



PRESENTS

Recycling - Reshaping the Future of the Aluminium Value Chain

July 2023, Edition No.17, www.alcircle.com

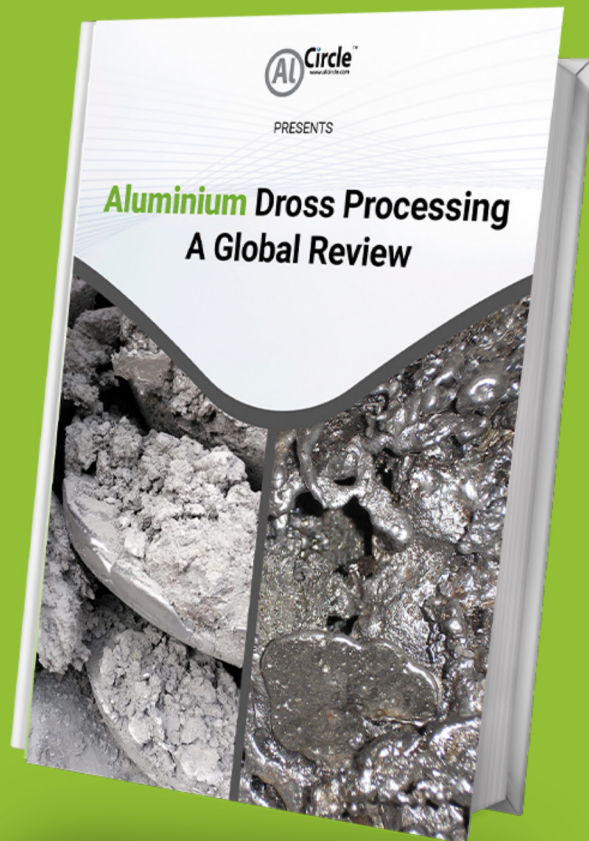


Aluminium Dross Processing

A Global Review

Phone :

±91 9833722588



BOOK NOW

Upcoming Report

Pre-book Now

booking@alcircle.com



Digital Transformation in the **Aluminium Industry**



EDITORIAL



Dear Readers,

On the one hand, aluminium demand is rising, and on the other, the disquietude for heavy greenhouse gas emissions. In this situation, recycling is an irrefutable solution as it is the most sustainable way to boost metal production and meet consumers' demand. Recycling aluminium uses 95 per cent less energy than primary metal production and saves 97 per cent of greenhouse gas emissions generated in the primary process. Moreover, aluminium is infinitely recyclable without losing its original properties.

All these significant factors have shifted the industry focus to recycling, giving birth to innovative recycling methods, technologies and solutions. So much so that industry players have even started R&D on recycling red mud, a by-product of alumina, and dross, a waste produced during aluminium smelting and recycling processes.

The future net-zero carbon emission goal also plays a major motivational role for the aluminium value chain industry to indulge in recycling. The global aluminium scrap recycling market is poised to grow by 11782.76 thousand tonnes during 2021-25,

at a CAGR of over 8%.

Aluminium scrap is recycled to deliver a myriad of products, such as castings, rolled products, and extrusions, which are then destined for end-use applications, such as in the automobile sector, packaging, solar panels, furniture, electronic gadgets and much more.

These multifaceted roles of recycled aluminium and its unmatched contribution towards environment protection have inspired the Team AL Circle to launch the 17th Edition of E-magazine on 'Recycling - Reshaping the future of the Aluminium Value Chain'. This e-Magazine has brought together the aluminium companies directly involved in recycling, remelting, and sorting activities or supply technologies and solutions to carry on the processes. The objective is to know their opinions and secure knowledge on how the aluminium recycling industry is expected to evolve in the future and give a new dimension to the entire aluminium value chain.

For this e-Magazine, the leading companies and associates have contributed articles or participated in interviews to share their initiatives and innovations around aluminium recycling, aimed at boosting metal production and supply in the market and reducing carbon footprint. Let us now flip through the pages and learn about the new-age developments in the recycling sector and how the industry people perceive the progression.

Best wishes & happy reading!

AL Circle Editorial Team:

Sarnali Chakraborty, email: schakraborty@alcircle.com
Debanjali Sengupta, email: dsengupta@alcircle.com
Mayurakshi Ganguly, email: mganguly@alcircle.com
Rupankar Majumder, email: rmajumder@alcircle.com

Design & Technical Team:

Snehasish Sahoo, email: snehasish@alcircle.com
Arpan Dhali, email: adhali@alcircle.com

TABLE OF CONTENTS

How aluminium can help solve concrete’s sustainability challenge | Norsk Hydro ASA.....08

Alustar is the first to install TOMRA’s new generation X-TRACTTM in Türkiye for aluminium recovery | TOMRA Recycling.....14

Novelis and thyssenkrupp materials services partner to drive circularity | Novelis.....22

GME Recycling and Bosch Rexroth: From the joint interest of two companies, “Ventiduedenti” is born - a revolutionary shredder that rewrites aluminium recycling history | Gianni Mori Engineering S.r.l.....28

New metal waste, new technologies | Insertec.....36

Sustainability in aluminium: Top 10 green initiatives across the value chain39

“Gouda Refractories is a worldwide reference in the field of secondary aluminium, and it seamlessly matches the design and the choice of materials to the specific needs of the industry and process.” | Miki Lagers, Sales Manager, Gouda Refractories.....46

“Due to the intense amount of energy required to create aluminium from raw materials, the need to recycle aluminium is extremely important to reduce our country’s energy consumption in creating this resource.” Andrzej Michalski-Stępkowski, President of Polish Aluminium Association.....	54
“Due to the intense amount of energy required to create aluminium from raw materials, the need to recycle aluminium is extremely important to reduce our country’s energy consumption in creating this resource.” PanelCycle Pty Ltd.....	60
“The increasing consumer focus on sustainability and environmental protection is driving the demand growth for aluminium.” Dr Ashok Nandi, President, International Bauxite, Alumina and Aluminium Society (IBAAS).....	64
“We are witnessing a paradigm shift towards the concept of ‘Reduce, Reuse, Remanufacture and Recycle’ as a strategy for building a low energy, low carbon, and low environmental impact future.” Dr Subodh Das, CEO, Phinix LLC.....	70
AI in the recruitment activities and its implications for AL Industry Soumyadip Chakraborty, Director, AL Circle Pvt Ltd.....	76
“JNARDDC has formulated guidelines for Dry Stacking of red mud to reduce the disposal problem. Dry stacking is the most popular and the best practice till now, followed by alumina refineries worldwide.” Dr Anupam Agnihotri, Director of JNARDDC.....	82
“Sustainability has always lain at the brand’s heart since its inception in Provence in the 1970s.” Mona L’Hostis, Head of Global Travel Retail Marketing - L’OCCITANE Group.....	92
“Of the material fed into the plant, approximately 85% of the aluminium is recovered.” Andrea Troy, Business Developer – Enval.....	98
“Aluminium recycling saves a significant amount of energy compared to producing new aluminium, which directly translates into a reduction in greenhouse gas emissions.” David Van Heuverswyn, Director Every Can Coun ts.....	102
“The ambitious staffs of Ad Rem is putting in all possible effort to maintain Ad Rem’s position as a front-runner in the industry.” Jelle Saint-Germain, Sales Engineer, AD REM.....	108

Performance Dashboard: Previous AlCircle E-magazine



E-magazine Performance Statistics Aluminium - Revolutionizing the Construction Sector



Total Global Reach **145296**



Total Countries Reached **86**



Facebook Reach **123864**



LinkedIn Reach **18027**



Direct Reach **2339**



Overall Social Media Presence **142957**

**E-Magazine Launch
Date: 29 Jun 2023**

**Statistics Reporting
Date: 26 Jul 2023**

Aluminium - Revolutionizing the Construction Sector

[Read e-Magazine](#)



RUSAL



FACE

FEDERATION OF ALUMINIUM
CONSUMERS IN EUROPE

LTEx

Aluminum Technology Extrusion

vedanta

aluminium

Capgemini



MINEX



Jindal Aluminium



ALUMINIUM
ASSOCIATION



ALUMINIUM
EXTRUDERS
COUNCIL

AludecoR
Metal Composite Panel



Norsk Hydro ASA

How aluminium can help solve concrete's sustainability challenge

A Hydro led research project using aluminium as reinforcement enables the use of concrete mixes where more than 50% of the cement can be substituted with sustainable binders. The result is concrete that requires far less energy and CO2 emissions to produce slimmer, lighter concrete structures with long service life.

The project is called DARE2C – Durable Aluminium Reinforced Environmentally-friendly Concrete Construction. The backdrop is the world's most used material, concrete, and has two main challenges: climate footprint and durability.

“Aluminium corrodes in the highly alkaline environment in today's concretes. On the other hand, in the development of more environmentally friendly clay-substituted cement, the steel reinforcement is not protected due to the low pH. The idea behind the research project is to hit two birds with one stone by combining low-carbon aluminium reinforcement with an extraordinary low-carbon concrete,” says Grete Hjetland, DARE2C Project Manager and Chief Engineer at Hydro.

DARE2C is a research and development project led by Hydro and supported by the Norwegian Research Council. The consortium comprises the Norwegian University of Science and Technology (NTNU), SINTEF and eight business partners.

“In the DARE2C project, we have found using aluminium as reinforcement enables the use of concrete mixes where more than 50% of the cement can be substituted with sustainable binders, such as clay and volcanic pozzolan from Iceland. This results in concrete requiring far less energy and CO2 emissions to produce,” says Hjetland.

Most aluminium alloys are stable in corrosive environments, meaning the concrete structure can be designed with respect to strength class rather than environment class. Since the reinforcement does not have to be protected by concrete, the cover can be reduced or omitted. The use of aluminium reinforcement, therefore, results in slimmer and lighter structures, and thereby also, less use of aggregates and cement. The lighter concrete

elements reduce emissions related to transport as well.

The new Ro-Ro ramp was built at Hydro's primary aluminium plant in Sunndal, Norway. Parts of the ramp use concrete and aluminium composite elements to demonstrate the concept's functionality.

"Presence of salt in water and sands used in traditional concrete will strongly reduce the durability as well as the lifetime of buildings and structures made from ordinary steel reinforcement. Revolutionary results from the DARE2C project show that seawater can be used as mixing water providing huge opportunities for green and durable buildings in countries with a shortage of fresh water. Additionally, the concept allows for the use of aggregates coated with salt," says Hjetland.



The low-carbon concrete mix developed in the research project provides durable concrete constructions with respect to carbonation, chlorides, sulphate and alkali aggregate reactions. One challenge that remains is that the concrete does not pass the standardized test for salt on top of the concrete, for example, when exposed to road salt. This is a challenge for all low-carbon concretes. However, the standardized freeze and thaw test is solved by adding air to the concrete mix in the usual way.

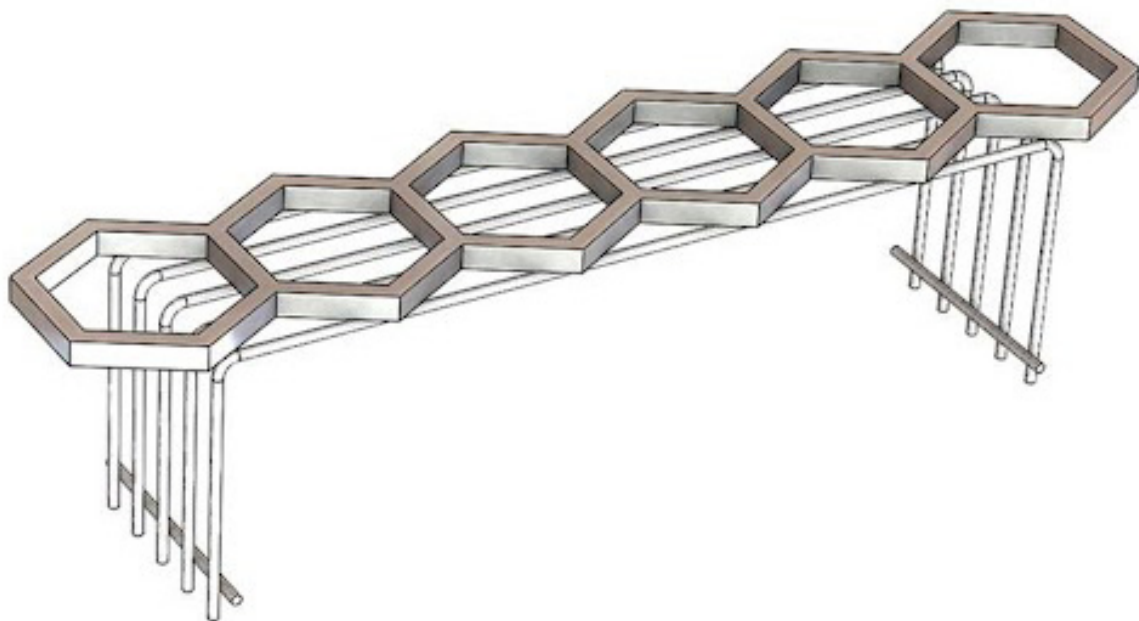


Two pilots demonstrating the DARE2C concept, combining aluminium and concrete, have already begun, with more exciting pilots and projects also in the pipeline:

A walkway made of aluminium-reinforced prefabricated concrete elements at Geitbåtmuseet, Heim Municipality in Norway. The possibility of leaving the structural reinforcement exposed and visible gives the designer an additional layer of expression.

At the new Ro-Ro ramp built at Hydro's primary aluminium plant in Sunndal, Norway, the DARE2C project has had the possibility to integrate a concrete and aluminium composite element in the traditionally built ramp to demonstrate the functionality of the concept in a heavily exposed structure in a corrosive environment.

"There is a growing focus on the climate challenge in the construction industry. Architects and engineers are looking for more sustainable materials with longer service life. Aluminium-reinforced concrete constitutes a more sustainable concrete. In that context, we are happy to be noticed," Hjetland says.





Every step matters on the path to zero



To continue developing modern society, we need more materials, and we need more from our materials, too. What we produce and consume must not only meet the surging demand, but also embody the principles of responsible sourcing, environmental consciousness, and recyclability.

Aluminium, with its infinite recyclability and corrosion-resistant longevity, is already a building block for a low-carbon, circular economy, but production comes with a footprint. Our recycled and low-carbon aluminium products are one step closer to solving that problem, and one step closer on the path to zero.

Choose your materials with the future in mind. Visit hydro.com/path-to-zero to learn more.



Industries that matter



TOMRA Recycling

Alustar is the first to install TOMRA's new generation X-TRACT™ in Türkiye for aluminium recovery

Alustar chose TOMRA's new generation X-TRACT™ for high-purity aluminium sorting in its production facility in Türkiye to produce secondary aluminium billet from aluminium scrap.

In late 2022, Alustar, a well-established smelter in the Karadeniz Ereğli Organized Industrial Zone in Zonguldak, Türkiye, invested in a new facility to produce aluminium billets with high-quality recycled content. The new plant is the first one to use TOMRA's new generation X-TRACT™ machine in Türkiye and has the highest production capacity.



Alustar's and TOMRA team in front of X-TRACT™

Zafer Çakır, Director of the Board, provided an outline of the company's goals and how they work towards them: "All our work is based on our knowledge and experience that has been passed on for generations. For 35 years, our family has been active in the aluminium industry and is now taking the next steps to live up to our mission. Offering best-in-class products and services to the global industry has always been our main goal. Combined with our ambition to lower our carbon footprint with the production of low-carbon aluminium and green billets, we are on the right way

to build a sustainable and safe future for future generations successfully and our planet alike.”

On a total area of 50,000 m², Alustar produces recycled aluminium that meets the manufacturing standards of aluminium profile manufacturers. The company belongs to Çakır Holding and has only recently become the supplier of Obal Aluminum, an aluminium profile producer operating in the same company group. Emre Şahin, Obal Aluminum Factory Manager, stated that the collaboration with Alustar will enable the company to increase the use of recycled content in producing aluminium billets.

Şahin explains, “In Türkiye, most aluminium profile manufacturers incorporate 30% recycled content in their products. To date, companies face the challenge of maintaining quality levels when using recycled content instead of virgin material. Until recently, we have used 20% of recycled aluminium to meet our quality targets. Thanks to Alustar’s recent investment in the new plant, we can now develop sufficient quantities of high-quality billets in-house and reduce the dependency on other external secondary raw material suppliers. In just 6 months after our facility started operations, we raised the use of secondary aluminium from 20% to over 50% without compromising product quality. In the next four months, we aim to reach even 70% of recycled content and are very optimistic about reaching our goal. We have a good positioning and reliable partners, such as TOMRA. Their latest aluminium sorting machine X-TRACT™ is one of the most important equipment in our facility.”

Initial investment of over \$40 million

The investment made by Çakır Holding leads back to their goal to turn scrap into superior secondary aluminium billets and reduce

the company's carbon footprint. In the initial phase, Alustar targets to process up to 4,000 tonnes/month. Of the total amount, 1,500 tonnes will be supplied to Obal's production, and 2,500 tonnes will be exported. By the end of 2023, the company aims to reach a production volume of 15,000 tonnes/month, providing 5,000 tons to Obal's production and exporting the remaining volumes.

Emre Şahin states, "Aluminum profile producers are facing multiple challenges. There is strong competition regarding costs and qualities. On the other hand, we must ensure efficient and environmentally friendly production. Turning to recycled feedstock and incorporating it in their products helps mitigate the challenges. Before we, Obal Aluminium, purchase secondary materials, we do a material quality analysis. Although the results have been good, we sometimes establish quality-related problems in the refining process. Bringing the qualities to the desired level is time intensive and leads to an increase in waste generation during production."

Using recycled content in aluminium profile manufacture is difficult because the recyclates must have the right qualities. Even the most negligible differences in material composition or contamination levels negatively affect the end product's quality. This is why many producers still prefer to use primary materials. "From the day we opened our plant that features the latest TOMRA sorting equipment, we have generated pure material fractions of aluminium. The quality is outstanding, and we could reduce costs, operate more profitably and competitively. Every step in the production process is important, but the role TOMRA's sorter plays regarding quality is the most crucial for us", adds Emre Şahin.

Osman Aydın, Alustar Factory Manager, on Alustar's export targets, said, "We aim to take on a leading role in the export of recycled aluminium billets and adhere to the strict CO2 emission regulations. As only the highest qualities of secondary materials can be used for the production of aluminium products with high recycled content, recycling took on a whole new meaning for us. It will enable Alustar to become Türkiye's largest aluminium scrap recycling company. We are still in the first phase, and our ambitions are high. To reach our targets, we rely on qualified employees and advanced equipment, such as TOMRA's X-TRACT™. Apart from the state-of-the-art technology, TOMRA delivers reliable and best-in-class after-sales service. Right from the start, we profit from TOMRA's high availability and get support in any situation."



Alustar's and TOMRA team in front of X-TRACT™

X-TRACT™ sorts a wide range of grain sizes and offers numerous additional benefits, as Osman Aydın explains, “Thanks to TOMRA’s technology, we can accurately recover recyclable aluminium from scrap and remove impurities with high efficiency. Apart from separating heavy metal and very light magnesium from aluminium profile scrap, X-TRACT™ can distinguish between high-alloy (hard alloy) and low-alloyed aluminium. Thus, we can directly feed the pure low-alloyed aluminium into our casting furnaces. Thanks to the high sorting performance of X-TRACT™, all can be accurately removed before entering the oven. This increases the melt quality, reduces the amount of pollution and helps to lower operating costs.”

Aydın outlines the difficulties in scrap recycling, “To optimize our purchasing process and only buy the best qualities, we analyze the material recovered by X-TRACT™ before the melting process. Based on this data, we can evaluate the product quality, choose the supplier that best fulfills our needs and define the right prices.

Alustar sources scrap from domestic and foreign markets. In the first step, the input material is shredded by a single and a double-shaft shredder to less than 8cm. Afterwards, dust and dirt are sieved and non-ferrous materials, plastics, inert materials and stainless materials are separated with magnetic and eddy current separators before TOMRA’s X-TRACT™ machine sorts the material. The machine’s powerful X-ray transmission technology removes impurities from the infeed stream to create pure aluminium fractions. If the materials pass the quality check, they are delivered to the foundry for smelting and undergo the refining process starts, including homogenization and further crucial quality controls. Only afterwards the newly created secondary aluminium billets are produced and packed. To achieve the best results possible, it is vital to reduce pollution and the level of

contamination as much as possible. This is why TOMRA's X-TRACT™ is of great importance for our entire process."

Oral Çimsöken, TOMRA Recycling Sorting Regional Sales Manager, states, "Alustar has a very strong experience in aluminium profile production. It is no surprise they invested in the production of secondary aluminium and cooperate with the best equipment providers in the world. Alustar couldn't have chosen a better moment to start their operation because recycled aluminium is high in demand worldwide."

"We value Alustar's trust in our expertise in metal recycling and that they consider our numerous projects around the world as best-practice. Thus, we are very delighted to be their sorting technology provider, supplying one of the first new generation X-TRACT™."

Reducing environment impact

With the use of secondary raw materials, a reduction in energy consumption and process optimizations, Alustar steps up in its commitment to mitigating environmental impact. Osman Aydın pointed out that Earth is gradually running out of resources, "We are well aware of the resource crisis we are in, but luckily, we can contribute to change. Entering the aluminium recycling business enables us to maximize resource use and protect primary materials. If we further rely on virgin materials, carbon emissions won't decrease. This is why recycling aluminium is so important. It lowers the carbon footprint while generating the same qualities. To date, we haven't determined our carbon footprint yet because we need to gather data for about a year. However, according to our forecast, we assume it is at least three to four times below the average."



Double your opportunity in
aluminum recycling.



Discover maximum potential
in aluminum and alloy
sorting with X-TRACT™ and
AUTOSORT™ *PULSE*.

Gain a leading edge in aluminum
recycling with our in-house
developed XRT and dynamic LIBS
sorting technology. Designed to
maximize purity and yield, our
sorting systems ensure a quick
return on investment.



See our machines in action





Novelis

Novelis

Novelis and thyssenkrupp materials services partner to drive circularity

Novelis Inc., a leading sustainable aluminium solutions provider and the world leader in aluminium rolling and recycling, and thyssenkrupp Materials Services, the biggest mill-independent materials distributor and service provider in the Western world with a distinctive portfolio of innovative digital supply chain solutions, have formed a partnership to increase end-of-vehicle-life recycling and availability of valuable secondary materials

that can be recovered from automobiles at the end of the consumer-use cycle.

Through the joint development of a digital platform called the Automotive Circularity Platform (ACP), the companies seek to digitalize the market for secondary materials recovered from end-of-life vehicles and increase its transparency by creating an ecosystem with the common long-term goal to increase the recycling rate of cars and reduce carbon emissions. ACP will be a digital marketplace that connects stakeholders throughout the automotive end-of-life value chain and empowers automotive suppliers to capture and reuse aluminium and other materials, such as steel, plastics, glass, rubber, and more.

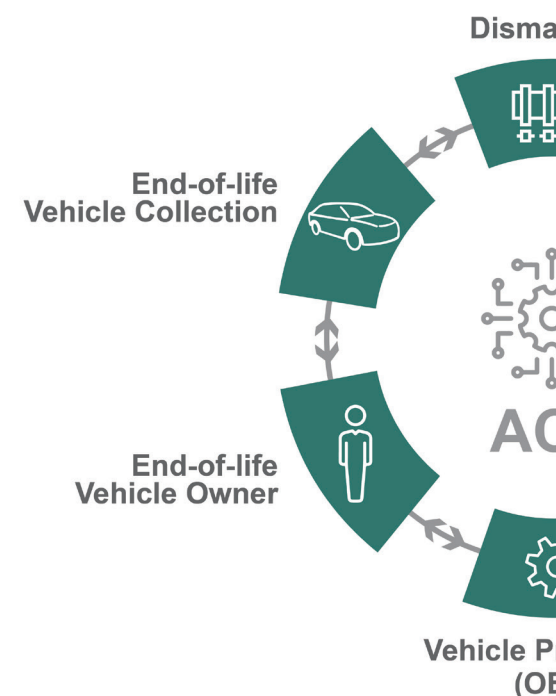
The first step is to create a prototype of the platform for comprehensive testing and evaluation purposes. The results of the proof-of-concept analysis will serve as feedback for Novelis and thyssenkrupp Materials Services to make enhancements and explore the possibility of wider adoption and use by their respective industry partners.

“ACP is a major step forward in creating an open, accessible trading platform for materials at the end of the consumer-use cycle for companies seeking to fulfill broader and deeper commitments to sustainability and circularity,” said Michael Hahne, Vice President and General Manager Automotive, Novelis Europe. “Not only will ACP increase circularity through optimized material flows and thus enable access to larger quantities of high-quality recycling materials while minimizing waste to landfill, it will also create a transparent and trusted connection for all stakeholders to create and deploy their own value-generating recycling processes.”

With the rise in electric vehicles, the reduction of pollutants from tailpipes will become secondary to increasing supply chain and manufacturing efficiencies as top targets for decarbonization. A circular ecosystem with unprecedented collaboration between all stakeholders will play an essential role in the automotive industry reaching its climate targets.

“Novelis and thyssenkrupp Materials Services have formed a relationship that leverages the best of our companies’ respective expertise, the strengths of which are complementary in every respect,” said Sebastian Smerat, Head of Customer Innovation at thyssenkrupp Materials Services. “thyssenkrupp Materials Services delivers unmatched materials knowledge and experience in digital supply chains and market access to a broad, complex sector. Novelis brings unique expertise in fields such as aluminium recycling, reuse processes and the development of aluminium alloys with high-recycled content. With the idea of developing an automotive circularity platform for aluminium, we are consistently pursuing the path of our sustainability strategy BEYOND at thyssenkrupp Materials Services.”

Automotive Circularity Platform End-of-Vehicle-Life Recycling a



For aluminium, in particular, recycling is the epitome of sustainable practices representing an approximate 95% reduction in CO2 emissions compared to the more energy-intensive requirements of primary production. Furthermore, aluminium has the ability to be infinitely recyclable with no loss of properties, including strength, lightness, durability, and formability. The many advantages aluminium offers contribute to its increasing use across industries seeking to achieve greater sustainability.

While closed-loop aluminium recycling of production scrap has become a sustainability best practice in the automotive industry in recent years, the loop at the end of a vehicle's life has yet to be closed. In a market that is thriving with diverse opportunities and on the brink of exciting growth, the partnership between Novelis and thyssenkrupp Materials Services is a major step toward achieving a circular economy for aluminium.

(ACP) Digitalizes the Market for
and Increases its Transparency



Novelis



EMPOWERING A SUSTAINABLE FUTURE

Where Our Values, People, and
Products Meet Excellence.



Qatalum



Qatar_Aluminium



Qatar_Aluminium



QatarAluminium

Excellence in Performance



In the past five years, over 35,000 hatchlings of the Hawksbill turtle have been released into the sea from Fuwairit Beach in Qatar.



PRESENTS

HEAT TREATMENT: **Challenges and Solutions in the** **Aluminium Industry**

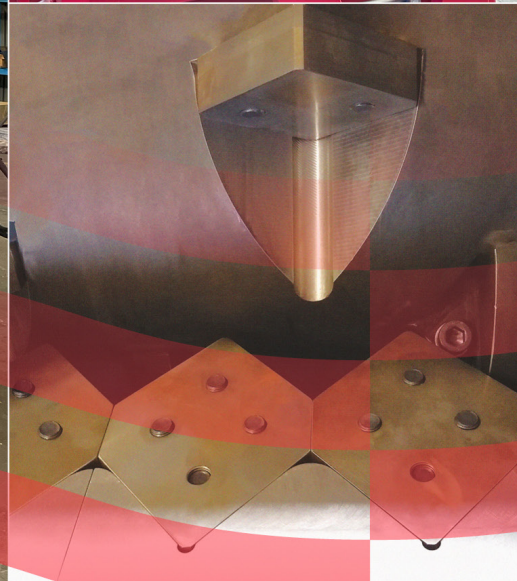
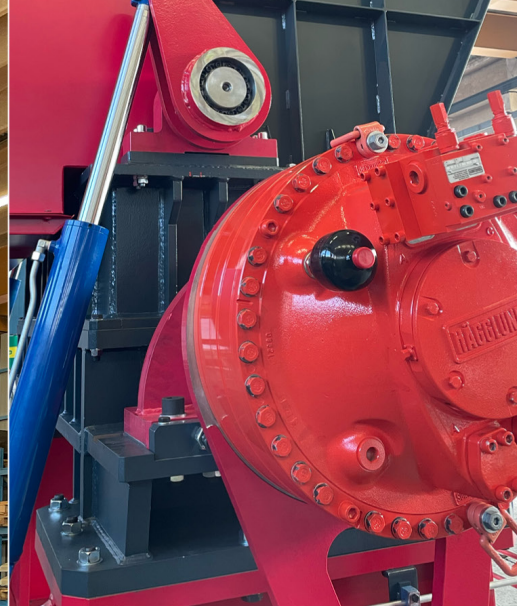


**PARTICIPATE
NOW**

CONTACT US

+91 9051666197

PROMOTIONS@ALCIRCLE.COM



Gianni Mori Engineering S.r.l.

GME Recycling and Bosch Rexroth: From the joint interest of two companies, “Ventiduedenti” is born - a revolutionary shredder that rewrites aluminium recycling history

High cutting precision, lower wear and reduced energy consumption. These three features make the machine conceived

and designed by GME, in partnership with Bosch Rexroth, a one-of-a-kind item.

GME, the acronym for Gianni Mori Engineering, is a company based in Monza with a technical division in Voghera. Maurizio Mori, GME Marketing and Sales Manager, said, “We are active in two main sectors - aluminium recycling and lead battery recycling - and we create, design and draw machines and even entire lines in-house”. “We outsource our production - he adds, through a rigid control chain that fully covers the management of approximately 280 suppliers we resort to, in order to ensure the highest quality at all times.”

GME’s way of working allows the company extreme flexibility, a condition that clients deem more and more essential. “In our case, this is possible,” says Mori, because we take care of the machine layout and design, which can be modified and adapted based on the client’s needs”. In short, “We listen to the client’s specifications, and the final project is the result of their specific needs and stringent requirements”.

Mori said, “One of our two strengths is conceiving aluminium recycling systems because we are one of the very few companies that can completely cover the recycling value chain for this material; this means that we don’t deal only with shredding and sorting of the scraps, but also with the melting part.” “This is proven by the fact” - continues Mori - that “we design and develop decoating technologies in house, to eliminate organic matter and paint from cans and profiles, and we design and manufacture melting or holding furnaces, as well as foundry plant casting machines to produce aluminium bars or billets”. GME’s market comprises 98% of exports abroad, with its most relevant clusters being the European, MEA (Middle East and Africa) and Asia Pacific

(India, China, Bangladesh and Pakistan) areas.

During the creation of a new aluminium shredder, GME reached out to Bosch Rexroth - a leading global company in the field of integrated industrial automation and mobile operating machine handling technologies. “We were looking for a partner - confirms Mori - that could support our will to create an updated production from a wear and maintenance standpoint, with high performances and greater flexibility”. In Bosch Rexroth, GME has found what it was looking for, and this was partially possible due to in-depth market analysis and, above all, to long-standing cooperation and a long history of mutual trust and reliability”. This is how “Ventiduedenti” was born, an aluminium shredder with revolutionary features, which is about to be launched on the market.

Mori explores the details of the new machine, highlighting the qualities that make it one of a kind.

Point 1, the precision of the cut. With these new blades, “teeth” developed for this shredder “we have a precision that reaches a fraction of a tenth of a millimetre. In this way, we guarantee a clean cut with a controlled and homogeneous size of the scrap loaded; this feature is especially appreciated by clients, which deem having even output sizes essential. The profile control system is ensured, apart from the new tooth design; also by an additional unload check, which prevents any out-of-range piece from exiting, ensuring the complete shredding and evenness of the output product.”

Point 2, less wear. “The machine we designed has significantly lower maintenance needs. This is because the new rotor we designed here at GME features a scissor-cut coupling elliptical

shape, with 22 offset teeth and Hägglunds hydraulic drive, ensuring the necessary cutting strength on profiles or scraps, even denser ones, generating a lower quantity of hydraulic peaks. Another essential aspect is the new Tooth design, with Quad-Cutting-Face technology, through which they can be rotated and tipped, to use the cutting faces four times before they need to be sharpened, with a blade duration in time four times longer than the previous product". We have two substantial benefits. The first medium-long-term benefit is a reduced wear of the system mechanics and hydraulics, while the second is a greater blade and hydraulic motor longevity.

Point 3, greater performances. "The concept behind Ventiduedenti focuses on using the motor to optimize the productivity/energy consumption ratio. The shredder is built so as to adapt to different kinds of scraps with different shredding strengths, and, through its innovative cutting geometry, it reduces absorption peaks for the power installed so that they can only be reached in a fraction of a second during which the knocker shears the scrap. After which, the system undergoes a downward spiral, which means that the effort is not always at full regime, but it is instead divided and slowed down according to the actual needs. The motor is used in a less massive manner through the system described earlier. This translates into less machine wear in general and also greater adaptability to the type of scrap loaded into the shredder, designed to be extremely eclectic and versatile. At a glance: the need to carefully divide everything that is inserted in the shredder is not so stringent".

The terms of the essential contributions to the "Ventiduedenti" project made by Bosch Rexroth are described by its Product Manager Giacomo Bosio: "With the Hägglunds product portfolio, we were able to satisfy GME's requests in terms of quality,

flexibility and reliability.

The quality of the finished product is also ensured by the performance of our components, which allows for improving the production process and increasing productivity.

Thanks to the flexibility of our solutions, we managed to meet the technological requirements of the machine fully.

Most importantly, our client knows they can count on the reliability of our Hägglunds systems, designed in order to provide a long service life, even in Heavy Duty continuous applications, with consequent maintenance reduction.

Moreover, with our control system, we are able to work in 'power on demand' mode, ensuring the correct size and use of the electric power installed, optimizing the productivity/energy consumption ratio."

A concept reiterated by Davide Borroni, Bosch Rexroth Sales Representative: "The Hägglunds motor, applied to this kind of machines, offers great benefits: high starting power without any time limitation, and direct shaft assembly without interposed gearboxes; this reduces inertia, making the machine less sensitive to impacts, and protecting both the mechanical part and the drive system".





Hägglunds started producing these systems in the 1980s and then constantly updated and improved them in step with technological developments.

The Swedish company is synonym with experience and success, “and this - says Bosio, from Bosch Rexroth – is truly important for the client because they know they can rely on an internationally-leading company that provides services and spare parts everywhere through the capillary diffusion of its operating branches”. “Furthermore, Hägglunds solutions are ‘plug & produce’ and turn-key. The system is assembled and tested by the manufacturing company. The client only needs to connect the components, install the motor on the shaft, and start the machine.



The drive is provided with a built-in control system - Spider II - that can fully manage the machine motion control by interacting with the most widespread communication protocols. It’s a simple parameter setting operation to make the commissioning easy and quick.”

Mori from GME adds: “This is a system 4.0 that reaches up to 10 tons/hour of loaded scrap, in a modular way, and with a precise cutting action, minimizing the production of fine particles and dust, and therefore aluminium loss compared to our standard systems, such as hammer mills; moreover, it prevents extremely noise environments, polluted by fine dust that hinder our

operators' health".

Concerning the time required to complete the project, Borroni from Bosch Rexroth says: "We met in November to define the supply order and made the material available to the client by mid-February. This is another of our signature characteristics: we are able to provide an entire drive system (motor, hydraulic power unit and motion control) in approximately 14 weeks, while the supply of the motor only requires just 7 weeks".



1. SHREDDING & SORTING

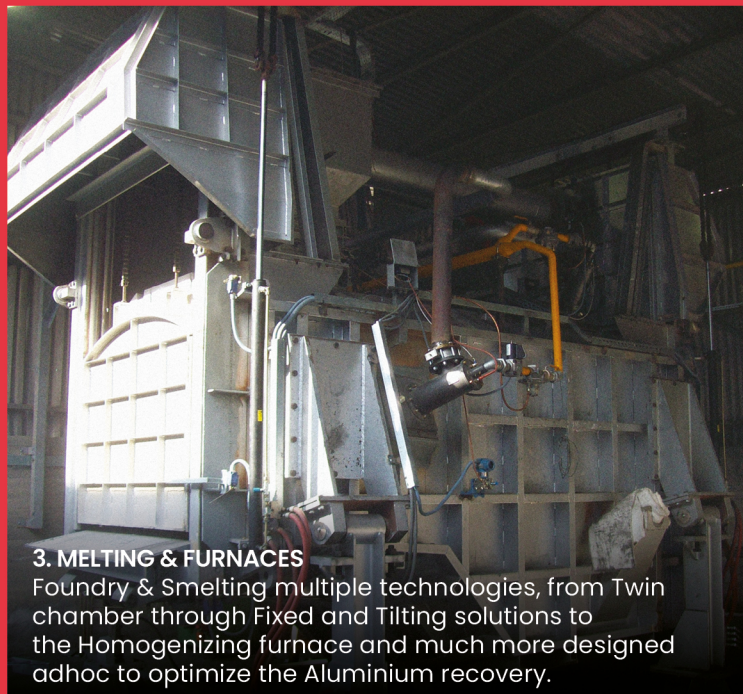
The CORE of the technology relies on a Variable speed process and high cutting/crushing force Shredder or Hammer mill that answer to different Recycling needs.



2. DECOATING & DELACQUERING

The Process is based on a pyrolytic system to pre-treat the scrap removing the organic part from Aluminium such as paint, oil, grease, plastic to be re-used as fuel for smelting phase.

TAILORED TURN-KEY SOLUTION FOR ALUMINIUM RECYCLING COMPLETE LINE



3. MELTING & FURNACES

Foundry & Smelting multiple technologies, from Twin chamber through Fixed and Tilting solutions to the Homogenizing furnace and much more designed adhoc to optimize the Aluminium recovery.

New metal waste, new technologies

Aluminium's use in mobile phones, laptops, and other electronic devices has increased due to its lightweight and durable properties. However, producing aluminium from raw materials is energy-intensive and contributes to greenhouse gas emissions.

Recycling aluminium from electronic waste (e-waste) helps conserve natural resources and significantly lowers the carbon footprint associated with aluminium production. Here's how recycling aluminium from electronic devices can lower the CO₂

footprint:

Energy Savings: Recycling aluminium requires significantly less energy compared to producing it from raw materials. The energy savings can be as high as 95%, translating to a considerable reduction in greenhouse gas emissions associated with energy generation.

Reduced Mining and Processing: Recycling aluminium reduces the need for mining and processing bauxite ore, which is the primary source of aluminium. Mining and refining processes emit greenhouse gases and cause habitat destruction, but recycling reduces these negative impacts.

Conservation of Resources: By recycling aluminium from electronic devices like mobile phones and laptops, we extend the lifespan of the metal and reduce the demand for new aluminium. This conserves natural resources and reduces the environmental impact of mining activities.

E-waste Management: Proper recycling of electronic devices ensures that hazardous substances in e-waste are handled safely and not released into the environment. Recycling facilities follow strict guidelines to manage e-waste responsibly, preventing pollution and health hazards.

Circular Economy: Aluminium recycling promotes a circular economy, where materials are reused and recycled, reducing the need for virgin resources. This approach supports sustainability and reduces the environmental burden of production and waste disposal.

To achieve significant reductions in the CO2 footprint associated with aluminum usage in electronics, it is imperative to focus on enhancing e-waste recycling efforts. This involves creating awareness about the importance of recycling electronic waste and implementing effective collection and recycling programs. The responsibility for building a sustainable e-waste management system lies with governments, manufacturers, and consumers, as each of these stakeholders plays a vital role in driving positive change.

As consumers, we can contribute to lowering the CO2 footprint by responsibly recycling our old electronic devices at designated e-waste recycling centres or through manufacturer-led recycling initiatives. Supporting products made from recycled aluminium can also encourage adopting sustainable practices in the electronics industry.

At Insertec, we think that is important to note that the development and adoption of green aluminium production technologies may vary depending on the economic feasibility, technological maturity, and regional factors.

We are working towards a more sustainable aluminium industry to reduce environmental impact and support global efforts to combat climate change.

By embracing these principles and incorporating them into the design and operation of new recycling plants, industries can lead towards a more sustainable and circular economy.



Sustainability in aluminium: Top 10 green initiatives across the value chain

The aluminium industry is undergoing a significant transformation, with a strong emphasis on sustainability, where recycling plays a vital role, making it a top priority for producers and consumers. The industry's focus has shifted towards implementing eco-friendly practices and embracing circular economy principles. This strategic shift reflects a commitment to reducing environmental impact, conserving resources, and promoting the responsible use and disposal of aluminium products. With a shared vision of a greener future, the aluminium supply chain stakeholders are collaborating to create a more sustainable and environmentally-conscious industry.

Green energy, carbon footprint, energy optimisation, sustainability, low carbon, recycled products and net zero have become the most discussed issues in almost every sector, including the aluminium business. The aluminium recycling sector is vital to the industry's continued success (economic, technological, and environmental). With a rising concern for the environment and a focus on carbon neutrality, significant aluminium leaders and

businesses are working to create a sustainability roadmap for the sector, while organisations are making efforts to celebrate their accomplishments. Top companies like Hydro, Amcor, Rio Tinto, Emirates, Alcor, etc., are leaving no stone unturned to shift towards a sustainable industry. In 2022, global aluminium consumption, including primary and recycled metal, climbed by around 1.9% to 95.3 million tonnes. During the previous decade, the demand for recycled aluminium had also significantly increased. While total demand for aluminium is expected to rise by 1.8% in 2023, demand for recycled aluminium is expected to rise by 4.2%. The global use of recycled aluminium grew from 26 million tonnes in 2021 to 27.1 tonnes in 2022. The consumption is predicted to exceed 28 million tonnes by 2023. The primary aluminium producers have also invested in establishing recycling facilities and are expanding their capacity. Alcoa, Hydro, Novelis, Constellium, and other significant businesses have closed-loop scrap-collecting partnerships with their clients. More post-consumer scrap (end-of-life) aluminium products are being used in the US and European markets, which is expected to continue in the future.

Similarly, demand for recycled aluminium is increasing in emerging nations, with significant companies investing in establishing recycling facilities. Recycling is becoming more of a need than a cause of concern in today's world, fraught with problems, including a growing population, more pollution, higher energy prices, and dwindling supplies of raw materials. Aluminium is one of the few metals that can be recycled indefinitely without degrading quality. Recycling aluminium furthers the goals of sustainability and stewardship, which demand accountability from manufacturers for their products' effects on human and environmental health and safety.

Amcor launches its new sustainability program called TRANSPARENCE

Amcor, a leading global provider of innovative, sustainable packaging solutions for consumer goods in industries as diverse as food and beverage, pharmaceutical, medical, and home/personal care, has launched TRANSPARENCE. This new sustainability programme provides Wine and Spirits businesses with clarity and certainty about sustainability actions.

To know more: <https://www.alcircle.com/news/amcor-raises-its-sustainability-game-with-the-new-transparency-initiative-97597>

Toyota promotes the circular economy by recycling 99% of its automobile components

Toyota marked World Recycling Day on May 17 by emphasising the significance of recycling to the environment and its decarbonisation agenda. Toyota has been pushing car recycling since 2003 with an easily accessible collection and separation procedure, resulting in the reuse of 99% of their vehicles' materials. This is made possible by Toyota Metal, their recycling firm.

To know more: <https://www.alcircle.com/news/toyota-evokes-circular-economy-by-recycling-99-of-its-car-parts-94986>

Niche Fusina leads sustainability with 100% low-carbon aluminium

Starting in September 2023, Niche Fusina Rolled Products (Fusina), one of the world's foremost makers of industrial rolled aluminium products, has pledged to source 100% of its raw

aluminium from environmentally aware suppliers using low-carbon practices.

To know more: <https://www.alcircle.com/news/italy-s-niche-fusina-spearheads-sustainability-with-100-low-carbon-aluminium-for-industrial-products-97599>

Crown Holdings' two facilities in Thailand achieves ASI Performance Standard V2 (2017) Certifications

Crown Holdings, Inc.'s two beverage can manufacturing plants in Nong Khae District, Thailand, have received Performance Standard V2 (2017) Certifications from the Aluminium Stewardship Initiative. Crown Bevcan and Closures (Thailand) Co., Ltd. and Crown TCP Beverage Cans Company Limited have been certified to produce aluminium cans for the food and beverage packaging industries.

To know more: <https://www.alcircle.com/news/crown-holdings-two-facilities-in-thailand-obtain-asi-performance-standard-v2-2017-certifications-97613>

Stora Enso and Tetra Pack open a new €29 million carton recycling facility in Poland

Poland recently received a new €29 million recycling plant geared at post-consumer beverage cartons, with the potential to more than treble the country's average recycling capacity to an astonishing 75,000 tonnes.

To know more: <https://www.alcircle.com/news/stora-enso-and-tetra-pack-deploy-a-new-29-million-carton-recycling-facility-in-poland-96397>

Rio Tinto to build hydrogen plant with Sumitomo

Rio Tinto, an Anglo-Australian metals and mining corporation, plans to establish a trial hydrogen plant in Gladstone and adapt an alumina refinery to replace natural gas consumption with clean hydrogen for the alumina refining process. Sumitomo Corporation, a Fortune 500 global trade and business investment firm, will assist with the project.

To know more: <https://www.alcircle.com/news/rio-tinto-to-build-hydrogen-plant-with-sumitomo-for-yarwun-alumina-refinery-aiming-to-curb-carbon-emissions-96539>

Jamestrong to use SMaRT@UNSW recycling technology for production

Jamestrong, a renowned Australasian can manufacturer with Taree factories, is collaborating with the UNSW Centre for Sustainable Materials Research and Technology (SMaRT@UNSW) to make aerosol cans utilising recycling technology developed by the University. The collaboration intends to use any kind of everyday and essential post-consumer trash as a raw material for creating aerosol cans, such as contact lens cases or food packaging.

To know more: <https://www.alcircle.com/news/australasian-aluminium-can-manufacturer-jamestrong-to-use-smart-unsw-recycling-technology-for-production-97655>

FCR researchers design innovative system for recycling aluminium waste using solar radiation

Fraunhofer Chile Research (FCR), one of the first research institutes of Corfo's Programme for the Attraction of International

Centres of Excellence, was founded in 2010 and is developing a solar concentration system to aid in the recycling of aluminium trash.

To know more: <https://www.alcircle.com/news/fcr-researchers-design-innovative-system-for-recycling-aluminium-waste-using-solar-radiation-96463>

Emirates launch 'Closed-Loop Onboard Waste Recycling System' for the aviation industry

The aviation sector now puts a high value on environmental sustainability. Airlines throughout the globe are making considerable efforts towards sustainable aviation to reduce their carbon footprint and embrace eco-friendly practices.

To know more: <https://www.alcircle.com/news/emirates-introduces-closed-loop-onboard-waste-recycling-system-to-foster-sustainability-95218>

SOLARCYCLE finalises green deal with Ørsted

Ørsted, a major sustainable energy firm, has formed a new cooperation with SOLARCYCLE, a technology-based solar recycling company, to recycle and process end-of-life solar modules from its projects around the United States. This recycling services agreement is in line with Ørsted's worldwide pledge, which takes effect immediately, to reuse or recycle 100% of solar panels that reach the end of their useful life. It is the industry's first of its sort.

To know more: <https://www.alcircle.com/news/solarcycle-finalises-green-deal-with-orsted-to-recycle-its-end-of-life-solar-panels-95132>



**Amplified synergy.
Unified force.**



AD BROCHOT MECFOR

Passion for challenges

epiqmachinery.com

info@epiqmachinery.com | +1 514 687-7678





Miki Lagers, Sales Manager, Gouda Refractories

“Gouda Refractories is a worldwide reference in the field of secondary aluminium, and it seamlessly matches the design and the choice of materials to the specific needs of the industry and process.”

Miki Lagers is a competent and well-rounded sales expert with 20 years of experience defining and optimizing commercial skills in various occupational areas. He has displayed the ability to combine an excellent sales strategy with the capability of knowledge of the human nature of different cultures. He joined the more than-century-old Netherlands-based Gouda Refractories as Sales Manager in April 2022.

His ability to work collegially with team members and leaders across business units and lines of business drives and promotes organizational change whilst embedding governance principles to move the organization up the functional excellence curve.

AL Circle: Can you provide a brief overview of Gouda Refractories and its role in the secondary aluminium industry?

Miki Lagers: Gouda Refractories is a worldwide reference in the field of secondary aluminium. Gouda Refractories seamlessly matches the design and the choice of materials to the specific needs of the industry and process. This is the result of years of development based on specific knowledge of the design process, the operational parameters, and the installation and use of refractory systems.

The long history of Gouda Refractories goes back over a hundred twenty years, to 1901. This long period underlines the added value of Gouda Refractories' products and services. Numerous customers throughout the world rely on our unique combination of problem-solving ability and practical experience of the advanced R&D and production departments for the design and production of refractory linings. Apart from refractory bricks, refractory monolithics, mortars and precast shapes, Gouda Refractories

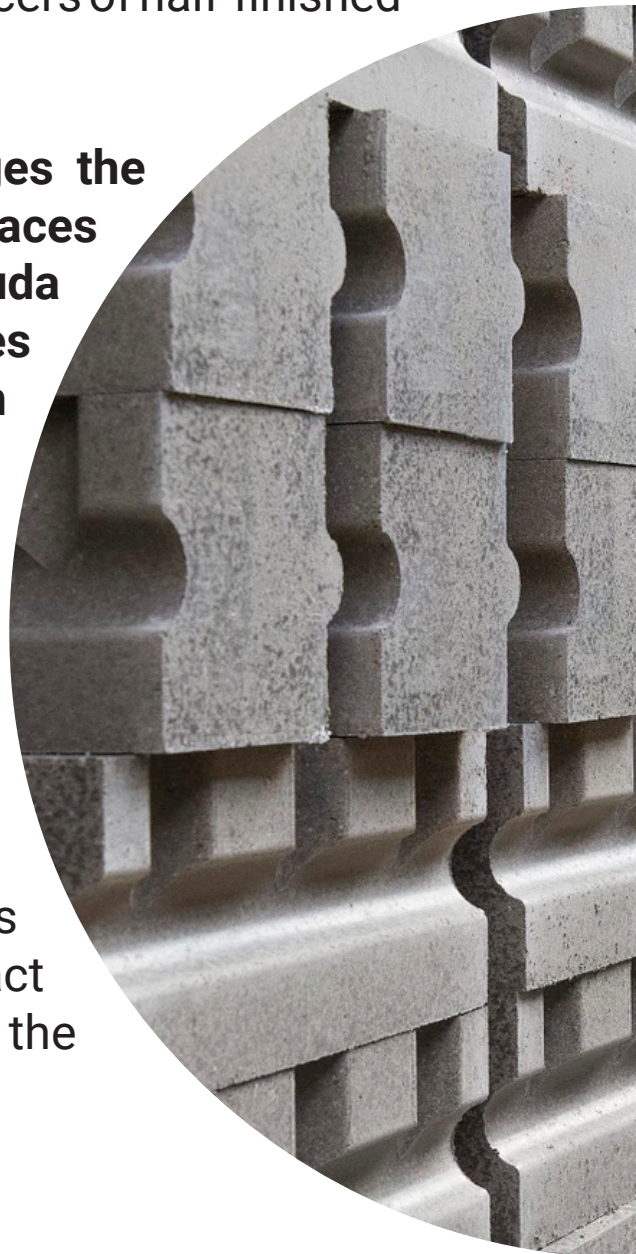
mainly manufactures and delivers customer-specific total solutions for aluminium melting and holding furnaces.

Gouda Refractories' AK 85 MP-brick and its ALU-CAST range of castables have proven to be excellent materials for all types of applications in the secondary aluminium industry throughout the years.

For the secondary process of making specific aluminium alloys and remelting aluminium (aluminium recycling included), Gouda Refractories delivers tailor-made refractory linings for furnaces used by aluminium producers and producers of half-finished products and end products.

AL Circle: What are the key challenges the secondary aluminium industry faces regarding refractories? How do Gouda Refractories address these challenges and provide solutions for the aluminium recycling sector?

Miki Lagers: Although the process conditions in an integrated aluminium plant are not so severe with respect to high temperatures, specially developed refractories must be used with specific properties in order to withstand process conditions such as temperature-fluctuation, chemical impact and, specifically for recycling furnaces, the mechanical impact.



These refractories must be tailor-made to meet the process conditions and obtain the best value in use. As one of the leading global suppliers of refractory solutions for the aluminium industry, Gouda Refractories has developed over the last four decades vast expertise in the engineering, the manufacturing (of bricks, monoliths and precast shapes) and the installation of refractory linings applied in Aluminium Melting and Holding Furnaces.

AL Circle: Could you highlight some refractory products specifically designed for the secondary aluminium industry? How do these products contribute to the overall efficiency and sustainability of the recycling process?



Miki Lagers: The low-porosity, phosphate-bonded bricks LP 60 MP and AK 85 MP are high-fired bricks specially developed for heavy-duty melting furnaces. These non-wetting brick grades have excellent resistance against liquid aluminium, thermal shock and erosion abrasion due to scrap loading and electromagnetic stirring.

In addition to its brick range, Gouda Refractories has a wide range of monolithic specially developed for aluminium melting and holding furnaces. The Low Cement Castable range of products is named ALU-CAST, and the No Cement Castable range is named SOLID.

In its precast fabrication facility, Gouda Refractories can manufacture a wide range of precast shapes from its castable range. These shapes can be delivered dried and/or burned above operation temperature if so required.

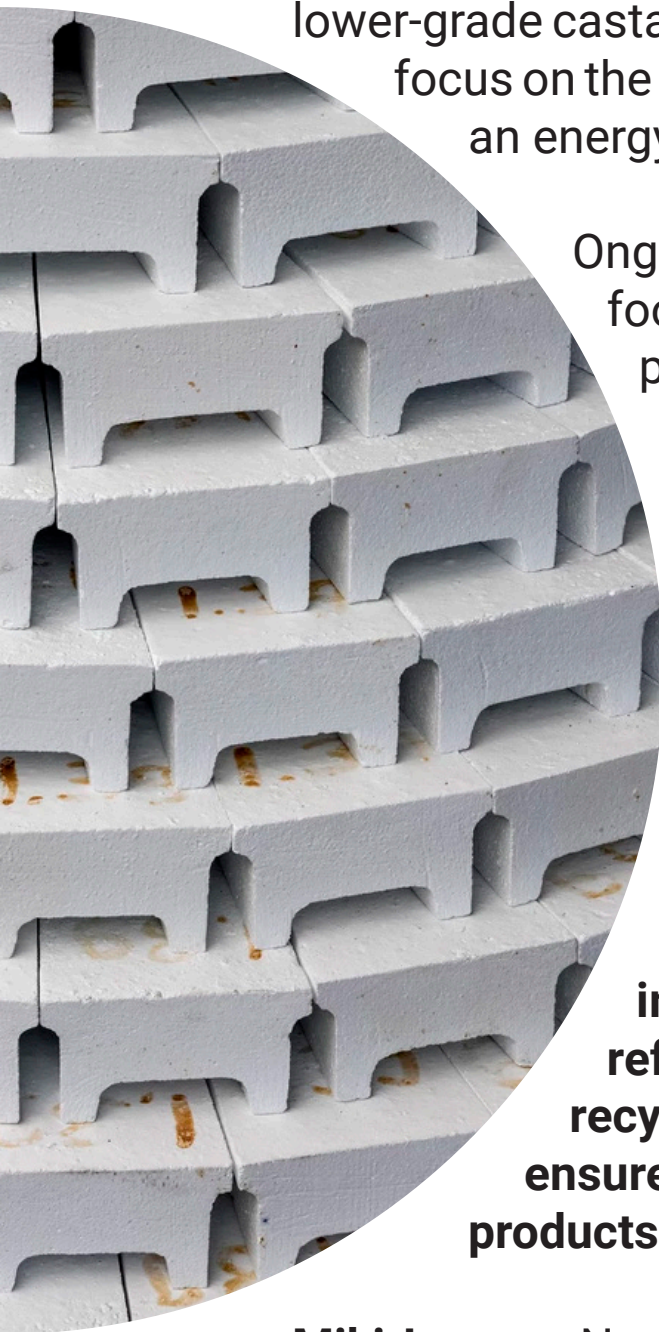
For each refractory part in the furnace, Gouda Refractories can supply a refractory grade that is specially developed for the specific demands in that section of the furnace.

AL Circle: In what ways does Gouda Refractories prioritize sustainability and environmental considerations in developing and producing its refractory solutions?

Miki Lagers: We are committed to implementing sustainable business practices to minimize our ecological footprint. This includes reducing energy and water consumption, limiting waste production and promoting recycling. Through continuous investment in research and development, we aim to find innovative solutions that benefit both our customers and the environment.

Sustainability and the environment are considered from the earliest stage of product development. Over the last 5 years, Gouda Refractories has developed internal recycling processes to remove spilled or rejected raw materials and/or end products. All other spilled or rejected raw materials and/or end products are recycled internally. Spent refractory material is re-used in





lower-grade castables and bricks. Our refractory designs focus on the longest possible lifetime and achieving an energy-efficient furnace operation.

Ongoing investments to reduce the CO₂ footprint of the refractory manufacturing process will be speed up and increased. We aim to achieve a reduction of ~50% by 2030 and 100% by 2050, which puts us at the level that is expected within the European Union. Our goal is to be a frontrunner in our industry and – as a trustworthy partner – to assist our customers in achieving their ESG targets.

AL Circle: Can you explain the importance of quality and durability in refractory materials used in aluminium recycling? How do Gouda Refractories ensure the high quality and longevity of its products?

Miki Lagers: Now more than ever, refractory materials for the lining of aluminium melting and/or holding furnaces should be carefully selected. The choice of refractory materials greatly depends on the operational circumstances of each part of the furnace, which affects the refractory materials. Therefore, intensive dialogue between the refractory engineer and the furnace operator is essential, and post-mortem research can help make improvements.

AL Circle: Looking towards the future, what trends or developments do you foresee in the secondary aluminium industry, and how are Gouda Refractories positioned to meet those challenges and opportunities?

Miki Lagers: As the aluminium industry evolves, furnace operations require more flexibility because of a wider variety of alloys processed and increased aluminium recycling combined with higher production stresses. Consequently, refractory linings are subject to more extreme circumstances than in the past.

Based on the literature, research on refractory and practical experience, Gouda Refractories has a philosophy on the refractory material to be used in the aluminium furnaces. By intelligence in the selection of raw materials (type of material and grain size) and specific process control, a refractory lining can be developed that withstands the demands that are put by the furnace process.

AL Circle: Are there any success stories or case studies where Gouda Refractories' refractory solutions have significantly impacted the secondary aluminium process? Could you share one such example?

Miki Lagers: Gouda Refractories has a comprehensive global reference list of success stories we are very proud of. We have built a worldwide reputation for the reliability of refractory materials, design and installation for melting and holding furnaces. This demands highly qualified, dedicated and committed people with a second nature to continuously improve materials, design and workmanship to bring excellence to our customers.

Since 1901

Refractory solutions you can count on!

Our in-house services:

- **Manufacturing** of bricks, precast shapes & monolithics
- **Design & Engineering** (mechanical design, HTC, design drawings)
- **R&D** (ISO 9001 certified lab, fully equipped according to ASTM and ISO standards)
- **Inspection & Supervision Services**
- **Installation Services**
- **Logistics** (nearby accessibility to Rotterdam port / Amsterdam airport)
- **Training** (refractory courses)



Would you like to know more?
Call us or check our website:
www.goudarefractories.com



Market segments:

- Non-Ferrous metals
- Energy & Chemicals
- Environment
- Steel
- Cement
- Biomass
- And others



Andrzej Michalski-Stępkowski,
President of Polish Aluminium
Association

“The primary task of the Polish Aluminium Association is to promote the use of aluminium in all possible applications. In doing so, we inevitably promote the use of recycled aluminium.”

Andrzej Michalski-Stępkowski has been associated to the Polish metal market for over 20 years. Having initially served as a journalist and editor at Rzeczpospolita, one of Poland's most widely circulated daily newspapers, and later transitioned into the role of publisher for 'Nowa Stal' Magazine. Since 2016, he has held the position of President of the Polish Stainless Steel Association. In 2021, he assumed the role of the inaugural President of the Polish Aluminium Association, and he continues to lead both organizations to this day.

AL Circle: Can you provide us with an overview of the role of the Polish Aluminium Association in promoting aluminium recycling? What are the main objectives of the Polish Aluminium Association regarding aluminium recycling?

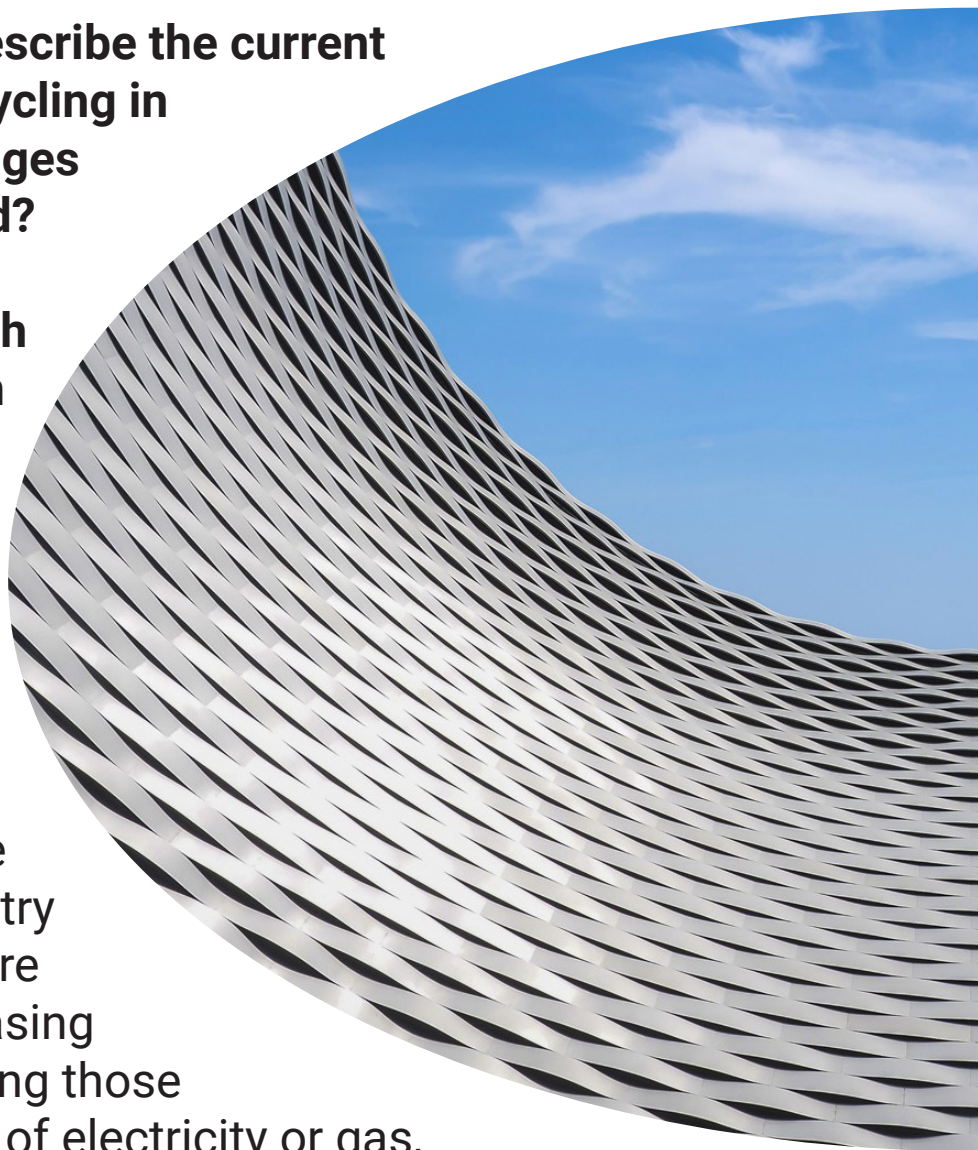
Andrzej Michalski-Stępkowski: The Polish Aluminium Association is a national industry organisation that brings together leading companies operating in the Polish aluminium market. Our members include manufacturing companies that produce, for example, flat products or aluminium profiles. In addition, the Polish Aluminium Association brings together entities from the broad business environment, e.g. distribution and processing companies, suppliers of services and products for the aluminium industry and end users of aluminium.

No primary aluminium is produced in Poland. However, our country is one of the largest European producers of secondary aluminium made from recycled aluminium scrap. This material is then used for the further production of particular products. They make their way, among others, to the transportation, automotive, construction, energy and many other industries.

The primary task of the Polish Aluminium Association is to promote the use of aluminium in all possible applications. In doing so, we inevitably promote the use of recycled aluminium. In our activities, we emphasise the message in which we explain how the development of secondary aluminium production is beneficial for the environment. This message is fully correlated with the marketing activities undertaken by individual Polish Aluminium Association member companies. This allows us to jointly build a positive image of aluminium as an ecological material that fully meets the requirements of modern industry.

AL Circle: Could you describe the current state of aluminium recycling in Poland and any challenges that must be addressed? What initiatives or programs has the Polish Aluminium Association implemented to encourage and facilitate aluminium recycling?

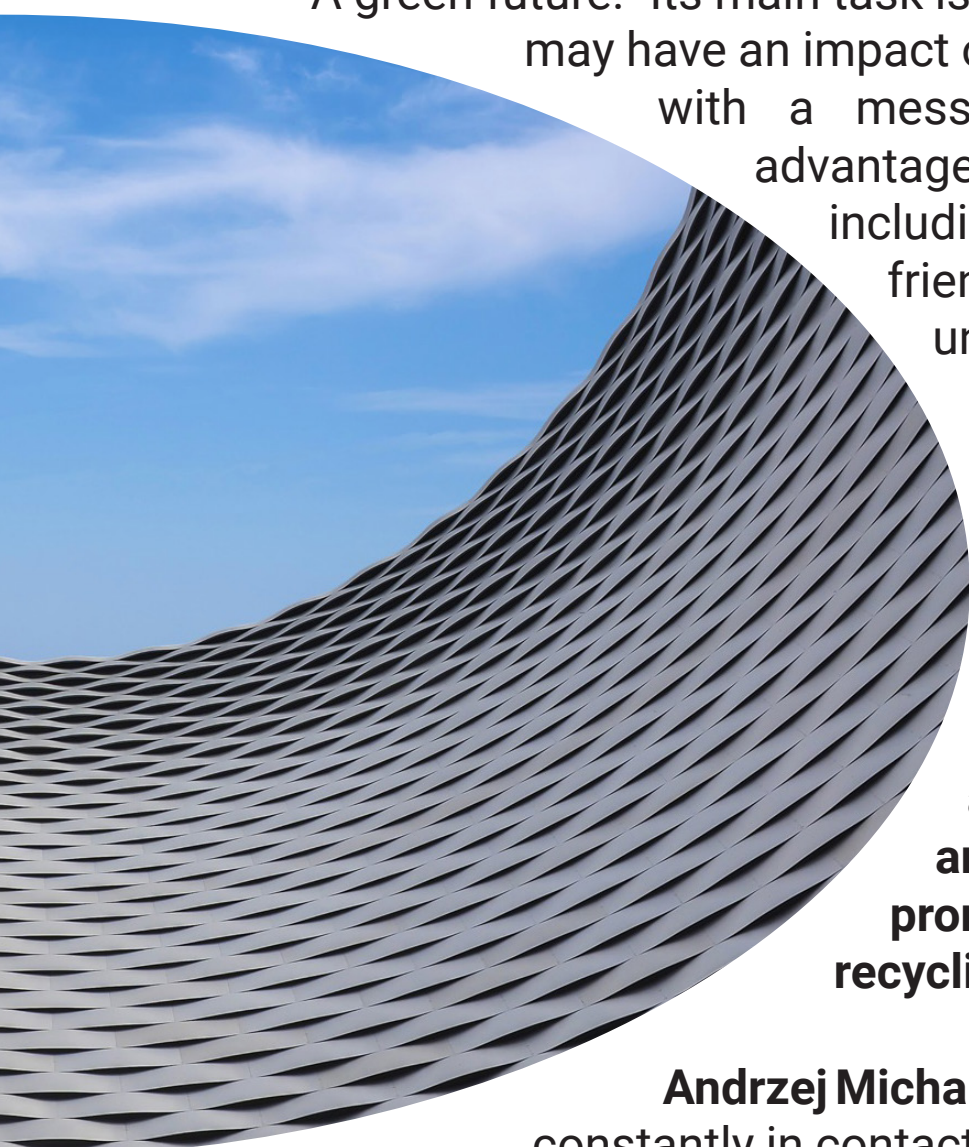
Andrzej Michalski-Stępkowski: The challenges faced by the Polish aluminium industry are common to the entire European sector. Increasing operating costs, including those related to the purchase of electricity or gas, are a major problem. In addition, there is currently limited demand for aluminium products, as well as uncertainty



related to geopolitical turmoil and the need to compete with suppliers outside the European Union who are not subject to the strict requirements of the EU environmental policy.

In these challenging conditions, the Polish aluminium industry is doing quite well. This is evidenced by the positive results of the companies and the scale of their investments. At the Polish Aluminium Association, we support our members in activities related to the promotion of aluminium. At the beginning of 2023, we launched the marketing and educational program “Aluminium.

A green future.” Its main task is to reach all people who may have an impact on the use of aluminium with a message emphasising the advantages of this material, including its environmental friendliness resulting from unlimited recycling.



AL Circle: How does the Polish Aluminium Association collaborate with other stakeholders, such as government agencies, businesses, and consumers, to promote aluminium recycling?

Andrzej Michalski-Stępkowski: We are constantly in contact with representatives of the Polish government. In this way, we make sure that the voice of the Polish aluminium industry is heard and that the

interests of the companies operating in it are protected. We also cooperate with the largest Polish scientific and research institutions. We undertake joint activities aimed at the development of production processes, including those related to the production and processing of recycled aluminium.

AL Circle: Can you share any success stories or best practices from other countries that inspire the Polish Aluminium Association's efforts in aluminium recycling?

Andrzej Michalski-Śtepkowski: The greatest inspiration for the activities undertaken by the Polish Aluminium Association is the experiences of European Aluminium – a European organisation that brings together entities from our industry. A significant part of its activity is related to the broadly understood recycling of aluminium or the promotion of aluminium as an ecological, modern and necessary material for green industrial transformation in Europe.

In a similar manner, we want to develop the message that comes from the Polish Aluminium Association. That is why, for example, we use publications prepared by EA in activities related to the campaign “Aluminium. A green future.” This offers many advantages. One of them is that we can prove that the challenges faced by the aluminium industry, including the aluminium recycling sector, are common to the whole of Europe. And only joint actions can result in tangible benefits.

Dispose your Surplus products



Free Registration



Sell your old machine

Excess finished and semi
finished products





Panel Cycle

“Due to the intense amount of energy required to create aluminium from raw materials, the need to recycle aluminium is extremely important to reduce our country’s energy consumption in creating this resource.”

We are pleased to offer a comprehensive solution for the responsible recycling of combustible ACP cladding that has been removed from buildings in Australia. Our team will expertly collect the materials from your site and transport them to our state-of-the-art facility. Our recycling process employs a specialized machine to shred the collected panels, and separates them into valuable aluminum and polyethylene powder. Thank you for considering our services and for prioritizing environmentally conscious practices.

AL Circle: How was the idea of PanelCycle materialised? What were the first concerns behind this initiative?

PanelCycle: We were looking at doing recladding because of the current need to remove combustible cladding and found there was no feasible solution to recycle once the cladding was removed. We began researching how we could recycle the large volume of cladding with aluminium and PE composition and came up with a solution of how we could break down the cladding and separate the aluminium from the core.

Some concerns we had were whether the business model was viable, offtake markets, and industry-accepting costs associated with recycling.

AL Circle: Why do you think recycling is the need of the hour? Are there any benefits of aluminium recycling?

PanelCycle: Due to the intense amount of energy required to create aluminium from raw materials, the need to recycle aluminium is extremely important to reduce our country's energy consumption in creating this resource. Our initiative promotes a circular economy and moves away from single-use products by feeding recyclables into the manufacturing stage to re-use the

embodied carbon within the existing, now redundant ACP cladding panels. 100% of the material received is diverted from landfill.

AL Circle: How much aluminium is being returned to the material cycle by the technologies applied by PanelCycle? How much impure is the aluminium your retrieve, and how is it clarified?

PanelCycle: Approximately 10-15 tonnes of aluminium per week is being separated and ready to be sent to manufacturing. The aluminium is 99% pure.

AL Circle: How does PanelCycle envision helping the Australian aluminium economy?

PanelCycle: PanelCycle provides granulated aluminium to many suppliers that require this product that usually would use virgin aluminium. This saves the cost and energy required to break down virgin aluminium into granules.

AL Circle: How long before PanelCycle's retained aluminium gets industry certified?

PanelCycle: As part of our research and development, we sent materials for testing to suppliers, and we now have a working solution.

AL Circle: What are the risks associated with combustible ACP claddings, and as panel recyclers, are there any difficulties you face?

PanelCycle: Combustible cladding currently on buildings is highly flammable and is getting removed Australian-wide to reduce the fire risk. Even with the removal and storage of this material, it

is still flammable. Initially, finding offtake markets was a difficulty we faced, as well as having the manpower and machinery to process the material that was coming in. However, we now have processes and relationships in place which have put us in a position to recycle all panels removed from all around Australia.

AL Circle: What is the future of PanelCycle in the upcoming five years? Is there any collaboration the company is looking forward to?

PanelCycle: In the future, PanelCycle is working towards recycling solar panels and glass in buildings.



Dr Ashok Nandi, President, International Bauxite, Alumina and Aluminium Society (IBAAS)

“The increasing consumer focus on sustainability and environmental protection is driving the demand growth for aluminium.”

Dr Ashok Nandi is a well-known bauxite-alumina expert who worked in Guinea bauxite while at BHP-Billiton. Dr Nandi is

currently working as an independent consultant and providing his services to worldwide projects, including bauxite companies in Guinea. He also holds the position of President at the International Bauxite, Alumina and Aluminium Society (IBAAS).

AL Circle: Please share the journey of IBAAS with our readers.

Dr Ashok Nandi: In the year 2012, International Bauxite, Alumina & Aluminium Society (IBAAS) was set up and registered in India by professionals active in various fields of aluminium industry. The first IBAAS conference was held in India in 2012 in Nagpur, and the response was quite encouraging. On the invitation of CHALIECO, the second IBAAS event and exhibition was held in 2013 in Nanning, Guangxi Province, China, and this was quite beneficial in understanding the developments of the aluminium industry in China and the good number of Indian, Chinese and foreign delegates participated in this mega event. From 2012 to 2022, IBAAS successfully organized ten large International Aluminium conferences in India, China and Guinea, and details of these are provided at <http://www.ibaas.info/events>.

This year IBAAS is organizing the 11th International Bauxite, Alumina and Aluminium Conference & Exhibition in India jointly with Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), during December 7-9, 2023. This event will cover the complete value chain from bauxite to aluminium downstream products in 3-day interactive meeting in Nagpur. IBAAS invites technical papers from Scientists, Engineers, R&D Institutions and Equipment manufacturers of the aluminium industry. All the selected technical papers will be compiled in the form of a Binder volume and given to the participants before the conference. There are opportunities for exhibitions, advertisements and sponsorships of this conference.

AL Circle: How are you helping the upstream aluminium sector, especially bauxite and alumina, to imbibe sustainability in daily operational practices?

Dr Ashok Nandi: IBAAS provides a platform to a large number of young Scientists, Engineers and Companies working in the field of bauxite, alumina and aluminium to interact and discuss the latest developments. Apart from usual topics on bauxite mining, beneficiation and alumina-aluminium production, there is a good number of papers on non-metallurgical applications of bauxite and alumina products, which has special significance for India as this encourages small and medium-scale industries in the country. With the increasing demand for refractories, abrasives, ceramics and value-added alumina products, there is always lively discussion on quality bauxite resources, beneficiation prospects and the technology/market of these special products. These kinds of topics are rarely discussed in any other international aluminium forum. Another area of special interest is the valorisation of bauxite residue (red mud), which attracts a good number of researchers as this is a major environmental issue for the alumina industry.

AL Circle: What impact do you expect Carbon Border Adjustment Mechanism (CBAM) to have on the Indian aluminium industry?

Dr Ashok Nandi: CBAM and the associated emissions reduction goal of the European Union (EU) pose fundamental decarbonization challenges for the aluminium industry. As Indian companies are presently using coal to generate the necessary thermal power for aluminium smelting, it will be necessary to not only bring down the power consumption in existing plants but also consider innovative techniques to achieve the decarbonization goal. European aluminium producers are calling for exclusion from

the first phase of the EU's carbon border adjustment mechanism, claiming the plan will put the industry at a competitive disadvantage to foreign rivals and do little to tackle climate change. As this is a big challenge for Indian aluminium industries to switch over to zero carbon emission, IBAAS can initiate activities in this line by inviting technical papers and proposals for a step-by-step decarbonization process. European Aluminium, representing smelters and manufacturers, said the tax proposal would harm its members and customers while accelerating so-called carbon leakage, where companies move their operations outside the EU to avoid tough climate regulations. India can meticulously study the developments in Europe and the US and plan the implementation of some of the technologies for decarbonization.

AL Circle: According to you, which aluminium product will drive the demand in global end-user industries in 2023?

Dr Ashok Nandi: The increasing consumer focus on sustainability and environmental protection is driving the demand growth for aluminium. Out of all the sectors, transport, electricity, packaging, and construction are identified as the biggest growth areas for aluminium. A new report has revealed that global aluminium demand will increase by almost 40 per cent by 2030 and that the aluminium sector will need to produce an additional 33.3 Mt to meet demand growth in all industrial sectors – from 86.2 Mt in 2020 to 119.5 Mt in 2030. India's aluminium demand may rise to 10 Mt per annum by 2030, which will be partly met by an environment-friendly recycling process. The decarbonisation policies plus a shift from fossil fuels in the transport sector will see an increase in EV production in the world to 31.7Mt in 2030 (compared to 19.9 in 2020). Renewable energy demands will also see a rise in demand for aluminium for solar panels, as well as replacing existing copper cabling for power distribution. In total,

the electric sector will require an additional 5.2 Mt by 2030. The construction sector will require an additional 4.6Mt by the end of the decade. Urbanisation will account for 44% of growth coming from Asia (excluding China). Aluminium packaging will rise from 7.2Mt in 2020 to 10.5Mt in 2030, driven by an increase in the popularity of canned drinks across North America, Europe and China. A surge in demand for environmentally friendly packaging combined with new products is also behind the increase.

The planned 2023 IBAAS conference will invite papers and presentations in these growing areas of aluminium uses.

AL Circle: Can you please share the three major challenges faced by the aluminium industry today?

Dr Ashok Nandi: The 3 major challenges for the aluminium industry are the increasing generation of bauxite residues (red mud) in alumina production, limited sources of green energy for aluminium smelting and the increasing competition from plastic, carbon fibres and special steel to replace aluminium. As the quality of bauxite is deteriorating in most mines, there will be more generation of red mud, and it will be necessary to find mass use of this environmentally harmful caustic-rich waste. Although in India, a significant quantity of red mud is being used in the cement industry, there is still a huge backlog of bauxite residue in the ponds. The major aluminium smelting is carried out by coal-based power plants, and it may not be easy to switch over to green energy. Although efforts are being made to minimise power consumption and use hydel and solar power, progress is quite slow and has cost implications, particularly for plants in India and China. The third challenge for the aluminium industry is intensive research to replace this metal with special plastics and carbon fibres. Major aerospace industries have already switched

over to carbon fibre for aircraft bodies, and only engines and other accessory parts are being built with aluminium alloys.

The aluminium industry should also invest in R&D to find new uses and applications for this versatile metal.

AL Circle: How are you promoting a circular economy in the global aluminium industry?

Dr Ashok Nandi: During the 2022 IBAAS conference, JNARDDC organized one-day special sessions on 'Non-ferrous Metal Recycling', where the main emphasis was recycling aluminium and circular economy.

National Non-Ferrous Metal Scrap Recycling Framework is one of the key initiatives of the Ministry of Mines to promote the recycling of aluminium, copper, lead and zinc and provide backing to the recycling industry. The objective of this policy is to promote a formal and well-organized recycling ecosystem and work towards economic wealth creation, job creation and increased contribution to GDP through metal recycling. IBAAS is actively involved with JNARDDC in various initiatives of Aluminium Recycling and invited several stakeholders to participate and present a paper at the 2022 conference of Raipur. The IBAAS-JNARDDC 2023 conference is also planning to have a special technical session on aluminium recycling.

Close to
\$2 billion worth
of aluminum cans end
in landfills each year
in USA!



PHINIX LLC
Globally Responsible Resource Management



Dr Subodh Das
CEO, Phinix LLC

“We are witnessing a paradigm shift towards the concept of ‘Reduce, Reuse, Remanufacture and Recycle’ as a strategy for building a low energy, low carbon, and low environmental impact future.”

AL Circle: Globally, we are witnessing an endeavour within the aluminium industry to focus on recycling. How much positive impact will it bring over the next few years?

Dr Subodh Das: The Paris Agreement aimed to keep global warming below 2 degrees Celsius over the 21st century. It also recognized the need to reduce global emissions substantially to achieve the goals. Meanwhile, it was claimed that circular economy strategies could reduce emissions by 40% in 2050 in the production process of key materials. Hence, the growing focus on aluminium recycling is a part of the greater goals of the circular economy and reducing global warming.

We are witnessing a paradigm shift towards the concept of “Reduce, Reuse, Remanufacture and Recycle” as a strategy for building a low energy, low carbon, and low environmental impact future.

According to the International Aluminium Institute’s (IAI) Material Flow Model, 20 million tons of post-consumer scraps were recycled in 2019, about 60% of scrap intake – equivalent to saving 300 million tonnes of GHG emissions. Global aluminium demand is expected to increase by 80% by 2050. The industry is looking at meeting this with a 50/50 balance of recycled and primary metal to achieve net zero emissions by 2050.

AL Circle: According to you, which regions will better adapt to Recycling in the Aluminium industry?

Dr Subodh Das: All regions will be involved in adapting to aluminium recycling. China is working on its environmental goals to reduce carbon emissions through technology adaptation and

increased recycling. India has started aggressively on a vehicle scrappage policy to boost recycling.

Meanwhile, European Aluminium is developing its Circular Aluminium Action Plan to develop a roadmap to facilitate 50% of Europe's aluminium demand through recycled aluminium by 2050 and reduce CO2 emissions by up to 39 million tons.

In the United States, in 2022, the country recovered 3.4 million tonnes of aluminium from scrap (old and new). Aluminium recovered from end-of-life scrap was equivalent to about 29% of apparent consumption. The country is working aggressively towards increasing aluminium recycling, especially for used aluminium cans (UBC).

AL Circle: What are the potential challenges towards achieving net zero for the Aluminium industry? How to overcome them?

Dr Subodh Das: The clash between economic viability and environmental sustainability remains challenging in achieving net zero for the aluminium industry. Switching to low carbon power, retrofitting to new technology, expanding the secondary production base, and establishing an

The US landfills contain about
90 million
tons of aluminum



effective closed-loop-recycling model for aluminium products need planning, investments, and implementation.

We will continue to see significant investments in the research, development, and commercialization of low-carbon technologies. Approximately \$1 trillion of investment is needed over the coming 30 years to deliver the low-carbon transition for the primary aluminium sector (IAI, Mission Possible Partnership).

AL Circle: What do you think is the role of the various regulatory bodies and certification agencies in promoting net zero within the aluminium industry?



Dr Subodh Das: Regulatory bodies and certification agencies have a deciding role in realizing net zero goals for the aluminium industry.

Regulatory laws can pressure industries to shift to sustainable materials and processes across all economies. Further, global certification bodies such as Aluminium Stewardship Initiative (ASI) are driving industry efforts toward responsible production, sourcing, and

stewardship in the global aluminium value chain. Additionally,

industry associations can establish the right collaboration between industries and policymakers to bring about the necessary transitions.

AL Circle: Please let our readers know about the areas of work of Phinix, LLC, and its role in promoting sustainability.

Dr Subodh Das: Phinix, LLC is a high-impact small entrepreneurial company serving global primary, fabrication, and secondary aluminium and light metals industries and rare earth materials. We are also developing and commercializing aluminium scrap processing disruptive technologies. Several R&D contracts have been awarded to Phinix by key organizations in the U.S. and Europe.

But most importantly, we provide unbiased, objective information, marketing-free awareness, and data-based policy statements on key industry issues through regular article/paper publications and LinkedIn posts.



PRESENTS

The World of **Aluminium Extrusions**

An industry analysis with forecasts to 2027



BUY NOW



Soumyadip Chakraborty
Director, AL Circle Pvt Ltd

AI in the recruitment activities and its implications for AL Industry

It is a globally recognized fact that Artificial intelligence (AI) has jolted each and every aspect around us – all the functions have been transformed to a great extent, and knowledge has taken one definitive step towards democratization. AL Circle has been publishing these recent developments on its website with the help of periodic columns (AL Tech) or blogs. Out of the many

fields which are the front-runners of the digital transformation journey with the use of AI, recruitment is a prominent one. Like many other industries, the world of Aluminium is also increasingly relying on AI tools for driving recruitment.

The requirements of manpower in the aluminium industry:

Like any other industry, the aluminium world tries to obtain access to the best of the talents. The usage and production of aluminium have shown a steady increase over the last decade, and the trend is also continuing in the days to come as well. As a result, employment in the Aluminium industry is also increasing significantly every year, along with new types of roles getting created. At present, the estimated employment in the sector, including direct and indirect global employment, is around 8 million* (including upstream and downstream aluminium industry and recycling as well). Increasing focus on digital marketing, sustainable way of working, supply chain transformation, online marketplace management and technology-related work, etc., are also contributing significantly to generating new employment in the Aluminium world.

While there are some roles where company-to-company shifting of manpower is taking place, there are many roles for which people are coming from other industries within the aluminium industry as well. For example, AL Circle's research shows that an increasing number of Aluminium companies are recruiting Chief Sustainability Officers and people in the sustainability department or related initiatives. Such roles often come from outside the Aluminium value chain, creating a unique challenge of articulating the right requirement, attracting and selecting the right talents and, most importantly, retaining them.

Key problems facing recruitment in the Aluminium world:

The key problems related to recruitment in the Aluminium industry are the following. The right Job description: As explained in the previous section, articulating the requirement of any job role is paramount. With the right job description, the expectation from the role in question is clear. The candidates develop a sound understanding of the role from a good job description; hence, the applications are more pointed and lesser becomes the chance of any expectation mismatch. However, in reality, HR managers create job descriptions, and often it is difficult for them to articulate the intricacies of the job role. Receiving cryptic job descriptions from the business functions is also often not enough.

The screening effort: In most cases, the applications are screened by the HR team and sometimes shared with the junior most member of the functional departments. As a result, often, some differently written CVs or applications are cancelled, leading to high levels of Type-2 errors (i.e. situations where a suitable candidate gets rejected). The time taken for manual screening is also strenuous at times, and hence often, manual error creeps in.

Screening tests: Sometimes, organizations take screening tests on some aspects related to the field for which the recruitment takes place. However, due to the manual effort required to evaluate the papers, often such screening tests are multiple-choice questions than perspectives. As a result, softer aspects like empathy or innovative or critical thinking elements are often missed in such tests, which also increases the overall risk associated with the recruitment process.

Candidates' fitment and coping with the environment: Companies often try to gauge the fitment of a candidate to a particular role

or the organization as a result of a few answers. However, whether the candidate can cope with the company's working environment and how many days he or she can work are often left to anybody's guess. This, again, creates a significant risk for the organization.

Solutions with the help of AI:

AI can offer unique solutions to each of these problems. The following table highlights such potential solutions:

Sl.	Problem	AI driven solution
A	To write the right job description	- In the days of ChatGPT or generative AI in general, the job descriptions may be generated very easily - At times the accuracy of such JDs are quite enviable
B	Screening efforts	- An associative model or a simple world cloud model can place the right candidates - A similar model may be generated from the JD and the models may be visually checked with a much lesser time and thus the screening efforts may come down significantly
C	Screening tests	- A word bank may be plotted based on the critical thinking questions and various statistical models may be leveraged to find out the right
D	Candidates' fitment and coping with the environment	- An HR analytics model based on the past employee data can be of great help in this area - The model may work with employee tenure of more than a particular period as the dependent variable & the independent variables being: previous years of experience, employee designation, travelling required or not (or the % of travel needed), the distance of work place and the like. - Alternatively, a GPT model based summary on the candidates Statement of purpose (SOP) may also be a quick solution to such an area.

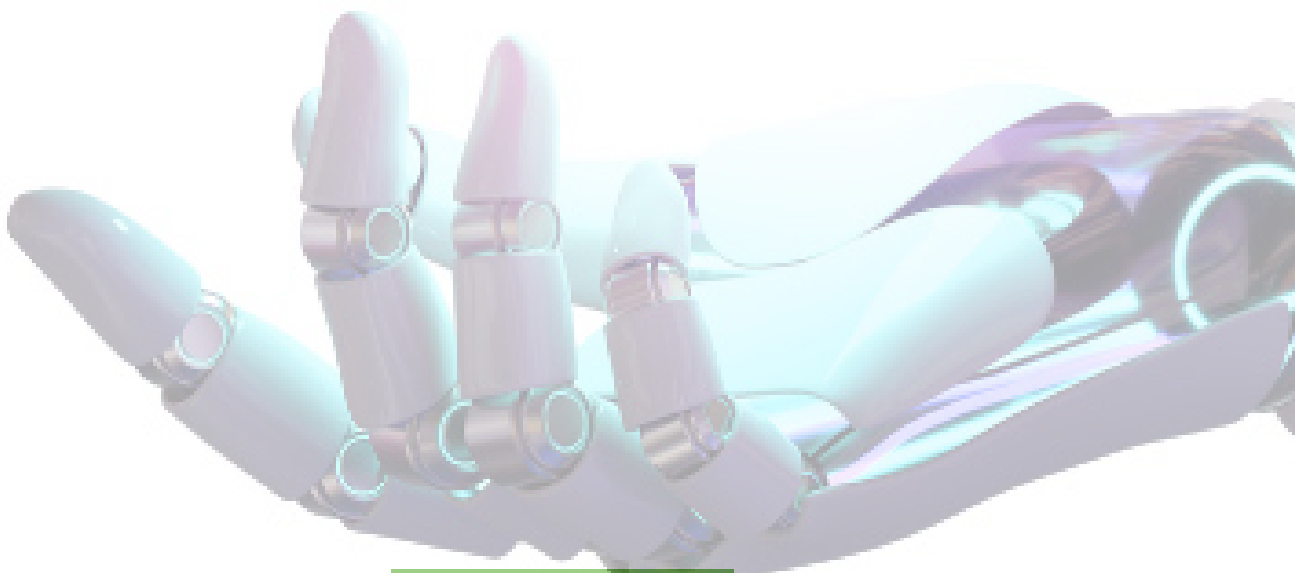
Conclusion:

It is already an established fact that globally more than 50% of the HR community, especially the ones related to the recruitment, are using AI to ease their regular work and increasing their effectiveness and efficiency. The HR cohort from the Aluminium



Industry is also catching up rapidly with this trend. The same will only increase in the recent future and bring more efficiency to the process. This will have many more implications in the Aluminium industry as the future training programs will be designed accordingly. The future targeted skill map will be developed accordingly and even the performance appraisals will be done with the help of various AI tools. Team AL Circle will soon launch a report on Digital Transformation in- the Aluminium world. Stay tuned to the same to know more about such interesting applications of AI in the Aluminium world.

*Source: AL Circle research





Dr Anupam Agnihotri
Director of JNARDDC

“JNARDDC has formulated guidelines for Dry Stacking of red mud to reduce the disposal problem. Dry stacking is the most popular and the best practice till now, followed by alumina refineries worldwide.”

Dr Anupam Agnihotri, Director of Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur, India, has willingly participated in our e-Magazine: 'Recycling - Reshaping the future of the Aluminium Value Chain' to share his knowledge on red mud recycling. He has spoken about the best recycling practices for red mud and the industry-trend applications of the by-product. He has also suggested the red mud disposal processes that would have lesser impacts on the environment. Dr Agnihotri is a Metallurgical Engineer from IIT Kanpur with PG Degree in Metallurgical Engineering from the Visvesvaraya National Institute of Technology, Nagpur.

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) is a "Centre of Excellence" set up in 1989 to make contributions to the technological growth of the Indian Aluminium Industry. The centre has well-established R&D facilities for bauxite, alumina and aluminium. Currently, the institute is highly focused on promoting aluminium recycling to usher in environmental sustainability.

AL Circle: What processes are commonly followed for red mud recycling worldwide?

Anupam Agnihotri: The processes commonly followed for red mud utilization/recycling are:

Product from red mud	Current utilization rate, million tonne/annum	Potential utilization rate, million tonne/annum
Additive/raw material to cement plants	1.0 - 1.5	100% red mud can be consumed. Today's annual global cement production has reached 2.8 billion tonnes, i.e. 140 Mt of BR a year is merely 5% of current annual cement production.
Additive/raw material to iron and steel plants	0.2 -1.2	Today's annual global pig iron production has reached 1.1 billion tonnes, needing about 1.8 BT of iron ore with Fe 65%. Thus 100% red mud will be consumed to make 3% of total pig iron production.
Direct iron reduction technologies	-	Potentially attractive after mastering technologies.
Sc and REE extraction	-	Promising Pilot plant trials are in progress
Building materials (bricks)	0.5-1.0	Use the sand separated from red mud (China)
Sorbent, coagulant, fertilizer, pigment, catalyst, ceramics, environm. appl.	0.3	Relatively small utilization volume, depending on local conditions
Total	2.0 – 4.0	

AL Circle: What are the major environmental challenges associated with red mud disposal? Are there any potential uses or applications of red mud that could help mitigate the environmental impacts?

Anupam Agnihotri: The generation of red mud mainly depends on two factors, the bauxite quality and the process parameters. The generation of red mud will be lower from good-quality bauxite in terms of higher alumina content and suitable digestion

technology, whereas the same will be higher with low-quality bauxite and inferior digestion technology. Depending on the same, 1.0 – 1.5 tonnes of red mud is yielded per tonne of alumina. Presently, approximately 9 million tonnes per annum of red mud is generated by various alumina plants in India, and that across the world is above 150 million tonnes per annum. These figures are likely to be increased further with the setting up of new alumina refineries and decreasing bauxite quality in India as well as the world. The most important environmental impact arising from red mud disposal is mainly the pollution of soil and water caused by the residue suspension fluid. The major challenges are:

- Problem of large land requirement and its cost
- Seepage of alkali water into neighbouring soil, underground water, and water supply streams or canals
- Overflow of mud slurry, especially during rainy seasons
- Chances of dyke/dam burst due to excessive load in the mud lake or due to local seismic activity
- Airborne dust carrying fine-sized brown particles which contain caustic and cause air pollution/aesthetic damage
- Dyke maintenance cost
- Damage to the flora and fauna in the neighbourhood

The potential uses or applications of red mud that could help mitigate the environmental impact s:

- The red mud can be used in manufacturing value-added products in an environmentally sound manner.

- Red mud is used to make cement in factories in China, Ukraine, India, Russia, Georgia, Moldova and Greece. It is increasingly being used to produce cement when used for the manufacturing of construction and building products. Nearly all of the red mud produced each year can currently be used.
- Apart from manufacturing value-added products, the red mud can be used for bauxite residue farming techniques. Soda and moisture level reduction of bauxite residue slurry can also be achieved using bauxite residue farming. The objectives of this technology are to achieve both a low moisture level and pH of less than 11.5, which makes the farmed bauxite residue (farmed BR) non-hazardous.

AL Circle: What role is JNARDDC playing in promoting red mud recycling in India, and what message is it delivering to the world?

Anupam Agnihotri: JNARDDC has formulated guidelines for Dry Stacking of red mud to reduce the disposal problem. Dry stacking is the most popular and the best practice till now, followed by alumina refineries worldwide. It reduces the potential leakage of caustic liquor into the surrounding environment as most of it will be recovered. In addition, dry stacking is beneficial in terms of



moisture reduction, leading to ease and reduced cost of transportation. The filtration reduces the moisture content to around 22- 25%, thus recovering the valuable caustic soda from the red mud. By using this method, a much larger volume of red mud can be stored in the same area, requiring less land area, levees, dykes or dams. When sufficiently thickened, red mud will not readily re-slurry, so rainfall will run off the surface, permitting atmospheric drying and aiding consolidation. The higher solid concentration allows more processed liquor to return to the refinery, and red mud can be transported easily for recycling/reuse.



Draft Guidelines for the utilisation of red mud (bauxite residue) in the Cement Industry have also been formulated by JNARDDC. For promoting the circular economy in the Primary Aluminium sector, NITI AAYOG has advised “Mandating use of red mud in the cement industry” under regulatory and monitorable Circular Economy Actions. The aluminium industry shall practice this guideline to facilitate the utilization of red mud in the cement industry.

Besides, projects related to the following areas have been carried out by JNARDDC to promote red mud reuse/recycling in India:

- Asia Pacific (AP7) project on clean technologies: Utilisation of Red Mud for bricks, Tiles, foam Bricks, gravels
- Guidelines for safe disposal of Red Mud
- Glass ceramic tiles with red mud as base material
- Lightweight Foamed bricks (LWFBs) utilizing red mud
- International/National Status of Red Mud production & Utilisation
- Red mud blocks to prevent east coastal erosion
- Extraction of REE from Red Mud
- Geopolymer bricks from Red Mud
- Nano red mud for enhancing pozzolanic activity
- Zero waste concept for Red Mud Utilization
- Red mud remediation by vegetation
- Technology Development for Holistic Utilization of Red Mud for Extraction of Metallic Value & Residue Utilization



AL Circle: What measures are you taking to reduce carbon emissions from red mud recycling?

Anupam Agnihotri: There is nothing like carbon emissions in red mud recycling but some studies related to carbon dioxide sequestration in red mud have been carried out. By mixing carbon



dioxide into the bauxite residue, the compound's pH level can be reduced to levels normally found in alkaline soil.

AL Circle: How much red mud is generated from China, the world's largest alumina producer? What percentage does the country recycle?

Anupam Agnihotri: More than 70 million tonnes of red mud is produced annually in China. As per literature, there are still no cost-effective integrated technologies for the comprehensive recycling of red mud applied on a large industrial scale.

AL Circle: If the utilisation rate of red mud in the world is 15%, how are you trying to optimise it?

Anupam Agnihotri: Inherent moisture, alkaline & hygroscopic characteristics make red mud moist, sticky, and difficult to handle. To overcome these associated problems, the industry must go for a dry disposal system that can reduce these problems to a certain extent. Technical and economic suitability are the most important things to investigate for the utilization of any waste. Red mud properties should be altered and made marketable to utilize. The aluminum industry must start looking at how the requirement of the concerned industry can be met. The cost of transportation of red mud to the utilizing industry should be

mutually decided as the transportation cost may be more than that of red mud disposal cost. The concerns of both sides (the alumina and utilizing industry) must be properly addressed, and the best solution should be implemented.

AL Circle: Can you share any success stories or best practices from industries that have effectively integrated sustainable red mud management practices?

Anupam Agnihotri:

- Dry stacking is the most popular and currently the best practice, which is being followed by alumina refineries worldwide. It reduces the potential leakage of caustic liquor into the surrounding environment as most of it will be recovered.
- Dry stacking is beneficial in terms of moisture reduction and can reduce the cost of transportation.
- Utilization of red mud in cement industries is one of the ways for sustainable red mud management practice
- Bauxite residue farming practiced at the Aughinish refinery in Ireland can achieve a final 'Farmed BR' with a moisture content of 25-28% and pH of less than 11.5.
- A variant of bauxite residue farming using sea water neutralization is implemented in Eastern Australia.



PRESENTS

World Recycled Aluminium Market Analysis

- Industry Forecast to 2026 -



BUY NOW



Mona L'Hostis, Head of Global Travel Retail Marketing - L'OCCITANE Group

“Sustainability has always lain at the brand’s heart since its inception in Provence in the 1970s.”

Mona commenced her career with L'OCCITANE Group in 2013 as International Marketing Fragrance Product Manager in Paris, followed by International Marketing Executive in Skincare. She then became the company’s International Body Care Group Manager in Switzerland in 2016 and progressed to Head of

Marketing Travel Retail EMEA & Americas. Since 2019 Mona has been Head of Global Travel Retail Marketing for L'OCCITANE Group.

AL Circle: What inspired you to use recycled aluminium for packaging? Was sustainability there in L'OCCITANE since the beginning?

Mona L'Hostis: L'OCCITANE en Provence has been an eco-pioneer since its inception in 1976, when it operated an in-store glass bottle return policy. The brand is committed to using eco-friendly manufacturing methods, eco-design, and sustainable packaging for its products in line with its motto of reduce, recycle, react. We, therefore, continuously communicate and underline our eco-friendly credentials and ethics to our new and existing customers while offering them a vibrant and compelling travel retail shopping experience. This inspires loyalty and instils trust in the brand.

In terms of products, we introduced our Solid range and expanded our Clean Charter products. We also increased the number of travel retail sets with eco-refills on Hair Care and are delighted that our eco-refills are now available globally. We already added recycled PET to our bottles but did not want to ignore aluminium. L'OCCITANE en Provence has collaborated with Tubex Aluminium Tubes as we found Tubex's technology attractive. It is based on 95% of post-consumer recycled aluminium. It's crucial for us that we clean up what comes out of our bins also. The Tubex technology reduces CO2 emissions and the carbon footprint by 70% and 60%, respectively, compared to a standard aluminium tube on the market, so it's a product that is both circular and has a low environmental footprint. We know this will appeal to our travel retail customers keen to reduce waste and their environmental impact on the planet.

This summer, L'OCCITANE en Provence is continuing its 2023 'Gift of Nature' roadshow at global airports, which highlights the importance of sustainability. During the promotion, a 150ml travel retail exclusive limited edition of the brand's iconic, best-selling Shea Hand Cream is available. The uniquely packaged hand cream is presented in a 95 per cent recycled aluminium tube decorated with a rich and vibrant fauna and flora motif designed by Philippines-based illustrator Raxenne Maniquiz.

To further reduce waste, we have taken a virtuous approach to packaging, using only 100 per cent FSC-certified paper with cellophane removed from most of our permanent kit portfolio. By the end of 2023, this will increase to 100 per cent, and we will be offering 100 per cent single-use plastic-free wrapping on TRENK kits by the end of next year. At the beginning of 2024, there will be critical improvements in packs of two L'OCCITANE Travel Retail iconic products.

We look forward to reaching our target of 100% recyclable packs by 2025.

L'OCCITANE is proud to have teamed up with TerraCycle® too. In 2018, we introduced a nationwide recycling programme in our retail stores, offering recycling bins for used beauty, skincare and haircare products.

AL Circle: Do you think miniature recycled aluminium bottles offer a good and sustainable alternative to small plastic bottles for travel?

Mona L'Hostis: It is one good solution to reducing plastic waste. What is exciting is that many inspirational and dedicated creators and product designers globally - including at L'OCCITANE R&D in Provence – are tirelessly seeking to find new and evermore

sustainable beauty packaging.

AL Circle: Is it true that you recently offered aluminium flight size bottles as a gift in a travel retail promotion?

Mona L'Hostis: Yes, we offered aluminium flight-size bottles as a travel retail gift to show that there are alternatives to using plastic. As a Cultivator of Change, L'OCCITANE incentivises its customers in all their sustainable actions by offering gifts with purchase, discounts, refill subscription cards and /or loyalty programme points across its global stores. The aim is to increase loyalty and to encourage customers to be part of 'the change' by collaborating on recycling their beauty empties, thereby reducing waste.

AL Circle: The 'Forever' bottle is used with eco-refills and in-store Refill Fountains. Tell us how that works?

Mona L'Hostis: The Forever Bottle is a chic addition to any home. Every bottle is made with durable, lightweight, recyclable and recycled aluminium and is embellished with images of the brand's signature ingredients. The bottle can be refilled at our Refill Fountains at key L'OCCITANE en Provence retail stores or used in conjunction with one of our eco-refills. The Fountains offer hand liquid, shower gel, shower oil, shampoo, and conditioner. There are 25 eco-refills across body, hair and skincare which use an average of 85 % less plastic. These eco-refills are also sold at airports and Duty-Free worldwide. The Forever Bottle has been offered as a gift with purchase in many company operations to encourage refills and reduce waste.

AL Circle: From where do you source the recycled aluminium used in the packaging for L'OCCITANE?

Mona L'Hostis: A key supplier is Tubex Aluminium Tubes.

AL Circle: How important is recycling and sustainability for L'OCCITANE?

Mona L'Hostis: Sustainability has always lain at the brand's heart since its inception in Provence in the 1970s. Our founder, Olivier Baussan, made it his business to ensure the traceability of ingredients and sourcing. He also introduced recycling in its early form by returning glass bottles to stores in 1992. Today, L'OCCITANE en Provence is regarded as a leader in sustainable beauty in travel retail, so we are always keen to underline the origins and authenticity of the brand. We have increased the number of travel retail sets with eco-refills, introduced our Solid range, and expanded our Clean Charter products. We also highlight our iconic ingredients, such as Almond, Verbena and Immortelle, and our fair-trade agreements and enduring relationships with our local producers.



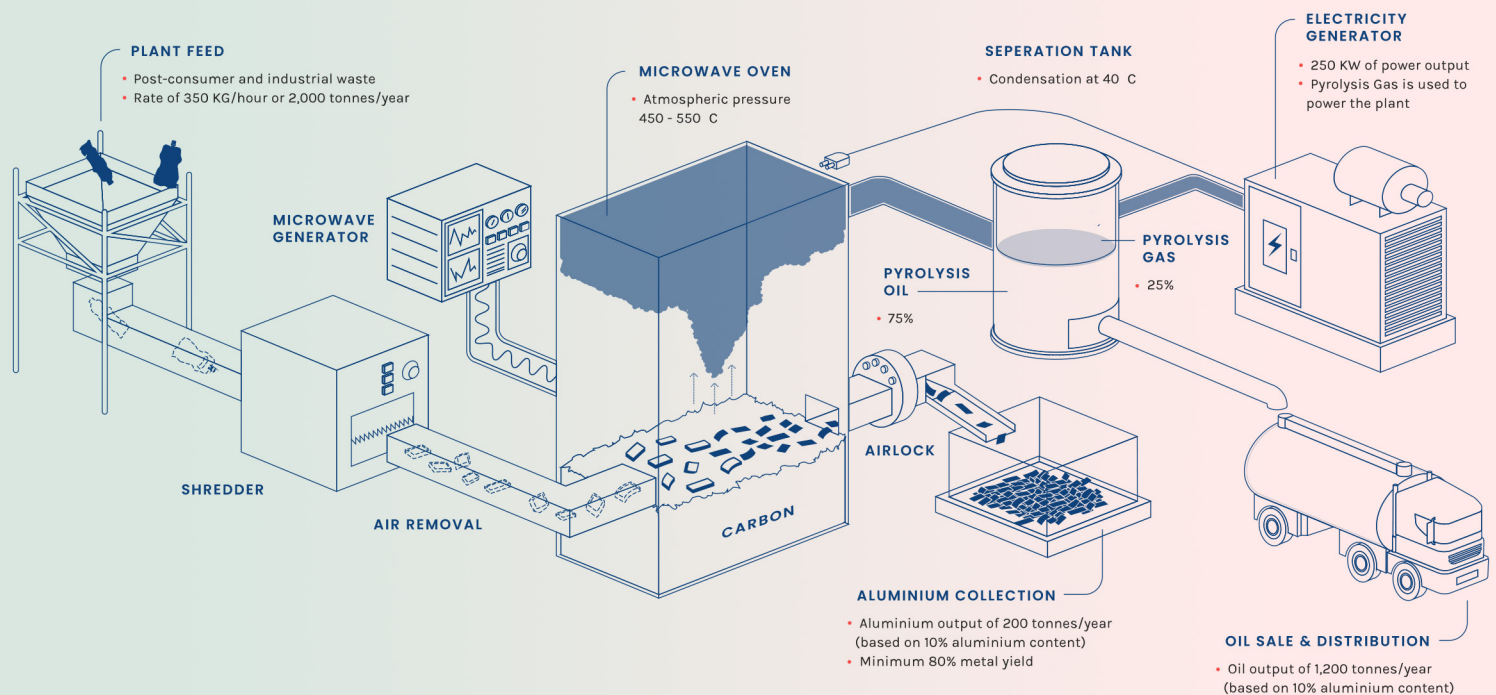
AL Circle: What are the advantages of using recycled aluminium for your products?

Mona L'Hostis: Aside from the obvious benefits of reducing waste, products crafted from recycled aluminium make ideal travel companions as they are durable, unbreakable and lightweight, meaning that they can be easily packed in luggage.

AL Circle: Do you think aluminium packaging is a cost-effective solution, or is sustainability the reason for its popularity?

Mona L'Hostis: Naturally, the economics must be considered by any company considering switching to more sustainable alternatives for its product packaging. However, as an eco-pioneering brand, L'OCCITANE en Provence will always look for solutions that are both sustainable and, of course, economically viable.





Andrea Troy
Business Developer – Enval

“Of the material fed into the plant, approximately 85% of the aluminium is recovered.”

My background in the plastic recycling industry started with 2 years of experience working at Viridor Polymers serving as the Commercial Manager in the Polymers team, overseeing all accounts and contracts for rigid plastic recycling through mechanical processes, specializing in PE, PP, and PET.

In January 2022, I joined Enval as the Head of Commercial and Business Development, leading. I lead the business development efforts of Enval's innovative recycling technology, with a specific focus on increasing the recycling of flexible plastics and laminates. I am passionate about driving positive change, and actively seek collaboration opportunities and invite others to connect with me to explore synergies or gain insights into my experiences in the plastic recycling field.

AL Circle: How much aluminium does Enval divert from landfills each year? How good is the quality of the metal extracted, and can it be reused?

Andrea: Our plant is capable of reclaiming approximately 85% of the aluminium from multilayer plastics, such as pet food pouches, that are fed into the system. The extracted aluminium is of high quality and has been certified as suitable for food-grade applications.

AL Circle: Do you think recycling is important? How much carbon footprint does Enval's flagship process leave behind?

Andrea: We are passionate about recycling and believe that many materials should not end up in landfills. It is vital that we work towards improving how we treat valuable resources.

Regarding the carbon footprint, the disposal of 1000 plastic aluminium baby food pouches creates 8.1 KG CO₂e in landfills, 10.3 KG CO₂e in energy recovery, and 1.8 KG CO₂e using Enval's process.

AL Circle: Is there any material loss during the Pyrolysis process led by Enval?

Andrea: Of the material fed into the plant, approximately 85% of the aluminium is recovered. We also recover approximately 75% of the plastic as oil, while the remaining 25%, in gas form, is used to power the plant via a generator.

AL Circle: Does Enval have integrated aluminium melting units, or do they export the extracted aluminium to other manufacturing firms?

Andrea: We have the option, within the design process, to add a melting furnace for smelting the aluminium into ingots. Alternatively, the aluminium flakes can be compacted and left to be smelted by the manufacturer.

AL Circle: What procedure is followed by Enval in sourcing pharmaceutical or packaging scrap? How effective is it?

Andrea: Our first fully operational plant is located in Mexico on a landfill site, where we process black bag waste. Therefore, we do not have direct contracts with



pharmaceutical companies or factories. In the UK, we have a commercial-scale demonstration plant that processes material from several brands, including both pharmaceutical and packaging companies. However, the first fully operational module is expected to be operational in 2024.

AL Circle: Some of the other aluminium laminate separators use laser-based sorting technologies. Why do you think microwave-induced pyrolysis is better?



Andrea: While laser-based sorting for aluminium (ALU) is used to determine the alloy, I have limited knowledge about it to make a direct comparison with microwave-induced pyrolysis. However, in relation to other pyrolysis solutions, our process is unique in that it allows for the reclamation of aluminium during the process. Other pyrolysis companies are unable to reclaim the aluminium when they reclaim the plastic.



David Van Heuverswyn
Director, Every Can Counts

“Aluminium recycling saves a significant amount of energy compared to producing new aluminium, which directly translates into a reduction in greenhouse gas emissions.”

Born in Belgium in 1975, David joined European Aluminium in March 2008, initially working on issues related to Public Affairs,

Communications & Packaging. In 2015 he became Coordinator of the Packaging Group, and in 2019 he was appointed Manager of Packaging Group and Director of Every Can Counts, Europe.

Since then, the Every Can Counts programme started growing outside Europe with the inclusion of Brazil in 2019 and recent pilot projects in the United Arab Emirates and the USA. Today the programme is active in 20+ countries worldwide.

Over the years, David accumulated extensive experience and knowledge in the aluminium and can-making industries while developing professional communication, marketing, recycling, sustainability and management skills.

AL Circle: How is Every Can Counts working towards lessening the United Kingdom's and other nations' carbon footprint?

David Van Heuverswyn: Our programme's mission is to inspire, encourage and empower people to recycle their drink cans wherever they are, with a focus on out-of-home drink can consumption and collection.

While constantly striving to achieve this mission, Every Can Counts is working towards lessening the carbon footprint across Europe and Brazil. Aluminium recycling saves a significant amount of energy compared to producing new aluminium, which directly translates into a reduction in greenhouse gas emissions. With a 76% recycling rate in Europe*, drink can recycling alone saves 4 million tonnes of CO₂, equivalent to the emissions produced by a European town with 440,000 inhabitants. Cutting carbon emissions is critical to tackling climate change and helping our planet recover to be a healthy home where people and nature can thrive. And Every Can Counts is to improve can recycling levels in

20 countries.

The life cycle of aluminium can, from collection to its return to store shelves, can take as little as 60 days. During this time, cans are collected, transported to a recycling centre, melted down, and reformed into new cans, saving up to 95% energy compared to producing new ones from raw materials. This closed-loop recycling process is a prime example of a circular economy, where materials are continually used and reused without losing their quality or integrity, reducing carbon emissions and conserving resources.

AL Circle: How successful was your third international recycling tour? What are the tour's main takeaways regarding recycling and sustainability?

David Van Heuverswyn: The third edition of the Every Can Counts International Recycling Tour unfolded across 16 countries and 18 locations spanning Europe and Brazil. From bustling metropolises to urban parks, vibrant beaches, and famous festivals, our dedicated ambassador embarked on a mission to promote the message, "Drink cans recycle forever," and encourage individuals to do their part in enabling a truly circular economy. The campaign likely engaged with numerous communities, festivals and partner organisations, inspiring people to participate actively in recycling efforts. The main takeaways from the tour may include



the importance of collective action, the positive environmental effects of recycling, and the need for ongoing education and outreach to maintain sustainable practices. The International Recycling Tour 2023 is an innovative initiative that turned recycling into an endless party and showed the world that we CAN make a difference.

AL Circle: What barriers, if any, do you face regarding recycling cans?



David Van Heuverswyn: When it comes to drink, can recycling and recycling in general, Every Can Counts may face various barriers, such as a lack of awareness or motivation among the public to recycle, insufficient infrastructure for recycling collection, and challenges in sorting and processing collected materials. Addressing misconceptions about recycling and the environmental benefits of aluminium recycling could also be a potential hurdle. For example, over 47% of Europeans feel poorly informed and want to know more about what happens to the material after recycling (Source: ECC Survey 2022) [See full report here.](#)

AL Circle: How can Every Can Counts better promote and encourage recycling?

David Van Heuverswyn: Every Can Counts aims to inspire behaviour change and help reach 100% can recycling in Europe and beyond. That's why we are inviting everyone—consumers, local authorities, brands, and event organisers—to join forces and find better ways to recycle on-the-go while having fun doing so. To better promote and encourage drink can recycling, we can implement targeted awareness campaigns like the International Recycling Tour, collaborate with local authorities and businesses to improve recycling infrastructure, and offer incentives for active participation in recycling programmes - Deposit Return Systems is a good example towards this direction. Engaging with educational institutions and integrating recycling awareness into the curriculum can also play a significant role in fostering a recycling culture from an early age. We are working on that in many countries where the programme is active.

AL Circle: How do you plan to ramp up the practice of recycling in the United Kingdom this year?

David Van Heuverswyn: Launching new outreach initiatives, expanding partnerships with businesses and events, and leveraging social media and digital platforms to reach a broader audience. Collaborating with local governments and waste management agencies can facilitate the expansion of recycling facilities and collection points, making it more convenient for individuals to recycle their aluminium cans.

AL Circle: What challenges do you face while educating society about the importance of recycling aluminium cans?

David Van Heuverswyn: Educating society about the importance of recycling aluminium cans may face challenges due to competing priorities, varying levels of environmental awareness, and the need for consistent messaging across different demographics. Addressing these challenges requires innovative communication strategies, tailored outreach programmes, and cooperation with influencers and community leaders who can amplify the message. And that's exactly what we do. Every Can Counts is a unique communications programme funded by drink can manufacturers, the recycling industry and drink brands. Since its launch in the UK back in 2009, the programme has continued to grow, and we now do our thing in 20 countries across Europe and Brazil.

AL Circle: How do you anticipate the year 2023 will shape the demand-supply scenario of the global aluminium industry for the recycling sector?

David Van Heuverswyn: With a growing emphasis on sustainability and circular economy practices, the demand for recycled aluminium may increase as businesses and consumers seek to reduce their carbon footprint. Governments' support and policies favouring recycling can also impact the demand for recycled aluminium, encouraging more companies to incorporate recycled materials into their supply chains.



Jelle Saint-Germain
Sales Engineer, AD REM

“The ambitious staffs of Ad Rem is putting in all possible effort to maintain Ad Rem’s position as a front-runner in the industry.”

In 2013, Jelle Saint-Germain earned his degree in chemical engineering from the University of Ghent and immediately embarked on his career as a project engineer at Valvan. Shortly

after completing his studies, he embarked on a professional journey as a project engineer at Valvan, the leading company within the Valtech Group. Valvan specializes in designing and manufacturing baling presses and textile sorting machines.

After accumulating three years of technical experience, he was offered a transfer to Ad Rem, a subsidiary of the Valtech Group, where he began his role as a sales engineer in 2016. As part of his responsibilities, he had the opportunity to travel to Sweden for an 8-week period. During this time, he played a vital role in the launch of Europe's largest flotation plant, overseeing the installation's various tests and commissioning processes.

Furthermore, he actively participated in a study to optimise material flows in recycling procedures. His expertise was valuable in developing new plants to separate aluminium and other non-ferrous metals from automotive shredder residues and incinerated bottom ash. These initiatives demonstrated his strong commitment to advancing sustainable practices within the industry.

AL Circle: Can you briefly overview AD REM and its core business areas? What about its role in the aluminium recycling industry?

Jelle Saint-Germain: Ad Rem is a Belgium-based joint venture of Group Galloo, one of Europe's leading recycling companies of ferrous and non-ferrous metals, and Valtech, a holding containing 15 niche market engineering and construction companies that are mainly active in or closely connected to the recycling industry.

Based on the technological experiences of Group Galloo, Ad Rem has developed a range of equipment for separating shredder residues. The heart of the process consists of a patented dense

media separation system (sink–float). This process enables the production of clean aluminium that can be sent directly to a smelter.

AL Circle: What specific recycling technologies and solutions does AD REM offer to the aluminium industry?

Jelle Saint-Germain: The Ad Rem flotation process enables the recovery of up to 100% of the aluminium present in a scrap metal mix. As opposed to dry sorting techniques, this process is suitable for big throughputs and delivers a clean end product. Sizes of 4mm up to 150mm can be treated all together at a rate of up to 50 tonnes per hour. Because of an integrated water treatment process, any pollution in the shredder residue can be removed and concentrated in a single sludge output.

What's more, the cleanliness of the aluminium coming from the sink-float plant enables new technologies such as XRT, XRF and LIBS to work better, since the surface of the material has no detectable obstructions anymore. This is why we see our customers excel at sorting different aluminium alloys effortlessly.



AL Circle: Sustainability and environmental responsibility are crucial in today's world. How does AD REM incorporate these principles into its operations and products?

Jelle Saint-Germain: Aside from the obvious fact that our technology contributes to a sustainable world by enabling the recycling of aluminium and therefore helping to eliminate up to 95% of CO₂ emissions, our plants are also built to last. At our parent company Galloo, our oldest still-running plant was commissioned in 1989!

AL Circle: Could you share some success stories or case studies where AD REM has significantly impacted the aluminium recycling sector?

Jelle Saint-Germain: In 2016, Ad Rem built the largest flotation plant in the world for Stena Recycling in Halmstad, Sweden. This plant has been extracting clean aluminium from over 200.000 metric tonnes of heavy automotive shredder residue every year since, saving literally millions of tonnes of CO₂ output.

Stena is renowned for its excellent quality of aluminium, just as Galloo is. At Galloo, we not only produce aluminium from automotive shredder residue. We also recover aluminium from incinerated bottom ash. Galloo processes the metal residue from about a quarter of Europe's IBA through our sink-float process. This was only possible with the heavy

focus on water treatment, as IBA is notoriously dirty.

Other references solidify Ad Rem's position in the aluminium market. For example, the Refial refinery in northern Spain gets its aluminium scrap from our newly built sink-float plant at Deydesa (Grupo Otua).

AL Circle: Innovation plays a vital role in the advancement of recycling technologies. How does AD REM foster innovation within the organization?

Jelle Saint-Germain: At Ad Rem, we are deeply committed to continuous innovation. Approximately 30% of our engineering efforts are dedicated to Research and Development (R&D). We actively collaborate with universities and technological partners to explore new separation techniques and enhance existing technologies.

An illustrative example of our R&D accomplishments is a recent research project completed in 2020. In partnership with KU Leuven, we successfully developed a numerical model for performing Computational Fluid Dynamics (CFD) analysis on our Dense Media flotation drum. This cutting-edge approach allowed us to gain valuable insights into the drum's performance and refine its design. As a result, we achieved an impressive separation accuracy of nearly 100%, significantly enhancing the efficiency of our process.



AL Circle: How does AD REM ensure the quality and reliability of its recycling machines and equipment? Are there any certifications or quality standards that the company adheres to?



Jelle Saint-Germain: The technology offered by Ad Rem results from a close collaboration with our parent company, Group Galloo. At Galloo, our Dense Media systems operate around the clock, with only one weekly shift allocated for cleaning and maintenance. The continuous operation of these systems underscores the critical importance of their reliability, as any failure can significantly impact production capacity.

We apply the same rigorous standards when building systems for external companies. Our approach includes continuous logging and monitoring of process parameters, enabling us to detect failing components at an early stage. This proactive approach helps us minimize downtime and ensure optimal system performance.

We prioritize preventive maintenance and timely component replacement by implementing robust logging and monitoring practices. This proactive stance ensures the smooth operation of our systems, minimizing disruptions and maximizing production efficiency for our valued customers.

Sustainability

in the Global **Aluminium** Industry

Outlook Report Series



BUY NOW



YOUR Surplus OUR Business

WE TRANSFORM ... THE WORLD OF ALUMINIUM

A VIRTUAL ALUMINIUM ECOSYSTEM

BOOK YOUR ADVERTISEMENT
in the next Special Issue and reach out
to the Global Aluminium Community

AlCircle Pte Ltd

30 Cecil Street # 19 -08 Prudential Tower Singapore - 049712

Ph: +91 33 4002 9316 Fax: +91 33 4002 9310 Email: info@alcircle.com



World's 1st online B2B marketplace for the entire aluminium value chain

FEATURES

► ENQUIRY GENERATION

Any seller can list their products & buyers can connect to specific sellers by sending an enquiry against listed products

► BUSINESS LEADS

Both sellers and buyers can post business leads for any specific requirements & can choose to respond to other business leads

► MY BIZ

Exclusive positioning to showcase your brand, a customized space for with all the advanced features to promote your products

► SURPLUS

If you have any unused assets or used equipment /machinery and want to sell it, you can get verified leads from potential customers.

WHY CHOOSE US?



Trusted platform, safe & secure, easy to use



40+ years of Experience in Global Aluminium Industry



Reduced carbon footprint for your business



50K+ Exclusive Database



Customized Marketing Strategy to find buyers



Get business leads and enquiries directly in your inbox, no commission

1400+

GLOBAL SELLERS

5000+

LIVE PRODUCT LISTINGS

110+

COUNTRIES

Registration on AL CircleBiz is FREE for all Sellers & Buyers

