संवादपत्र
Newsletter

JNARDDC
RECOGNISED AMONG
INDIA'S TOP 5 INNOVATIVE R&D INSTITUTIONS BY CII

January 2026, Volume 12, Number 2 (12.2)

JNARDDC Recognized Among India's Top 5 Innovative R&D Institutions by CII

JNARDDC has been recognised among the Top Five Innovative Research Institutions in India for 2025 by the Confederation of Indian Industry (CII), following a rigorous evaluation by an eminent Grand Jury assessing innovation capability, research outcomes, translational impact, and alignment with national priorities. The Centre was formally felicitated at the CIIInnovation Award Ceremony 2025. The recognition highlights JNARDDC's leadership in applied R&D for aluminium and non-ferrous metals, with strong focus on sustainability, circular economy, recycling, and critical minerals, and its contributions aligned with Atmanirbhar Bharat, the National Critical Mineral Mission, and Viksit Bharat 2047.


CII
Confederation of Indian Industry
CII INDUSTRIAL INNOVATION AWARDS 2025
CII Industrial Innovation Awards 2025
This is to certify that
Jawaharlal Nehru Aluminium Research Development and Design Centre Nagpur
is recognized as
Top 5 Innovative Research Institute
December 2025
Mr. Vipin Sondhi
Chairman
CII Industrial Innovation Awards 2025
Mr. Alok Nanda
Co- Chairman
CII Industrial Innovation Awards 2025
Prof. Rishikesha T Krishnan
Co-Chairman
CII Industrial Innovation Awards 2025
Dr. Ashish Mohan
Executive Director
Technology, Innovation & IP,
Confederation of Indian Industry

CII Award

Director JNARDDC at CII Summit

निदेशक का प्रतिवेदन
DIRECTOR'S MESSAGE

हमारे सभी पाठकों, शुभचिंतकों और संरक्षकों को हार्दिक अभिवादन!

वैश्विक एल्युमिनियम बाज़ार ने वर्ष 2026 की शुरुआत मजबूत स्थिति के साथ की है, जहाँ LME की कीमतें कई वर्षों में पहली बार $3,000 प्रति टन से अधिक हो गई हैं। यह वृद्धि किसी अस्थायी उछाल के बजाय एक संरचनात्मक परिवर्तन को दर्शाती है। चीन द्वारा 45 मिलियन टन के उत्पादन सीमा को लागू करना तथा मध्य पूर्व—जो वैश्विक उत्पादन का लगभग 9% हिस्सा रखता है—में भू-राजनीतिक तनाव आपूर्ति पर प्रभाव डाल रहे हैं। इस कारण एल्युमिनियम को अब एक रणनीतिक "ऊर्जा वाहक" के रूप में देखा जा रहा है। जैसे-जैसे भंडार घट रहे हैं, उद्योग अब मात्रा-आधारित वृद्धि से हटकर उच्च-मूल्य और कम-कार्बन भविष्य की ओर बढ़ रहा है।

देश के संदर्भ में, जनवरी 2026 एक महत्वपूर्ण मील का पत्थर साबित हुआ, जब नीति आयोग द्वारा एल्युमिनियम क्षेत्र के डीकार्बोनाइजेशन के लिए रोडमैप लॉन्च किया गया, जिसमें JNARDDC को योगदान देने का अवसर प्राप्त हुआ।

JNARDDC ने राष्ट्रीय महत्वपूर्ण खनिज मिशन के अंतर्गत भी अपनी भूमिका का विस्तार किया है। इसे महत्वपूर्ण खनिज पुनर्चक्रण को बढ़ावा देने हेतु प्रोत्साहन योजना के लिए परियोजना प्रबंधन एजेंसी (PMA) के रूप में नामित किया गया है। इस पहल का उद्देश्य ई-वेस्ट और प्रयुक्त बैटरियों जैसे द्वितीयक संसाधनों से महत्वपूर्ण खनिजों की घरेलू पुनर्प्राप्ति को सुदृढ़ करना है। केंद्र सरकार ओवरबर्डन, खदान टेलिंग्स, फ्लाई ऐश और रेड मड से महत्वपूर्ण खनिजों की पुनर्प्राप्ति हेतु पायलट परियोजनाओं का भी समर्थन कर रही है, साथ ही औद्योगिक अपशिष्टों से पुनर्प्राप्ति पर अनुसंधान जारी है, ताकि रणनीतिक सामग्रियों के लिए एक सुदृढ़ और आत्मनिर्भर आपूर्ति श्रृंखला विकसित की जा सके।

पिछले छह महीनों में कई महत्वपूर्ण परियोजनाएँ पूर्ण हुई हैं। मैं हमारे शोधकर्ताओं, आविष्कारकों और पुरस्कार विजेताओं को बधाई देता/देती हूँ, जिनके कार्य इस समाचार पत्र में प्रकाशित हैं। JNARDDC ने अपने सहयोगी नेटवर्क का भी विस्तार किया है। यूक्रेन की JSC Titanium के साथ एक नई साझेदारी के तहत JNARDDC में बेयर लिकर से गैलियम की पुनर्प्राप्ति हेतु एक पायलट प्लांट स्थापित करने की योजना है, जबकि RUSAL के साथ रेड मड से स्कैंडियम की पुनर्प्राप्ति के लिए एक पायलट सुविधा पर चर्चा जारी है। मिशन के अंतर्गत अपनी भूमिका को और सुदृढ़ करते हुए, JNARDDC अब IIT हैदराबाद, IISc बेंगलुरु और C-MET हैदराबाद द्वारा संचालित तीन उत्कृष्टता केंद्रों (CoEs) के लिए एक "स्पोक" संस्थान के रूप में कार्य कर रहा है, जिससे महत्वपूर्ण खनिजों में सहयोगात्मक अनुसंधान को बढ़ावा मिल रहा है।

S&T PRISM पहल के अंतर्गत चौथे कॉल में छह नए स्टार्टअप्स को समर्थन प्रदान किया गया है, जिससे समर्थित स्टार्टअप्स की कुल संख्या 31 हो गई है। ये परियोजनाएँ उन्नत सामग्रियों, पुनर्चक्रण तकनीकों और संसाधन दक्षता पर केंद्रित हैं, जो गैर-लौह और महत्वपूर्ण खनिज क्षेत्र में नवाचार पारिस्थितिकी तंत्र को सुदृढ़ कर रही हैं। JNARDDC सतत और सुदृढ़ सामग्री पारिस्थितिकी तंत्र के लिए पुनर्चक्रण तकनीकों को आगे बढ़ाने, अनुसंधान अवसंरचना को सशक्त करने और सहयोगात्मक नवाचार को प्रोत्साहित करने के प्रति प्रतिबद्ध है।

जय हिंद!

डॉ अनुपम अग्निहोत्री

Greetings to all our readers, well-wishers, and patrons!

The global aluminium market has entered 2026 on a strong note, with LME prices crossing $3,000 per tonne for the first time in years. This surge reflects a structural shift rather than a temporary rally. With China enforcing its 45-million-tonne production ceiling and geopolitical tensions in the Middle East—accounting for nearly 9% of global output—impacting supply dynamics, aluminium is increasingly viewed as a strategic "carrier of energy." As inventories tighten, the industry is transitioning from volume-driven growth toward a high-value, low-carbon future.

Closer to home, January 2026 marked a significant milestone with the launch of the NITI Aayog Roadmap for Aluminium Sector Decarbonisation, to which JNARDDC had the privilege of contributing.

JNARDDC has also taken on an expanded role under the National Critical Mineral Mission, having been designated as the Project Management Agency (PMA) for the Incentive Scheme for Promotion of Critical Mineral Recycling, aimed at strengthening domestic recovery of critical minerals from secondary resources such as e-waste and spent batteries. The Centre is also supporting pilot projects for recovery of critical minerals from overburden, mine tailings, fly ash, and red mud, alongside ongoing research on recovery from industrial wastes to build a resilient and self-reliant supply chain for strategic materials.

Over the past six months, several important projects have been completed, and I congratulate our researchers, inventors, and award recipients whose work is highlighted in this newsletter. JNARDDC has also expanded its collaborative network. A new partnership with JSC Titanium, Ukraine aims to establish a pilot plant for recovery of gallium from Bayer liquor at JNARDDC, while discussions with RUSAL are underway for a pilot facility for scandium recovery from red mud. Further strengthening our role under the Mission, JNARDDC is now a spoke institution for three Centres of Excellence (CoEs) led by IIT Hyderabad, IISc Bengaluru, and C-MET Hyderabad, promoting collaborative research in critical minerals.

Under the S&T PRISM initiative, six new startups have been supported during the 4th call, taking the total number of supported startups to 31. These projects focus on advanced materials, recycling technologies, and resource efficiency, strengthening the innovation ecosystem in the non-ferrous and critical minerals domain. JNARDDC remains committed to advancing recycling technologies, strengthening research infrastructure, and fostering collaborative innovation for a sustainable and resilient materials ecosystem.

Dr Anupam Agnihotri

Industry Connect

Red Mud Brick Plant Initiative by JNARDDC, NALCO and Manishri Refractories

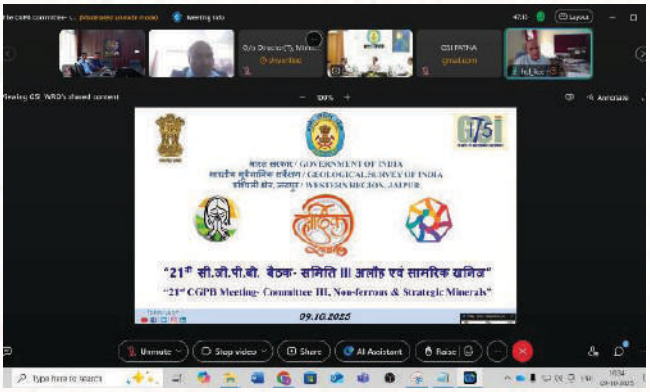
Director JNARDDC met with the CMD and ED (M&R) of NALCO at Damanjodi on October 5, 2025, to finalize the site and operational framework for a pioneering red mud brick manufacturing plant. Based on a joint patent held by JNARDDC and NALCO, this facility will be the first in India to target 100% utilization of bauxite residue by producing hard bricks for construction, lightweight green building bricks, and enabling iron recovery. Following a technical review and site inspections with industry partner Manishri Refractories and Ceramics Pvt Ltd, a location was unanimously selected based on infrastructure suitability. The project defines clear roles for all three parties with a shared commitment to complete the plant by November 2026, setting a benchmark for the circular economy in the aluminium sector.

Officials during site inspection

Officials at NALCO office

JNARDDC Participates in 21st CGPB Committee Meeting on Non-Ferrous & Strategic Minerals

Dr P G Bhukte and Dr Biwas Pradhan represented JNARDDC in the virtual 21st CGPB Committee–III meeting on October 9, 2025, to discuss the national framework for non-ferrous and strategic minerals. As part of the deliberations on the JNARDDC team provided scientific input on the assessment and exploration of critical resources. This participation ensures the institute remains central to national policy-linked research, helping shape the future development of India's mineral security and exploration strategies.



Virtual participation of JNARDDC in the meeting

JNARDDC Co-Organizes First Edition of ALUMEX India 2025 in New Delhi

JNARDDC co-organised the ALUMEX Global Conference, held from 10–12 September 2025 at Bharat Mandapam, Delhi. The event witnessed insightful technical sessions led by scientists R. N. Chouhan, VNSU Viswanath Ammu, and Dr Anas N. S. These sessions delved deep into critical topics like billet quality, extrudability, die design, extrusion simulation, quality control, and innovative approaches to solid-state recycling of chips through extrusion. Alongside the conference, JNARDDC is showcasing its niche projects funded by Govt and Private industries, cutting-edge extrusion profiles, Al alloy CRMs, and posters highlighting the S&T PRISM scheme, and the Nonferrous portal at the ALUMEX India Exhibition. The stall has attracted widespread attention and appreciation from government officials and dignitaries alike, applauding JNARDDC's commitment to advancing research, fostering innovation, and driving forward the vision of the Ministry of Mines, Government of India.

JNARDDC's stall at the exhibition

JNARDDC scientists delivering the the lectures

JNARDDC Showcases "Waste-to-Wealth" at IITF 2025 as Ministry of Mines Secures Silver

JNARDDC presented its pioneering research in sustainable mining and circular economy initiatives at the India International Trade Fair (IITF) 2025, held at Pragati Maidan, New Delhi. The exhibition stall highlighted the Centre's expertise in bauxite research, mineral beneficiation, and critical minerals. Aligning with the national theme, models developed from e-waste were also displayed to emphasize the significance of e-waste in critical mineral recycling and to promote responsible disposal practices.

Hon'ble Minister (Mines & Coal) Shri G Kishan Reddy and Secretary (Mines) Shri Piyush Goyal at the JNARDDC's stall

JNARDDC Presents R&D Outcomes at 61st SGPB Maharashtra Meeting

Dr Pravin Bhukte (Principal Scientist) represented JNARDDC at the 61st State Geological Programming Board meeting in Nagpur on October 31, 2025, to present the institute's R&D achievements and future work plan. The session, chaired by Dr Iqbal Singh Chahal (IAS), focused on Maharashtra's mineral development and the strategic importance of critical minerals. JNARDDC highlighted its recent progress in mineral beneficiation and product development, coordinating with key agencies like GSI, MECL, and IBM to align scientific efforts with exploration goals for 2025–26.

Dr Bhukte participating in the SGPB meeting

Transforming Waste into Resources: JNARDDC and NALCO Co-Host Waste Utilisation Conference

A one-day conference titled "Transforming Metallurgical Industry Waste Streams into Valuable Resources" was held at JNARDDC Nagpur on December 12, 2025, to advance circular economy solutions. The event brought together industry leaders, R&D organizations, and startups to deliberate on innovative waste valorization and the recovery of mineral values. The conference was inaugurated by Shri Brijendra Pratap Singh (CMD, NALCO) alongside Guests of Honour Shri Jagdish Arora (Director P&T, NALCO) and Dr Ramanuj Narayan (Director, CSIR–IMMT). By bridging the gap between academia and industry, the sessions focused on accelerating the deployment of resource-efficient technologies that convert industrial waste into economic assets.

Shri Brijendra Pratap Singh delivering the keynote address

Dignitaries take part in Tree Plantation Drive

Conference delegates

JNARDDC Highlights Downstream Potential at Angul Aluminium Park Roadshow

NALCO (National Aluminium Company Limited) and IDCO (Odisha Industrial Infrastructure Development Corporation) co-organized a roadshow on September 23, 2025, to highlight investment and R&D opportunities within the Angul Aluminium Park. The event promoted the park's infrastructure as a hub for downstream and ancillary industries. Dr Agnihotri (Director, JNARDDC) delivered a keynote on "Aluminium Downstream 2030," while Shri B P Singh (CMD, NALCO) outlined the strategic support available to investors. The roadshow successfully bridged government, industry, and R&D sectors to strengthen the aluminum ecosystem.

Ms Yoko Kawaguchi from Kawai Dizen Japan Visits JNARDDC for E-Waste and Green Drive

Ms Yoko Kawaguchi (Kawai Dizen Pvt Ltd Japan at JNARDDC) and Mr Narender Bhalla (DAIKI India Pvt Ltd) visited JNARDDC to explore the Ministry of Mines' e-waste recycling and incentive frameworks. The JNARDDC team provided a detailed briefing on national schemes promoting e-waste recycling, identifying potential areas for international collaboration and technical exchange. In addition to the technical discussions, the delegates participated in the "Ek Ped Maa Ke Naam" plantation drive, highlighting a shared commitment to environmental conservation alongside industrial progress.

Visitors participating in plantation during their visit

Recycling Promotion Division

JNARDDC Engages with Russian Delegation on Critical Mineral Technology

Shri Vivek K Bajpai (Joint Secretary, Mines) chaired a high-level meeting with the GIREDMET Russian team and the Ministry of Mines to explore advanced technologies for strategic minerals. The deliberations focused on securing technological pathways for Titanium, Lithium, Cobalt, and rare earth elements like Neodymium and Praseodymium. Representatives from JNARDDC, NFTDC, IREL, IMMT, and KABIL participated in the session, identifying specific avenues for Indo-Russian collaboration. This engagement supports the National Critical Mineral Mission by seeking international expertise to bolster India's domestic extraction and processing capabilities for minerals vital to high-tech manufacturing and green energy.

Ministry of Mines & officials from different organizations in meeting with Russian Team

JNARDDC Hosts Vidarbha Recycling Stakeholders Meet and Industry Visit

JNARDDC Nagpur hosted the Vidarbha Non-Ferrous Metals (NFM) Recycling Stakeholders' Meet on July 28, 2025, to address the technological and policy needs of the regional recycling sector. The event brought together over 35 regional stakeholders, including recyclers, traders, and aggregators from the Vidarbha region. Discussions focused on local challenges and policy gaps, providing a collaborative platform for growth. Participants also toured the research facilities at JNARDDC to gain insights into the latest R&D efforts in sustainable metallurgy. Following the meet, the delegation visited Chanvim Engineering to witness large-scale industrial applications of aluminium recycling. The visit offered a detailed look at the production of aluminium roll bond evaporators and high-volume aluminium cookware manufacturing.

Delegates witnessing DC casting facility at JNARDDC

Delegates & JNARDDC officials at Chanvim Engineering

JNARDDC and C-MET Hyderabad Partner to Accelerate Critical Mineral Recycling

On September 15, 2025, a delegation from JNARDDC visited C-MET Hyderabad to finalize a strategic partnership focused on advanced technology transfer for e-waste and battery recycling. Led by Dr Anupam Agnihotri (Director, JNARDDC), the team, including Mr R N Chouhan (Head, Downstream & Recycling Promotion Division) and Dr Upendra Singh (Head, Analytical Division), met with C-MET officials to discuss the recycling of key e-waste streams like PCBs and Li-ion batteries. The collaboration aims to strengthen India's circular economy by exploring new avenues in e-waste recycling and gallium refining. By bridging R&D and industrial application, this joint effort will drive innovations in sustainable metallurgy and enhance national resource security for critical minerals.

JNARDDC scientists during discussion at C-MET

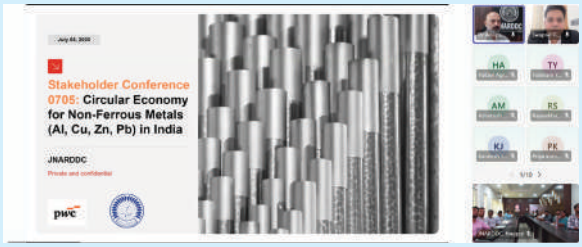
International Copper Association India at JNARDDC

Mr Mayur Karmarkar, Managing Director of International Copper Association India (ICAI) visited JNARDDC on July 17, 2025, to provide copper-focused inputs for the Circular Economy Vision Document. The meeting centered on India's high copper recycling efficiency and insights from a joint ICAI–Fraunhofer Institute study. Discussions focused on leveraging these findings to strengthen the national framework for secondary copper recovery and resource security.

Mr Karmakar and JNARDDC team during plantation

JNARDDC and PwC India Host Circular Economy Workshop

JNARDDC and PwC India organized an online stakeholder workshop on July 5, 2025, to develop the Vision Document on Circular Economy in Non-Ferrous Metals. The session, conducted under the Chairmanship of Ministry of Mines, gathered over 80 industry representatives from the aluminium, copper, lead, and zinc sectors. Dr Anupam Agnihotri delivered the opening address, while PwC presented an inception report on market trends and sectoral mapping. The workshop provided critical industry insights to shape a roadmap for resource efficiency and sustainable growth in India's metal industry.



Participants during the stakeholder's meet

JNARDDC and G R Metalloys Discuss Aluminium Recovery Practices

JNARDDC officials met with Mr Jayant Jain (MD, G R Metalloys) Visits JNARDDC on August 29, 2025, to discuss sustainable aluminium casting and recovery. The meeting focused on establishing a common facility centre (CFC) for processing dross and cyclone dust into value-added products. Key technical discussions included minimizing porosity in aluminium cast alloys and developing innovative methods to recover clean aluminium from multilayer packaging waste. The engagement was oriented towards translating R&D into practical, industry-ready solutions to strengthen circularity and material efficiency in the secondary aluminium sector..

Mr Jayant Jain along with JNARDDC officials

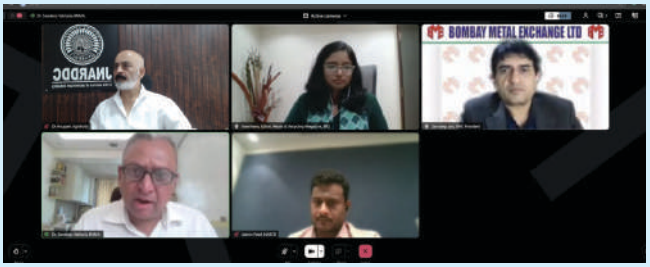
Daiki Aluminium Industry Co., Ltd. Japan Visits JNARDDC

JNARDDC hosted a delegation from Daiki Aluminium Industry, Japan, on October 4, 2025, to discuss the technical roadmap for a new Centre of Excellence (CoE) in non-ferrous metal recycling at JNARDDC. The meeting focused on the facility layout, process flow, and equipment design for the proposed demonstration, Research, and Skill Development Unit. As a global leader in recycling, Daiki Aluminium is providing technical expertise to ensure the CoE features state-of-the-art specifications. This collaboration aims to establish a world-class facility at JNARDDC for advanced metal recovery and industry-wide skill development.

Daiki officials participating in plantation during their visit

JNARDDC Participates in Webinar on Metal Scrap Trade and Regulations

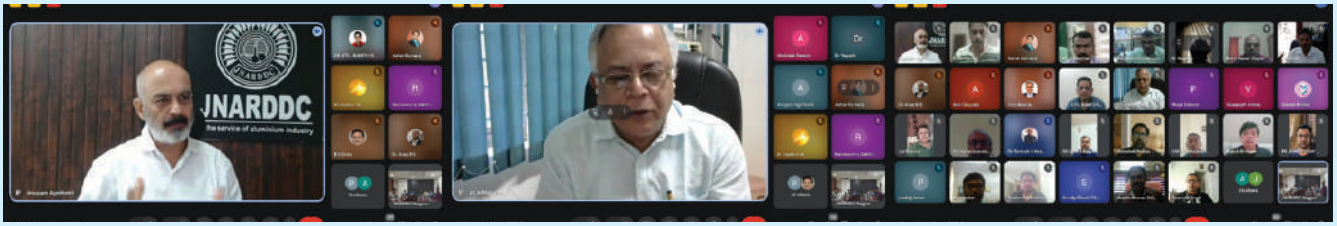
JNARDDC collaborated with the Bombay Metal Exchange for a pre-event webinar of the Bharat Recycling Show 2025, focusing on regulations and global trade forces. Dr Anupam Agnihotri (Director, JNARDDC) joined industry leaders to highlight Ministry of Mines initiatives on infrastructure and resource efficiency. The panel addressed the EU's Carbon Border Adjustment Mechanism (CBAM) and India's low-carbon pathways for staying globally competitive. Discussions also focused on bridging policy gaps and harmonizing quality standards to build a resilient, future-ready recycling ecosystem.



Officials during the discussions over VC

JNARDDC Hosts Virtual Meet to Address R&D Gaps in Metals and Mining

JNARDDC organized a virtual session with over 70 experts from CSIR, IITs, ISRO, and DMRL to identify collaborative solutions for the metals and mining sector. Director JNARDDC, Dr Anupam Agnihotri, emphasized the need for synergy in critical minerals, recycling, and metallurgy. Key speakers and prominent experts shared their insights, including Dr R. Vijay (Director, ARCI), Dr Ramanuj Narayan (Director, CSIR-IMMT), Dr K. Ramesha (Director, CSIR-CECRI), and Prof. S. Subramanian (IISc). The discussion, featuring other prominent experts from NIIST, CSIR-NEERI, and various IITs, focused on identifying critical R&D gaps in strategic materials such as powder metallurgy and battery technologies, as well as process engineering for mineral beneficiation and import substitution. The meet concluded with a call for stronger Ministry support and the optimized use of National Facilities across academia and R&D institutes to align research with India's industrial requirements and self-reliance goals.



Experts during the virtual discussion

JNARDDC Appointed as PMA for Ministry of Mines' Incentive Scheme on Critical Mineral Recycling under NCMM

The Ministry of Mines commenced the implementation of a ₹ 1,500 crore Incentive Scheme on October 2, 2025, to boost domestic critical mineral recycling, appointing JNARDDC as the Project Management Agency (PMA). Approved under the National Critical Mineral Mission (NCMM), the scheme aims to build self-reliance by recovering strategic minerals from e-waste, lithium-ion battery scrap, and other end-of-life products. The primary objective is to incentivize domestic recovery and strengthen India's supply-chain resilience through in-country separation and production. As the PMA, JNARDDC has undertaken proactive engagement through national webinars, hybrid consultations in Nagpur, and weekly virtual help sessions. They have also published step-by-step video tutorials and user manuals to ensure compliant applications.

JNARDDC Designated as Spoke Institute under NCMM for Multiple Centres of Excellence

Under the National Critical Mineral Mission (NCMM) of the Ministry of Mines, JNARDDC has been designated as a spoke institute for three Centres of Excellence. JNARDDC will serve as a spoke for the Indian Institute of Science (IISc), Centre for Materials for Electronics Technology (C-MET), and Indian Institute of Technology Hyderabad, supporting collaborative R&D, pilot validation, and industry engagement across the critical minerals value chain. The multi-spoke role strengthens JNARDDC's contribution to coordinated national efforts on critical minerals and recycling..

"Hon'ble Minister Shri G Kishan Reddy awarding CoE status to IIT Hyderabad (Hub) and spoke institutes"

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

भारतीय विज्ञान संस्थान

सी मेट CMET

Joining of new Scientists in RPD

Akshay Jaiswal, Contractual Scientist-II

Date of Joining : 01-01-2026

Qualification: B.Tech Mechanical Engineering (IIT Kharagpur), M.Tech Thermal Engineering (IIT Kharagpur)

Experience: 1 year (Contractual Scientific Assistant-II, JNARDDC) & 1 year (Assistant Manager, Sterling and Wilson Cogen Solutions Pvt Ltd, Mumbai)

Hemendra Waswani, Contractual Scientist-II

Date of joining: 01-01-2026

Qualification: B.E (Mechanical Engineering), RTMNU, Maharashtra

Experience: 4 Years (Engineer (Project Lead), Waman Engineering- Designing, Production, Planning & Client management), 2 Years (SRF, JNARDDC-Die designing and simulation, CAD/CAE)

S&T PRISM Update

PRISM 4.0

Under the S&T PRISM (4.0) Scheme of the Ministry of Mines, JNARDDC has facilitated rapid evaluation, approval, and funding of innovation-driven projects to bridge the gap between research and commercialization. A total of 57 proposals were received through the Satyabhama portal by June 15, 2025. JNARDDC coordinated a two-stage Technical Expert Committee (TEC) evaluation, comprising adequacy screening followed by physical presentations held at JNARDDC, Nagpur. Based on TEC recommendations, the Apex Committee, chaired by the Secretary, Ministry of Mines, approved six projects in its meeting on August 13, 2025. The approved projects span low-cost hyperspectral imaging, battery waste recycling and critical mineral recovery, indigenous niobium–tantalum metal powders and master alloys, magnesium sacrificial anodes from scrap, and advanced wear-resistant coating powders for mining tools, supporting transition of critical mineral technologies from lab-scale validation to pilot-scale readiness and commercial deployment.

Following approval, MoUs were signed at JNARDDC on December 24, 2025, and funds were released to all six grantees, ensuring rapid project commencement.

Spectrum Industries, Mangalore

Bhagyanagar Magnesium, Medak

Fonsmet Materials, Navi Mumbai

TEC meeting for PRISM 4.0 proposal evaluation

K2BJN Industries, Tiruchirappalli

Aegion Aerospace, Haryana

NiLiCo Technologies, Bengaluru

India's First Nd–Pr Metal Manufacturing Plant

JNARDDC at Inauguration of India's First Nd-Pr Manufacturing Plant by AREPL Pune, on 17 October 2025, under the S&T PRISM Scheme of the Ministry of Mines, with facilitation and coordination support from JNARDDC. Established in collaboration with BARC and IREL, the plant enables indigenous production of neodymium and praseodymium metals critical for EVs, wind energy, and other strategic applications. Dr. Anupam Agnihotri, Director, along with Dr Upendra Singh and Mr R N Chouhan from JNARDDC, participated in the inauguration alongside industry and institutional representatives.

Following this successful commissioning, the Ministry of Heavy Industries invited JNARDDC along with Shri Vikram Dhoot from AREPL on October 31 to understand the initiative and its implementation learnings, ahead of the proposed launch of an incentive scheme for manufacturing of Rare Earth Permanent Magnets (REPM).

JNARDDC officials at AREPL Pune

Dr Agnihotri with Secretary (MHI) and other officials

TEC Reviews S&T PRISM Projects at JNARDDC

A Technical Evaluation Committee (TEC) review meeting was conducted at JNARDDC on August 5 to assess progress of 16 startups and MSMEs supported under the S&T PRISM Scheme across Calls 1.0, 2.0, and 3.0.Chaired by the Director, JNARDDC, the meeting reviewed milestone achievements and validations, with several grantees completing targets ahead of schedule. TEC members from GSI, CSIR, IITs, HINDALCO, IBM, and CMET participated online, while grantees showcased advancements including Nd–Pr metal production, battery and coating technologies, rare earth extraction processes, hydrogen storage solutions, and AI-based mineral exploration tools. The review highlighted the role of PRISM-supported startups and MSMEs in advancing indigenous technologies and strengthening self-reliance in India's mining and metals sector.

S&T PRISM Project Review Meeting

Director JNARDDC Inaugurates Ishita International's Fertilizer Pilot Plant at Butibori

The Phase-I pilot plant of Ishita International at Butibori, Nagpur, was inaugurated on December 22, 2025, by Dr Anupam Agnihotri, Director, Supported under the S&T PRISM Scheme of the Ministry of Mines, with JNARDDC as the Implementing Institute, the project focuses on processing Indian-origin rock phosphate to produce 100% water-soluble fertilizers such as calcium nitrate, phosphoric acid, and MAP/MKP, enabling import substitution of nearly USD 120 million.

The project adopts an integrated processing route that significantly reduces phospho-gypsum generation and CO_2 emissions by converting residues into value-added products. The commissioning demonstrates the technical viability of using low-to-medium grade Indian rock phosphate for high-value fertilizer production, supporting cleaner processing and scalable commercialisation.

JNARDDC officials at the inauguration of the Phase-I pilot plant

Academia Connect

School Students Visit to Explore Aluminium and Materials Research

Around 40 students of Class XI and XII (Science) from Bhavan's B.P. Vidya MandirTrimurti Nagar, Nagpur, visited the institute in August 2025, to gain exposure to research in aluminium and materials science. The visit included interactive sessions, live demonstrations, and presentations on ongoing R&D activities, providing students with insights into applied science and inspiring interest in research and innovation.

Bhavan's B.P. Vidya Mandir's students at JNARDDC

Internship Opportunities for Undergraduate Students at JNARDDC

Engineering students from COEP Pune and VNIT Nagpur are undertaking short-term internships of 1–2 months at the institute as part of their academic curriculum. The internships provide hands-on exposure to ongoing research activities and laboratory practices, helping students gain practical experience and research-oriented learning.

Director issuing certificates to students

JNARDDC Engages Across Stages of Smart India Hackathon 2025

JNARDDC actively participated in Smart India Hackathon (SIH) 2025 by contributing two problem statements aligned with national priorities on sustainability and digital solutions, focusing on AI-driven life cycle assessment for circularity in metallurgy and mining and secure data wiping for IT asset recycling. As a Nodal Centre, JNARDDC provided end-to-end technical support through virtual mentoring sessions, guiding shortlisted student teams in refining concepts, strengthening technical approaches, and aligning solutions with real-world industry requirements. JNARDDC scientists also served as evaluators and mentors during the hackathon process. Further strengthening its engagement, JNARDDC scientists participated as Nodal Officers and Jury Members at the SIH 2025 Grand Finale hosted at PSNA College of Engineering and Technology, Dindigul, Tamil Nadu, organised by the Ministry of Education's Innovation Cell in collaboration with AICTE. The multi-stage involvement reflects JNARDDC's sustained commitment to nurturing innovation, mentoring young talent, and supporting indigenous technology development through national innovation platforms.

JNARDDC scientists at SIH grand finale in Dindigul

Recently Completed Projects

Process for production of ATH with high whiteness using non-metallurgical grade bauxite by following soda sintering process

Sponsor: S&T, Ministry of Mines

Collaborator: Institute of Chemical Technology (ICT) Mumbai, Indian Oil Campus, Bhubaneswar

Industry partner: NIKNAM Chemicals Pvt Ltd, New Delhi

Principal Investigator: Prachiprava Pradhan

Co-PIs: Dr Suchita Rai, K J Kulkarni, M Panchal, Amol Mankar

Team: Dr Upendra Singh, Dr P G Bhukte, S Yadav

High whiteness Aluminium hydroxide

A process know-how was successfully developed for the production of high-whiteness aluminium hydroxide (up to 97%) from non-metallurgical grade bauxite. The product development involved systematic optimization of each process step. Laboratory-scale investigations focused on optimizing key parameters during sintering, leaching and precipitation, consistently yielding aluminium hydroxide with whiteness values reaching 97%. Based on these results, scale-up trials were conducted using 10–15 kg batches of bauxite, successfully validating the laboratory findings. The outcome of this project is expected to provide significant benefits to the solid-surface industry, particularly for the manufacture of onyx-grade artificial marble and premium solid-surface countertops.

Lead contamination in recycled aluminium cookware – Identifying sources and developing strategies

Sponsor: S&T, Ministry of Mines

Industry partner: Pure Earth, USA

Principal Investigator: K Immanuel Raju

Co-PIs: R N Chouhan, R Anil Kumar

Team: V N S U V Ammu, S Mukherjee

Utensils sourced from local market for testing

Testing of lead leaching from utensils

Lead removal experiments

The completed project successfully demonstrated refining and lead removal strategies for recycled aluminium used in cookware through systematic evaluation of melt processing routes. Effective methods such as gravity-based sedimentation, optimisation of furnace holding conditions, vacuum distillation for deep lead removal, and anodising to reduce lead leaching were validated, providing a robust technical framework to improve melt quality, ensure food-contact safety, and support adoption of refined recycling practices in the cookware industry.

Utilisation of aluminium dross in synthetic slag preparation for secondary steel making

Sponsor: S&T, Ministry of Mines

Collaborator: VNIT Nagpur

Industry partner: Daiki Aluminium India Pvt Ltd, Sri City, Andhra Pradesh

Principal Investigator: R N Chouhan

Co-PIs: Dr U Singh, R Anil Kumar

Team: K Immanuel Raju, S Mukherjee

The project successfully demonstrated the manufacture of calcium-aluminate–based synthetic slag using aluminium dross residues sourced from Daiki Aluminium Pvt Ltd. Optimised slag compositions with low fusion temperature were identified using FactSage thermodynamic modelling, followed by laboratory-scale slag preparation through controlled addition of CaO. Phase formation and chemical composition were confirmed through XRD and XRF characterisation, validating the formation of calcium aluminate phases essential for deep desulphurisation in secondary steelmaking. The outcomes establish a technically viable route for value addition of aluminium dross, with SOP finalisation and technology transfer planned for industrial adoption.

Synthetic slag prepared using aluminium dross and other industrial wastes

Ongoing Projects (Sponsored by GoI)

An optimal approach for the retrieval of value-added substances from secondary aluminum black dross

Sponsor: S&T, Ministry of Mines

Collaborator: Sri Ramakrishna Engineering College, Coimbatore

Industry partner: Phoenix Alloys, Coimbatore

Principal Investigator: K Immanuel Raju

Co-PIs: V N S U V Ammu, R Anil Kumar

Team: R N Chouhan, Dr Anas N S, S Mukherjee

V N S U V Ammu
Co-PI

The project adopts a hybrid pyro-hydrometallurgical processing strategy, leveraging the complementary expertise of the two collaborating institutions. SREC, Coimbatore focuses on the utilisation of waste heat from aluminium melting operations for drying and thermal treatment, significantly improving energy efficiency and reducing operating costs. JNARDDC leads the hydrometallurgical extraction of aluminium values, including mechanical recovery of residual metal, selective chemical treatment of fine dross fractions, controlled precipitation of aluminium hydroxide, and subsequent calcination to produce phase-controlled alumina for value-added applications. The chemically stabilised solid residue will be evaluated for reuse in construction or ceramic applications. The integrated and scalable approach is designed for adoption by small and medium aluminium recycling units and is expected to reduce landfill dependency, enhance resource efficiency, generate value-added products, and create strong potential for industrial implementation and intellectual property generation.

Recycling coal mine overburden to reuse as a value-added building material to promote a circular economy

Sponsor: Ministry of Coal

Collaborators: VNIT Nagpur, BIT Mesra, CMPDIL Dhanbad

Principal Investigator: Dr Mohamed Najar

Co-PIs: M T Nimje, Dr Upendra Singh, K Janbandhu

Team: Dr P Mondi, Shweta V Naik

K Janbandhu
Co-PI

The project has successfully converted Coal Mine Overburden (CMO) into several geopolymerized building components, including Blocks, Concrete Colum (M20-M30 grade), Slabs and Paver Blocks. Erection of a structural unit using these developed materials is currently in progress at the CMPDI, Ranchi, Jharkhand. This study demonstrates that CMO can replace up to 30-40% of natural river sand in concrete for improving compressive and flexural strength while reducing environmental impact.

Coal mine overburden alkali-activated composites (CMOAAC) for pre-fabricated 3D volumetric construction elements & system thereof (3DVCES)

Sponsor: Ministry of Coal

Collaborators: VNIT Nagpur, IIT BHU, CMPDIL Dhanbad

Principal Investigator: Dr Mohamed Najar

Co-PIs: Dr P Mondi, Dr P G Bhukte, Dr Upendra Singh

Team: Dr Priyanka Nayar, Jyoti Pendam, K Janbandhu

Dr P Nayar
Team member

The mix designs derived from the geopolymerization of Coal Mine Overburden (CMO) have been optimized for the rheological and mechanical requirements of 3D printing technology. Standard architectural units have been produced on a trial basis, to demonstrate feasibility and structural integrity. Material compositions and print parameters were fine tuned for consistency, speed, and structural soundness of the printed elements. The technical development activities are in their final stages for establishing a full-scale 3D Printed implementation model at the CMPDI Nagpur Premise.

Extraction of gallium from titanium and iron ore industrial wastes

Sponsor: S&T, Ministry of Mines

Collaborator: CSIR NIIST, Thiruvananthapuram, Kerala

Industry partner: V V Titanium Pigments Pvt. Ltd., Thoothukudi, Tamil Nadu

Principal Investigator: Dr Upendra Singh

Co-PIs: Jyoti Pendam, Sreedevi T E

Team: Dr Priyanka Nayar

Jyoti Pendam
Co-PI

Gallium was recovered using solvent extraction and adsorption routes. Among the extractants tested (D2EHPA, phosphonic acid, and TBP), TBP showed the highest and most consistent gallium extraction, confirm by ICP analysis. Na_2PO_4 stripping and precipitation led to significant gallium enrichment (~2000 ppm $GaPO_4$).

In parallel, silica-modified boehmite adsorbents exhibited high gallium uptake, with pelletized forms providing improved porosity, stability, and handling, achieving enrichment up to ~712 ppm. Overall comparison: Solvent extraction (TBP) achieved higher gallium enrichment, while adsorption offered simpler operation and material handling, making the two approaches complementary depending on process requirements.

Sustainable manufacturing of automobile engine pistons with 100% recycled aluminium alloys with extended Fe-impurity tolerance

Sponsor: S&T, Ministry of Mines

Collaborators: GITAM Visakhapatnam

Industry partner: Motocast Power Alloys Pvt Ltd., Rajasthan

Principal Investigator: R Anil Kumar

Co-PIs: R N Chouhan, K Immanuel Raju

Team: V N S U V Ammu, Arun Kumar, S Mukherjee

R N Chouhan
Co-PI

Recycling-friendly aluminium alloy compositions with high iron content have been fine-tuned and successfully cast into two-wheeler piston prototypes using a Gravity Die Casting (GDC) machine at GITAM University. Initial microstructural studies indicate stable modification behaviour despite variations in copper and iron content. Further characterisation of mechanical, wear, and corrosion properties is currently in progress, which will form the basis for subsequent prototype validation.

Recovery of nickel from secondary steel industry waste

Sponsor: S&T, Ministry of Mines

Industry partner: Hydromet Research and Recovery LLP, Chinchpada, Maharashtra

Principal Investigator: Jyoti Pendam

Co-PIs: Dr Upendra Singh

Team: Dr Priyanka Nayar, Dr Mohamed Najar, Dr P Mondi, Sreedevi T E

Dr P Mondi
Team Member

Leaching and precipitation studies achieved >85% leaching efficiency under atmospheric conditions. Precipitation using the Jarosite method resulted in coarse particle formation, facilitating efficient filtration. Sequential solvent extraction was then employed to purify nickel from the leach liquor: D2EHPA was used to remove impurities (Fe, Ca, Mg, and Mn), followed by selective nickel extraction with Versatic 10. Under optimized conditions, >98% nickel extraction efficiency was achieved for solvent extraction. High-purity nickel sulphate crystals were produced via antisolvent crystallization, and product characterization is currently in progress.

Conformal cooling strategies for minimising peripheral coarse grain growth in high-strength aluminium alloy extrudates

Sponsor: S&T, Ministry of Mines

Industry partner: Yantra India Limited, Nagpur and Bharat Forge, Pune

Principal Investigator: V N S U V Ammu

Co-PIs: R N Chouhan, K Immanuel Raju

Team: Dr N S Anas, S Mukherjee

Dr Anas
Team member

Two different die schemes incorporating internal cooling channels were designed to enable conformal cooling during extrusion of a 50 mm solid bar and a square tube profile. In this context, a modular die insert concept was adopted, wherein the insert is shrink-fitted into the main die. Owing to the geometric complexity of the cooling channel network, the die insert is proposed to be fabricated using an additive manufacturing process. In addition, a few more die inserts are planned to be manufactured at one of the project partners, M/s Bharat Forge Limited, Pune, using additive manufacturing route. The extrusion trials are planned to be carried out on the 14 MN extrusion press available at JNARDDC. Further, extruded profile samples have been collected from another project partner, Ordnance Factory, Ambajhari, for detailed evaluation of product properties and for establishing correlations between process parameters and resultant mechanical and microstructural characteristics.

Triazine derived g-C3N4 based separation of niobium & tantalum from the tin slag: A fully scalable fluoride-free process

Sponsor: S&T, Ministry of Mines

Collaborator: BHU Varanasi

Industry partner: Lohum, Noida

Principal Investigator: Dr Upendra Singh

Co-PI: Jyoti Pendam

Team: Dr Priyanka Nayar, Sreedevi T E

Sreedevi
Team member

A novel fluoride-free leaching process using $HCl–H_2SO_4–Na_2SO_4$ has been developed and optimized at the laboratory scale, achieving >75% niobium recovery. A subsequent secondary treatment using H_2SO_4 and a reducing agent further enhanced recovery to >90% Nb and >75% Ta. In parallel, a new g-C_3N_4-based adsorbent was synthesized and evaluated using synthetic solutions, demonstrating selective separation of Nb and Ta from Sn, where Sn is retained on the adsorbent while Nb and Ta are eluted. The same approach is currently being applied to actual leach liquor, showing promising selectivity for niobium and tantalum. Adsorption optimization, solvent extraction integration, and scale-up studies are in progress.

Assessment, mapping, and in-situ sampling of lateritic bauxite deposits through integrated hyperspectral sensor data and AI-powered heterogeneous robotic systems

Sponsoring Agency: S&T, Ministry of Mines

Collaborators: Indian Institute of Science (IISc), Bangalore, National Remote Sensing Centre (NRSC-ISRO), Hyderabad

Principal Investigator: Dr Pravin G Bhukte

Co-PI: Dr Bivas K Pradhan

Team: M Meena, Vinod K, Amit Palade

Dr Bivas K Pradhan
Co-PI

As part of our continued commitment to innovation and efficiency in the mineral sector, our collaborative organizations are to announce a major step forward in the assessment of bauxite deposits through the integration of cutting-edge technologies. Our objective is to evaluate the quality of bauxite deposits through hyperspectral remote sensing data with integration of heterogeneous autonomous systems capable of traversing challenging environments and executing automatic sample retrieval and return. These advanced robotic systems significantly reduce the need for manual intervention in the field, enabling continuous, high-precision sampling. In addition, the systems can be operated remotely, allowing sampling activities to be conducted from a centralized location, thereby improving operational efficiency, safety, and accessibility in challenging environments. This initiative demonstrates the feasibility and potential of emerging technologies including robotics, AI, autonomous systems, and advanced sensors to revolutionize traditional mining practices. The bauxite plateaus deposits located in Chhattisgarh State were identified for the preliminary field.

Beneficiation of bauxite (Scale up laboratory & pilot plant studies)

Sponsoring Agency: M/s Varun Minerals, Dwarka, Jamnagar, Gujarat

Principal Investigator: Dr Pravin G Bhukte

Co-PI: Dr Bivas K Pradhan

Team: V Kshirsaut

Dr Pravin G Bhukte
PI

The objective of this study is to reduce the concentration of silica (SiO_2) and iron oxide (Fe_2O_3), while enriching the alumina (Al_2O_3) content to achieve the desired grade for industrial applications. After completion of laboratory scale up studies, bulk bauxite sample has been collected for pilot plant studies. The beneficiation techniques (screening, scrubbing, magnetic separation, leaching) are being evaluated for their effectiveness in improving ore quality and maximizing yield efficiency. The results of this optimization study will provide key insights into process enhancements and potential pilot plant studies for industrial applications.

New Projects

Setting up a 1000-liter Bayer liquor processing pilot pant for recovery of Gallium in India

Sponsoring Agency: Ministry of Mines

Collaborator: JSC Titanium Institute, Ukraine

Principal Investigator: Dr Upendra Singh

Co-PIs: Jyoti Pendam, Sreedevi TE

Team: Dr Priyanka Nayar, Ragi T M, K Janbandhu, M Tirpude

Dr U Singh
Co-PI

The main objective of this project is to establish pilot-cum-demonstration facility for the extraction of 4N-purity gallium from 1,000 litres of Bayer liquor at JNARDDC, Nagpur. The project is being implemented through a strategic technical collaboration with the globally acclaimed JSC Titanium Institute, Ukraine, a pioneer in non-ferrous metallurgy and critical metal extraction technologies.

The project is already in the execution phase. The kick-off meeting has been conducted, and design finalization activities are currently underway in coordination with the Ukrainian partner.

Recovery of sulphur free nickel from pharmaceutical spent catalyst sludge to achieve zero waste

Sponsoring Agency: S&T, Ministry of Mines

Collaborator: VNIT Nagpur

Industry Partner: ABN Metal Recycling Pvt. Ltd

Principal Investigator: Shweta D Naik

Co-PIs: Jyoti Pendam, Sreedevi TE

Team: Mahin Sapkal, Prachi Pradhan, S Yadav

Shweta Naik
PI

Pharmaceutical spent catalyst sludge is a hazardous industrial waste rich in nickel along with sulfur, alumina, and alkali components, posing serious environmental risks while containing high-value critical metals. This project develops a sustainable zero-waste process for the recovery of sulphur-free nickel through controlled roasting at 600 °C followed by sulfuric acid leaching with hydrogen peroxide at 90 °C, achieving significant sulphur removal and enrichment of nickel content to over 94–97 wt.% NiO. The pregnant leach solution is further processed for sequential recovery of nickel sulfate, alumina as aluminum hydroxide, and soda as sodium sulfate through selective precipitation and crystallization. The integrated process ensures complete resource utilization, eliminates secondary waste generation, and demonstrates technical, environmental, and economic feasibility, supporting circular economy–based zero-waste management in the pharmaceutical industry.

Setting up of one tone per day pilot plant for hydro-chemical delamination of flexible multi-layer packaging refuses to recover metallic aluminium and polymers

Sponsoring Agency: S&T, Ministry of Mines
Industry Partner: Alumicopper Private Limited
Principal Investigator: Dr Md Najar
Co-PIs: Dr Upendra Singh, Dr P Mondi
Team: M Tirpude, K Janbandhu, D R Meshram

Dr Md Najar
Co-PI

JNARDDC achieved impressive records and patent in the wet delamination of single use and flexible multi-layer packaging (MLP) rejects for recovering metallic aluminium and polymer (poly ethylene, poly propylene etc.) mineral values. The developed process achieved 98-99 % recovery of materials as resource for recycling. The precise output of wet delamination process in grams to kilogram range developed at JNARDDC, and the scaleup studies up to ITPD aims validation technology for promoting commercial and industrial startups.

Setting up of 1 tpd pilot plant for the recovery of salt from waste aluminum dross

Sponsoring Agency: S&T, Ministry of Mines
Industry Partner: Alumicopper Private Limited
Principal Investigator: Dr Upendra Singh
Co-PIs: Jyoti Pendam, Dr Priyanka Nayar, Sreedevi TE
Team: Ragi T M, M Tirpude, A S Gijare, Naushin A

Dr Nayar
Co-PI

The main aim of the project is to extract salts from aluminium dross and demonstrate the commercial potential of this technology through a 1-TPD pilot plant. The process involves sequential leaching to recover salts and fluorides, followed by evaporation and crystallization. Key process parameters across leaching, filtration, and evaporation are being optimized to ensure efficiency, highlighting a sustainable approach to waste valorisation and resource recovery.

Optimizing Homogenization Practices for 6005 and 6082 Aluminum Alloys - SOP Development for the Recycling Industry

Sponsoring Agency: S&T, Ministry of Mines
Industry Partner: Yashoda Metals & Alloys
Principal Investigator: R Anil Kumar
Co-PIs: K Immanuel Raju, Shweta D Naik
Team: R N Chouhan, Dr Anas N S, Dr Arun Kumar, Ramesh Naik,

R Anil Kumar
PI

The project focuses on developing standardised SOPs and a machine learning–based tool to assess and optimise billet homogenisation without relying on advanced microstructural characterisation. By using easily measurable inputs such as electrical conductivity, hardness, temperature, and processing history, the tool will estimate the extent of homogenisation. The initiative is expected to enable reliable prediction and optimisation of homogenisation response, leading to better control over extrusion behaviour, reduced process variability in aluminium alloys.

Development of red mud-based pigment & filler for paint and allied industry

Sponsoring Agency: S&T, Ministry of Mines
Collaborator:
Industry Partner: CHEMSPERTS
Principal Investigator: Dr P G Bhukte
Co-PIs: Md Najar, Bivas Pradhan
Team: M Tirpude, Vinod K, M Meena, Amit Palade

Md Najar
Co-PI

This project aims to explore the value-added utilisation of red mud, an industrial by-product of the alumina industry, as a pigment and functional filler for paints and allied applications. The study focuses on assessing the suitability of red mud for use in different categories of paints, including water-based and solvent-based systems such as primers, intermediate coats, and topcoats. The proposed study will be done in East coast and central Indian red mud origin. The samples of red mud have been collected from NALCO, Vedanta plant and characterisation are in progress. The necessary beneficiation and chemical treatment will be performed to enhance their colour properties, chemical composition, particle characteristics, and performance attributes relevant to paint formulations. The trails related to development of pigment & formulation of different types of paints will be done at IKON Chemical Lab Pvt Ltd, Mumbai. The outcomes of this project are expected to support sustainable waste utilisation while offering cost-effective alternatives to conventional pigments and fillers for the paint industry.

Recovery of potash from granitic gneiss (rock dust)

Sponsoring Agency: S&T, Ministry of Mines
Collaborator: CSIR NIIST
Industry Partner: M/s. N.S & Co.
Principal Investigator: Dr Upendra Singh
Co-PIs: Dr P Mondi, Dr Priyanka Nayar, Sreedevi T E
Team: Jyoti Pendam,, A S Gijare, Kiran J, Ragi TM

Dr P Mondi
Co-PI

JNARDDC, in collaboration with CSIR–National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram, has initiated a strategic R&D project on the "Recovery of Potash from Granitic Gneiss (Rock Dust)" aimed at developing an indigenous and sustainable source of potash. The project focuses on the valorisation of quarry waste generated from granite crushing operations, which has been scientifically validated to contain significant potassium values. The study involves the development of a process flowsheet incorporating roasting, water and chemical leaching, and precipitation techniques to recover fertiliser-grade potassium products such as potassium chloride, potassium sulphate and potassium nitrate, while simultaneously enabling utilisation of the silica-rich solid residue for construction applications.

Setting up a semi-pilot plant for converting aluminium extrusion die sludge into alumina, zeolite and recycled leachate

Sponsoring Agency: S&T, Ministry of Mines
Industry Partner: Balaji Extrusions, New Delhi
Principal Investigator: Amol Mankar
Co-PIs: Dr Suchita Rai, Prachi Pradhan, Megha P, Mahin Sapkal
Team: KJ Kulkarni, S Yadav, Shweta N

Amol Mankar
PI

Extrusion press produces various types of extruded products, requiring frequent die changes. During die changeover, a small portion of Aluminium get stuck inside the die. As this cannot be removed straightaway by mechanical means, it is partially dissolved in caustic solution and subsequently removed manually. Over a period of time, the dissolution of aluminum slows down due to its supersaturation in the caustic liquor. When this condition is reached, the used caustic liquor is removed and replaced with a fresh caustic solution, and the dissolved aluminum gets precipitated as aluminum sludge. JNARDDC will develop a process for the complete utilization of this aluminum sludge to produce calcined alumina from the sludge (solid) and zeolite from the liquor. This will enable the production of two value-added products and allow the reuse of caustic liquor for die cleaning. This process ensures the development of zero waste technology.

The project aims to produce both calcined alumina by utilizing 50 kg of sludge and zeolite by utilizing 50 litres of liquor on a semi- pilot scale from die sludge generated by aluminum extrusion press.

Fiber laser induced break-down spectroscopy for real-time analysis of ores and aluminium

Sponsoring Agency: S&T, Ministry of Mines
Collaborator: CSIR CGCRI
Industry Partner: HINDALCO
Principal Investigator: Dr P G Bhukte
Co-PIs: R N Chouhan, Bivas Pradhan, Dr Arun Kumar
Team: Ramesh K Naik, M Meena

Dr P G Bhukte
PI

The project is developing a high-energy pulsed Ytterbium Fiber Laser–based LIBS system for rapid, non-destructive elemental analysis of ores and aluminium. The laser is being optimised for high beam quality and controlled pulse parameters to enable precise plasma generation with minimal thermal effects.The integrated LIBS setup, including advanced optics, spectrometer, and data analytics, is being tuned in collaboration with industry partners to support real-time, high-resolution material characterisation for mining and metallurgical applications.

Development and indigenization of AA4032 and AA2618 aluminum alloy billets for lightweight automotive applications

Sponsoring Agency: S&T, Ministry of Mines

Collaborator: GITAM Vizag

Industry Partner: M/s Abilities India Piston & Rings Limited

Principal Investigator: K Immanuel Raju

Co-PIs: R N Chouhan, R Anil Kumar, Dr Arun Kumar

Team: V N S U V Ammu, Ramesh Naik

K Immanuel
PI

A new R&D project titled "Development and Indigenization of AA4032 & AA2618 Aluminium Alloy Billets for Lightweight Automotive Applications" has been recently sanctioned by the Ministry of Mines, marking a significant step towards strengthening India's self-reliance in advanced aluminium alloys for the automotive sector. The project aims to reduce dependency on imported AA4032 and AA2618 alloys by establishing a scalable and cost-effective indigenous manufacturing protocol, while developing robust Standard Operating Procedures (SoPs) for achieving uniform composition and microstructure through the integration of Direct Chill (DC) Casting with Ultrasonic Melt Processing (USP). The indigenously developed billets will be comprehensively validated through microstructural characterization, mechanical testing, electrochemical corrosion studies, and impression creep behaviour, ensuring their suitability for high-performance lightweight automotive applications. The project is being implemented in collaboration with GITAM University, Visakhapatnam, with Abilities India Pistons as the industry partner, reinforcing strong academia–industry synergy to accelerate technology translation and industrial adoption.

Study on effect of addition of dust suppression chemicals in bauxite processing

Sponsoring Agency: Ma'aden Aluminium Company (MAC) Saudi Arabia

Principal Investigator: Amol Mankar

Co-PIs: Dr Suchita Rai, Mahin Sapkal, Prachi Pradhan, Megha P

Team: K J Kulkarni, Shweta Naik, S Yadav

Dr Suchita Rai
Co-PI

The objective of this study is to investigate changes in organic impurity levels in the process liquor due to the addition of dust suppression chemicals. The study will also evaluate the impact of these chemicals on the quality of alumina hydrate and assess the poisoning effect of organic impurities on the precipitation process.

The outcome of the study is expected to support decision-making in the selection and use of dust suppression chemicals. This will help maintain process efficiency while promoting sustainable and environmentally responsible material-handling practices.

Research Publications

Conference Papers

» S. Arun Kumar, V. N. S. U. Viswanath Ammu, H. Waswani, K. I. Raju, R. N. Chouhan, and A. Agnihotri, "Optimization of Bearing Line Design for Defect-Free Extrusion of AA6082 Seat Back Stiffener Frame Using Finite Element Simulation," in Proc. Int. Conf. on Non-Ferrous Materials (ICNFM), Kolkata, India, July 10–12, 2025.

» P. Nayar, P. Yadav, H. Kumar, U. Singh, and A. Agnihotri, "Synthesis of Ultrapure Alumina: A Comparative Study," in Proc. Int. Conf. on Non-Ferrous Materials (ICNFM), Kolkata, India, July 10–12, 2025.

» S. Dhamande, K. L. Wasewar, A. Agnihotri, A. Mankar, and M. Sapkal, "Innovative Techniques for Sustainable Extraction of Rare Earth Elements from Coal Fly Ash," in Proceedings of the International Conference on Non-Ferrous Metals (ICNFM), July 2025.

» Bivas K Pradhan, Pravin Bhukte, Anupam Agnihotri & Nikkam Suresh (2025); Fluidized bed separator for high-ash Indian fine Coal: A sustainable beneficiation approach; 29th International Conference on Non-ferrous Metals, July 11-12, 2025, Kolkata

» Bivas K Pradhan, Pravin Bhukte & Tejas Bhosale (2025); ''Critical Minerals in Lateritic Bauxite Profiles & Possible Processes of Extraction"; International Seminar on Critical & Strategic Minerals for Viksit Bharat @ 2047, Organised by HCL, November 09, 2025 at Kolkata.

» J Pendam, J Chatrawani, S Kowe, U Singh, and A. Agnihotri, "Leaching studies for the recovery of Nickel from stainless steel industry waste." International Seminar on Critical and Strategic Minerals for Viksit Bharat @ 2047, Hindustan Copper Limited, Kolkata, India. Nov 9, 2025.

» Prachiprava Pradhan, Suchita B Rai, Amol Mankar, Megha Panchal, Anupam Agnihotri, "Investigating the Impact of Modifier and Solid Slurry Concentration on the Rheological Properties of Bauxite Residue" International Conference on Trends in Energy and Environmental Research for Sustainable Development - III-2025 (TEERSD-III-2025), December 11-12th 2025.

» Sreedevi.T.E, Jyoti Pendam, Upendra Singh, Anupam Agnihotri, "Studies on Modified Boehmite Sorbents for Efficient Recovery of Strategic Metal: Gallium" IIM ATM at Hyderabad 3-6th December 2025.

» S Rajgire, V Jha, M Nimje, and A Agnihotri, "Indigenous Development of Instrument for Real Time Measurements for Aluminium Smelter," in Proc. ICNFM, Kolkata, India, Jul. 10–12, 2025.

» N S Anas, K N Ramteke, R A Kumar, R N Chouhan, A Agnihotri, and R Radhakrishnan, "Towards Zero-Melt Circularity: Pilot-Scale Solid-State Recycling of Aerospace Aluminium Machining Swarf for Extrusion Applications," in Proc. IIM-ATM, Hyderabad, India, Dec. 3–6, 2025.

Invited Lectures

» Mohamed Najar, Circularity of Industry Rejects in Building Materials: Emphasis on the Issues, Challenges and Possibilities of Utilizing Secondary Resources of Aluminium and Coal Industries – International Conference on Sustainable Waste Management to Achieve Circular Economy in the Construction Industry (ICSWM-2025), Birla Institute of Technology, Ranchi, Jharkhand, August 7–8, 2025.

» V. N. S. U. Viswanath Ammu, Extrusion of Aluminium Alloys: Process Parameters and Optimisation – One-Day Workshop on "Technology Conclave on Advanced Aluminium Manufacturing Technologies for Defence Applications," Ordnance Factory Ambajhari (OFAJ), Nagpur, November 18, 2025.

» V. N. S. U. Viswanath Ammu, Metallurgy of Aluminium Alloy Extrusion – Expert lecture under the Faculty Development Program on Advances in Material Science and Engineering, Nagpur Institute of Technology, Nagpur (Virtual Mode), December 16, 2025.

» Dr. Paparao Mondi, Development of Ceramic Tiles from Coal Mine Overburden and Manganese Mine Overburden Materials – International Conference on Sustainable Waste Management to Achieve Circular Economy in the Construction Industry (ICSWM-2025), August 7, 2025.

» Dr. Upendra Singh, Value Addition of Aluminium Metallurgical Rejects to Support Sustainable Industrial Practices – One-Day Conference on "Transforming Metallurgical Industry Waste Streams into Valuable Resources," organized by National Aluminium Company Limited (NALCO) and Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur, December 12, 2025.

Patents Filed

A process for conversion of lithomarge clay as filler material in paint industry; Pravin G Bhukte, P A Mohamed Najar, Anupam Agnihotri; Application No: 202521090202 dated 20/09/2025.

JNARDDC News

Hon'ble MoS (Coal & Mines) Visits JNARDDC

Shri Satish Chandra Dubey, Hon'ble Union Minister of State for Coal and Mines, Government of India, visited JNARDDC, Nagpur, on November 27, 2025, to review the Centre's ongoing R&D initiatives. The visit commenced with a plantation under the "Ek Ped Maa Ke Naam" initiative, followed by a review meeting on JNARDDC's work in critical minerals, recycling, and innovative technologies. The Hon'ble Minister appreciated the Centre's contributions and encouraged continued efforts towards Atmanirbhar Bharat. He also inaugurated the new XRF Laboratory and interacted with scientists during laboratory visits. The visit reaffirmed JNARDDC's role in advancing national priorities through research, infrastructure strengthening, and sustainable mineral technologies.

Mr Satish Chandra Dubey (MoS, Ministry of Mines) during his visit at JNARDDC

JNARDDC Co-Organises ICNFM 2025, Showcases Research on Non-Ferrous Metals

JNARDDC co-organised the International Conference on Non-Ferrous Metals 2025 (ICNFM) during July 11-12, 2025, as a platform to deliberate on recycling, resource security, and decarbonisation in the non-ferrous metals sector. At the conference, Dr Anupam Agnihotri presented a theme paper titled "Future of Non-Ferrous Metal Recycling in India: Pathways to Resource Security, Circular Economy and Decarbonisation", highlighting projected global demand growth and the need to scale recycling and low-carbon pathways. JNARDDC scientists presented five technical papers in areas including extrusion simulation, ultrapure alumina synthesis, bauxite processing, and recovery of rare earth elements from coal fly ash, reflecting the institute's active research engagement.

JNARDDC Scientists at ICNFM-2025

Dr Agnihotri addressing the gathering during the inaugural ceremony

JNARDDC Hosts One-Day Meet on Non-Metallurgical Applications of Hydrate and Alumina

JNARDDC successfully hosted a One-Day Meet on "Recent Trends in Non-Metallurgical Applications of Hydrate and Alumina" at Nagpur on September 20, 2025, to discuss emerging technologies and industry needs in the speciality alumina sector.

The programme featured addresses by Dr Saumen Sinha (Calderys) and Dr Anupam Agnihotri, Director, JNARDDC, highlighting the importance of indigenising speciality alumina to meet growing domestic demand and global opportunities. Two technical sessions, chaired by Shri Amol Mankar, HoD, and Dr Suchita Rai, Senior Principal Scientist, showcased R&D in alumina trihydrate, speciality aluminas, and non-metallurgical applications, with industry inputs from HINDALCO, NALCO, Almatis, RHI Magnesita, Carborundum, and others.

The meet concluded with a "Way Forward" discussion and a guided laboratory tour, reinforcing JNARDDC's role in fostering innovation and collaboration across the alumina ecosystem.

Participants of the one-day meet

XRD Laboratory Inaugurated at JNARDDC by EA (Mines)

The Empyrean XRD Laboratory was inaugurated at JNARDDC on July 29, 2025, by Shri Shakil Alam, Economic Adviser, Ministry of Mines in the presence of Shri Ashish Saxena, Deputy Secretary (Mines). The laboratory is equipped with a state-of-the-art Malvern Panalytical Empyrean X-ray Diffractometer, which will significantly strengthen advanced materials characterisation capabilities and support research in non-ferrous metallurgy, critical minerals, and advanced materials.

Officials from Ministry of Mines and JNARDDC during the inauguration of XRD

42nd RAC Reviews JNARDDC R&D Progress and Roadmap

The 42nd Research Advisory Committee (RAC) meeting of JNARDDC, chaired by Prof S. P. Mehrotra, IIT Gandhinagar, was held on on July 27 & 28, 2025, with participation from experts representing IISc Bangalore, DST, NALCO, HINDALCO, and other institutions. Dr Anupam Agnihotri presented an overview of recent R&D progress in critical minerals, non-ferrous recycling, red mud utilisation, and sustainable metallurgical technologies. The RAC appreciated the Centre's focus on translating research into field-level demonstrations and provided strategic recommendations to further strengthen scientific impact and industry relevance.

RAC Members

27th PERC Meeting Reviews New R&D Proposals under S&T Scheme

The 27th Project Evaluation and Review Committee (PERC) meeting was held on July 28 under the chairmanship of Shri Shakil Alam, Economic Adviser (Mines), to review new R&D proposals submitted under the Science and Technology Scheme of the Ministry of Mines. Project investigators from IITs, IISc, and other leading research institutions and universities presented their proposals, which were evaluated by the Committee. The shortlisted projects will be recommended to the Standing Scientific Advisory Group (SSAG) for final consideration and approval.

Review by PERC Members

JNARDDC Tops Swachhata Pakhwada 2025 Rankings; Leads Swachhata hi Seva & Special Campaign 5.0 Initiatives

JNARDDC, Nagpur secured 1st rank among PSUs and autonomous bodies of the Ministry of Mines during Swachhata Pakhwada 2025, in recognition of its comprehensive and sustained cleanliness and sustainability initiatives carried out under Swachhata hi Seva (SHS) 2025 and Special Campaign 5.0.

The campaign at JNARDDC commenced on September 16, 2025, with a Swachhata Pledge ceremony, where employees reaffirmed their commitment to cleanliness, hygiene, and environmental sustainability in alignment with the Swachh Bharat Abhiyan. As part of SHS 2025, JNARDDC also launched a 'Say No to Plastic' campaign, promoting reduction of single-use plastics through awareness sessions, interactive discussions, and employee pledges to adopt eco-friendly alternatives. Creative engagement was encouraged through slogan writing and painting competitions for employees and their families, spreading messages on cleanliness, waste segregation, and sustainable living.

On September 24, 2025, JNARDDC organised a Swachhata Run in collaboration with school children of Nagpur Nagar Parishad, engaging employees and students to spread awareness on cleanliness and responsible waste management. This was followed by a Shramdaan drive on September 25, 2025, conducted jointly with Wadi Nagar Parishad and Feedback Foundation at CTU Khadgaon Road, Wadi, where volunteers undertook mass cleaning activities with appropriate PPE support, reinforcing the spirit of community participation.

Under the Special Campaign 5.0 of the Ministry of Mines, JNARDDC coordinated a Pan-India E-Waste Recycling Drive launched on October 2, 2025, and conducted an on-campus e-waste collection drive from October 15 to 17, 2025. The nationwide initiative concluded on November 1, 2025, with 9.02 tonnes of e-waste collected across 58 locations, spanning Shillong to Goa and Gandhinagar, and Delhi to Bengaluru, and channelised through authorised recyclers Attero Recycling and MRAI, with over ₹ 11 lakh disbursed.

Through these integrated efforts, JNARDDC demonstrated strong institutional leadership, community engagement, and commitment to sustainability, aligning closely with the Ministry of Mines' vision of Swachh Bharat, circular economy, and Jan Bhagidari.

Highlights from swachhata pakhwada and special campaign 5.0 inititatives

जेएनएआरडीडीसी में हिंदी के प्रभावी प्रयोग की सराहना

राजभाषा विभाग, गृह मंत्रालय, भारत सरकार द्वारा जारी वार्षिक कार्यक्रम 2025-26 के अनुपालन में, खान मंत्रालय के सहायक निदेशक (राजभाषा) श्री अनूप सिंह और कनिष्ठ अनुवाद अधिकारी श्रीमती प्रीति गौतम द्वारा 13.11.2025 को जेएनएआरडीडीसी का राजभाषा निरीक्षण किया गया। निरीक्षण दल ने आधिकारिक संचार में हिंदी को बढ़ावा देने के लिए जेएनएआरडीडीसी द्वारा किए गए कार्यों की सराहना की। डॉ. उपेंद्र सिंह राजभाषा अधिकारी ने दल को पुस्तकालय और प्रयोगशालाओं का भ्रमण कराया। दल ने यह सुनिश्चित करने का सुझाव दिया कि 80% से अधिक कर्मचारी हिंदी का कार्यसाधक ज्ञान प्राप्त करें ताकि राजभाषा नियम, 1976 के नियम 10(4) के अंतर्गत जेएनएआरडीडीसी कार्यालय को राजभाषा राजपत्र में अधिसूचित किया जा सके।

राजभाषा निरीक्षण के दौरान पधारे अधिकारीगण।

JNARDDC Scientist Participates as Panelist in Low-Carbon Power Workshop

A JNARDDC scientist participated as a panelist in a workshop on “Identifying Low-Carbon Captive Power Supply Options for the Indian Aluminium Industry”, organised by IRADe at IIC, New Delhi, on November 11. The session highlighted pathways for sustainable energy transition and emphasised the need for clean, efficient, and future-ready captive power solutions to support decarbonisation of the aluminium sector.

Mr Shanmukh Rajgire as Panelist

28th PERC Reviews Ongoing and Completed S&T Projects

The 28th Project Evaluation and Review Committee (PERC) meeting was held in online mode on October 15, 2025, marking the first PERC meeting chaired by Dr Anupam Agnihotri following his assumption as Chairman, PERC. The meeting reviewed 75 ongoing and completed projects under the Science and Technology Programme of the Ministry of Mines, focusing on technical progress, outcomes, and alignment with programme objectives.

जेएनएआरडीडीसी में ‘वंदे मातरम्’ के 150 वर्ष पूरे होने का उत्सव

7 नवंबर 2025 को जेएनएआरडीडीसी में ‘वंदे मातरम्’ के 150 वर्ष पूरे होने के उपलक्ष्य में देशभक्ति और राष्ट्रीय गौरव के साथ कार्यक्रम आयोजित किया गया। संस्थान के सभागार में आयोजित इस कार्यक्रम में अधिकारियों एवं कर्मचारियों ने सामूहिक रूप से वंदे मातरम् का गायन किया, जिससे सभागार देशभक्ति की भावना से गूंज उठा।इस अवसर पर कर्मचारियों ने माननीय प्रधानमंत्री श्री नरेंद्र मोदी के संबोधन का सजीव प्रसारण भी सुना, जिसमें उन्होंने स्वतंत्रता संग्राम में वंदे मातरम् की ऐतिहासिक भूमिका और आज भी राष्ट्रीय एकता के प्रतीक के रूप में इसके महत्व पर प्रकाश डाला।

वंदे मातरम् का गायन करते हुए कर्मचारी

JNARDDC Participates in Critical Mineral Ecosystem Summit at IISc Bengaluru

The Critical Mineral Ecosystem Summit was held at the IISc Bangalore, on October 13, 2025, in collaboration with the Ministry of Mines, with participation from leading stakeholders across government, academia, and industry. The Summit was addressed by the Chief Guest, Shri Piyush Goyal, Secretary, Ministry of Mines, who emphasized the importance of securing India's critical mineral supply chains through strong industry–academia collaboration. Dr. Anupam Agnihotri, Director, JNARDDC, represented the institute at the Summit, highlighting JNARDDC's role in advancing research, technology development, and capacity building in critical minerals and recycling.


Critical Mineral Ecosystem Summit -2025

Sporting Events Foster Teamwork and Healthy Work Culture

The JNARDDC Sporting Events were inaugurated by Dr A Agnihotri Director on November 1, 2025.The events were organised to promote physical fitness, teamwork, and a spirit of camaraderie among employees alongside regular professional activities. Badminton, cricket, and table tennis competitions were conducted, contributing to a healthy, engaging, and participative work culture.

Director Inaugurating Sporting Event at JNARDDC

Vigilance Awareness Week Observed at the Centre

Vigilance Awareness Week was observed at the Centre from October 27 to November 2, 2025, with the theme "Zero Tolerance to Corruption." The observance commenced with the Integrity Pledge administered by Dr. Anupam Agnihotri, Director, to officers and staff, reaffirming commitment to transparency and ethical conduct. Mr. R. N. Chouhan, Chief Vigilance Officer, highlighted the role of vigilance and integrity in promoting good governance. Various awareness activities, including sessions, displays, and discussions, were organised during the week. The activities reinforced the institute's commitment to fostering a culture of integrity and accountability.


JNARDDC Employees taking Integrity Pledge

राष्ट्रीय एकता दिवस पर 'यूनिटी रन' का आयोजन

31 अक्टूबर 2025 को राष्ट्रीय एकता दिवस के अवसर पर, सरदार वल्लभभाई पटेल की जयंती के उपलक्ष्य में संस्थान में यूनिटी रन का आयोजन किया गया। इस दौड़ का उद्देश्य कर्मचारियों में एकता, अखंडता और राष्ट्रीय एकीकरण की भावना को सुदृढ़ करना था।इस अवसर पर श्री एम. टी. निमजे, वरिष्ठ प्रधान वैज्ञानिक, ने दिवस के महत्व पर प्रकाश डाला और प्रतिभागियों को सरदार पटेल द्वारा प्रतिपादित एकता और समर्पण के मूल्यों को अपनाने के लिए प्रेरित किया। अधिकारियों, कर्मचारियों और प्रशिक्षुओं की उत्साहपूर्ण भागीदारी के साथ कार्यक्रम का समापन राष्ट्रीय एकता प्रतिज्ञा के साथ हुआ।.

यूनिटी रन - 2025

संस्थान में संविधान दिवस पर शपथ समारोह का आयोजन

संस्थान में संविधान दिवस के अवसर पर सभागार में शपथ समारोह आयोजित किया गया, जिसमें डॉ. अनुपम अग्निहोत्री, निदेशक, ने अधिकारियों एवं कर्मचारियों को संविधान की शपथ दिलाई।इस अवसर पर न्याय, स्वतंत्रता, समानता और बंधुत्व जैसे संवैधानिक मूल्यों के प्रति प्रतिबद्धता को दोहराया गया। कर्मचारियों ने उत्साहपूर्वक भाग लिया और अपने व्यावसायिक कार्यों में नैतिक आचरण एवं लोकतांत्रिक मूल्यों को अपनाने का संकल्प लिया।

संविधान दिवस समारोह

JNARDDC at Golden Jubilee Conclave on Critical Minerals

Dr Anupam Agnihotri, Director, JNARDDC, released the souvenir and delivered the keynote address at the Golden Jubilee Conclave on "New Vistas in Critical Minerals and Materials" held at CSIR-NIIST, Thiruvananthapuram, on September 21, 2025. The conclave, aligned with the National Critical Mineral Mission, focused on India's critical mineral priorities, with Dr Upendra Singh, Senior Principal Scientist, contributing as a panelist.

Director, JNARDDC delivering keynote address

JNARDDC Celebrates 'Har Ghar Tiranga' with Bike Rally and Patriotic Activities

As part of the nationwide Har Ghar Tiranga campaign, JNARDDC organised a Tiranga Bike Rally from its campus, which was flagged off by Dr Anupam Agnihotri, Director, in the presence of employees and residents. The rally, with participants carrying the national tricolour and patriotic messages, moved through the office and township to spread awareness on hoisting the National Flag and reinforcing the spirit of unity and patriotism. Following the rally, JNARDDC employees formed a human chain holding the tricolour, symbolising unity, solidarity, and collective pride. Employees also actively participated by hoisting the Tiranga at their homes and taking selfies with the national flag, celebrating the values of freedom, sacrifice, and togetherness. The activities reflected JNARDDC's strong commitment to national pride and collective participation in India's patriotic initiatives.

Har Ghar Tiranga Celebration

जेएनएआरडीडीसी में 79वां स्वतंत्रता दिवस उत्साहपूर्वक मनाया गया

जेएनएआरडीडीसी में 79वां स्वतंत्रता दिवस देशभक्ति और उत्साह के साथ मनाया गया। कार्यक्रम की शुरुआत डॉ. अनुपम अग्निहोत्री, निदेशक, द्वारा राष्ट्रीय ध्वज फहराने और राष्ट्रगान के साथ हुई। अपने संबोधन में डॉ. अग्निहोत्री ने राष्ट्र निर्माण में नवाचार, सतत विकास और समर्पण के महत्व पर प्रकाश डालते हुए एल्यूमिनियम उद्योग में जेएनएआरडीडीसी के योगदान को रेखांकित किया। समारोह के दौरान कर्मचारियों द्वारा प्रस्तुत सांस्कृतिक कार्यक्रमों ने स्वतंत्रता सेनानियों के बलिदान और भारत की समृद्ध विरासत को सम्मान दिया। इस अवसर पर कर्मचारियों ने हर घर तिरंगा अभियान के तहत तिरंगे के साथ सेल्फी लेकर उत्साहपूर्वक भागीदारी की।

स्वतंत्रता दिवस समारोह

Khanij Cup Inter-Office Cricket Tournament Organised by JNARDDC

JNARDDC organised the Khanij Cup Inter-Office Cricket Tournament with enthusiastic participation from offices of the Coal and Mines sector. The tournament featured teams from MECL, IBM, MOIL, WCL, CMPDI, Bank of Maharashtra, and JNARDDC, promoting teamwork, fitness, and inter-office camaraderie. The tournament concluded with Western Coalfields Limited (WCL) winning the Khanij Cup, defeating Indian Bureau of Mines (IBM) in the final match. The prize distribution ceremony was held in the presence of senior officials, reflecting strong sportsmanship and collaborative spirit among participating organisations. Dr Anas N S from JNARDDC emerged as the Best Bowler of the tournament.

Khanij Cup Inter-Office Cricket Tournament at JNARDDC

Mission Karmayogi Program at JNARDDC

JNARDDC organised the Khanij Cup Inter-Office Cricket Tournament with enthusiastic participation from offices of the Coal and Mines sector. The tournament featured teams from MECL, IBM, MOIL, WCL, CMPDI, Bank of Maharashtra, and JNARDDC, promoting teamwork, fitness, and inter-office camaraderie. The tournament concluded with Western Coalfields Limited (WCL) winning the Khanij Cup, defeating Indian Bureau of Mines (IBM) in the final match. The prize distribution ceremony was held in the presence of senior officials, reflecting strong sportsmanship and collaborative spirit among participating organisations. Dr Anas N S from JNARDDC emerged as the Best Bowler of the tournament.

Dignitaries during the Mission Karmayogi Program at JNARDDC

Achievements

Scientific Excellence Award

Mr R N Chouhan, Senior Principal Scientist and HoD (Downstream & Recycling Promotion Division), JNARDDC, was conferred the Scientific Excellence Award during ICNFM 2025, in recognition of his significant contributions to research and technology development.

New Equipment

Laser particle size analyser

Make & Model: HORIBA (Japan) Partica LA-960V2

Salient features:

- The system enables high-resolution particle size distribution analysis from 10 nm to 2000 micro-m.
- Delivers fast measurements (typically ~60 s) while complying with International particle sizing standards (ISO 13320)
- Provides high precision with excellent instrument-to-instrument agreement.
- Supports both routine quality control and demanding research applications.

Graphite Furnace - Atomic Absorption Spectrometer

Make & Model: Analytikjena (Japan) ZEEnit 700P

Detection limit: up to 0.1ppb

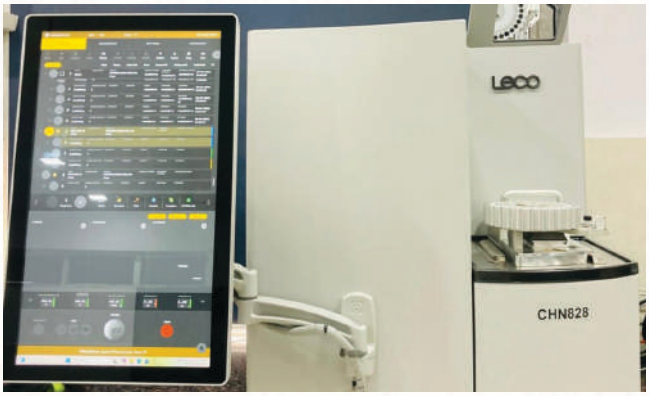
The atomic absorption spectrometer ZEEnit 700 P is a compact tandem spectrometer with a transversely heated graphite tube atomizer with Zeeman background correction at the furnace as well as a flame atomizer with deuterium background correction. The Zeeman graphite tube furnace and flame module are arranged in two separate sample chambers. It is used for ultra-trace detection of metals at very low concentrations in environmental, biological, food, and industrial samples.

CHN Analyzer

Make: Leco

Model: CHN828

The LECO CHN 828 Elemental Analyzer simultaneously measures Carbon, Hydrogen, and Nitrogen in organic samples using a vertical resistance furnace (up to 1050 °C). It handles 0.1–0.3 g samples with 4 min analysis time, using NDIR detectors for C and H and a thermal conductivity detector for N. The system includes a 30-position autoloader (expandable), operates with helium or argon and oxygen, and is controlled via LECO Cornerstone® software. It is suitable for coal, biomass, fuels, soils, polymers, food, and feed analysis.

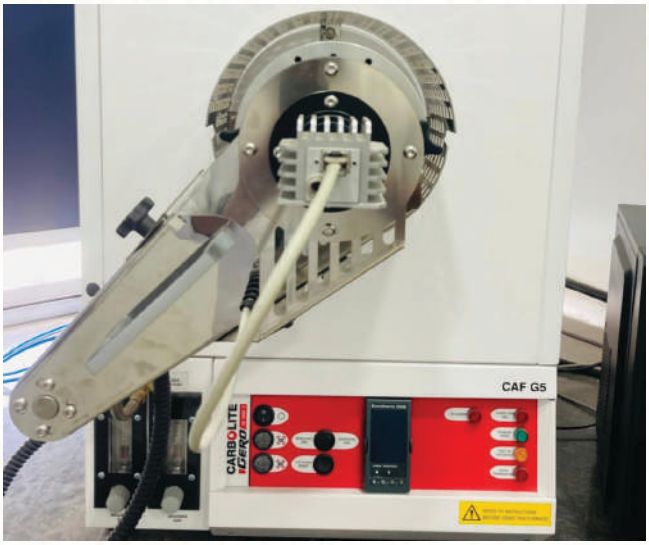


Ash Fusibility test furnace

Make: Carbolite Gero

Model: CAF G5

The Carbolite Gero CAF G5 furnace is designed for ash fusibility testing of coal, biomass, and solid recovered fuel (SRF) samples. It operates at a maximum temperature of up to 1600 °C with a precision of ±3 °C above 800 °C and a temperature ramp rate of approximately 7 °C/min. The furnace features digital PID temperature control with software, a work tube with an internal diameter of 79 mm, and silicon carbide (SiC) heating elements. It can accommodate up to 8 samples manually or about 6 automatically. The furnace complies with standards.



MoUs

Forging Partnerships: Recent MoUs Signed by JNARDDC

MoU with Bhushilp Mines and Minerals Private Limited (BMMPL)

On December 12, 2025, JNARDDC signed an MoU at Nagpur with BMMPL for collaboration in mineral testing, mineralogical characterisation, impurity assessment, and joint field-based studies in mining and critical minerals.

MoU with IKON Chemical Testing Lab and Chemsperts

On December 12, 2025, JNARDDC entered into a tripartite MoU with IKON Chemical Testing Lab Pvt Ltd, Navi Mumbai, and Chemsperts, Mumbai, to strengthen collaboration in chemical testing, analytical services, and industrial problem-solving.

MoU for SPL Detoxification Technology Transfer

On November 4, 2025, JNARDDC signed an MoU with M/s A3 Minerals and Metal Export Pvt Ltd, Cuttack, for transfer of JNARDDC-developed Spent Pot Liner (SPL) detoxification technology for safe treatment and value-added utilisation of hazardous aluminium smelter waste.

MoU with Singareni Collieries Company Limited (SCCL)

On November 3, 2025, JNARDDC signed an MoU at Hyderabad with Singareni Collieries Company Limited (SCCL) to collaborate in geology, mineral beneficiation, and advanced research on rare earths and critical minerals using JNARDDC's R&D facilities.

MoU with CSIR–Institute of Minerals and Materials Technology (IMMT)

On July 8, 2025, JNARDDC signed an MoU with CSIR-IMMT to strengthen joint research in critical metal extraction, metal recycling, and materials engineering, aligned with national priorities on circular economy and resource security.

Spotlight

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JNARDDC among India's top 5 Innovative Institutes for 2025

■ Staff Reporter

THE Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Ministry of Mines, Government of India, has been recognised among the Top 5 Innovative Research Institutions in the country for the year 2025 by the Confederation of Indian Industry (CII) recently. JNARDDC will be formally honured during the CII Innovation Award Ceremony 2025.

JNARDDC played a pivotal role in developing innovative technologies for aluminium recycling, waste-to-wealth solutions, recovery of critical and strategic minerals from industrial residues such as red mud, fly ash, and mine tailings.

Appreciating the achievement, Dr Anupam Agnihotri, Director, JNARDDC, said, the recognition by CII is a matter of immense pride for the organisation.

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Khanij Cup cricket begins

THE Khanij Cup Inter-Office Cricket Tournament, organised by JNARDDC, was inaugurated on Sunday with great enthusiasm marking the beginning of a spirited sporting event among leading offices of coal and mines. The tournament was formally inaugurated by Indradev Narayan, CMD, MECL, Dr Anupam Agnihotri, Director, JNARDDC, and Mukesh Kr Sharma, AGM, BoM.

Seven teams — MECL, IBM, MOIL, WCL, CMPDI, BoM, and JNARDDC are taking part in the event. The tournament aims to strengthen camaraderie, teamwork, and a healthy sporting culture across inter-office fraternities. Bank of Maharashtra (BoM) is the lead sponsorer.

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Conference on 'Recent Trends in Non-Metallurgical Applications of Hydrate and Alumina' held

Chief guest Dr Soumen Sinha, Dr Anupam Agnihotri and other participants of the event.

■ Staff Reporter

JAWAHARLAL Nehru Aluminium Development and Design Centre (JNARDDC), Nagpur conducted a one-day conference on "Recent Trends in Non-Metallurgical Applications of Hydrate and Alumina" recently.

Dr Soumen Sinha was the chief guest of the programme. Dr Anupam Agnihotri, Director, JNARDDC, presided over the event. Dr Agnihotri also highlighted the growing significance of indigenising in special alumina sector to meet India's expanding domestic demand and global opportunities.

Two insightful technical sessions, chaired by Amol Mankar, HoD and Dr S Rai, Senior Principal Scientist, Alumina Division, spotlighted pioneering R&D in alumina trihydrate, speciality aluminas, and breakthrough processes for diverse non-metallurgical applications.

Industry leaders from HINDALCO, NALCO, Almatis Alumina, Hindustan Abrasives, Carborundum, Dharti Group, RHI Magnesita, Calderys, Passary Minerals, and others shared perspectives on high-purity alumina, flame-retardant applications, sustainability pathways, and emerging technologies shaping the sector.

The meeting concluded with a 'Way Forward' discussion followed by a tour of JNARDDC's world-class laboratories, underlining its role as a catalyst for innovation and collaboration in the alumina ecosystem.

जेएनएआरडीडीसी में नई एक्सआरएफ लैब शुरू

नागपुर : कोयला एवं खनन राज्य मंत्री तथा राज्यसभा सांसद सतीश दुबे नागपुर स्थित जवाहरलाल नेहरु एल्यूमिनियम अनुसंधान, विकास एवं डिजाइन केंद्र (जेएनएआरडीडीसी) में हाल ही में अपने आधिकारिक दौरे पर पहुंचे. इसकी शुरुआत राष्ट्रीय पहल 'एक पेड़ मां के नाम' के अंतर्गत पौधारोपण से हुई. कॉन्फ्रेंस रुम में, मंत्री दुबे ने केंद्र के अनुसंधान और विकास कार्यों पर आधारित एक संक्षिप्त प्रस्तुति के बाद जेएनएआरडीडीसी के चल रहे कार्यक्रमों की समीक्षा की. उन्होंने नवाचारपूर्ण तकनीकों के विकास, पुनर्चक्रण क्षमता को मजबूत करने और महत्वपूर्ण खनिजों पर अनुसंधान के लिए केंद्र के प्रयासों की सराहना की. उन्होंने वैज्ञानिक टीम को आत्मनिर्भर भारत की दृष्टि के अनुरुप, एक मजबूत, आत्मनिर्भर और टिकाऊ खनिज क्षेत्र के निर्माण में योगदान जारी रखने के लिए प्रोत्साहित किया. इस दौरे के दौरान मंत्री दुबे ने नवनिर्मित एक्सआरएफ प्रयोगशाला का उद्घाटन किया, जो केंद्र की विश्लेषणात्मक और परीक्षण क्षमताओं में महत्वपूर्ण वृद्धि करने वाली प्रमुख सुविधा है. इसके बाद उन्होंने विभिन्न प्रयोगशालाओं का निरीक्षण किया तथा केंद्र की तकनीकी प्रगति में गहरी रुचि दिखाई.

अर्द्धवार्षिक

January, 2026

திண்டுக்கல் பி.எஸ்.என்.ஏ பொறியியல் கல்லூரியில் ஸ்மார்ட் இந்தியா ஹாக்கத்தான் 2025: இறுதிச் சுற்று நிறைவு விழா.

Conference on transforming metallurgical industry waste streams organised

Brijendra Pratap Singh addressing the conference while other guests look on.

■ Staff Reporter

JAWAHARLAL Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and National Aluminium Company Limited (NALCO) jointly conducted a one-day conference on 'Transforming Metallurgical Industry Waste Streams into Valuable Resources' at JNARDDC, Wadi recently.

The conference highlighted the pressing environmental challenges associated with the generation of metallurgical waste. It showcased science-driven solutions for converting industrial by-products into valuable resources, in line with the principles of sustainability and the circular economy.

The event was inaugurated by Brijendra Pratap Singh, CMD, NALCO, in the presence of Jagdish Arora, Director (P&T), NALCO, and Dr Ramanuj Narayan, Director, CSIR-IMMT, Bhubaneswar, as guests of honour. Dr Anupam Agnihotri, Director, JNARDDC presided over the event. Experts highlighted that systematic utilisation of waste streams generated across upstream and downstream metallurgical operations can substantially reduce environmental footprints, conserve natural resources, and contribute to climate-resilient industrial growth. A key outcome of the conference was the emphasis on strengthening industry-research collaboration to accelerate the deployment of green and resource-efficient technologies. The inauguration of a state-of-the-art GF-AAS Laboratory also took place during the event.

जेएनएआरडीडीसी का एमएसएमई और स्टार्टअप्स के साथ समझौता

नागपुर | जेएनएआरडीडीसी ने भारत सरकार के खान मंत्रालय की विज्ञान एवं प्रौद्योगिकी प्रिज्म योजना के तहत चयनित छह लघु एवं मध्यम उद्यमों और स्टार्टअप्स के साथ समझौता ज्ञापनों पर हस्ताक्षर करके भारत के नवाचार और महत्वपूर्ण खनिज पारिस्थितिकी तंत्र को मजबूत करने की दिशा में एक और महत्वपूर्ण कदम उठाया है। इन छह परियोजनाओं के लिए कुल अनुदान लगभग 7.58 करोड़ रुपए होगा। ये सहयोग अत्याधुनिक विचारों को आत्मनिर्भरता, स्थिरता और संसाधन सुरक्षा की राष्ट्रीय प्राथमिकताओं के अनुरूप उपयोगी प्रौद्योगिकियों में बदलने की दिशा में एक महत्वपूर्ण मील का पत्थर है। अनुदान प्राप्त करने वालों में स्पेक्ट्रम इंडस्ट्रीज (कर्नाटक), के2बीजेएन इंडस्ट्रीज एलएलपी (तमिलनाडु), फॉन्समेट मैटेरियल्स प्राइवेट लिमिटेड (महाराष्ट्र), एनआईएलआईसीओ ग्रीन टेक्नोलॉजीज प्राइवेट लिमिटेड (कर्नाटक), भाग्यनगर मैग्नीशियम प्राइवेट लिमिटेड (तेलंगाना) और एगिथन एयरोस्पेस प्राइवेट लिमिटेड (हरियाणा) शामिल हैं। डॉ. अनुपम अग्निहोत्री, निदेशक, जेएनएआरडीडीसी द्वारा समझौता ज्ञापनों पर हस्ताक्षर किए गए।

Union MoS for coal & mines visits JNARDDC

Union MoS for coal and mines, **Satish Dubey**, visited the **Jawaharlal Nehru Aluminium Research, Development and Design Centre** (JNARDDC) recently and inaugurated the newly establi XRF Laboratory. The visit bega n activity under the itiative "Ek Ped Ma a review meeting, D d on JNARDDC's on nd development es. He appreciated ork in developing technologies, ing recycling capa ing research in cri e urged the scienti tinue contributing obust, self-reliant mineral sector. H ous laboratories, vith scientists.

Centre appoints JNARDDC as PMA for Incentive Scheme for Critical Mineral Recycling

■ Aiming drop in import dependency, the Ministry launched this first-of-its-kind Rs 1,500 cr incentive scheme, recently. The scheme is expected to increase India's lithium-ion battery recycling capacity to 400 kilo tonnes per annum by 2030

■ By Kaushik Bhattacharya

THE Ministry of Mines, Government of India, has appointed Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur as the Project Management Agency (PMA) for implementing Incentive Scheme for Critical Mineral Recycling recently.

The Ministry launched this Rs 1,500 crore scheme, which is a first-of-its-kind initiative recently and it aimed at reducing import dependency, building domestic capacity, and accelerating India's transition to a circular economy.

"This six-year scheme for the period Financial Year 2025–26 to 2030–31 will incentivise the recovery of 27 notified critical minerals, including lithium, cobalt, nickel, rare earth elements, tungsten, tantalum, vanadium, zirconium, gallium, and graphite from e-waste, lithium-ion battery scrap, and other industrial residues," Dr Anupam Agnihotri, Director, JNARDDC told "The Hitavada".

The scheme introduces an outcome-linked incentive model, rewarding recyclers only on verified recovery of critical minerals. It offers a 20% capital subsidy on eligible plant and machinery (with a tapering schedule if production is delayed) and opex-linked subsidies of 40% in Year 2 and 60% in Year 5, tied to incremental sales thresholds, informed Dr Agnihotri.

To ensure wider participation, incentive ceilings have been fixed at Rs 50 crore for large/established recyclers (GMR = Rs 200 crore) and Rs 25 crore for smaller/start-up recyclers (GMR < Rs 200 crore), with additional limits on opex claims.

Only advanced recyclers, are eligible, ensuring incentives go to those engaged in actual mineral recovery and refining, not just collection or dismantling.

The Centre will provide scientific verification, sampling/testing protocols, and transparent claim evaluation to ensure credibility and trust in disbursal. The scheme is expected to quadruple India's lithium-ion battery recycling capacity to 400 kilo tonnes per annum by 2030, stimulate investments in advanced technologies -- hydrometallurgy, pyrometallurgy, hybrid -- formalise MSMEs and dismantlers into the recycling value chain, generate green jobs, and directly support India's 'Atmanirbhar Bharat' and 'Net Zero 2070' commitments, claimed JNARDDC Director.

JNARDDC in MoU with Saudi company

■ Staff Reporter

THE Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) has been entrusted with a prestigious international assignment by Ma'aden Aluminium Company, Saudi Arabia, to carry out an advanced technical study on the influence of dust suppression chemicals used in bauxite processing at the Ma'aden Alumina Refinery. This marks another milestone in JNARDDC's expanding global engagement. The study aims to strengthen environmental safety, improve refinery performance, and enhance process reliability by examining how polymer-based dust suppressants behave during bauxite handling and throughout the Bayer process.

Under the leadership of Amol Mankar, HoD (Alumina), and the guidance of Dr Anupam Agnihotri, Director, JNARDDC, a dedicated research team will undertake detailed laboratory investigations to understand the interaction of these chemicals with process liquor, their effect on caustic components, and their downstream influence on digestion efficiency, clarification behaviour, precipitation dynamics, and the quality of alumina hydrate. Through these rigorous assessments, JNARDDC will provide Ma'aden with valuable insights into chemical compatibility and its implications for full-scale refinery operations.

The outcome of this study is expected to support informed decision-making for optimising refinery processes, ensuring smoother operations, and advancing sustainable material handling practices.

This international project reinforces JNARDDC's commitment to high-end applied research, specialised consultancy, and innovative solutions that address real-world challenges of the aluminium sector. It further demonstrates India's growing technical capability in supporting global industries and contributing to more efficient and environmentally responsible aluminium production.

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