flipped Wire Rod in Coil form (11.95 mm dia)	**WF 22**	61.000 to 61.499
12	CG Flipped Wire Rod in coil form (11.95 mm dia)	**WF 32**	**<** 61.00

Annexure-II

OVERVIEW OF THE HOMOGENISING FURNACES AT NALCO IN BILLET CASTING PLANT

The Process:-

The Billet Casting Facility undertakes the casting, homogenizing, and finishing of aluminium alloy billets across a wide range of grades, meeting the requirements of architectural, structural, engineering, and electrical-grade extrusion sectors.

Homogenizing Furnace Facility Scale – Production Lines and Make

The Homogenising Facility at the Billet Casting Facility, Smelter Plant, NALCO, Angul comprises two (2) Electrically Heated Bogie Hearth Type Aluminium Log Homogenising Furnaces.

Homogenizing Furnace is a double-ended car bottom type designed with two bogies operating within a single chamber, ensuring continuous loading/unloading while the other bogie is in service. The furnace chamber is heated by electrically powered heater batteries mounted on the roof of the furnace chamber. Charge material is uniformly heated through forced hot-gas circulation by recirculation fans with reversible flow, and heat distribution is achieved through scoops and guide vanes.

Key Technical Specifications of Homogenizing Furnace:

Furnace Provider: M/s Wesman Engineering Co. Ltd., Calcutta.
No. of Furnaces: 2
Type of Furnace: Electrically Heated Bogie Hearth (Double-ended, Car Bottom)
Primary Product: 100 mm to 250 mm dia × 6500 mm long aluminum billets.

Product Range

The broad product grades currently manufactured are detailed below:

Sl.	Product Code	Alloy Series	Key Composition Range (Si% / Mg%)
1	CH01	6xxx (general)	Si: 0.30–0.70 / Mg: 0.40–0.90
2	CH10 / CH11	6063-type	Si: 0.38–0.48 / Mg: 0.47–0.57
3	CH20	6063A-type	Si: 0.49–0.55 / Mg: 0.58–0.70
4	CH64	6060-type	Si: 0.43–0.53 / Mg: 0.46–0.52
5	CH65	6060/63-type	Si: 0.44–0.60 / Mg: 0.39–0.51

Sl.	Product Code	Alloy Series	Key Composition Range (Si% / Mg%)
6	CH90	Tight-tolerance 6063	Si: 0.40–0.45 / Mg: 0.40–0.45
7	CH91	6063-variant	Si: 0.40–0.48 / Mg: 0.47–0.57
8	CH61	6061-type	Si: 0.40–0.80 / Mg: 0.80–1.20
9	CH63	6xxx	Si: 0.30–0.70 / Mg: 0.40–0.90
10	CH51 / CH82	6xxx – Mn-alloyed	Si: 0.60–1.30 / Mn: 0.40–1.00
11	CH05	6xxx – higher Si	Si: 0.60–1.00 / Mg: 0.45–0.80
12	CH60	6xxx – mid-range	Si: 0.30–0.60 / Mg: 0.35–0.60
13	CH16 / CH50 / CH70	1xxx – high purity	Si: ≤0.25 max / Al: ≥99.50–99.70%

Billet Dimensional Standards:

Parameter	Standard	Tolerance	Remarks
Diameter	127 / 152 / 178 / 203 / 229 / 254 mm	±1.5 mm	Six standard sizes
Length	Up to 5800 mm	±5 mm per 1000 mm length (or part thereof)	Cut-length billets
Bow	2 mm per meter	10 mm maximum per log	
Squareness	1 mm per 100 mm diameter	—	

Annexure-III

OVERVIEW OF THE SECO-WARWICK ANNEALING FURNACES AT NALCO IN ROLLING PLANT

The Process

Nalco has also set up a 50,000 MT per annum Rolled Products Unit, integrated with the Smelter Plant at Angul, for production of aluminium cold rolled sheets and coils from continuous caster route, based on the advanced technology of FATA Hunter, Italy. In order to vary the temper of the coils or sheets & to relieve internal stresses induced during cold rolling, coils are subjected to annealing in SECO-WARWICK Annealing furnaces.

Technical details

Annealing Furnace Provider: SECO WARWICK, USA.
No. of Annealing Furnaces: 3 (2 Annealing & 1 Homogenizing)
Capacity: 40 MT

Please visit the product section of our website , www.nalcoindia.co.in, for an elaborate product specification.

Annexure-IV

EXPERIENCE CRITERIA & PROVEN TRACK RECORD

List top five Industrial consultancy or projects in the field of Aluminium casting ongoing/ completed, if any (in last 7 years)

Name of the Project	Industry where the consultancy was carried out	Duration of the project (in years) From - To	Status of the project as on date

Annexure-V

DETAILS OF THE ORGANIZATION

Sl No	Details	
1	Name of the Company/ Organization	
2	Registered office	
3	Year established	
4	Website	
5	Parent company / group, subsidiaries.	
6	Point of contact for EOI (name, email, phone).	
7	Nature of Business	
8	Reference Plants	
	Plant name, owner, country -	
	Tenure of association	
	Details of the Work (in less than 1000 words)	
	Contact reference	
8	Technology ownership (whether proprietary, licensed or third-party)	
9	Basic Engineering Package (BEP) / Basic design package availability?	
10	Any additional features	

Declaration & Signature