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Aluminium - Revolutionizing the Construction Sector

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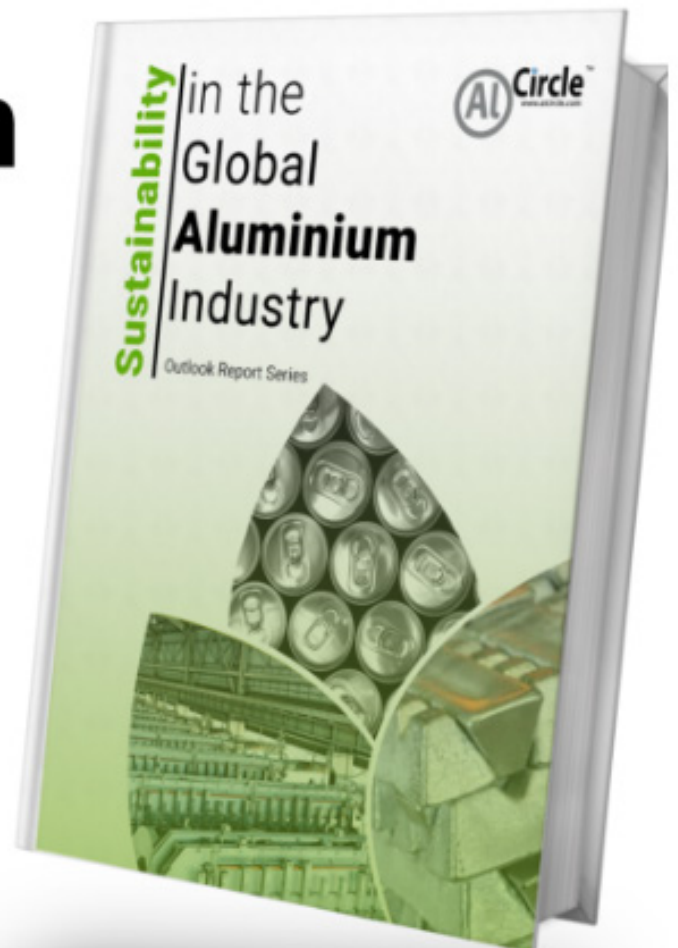
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Editorial

Dear Readers,

The use of aluminium in the Building & Construction sector is growing as a modern alternative to steel and iron for obvious reasons like corrosion-resistant and lightweight. Also, thanks to its malleability and smooth fabrication allowing deep, intricate and precise spinning, aluminium is becoming a preferred metal for architects. Not only popular, but the application of aluminium has also grown versatile in buildings and constructions for its intrinsic properties. From external facades to roofs and walls, windows and doors to staircases, railings and shelves to air conditioning systems and solar protection, aluminium is used widely.

AL Circle's report on 'Global Aluminium Industry Outlook 2023' shows that Building & Construction is the second-highest industry after transportation to have consumed aluminium, accounting for 23 per cent of the world's total aluminium usage. In 2023, the B&C sector is estimated to consume 21.84 million tonnes of aluminium compared to 21.58 million tonnes in the previous year.

Hence, it is well understood that aluminium is becoming a popular choice of metal for buildings and construction. A strong impetus for reducing carbon footprint is also driving the use of aluminium in the B&C sector.

So, learning this potential growth of aluminium in the Building & Construction sector, AL Circle has come up with its sixteenth e-Magazine titled 'Aluminium – Revolutionizing the Construction Sector'. This e-Magazine is an attempt to discover more prospects of this metal in the B&C sector and how it is constantly bringing out innovation in the industry.

We have with us the stalwarts from the world-leading aluminium companies and associations in this e-Magazine who have shared why the demand for aluminium in the construction sector is growing and which semi-finished aluminium products are driving the growth. They have also mentioned their forecasts on aluminium usage in the industry for 2023 and beyond.

Kindly read the e-Magazine and feel free to share your comment, feedback and opinion.

Best wishes & happy reading!

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Performance Dashboard: Previous AlCircle E-magazine



E-magazine Performance Statistics Aluminium LeaderSpeak 2023



Total Global Reach **168139**



Video Viewership **3116**



Total Countries Reached **134**



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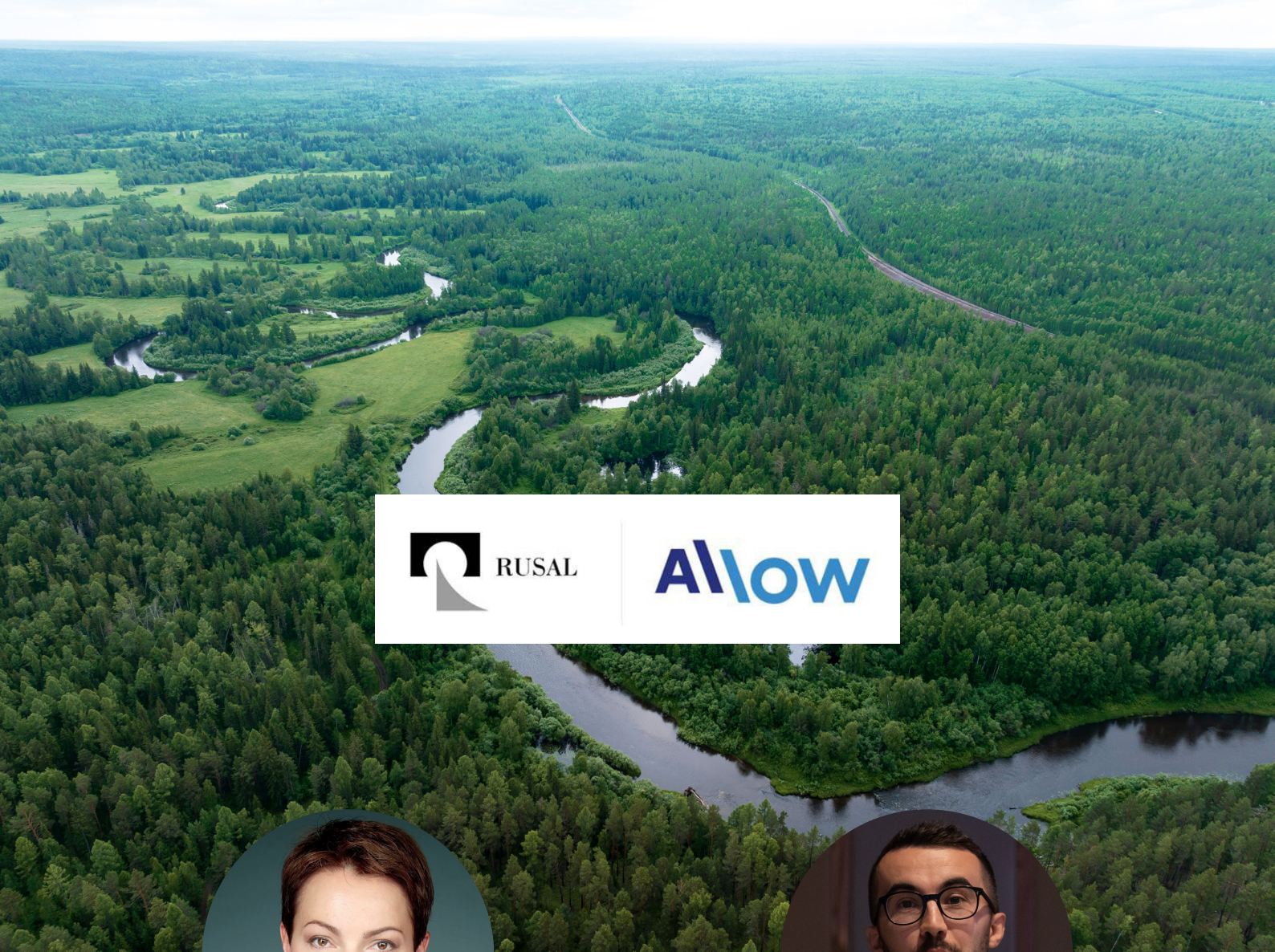


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Inga Simonenko

Market Intelligence and
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Director, UC Rusal



Ben Salt

Sustainable Solutions Manager.
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Low-carbon aluminium: A silver bullet for the construction industry

If the building and construction sector is to keep pace with global climate goals, it must overcome formidable decarbonisation challenges. With the industry increasingly turning to Whole Life

Carbon Assessments to manage building emissions, both the scrutiny of raw materials and the case for aluminium use are growing. Nevertheless, this does not mean all of the world's aluminium capacity fits the task; the construction sector needs explicitly low-carbon aluminium.

Considering the impacts of the construction industry

While construction represents one of the most important economic and social development drivers, it also embodies many of the most environmentally damaging human practices. Today, the building sector is responsible for over a third of global carbon dioxide emissions, responsible for around 50% of global resource consumption, and is one of the biggest waste generators. Moreover, the industry is showing no signs of slowing down, with world-building stock expected to double by 2050 and the sector's resource consumption to double by 2060.

Given its scale of impact, it is not surprising that the decarbonization of the building & construction sector is a key pillar to many regional climate strategies. Delivering on the terms of the UN Sustainable Development Goals, the Paris Agreement and the EU's climate-neutral target will all require considerable changes in how the construction sector manages its emissions. Moreover, recent indications that the industry is not yet on track to achieve decarbonization by 2050 are only adding to the urgency.

From operational emissions to whole-life carbon assessments

Traditionally, sustainability efforts have focused on operational emissions – how to make buildings more energy efficient – which account for most of the sector's carbon footprint. More recently, roadmaps to carbon neutrality have widely stated the need for a

broader view of emissions. Consequently, European and North American governments have been responding with policies that will enforce Whole Life Carbon Assessment (WLC). WLC assessments consider operational emissions and those associated with product manufacturing, construction processes and end-of-life emissions. This makes the performance of raw materials against embodied carbon, recyclability, part replacement rates, utilization and recycling metrics immensely important.

Aluminium as a sustainable raw material

Aluminium currently plays a vital role in both house construction and more complex infrastructure developments. In a standard home, aluminium is likely embodied in roofing, guttering, facade, shutter, balcony, window, door or fencing systems. Outside, much of the road furniture, tunnels and bridges passed on a typical work commute will also be made from aluminium. In these applications, aluminium's corrosion resistance, strength-to-weight ratio, aesthetics, temperature resistance, elasticity and ease of fabrication have historically driven its consumption. It is, however, in the area of sustainability where many of the future drivers for aluminium consumption will be found.



The benefits of aluminium across WLC emissions:

- 1. Longevity:** Aluminium is an exceptionally durable and corrosion-resistant metal. As these properties reduce the maintenance and replacement rates of associated parts, buildings can reduce the environmental impact of repeated resource consumption.



- 2. Recyclability:** Aluminium can be recycled multiple times while retaining its exceptional physical properties. By retaining its usefulness post-life, aluminium-containing products can perform strongly in WLC assessments that consider the impacts of material waste and recovery. Projects can also benefit from the addition of recycled content within their input materials, as they can contribute to LEED (Material & Resources) credits.
- 3. Ease of fabrication, lightweight & transport:** Aluminium's exceptional strength-to-weight ratio means that lighter aluminium components can achieve comparable performance to heavier alternatives. Due to these characteristics, manoeuvring, transporting and fabricating products can be both easier and less energy intensive. Lightweight aluminium mounting systems further help drive renewable use by supporting the installation of solar panels on a wide range of surfaces, such as rooftops and walls.
- 4. Energy efficiency:** Aluminium systems can be used to decrease the energy burden of buildings in several ways. Using specialized aluminium roofing systems, buildings can increase solar radiation reflection, lower temperature absorption, improve energy regulation and limit the impact of material expansion caused by heating. Meanwhile, aluminium cladding and thermally broken aluminium window frames can be used to enhance insulation and reduce the energy burden. Products that improve temperature regulation can further qualify for LEED (Atmosphere & Energy) credits.

It is clear that aluminium has a positive role to play in the industry; however, complete WLC assessments require consideration of the upstream emissions to manage the embodied product emissions.

But isn't all aluminium green?

A common mistake when dealing with commodities is to overlook the differences in product supply chains. This is especially true of primary aluminium, where a wide range of energy sources can lead to extremely different environmental impacts. Emissions are generated throughout mining, refining and smelting processes; however, the key driver of the aluminium sector's emissions lies in the electricity used within the electrolysis process at the smelter. In general, a smelter will source one of 3 power sources: Hydropower, Gas or Coal. Coal is responsible for more than half of global production and is associated with typical cradle-to-gate values of around 17-24 t CO₂e/ t Al. Smelters using gas can be seen associated with aluminium, often produced at about 10-14 t CO₂e/ t Al. Meanwhile, those smelters using hydropower can eliminate almost all electricity emissions and produce aluminium at less than 7 t CO₂e/ t Al. If we, therefore, consider a project utilizing 10 tonnes of aluminium, we can see savings of more than 100 tCO₂e just by selecting a low-carbon aluminium over a tempting coal-based alternative!

Introducing ALLOW

Rusal is a leading player in the low-carbon aluminium market and believes in delivering lower GHG emissions at every production stage. The current result is the low-carbon brand ALLOW. Representing more than 3 million tonnes of production, ALLOW is produced by harnessing Siberian hydropower to supply some of the cleanest aluminium available today. With average cradle-to-gate emissions of just 5.9 tCO₂e / t Al, it is less than half the industry average and 4 times lower than the emissions embedded in many coal-based alternatives. ALLOW distinguishes itself not only with its carbon footprint but also in its transparency,

certification and support; this means guiding clients through the different materials and tools available to ensure total capacity to trace emissions.

Leveraging the advantages of low-carbon aluminium

Procuring responsibly produced aluminium further enables contractors and semis producers to leverage the competitive advantages of a low-carbon offering. Businesses producing construction goods are increasingly developing and profiting from low-carbon product brands. Moreover, companies across the value chain can use low-carbon content to gain credits from green building certifications that reward suppliers with low-carbon solutions. This includes LEED certifications, which can credit those demonstrating embodied carbon levels below the market average.

Shaping tomorrow's sustainable supply chains

Decarbonization cannot take place in isolation. Making meaningful changes to embodied emissions requires collaboration, knowledge sharing and transparency across the supply chain. In the case of RUSAL, billets, slabs and wire rods are produced, giving rise to low-carbon extrusion, FRP and cabling products. Beyond this, however, Rusal endeavours to understand the specific sustainability demands of end users and deliver the independently audited carbon footprint data needed to drive transparency throughout the supply chain.

Delivering on tomorrow's needs means investing in and collaborating on solutions that will decarbonize hard-to-abate emissions, which remain even after utilizing renewable energy for electrolysis. Rusal's comprehensive decarbonization plan

targets both smelter technology and recycled content. The former include smelter upgrades and the development of breakthrough inert anode smelting technology, which seeks to eliminate almost all direct smelting emissions. Meanwhile, Rusal is developing its capacity to incorporate scrap into billets and alloys at smelters in Sweden and Russia.

Your sustainability partner

The demands of GHG accounting methodologies, ESG requirements and environmental regulations continue to increase. In response, Rusal has been developing its sustainability solutions offering to help companies across the aluminium supply chain overcome ESG challenges and take advantage of them. Rusal offers low-carbon products in all shapes for all key market applications. A dedicated sustainable solutions team are further prepared to assist clients with sustainability insights, market data and guidance on new regulations. Meanwhile, sustainability passports and independently audited carbon footprint statements drive transparency through the supply chain. Industry-leading ESG ratings are a further testament to Rusal's solid environmental performance. This includes Rusal's A- CDP climate rating (2021), which reflects the company's decisive actions against climate change.

Collaborate with Rusal today and deliver ESG results that help both combat climate change and deliver longer-term competitive advantages. Whatever your sustainability challenge, Rusal is ready to help.

<https://content.comms.euromoneyplc.com/rs/376-KVV-177/images/Rusal-Microsite-Low-carbon-aluminium-key-to-sustainable-construction.pdf>



ALLOW

LOW-CARBON ALUMINIUM INSPIRED BY NATURE



LOW-CARBON ALUMINIUM

ALLOW has a carbon footprint 4-5x lower than the industry's average scope 1 & 2 emissions.



HARNESSING HYDROPOWER

RUSAL captures hydropower from EN+ assets – the largest privately owned hydropower supplier.



DELIVERING TRANSPARENCY

ALLOW drives supply chain transparency through carbon footprint certificates & sustainability passports.

3M+

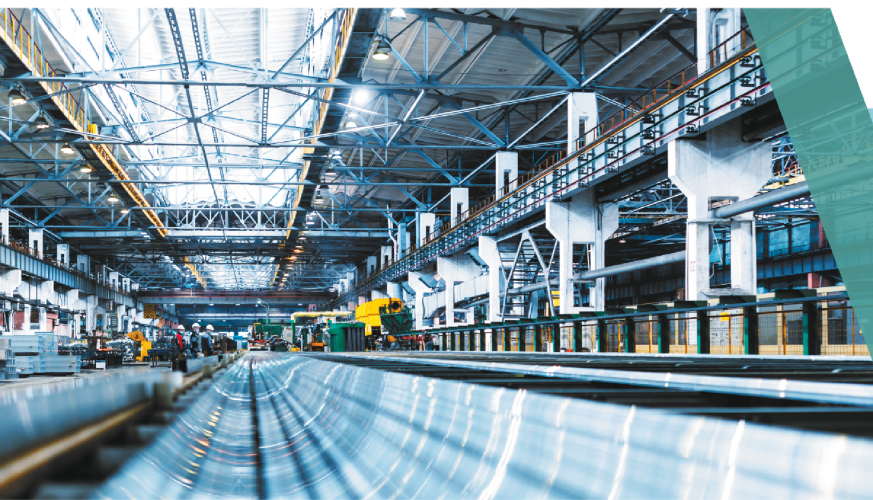
LEADING LCA PRODUCER

With more than 3 million tonnes of ALLOW capacity, RUSAL is a leading low-carbon aluminium producer.

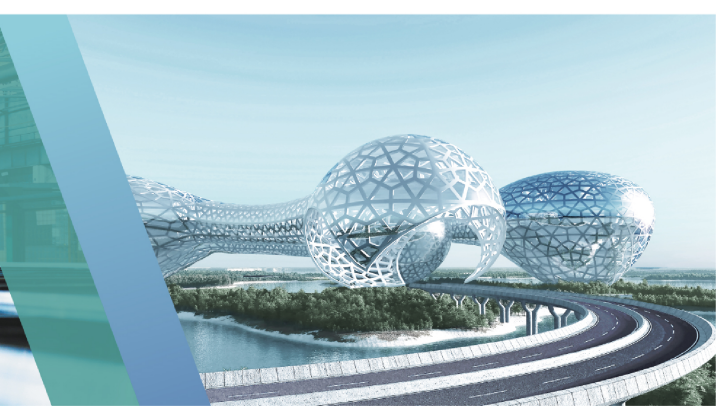


INNOVATIVE TECHNOLOGIES

RUSAL is developing breakthrough inert anode technologies and is striving to increase circularity.



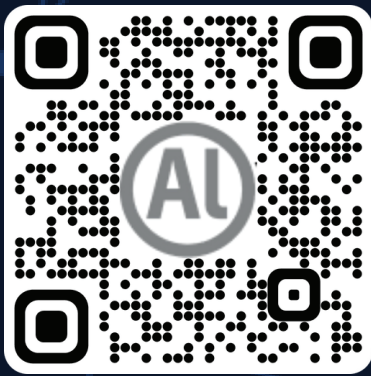
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Khaled Abdelmoneim

CEO, ALUPCO

“Architects have shown great creativity in using aluminium for thousands of iconic designs around the globe.”

Khaled Abdelmoneim was appointed the CEO of ALUPCO in 2009. With a robust 32 years of experience, he has held various positions across multiple industries in engineering, project management, sales, and general management. Khaled left his mark in esteemed multinational organizations like Procter & Gamble and PepsiCo International before holding his position at ALUPCO. As CEO of

ALUPCO, Khaled has diversified and expanded the company's practices across the value chain with a global reach and sustainability top of mind.

AL Circle: How do you envision the future of aluminium in the construction sector? What trends or developments do you expect in the coming years?

Khaled Abdelmoneim: Like all other industries, the construction industry is heavily influenced by the rapid growth of digitalization, AI, and the Circular economy. Building information systems, 3D visualization and digital delivery, are some of the aspects that will play a vital role in the future of the industry. With today's labour shortages coupled with the need for fast delivery, modular buildings are gaining an advantage over traditional construction. A circular economy calls for smart cities and improved manufacturing processes with improved carbon emissions. Aluminium plays a key role in providing smart solutions that meet current and future industry demands. It offers great design capability, lighter weight, and continuous improvement in carbon emission.

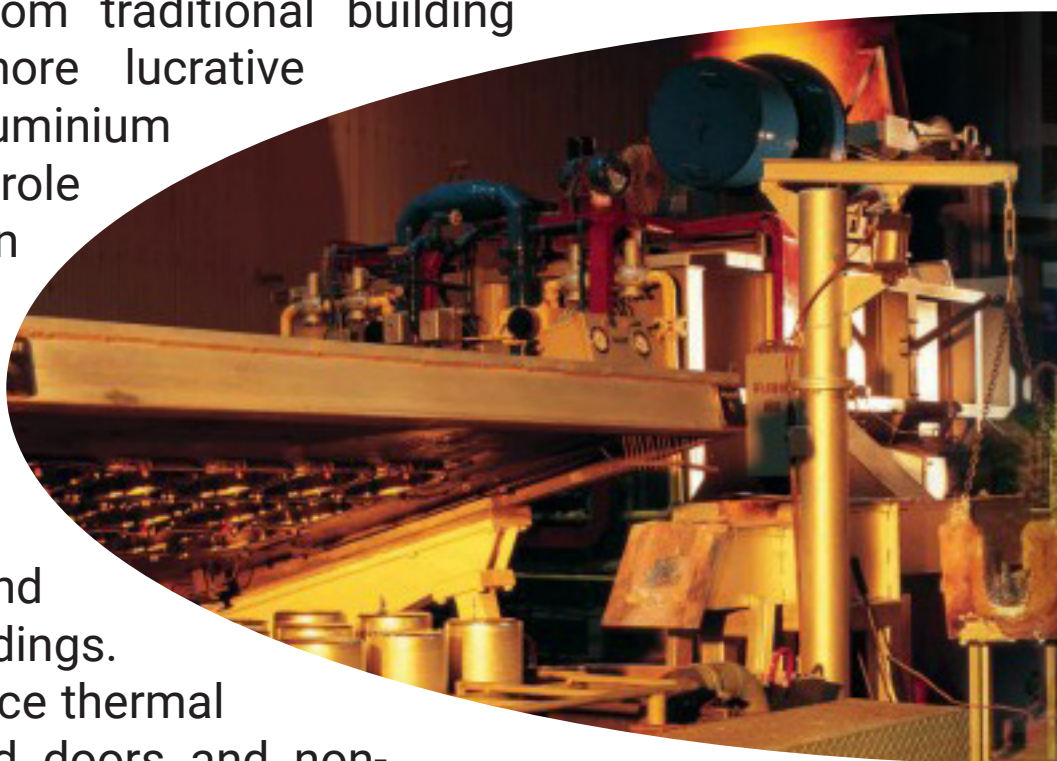
The use of technology will improve the whole supply chain from material management to production planning and improve efficiencies ending with optimum delivery and prompt customer service. While architects have shown great creativity in using aluminium for thousands of iconic designs around the globe, the need to develop more artistic designs and improved thermal insulation calls for more aluminium usage in the industry.

AL Circle: In your opinion, what are the key advantages of using aluminium in construction projects?

Khaled Abdelmoneim: In addition to its strength-to-weight ratio, corrosion resistance, durability, low maintenance, availability and infinite recyclability, aluminium has the greatest advantage: limitless design capabilities. This provides superior for architectural system designers to offer many alternative solutions and beautiful artistic designs using aluminium.

Moving forward from traditional building structures into more lucrative skyscrapers, aluminium has played a vital role in the construction industry by going beyond reliable products to become a key ingredient in building green and sustainable buildings.

The ability to produce thermal break windows and doors and non-reflective curtain walls increases the energy efficiency of buildings. Solar façade generates the energy required to reduce greenhouse gas emissions and provides self-sustainable buildings. Such evolving achievements are concentrated around the use of aluminium.



AL Circle: What efforts or initiatives are being undertaken by ALUPCO to promote the use of aluminium in the construction sector?

Khaled Abdelmoneim: Being the largest aluminium extrusion and service treatment company in the Middle East and Africa, ALUPCO's R&D team works closely with internal and external system designers, architects, major contractors, and project owners to make sure that we obtain the latest technologies and designs around the globe to be reimplemented regionally.



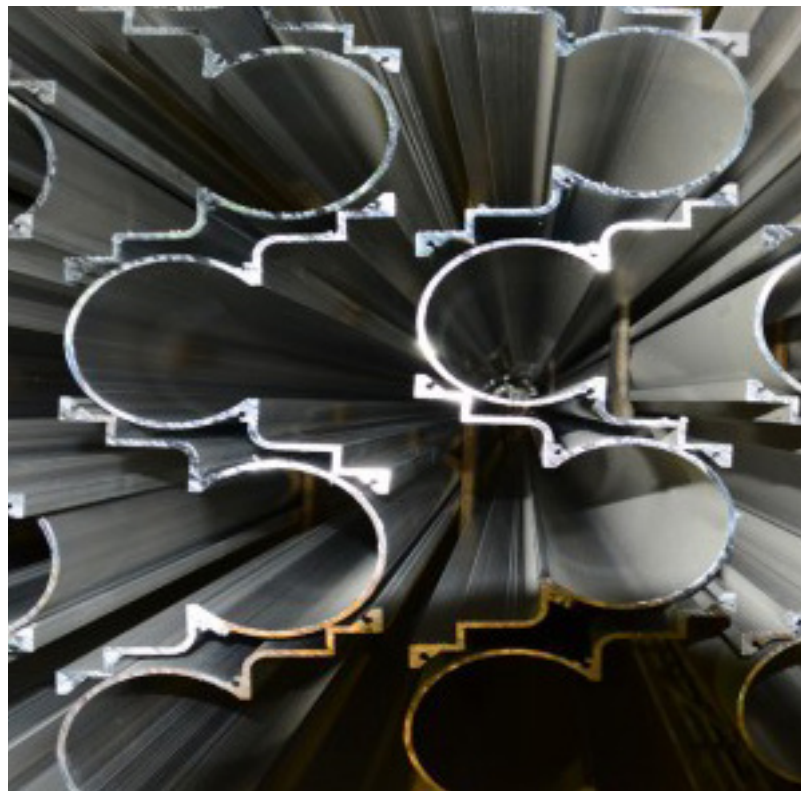
ALUPCO works closely with leading industrial companies in the field of solar systems, tank covers, electrical production and transportation system, and EVs to promote our latest designs as well as collectively explore the possibilities of shifting material use to aluminium. As a major

regional player, ALUPCO closely monitors aluminium trends and developments in the international market and constantly explores the regional implementation of the world's best practices from a process, design, and material (alloys) point of view.

The ALUPCO design team has led the development of over 30 different systems in the building and construction field, from simple systems for economical short-term implementation to very high-standard systems and solutions for more sophisticated landmark projects.

AL Circle: How is ALUPCO taking its place among industry giants in the year 2023?

Khaled Abdelmoneim: ALUPCO is one of the world's top ten aluminium extruders and surface treatment companies. Our extrusion plants are in both Dammam and Jeddah (Kingdom of Saudi Arabia) and are strategically located on the east and west coasts of Saudi Arabia, respectively. ALUPCO provides the best in class products and services to the Gulf region, Iraq, Yemen, Levant, India, Australia, North and Central Africa, Europe and North America.



We have also ventured into project management to ensure better customer service through the initial state of the project design, material manufacturing, delivery and final installation. ALUPCO has also partnered with market-leading companies in the fields of fabrication, glass, rubber, wood, and façade lighting. This gives a complete building solution that delivers satisfactory results and ease of project management.

AL Circle: How is ALUPCO supporting the world to attain net-zero emissions?

Khaled Abdelmoneim: ALUPCO has always been focused on recyclability. Both plants in Dammam and Jeddah have had recycling facilities since inception back in 1978. The plants work on post-consumer scrap in line with LEED requirements. Additionally, they have been working with international suppliers to ensure meeting all international sustainability standards. At ALUPCO, we believe that our role towards creating a more sustainable world



for future generations is of the utmost importance. The core of our practice operates with the dedication to building the future and restoring the past.

AL Circle: How did Alupco navigate the global turbulence during Covid and the Russian and Ukraine geopolitical crises?

Khaled Abdelmoneim: During Covid, ALUPCO was one of the few companies in Saudi Arabia that continued to work with less activity but also with no interruption. The cost management program that was put in place and the professionalism of our organization allowed ALUPCO to pass through this crisis with positive numbers. The Russian and Ukraine war has had a lesser effect on ALUPCO and is opening doors of opportunity for us in Europe due to the energy cost in this region.

Post crises, we are seeing a global shift in a new direction. Ultimately, we are seeing that 2023 is and will continue to be the year of recovery and stability that will allow us to build a solid base for the company's future growth in the core business and in the subsidiaries, all aligned with the Saudi Vision 2030.

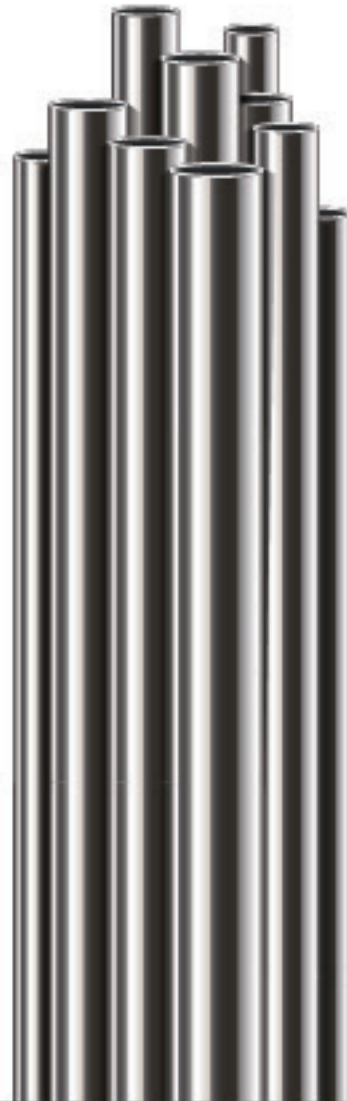
AL Circle: What key factors will attract industry clients to ALUPCO in the coming year?

Khaled Abdelmoneim: Industrial customers seek long-term work relations and stability in the supply chain. ALUPCO is in one of the biggest aluminium production areas worldwide, with more than 6 million tonnes where the energy is guaranteed. Adding to the previous condition, the competitive labour cost, the international quality, and the process standards of ALUPCO are the factors that will attract this sector for the next years.

ALUPCO will play a decisive role in diversification within the aluminium extrusion industry and will be a pioneer in the way of understanding the aluminium business. Our target is to satisfy any necessities our customers will have related to aluminium and add the maximum value possible.



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THE BUILDING JOURNEY IS HASSLE FREE.

ALUPCO is a major solutions provider in the aluminium industry. Through the forging of internal and external partnerships we bring you the latest and most innovative solutions. At ALUPCO, we prioritize our role in creating a sustainable world for future generations.

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Rupankar Majumder

AL Circle

Aluminium: Influencing the construction sector's landscape with material usage and project execution

Aluminium has established itself as one of the most highly sought-after metals worldwide, finding extensive usage in various building designs for over a century. Its versatile properties have made it a key element in iconic structures such as the Empire State Building in NYC and the Lakhta Center in Russia. Here are the reasons why aluminium remains a revolutionary material in

the construction industry:

Versatile

Aluminium offers exceptional versatility, allowing it to be shaped and formed into various designs and structures. It can be extruded, rolled, or cast into different shapes and profiles, making it suitable for a wide range of construction applications. It can be used in almost any aspect of construction, including as the main support or as a decorative component.

Lightweight

One of aluminium's most significant advantages is its low density, making it a lightweight material compared to other metals. This property simplifies transportation and installation, reducing costs and time associated with construction projects. The majority of construction employees concur that aluminium foundry metal is simpler to work with than other alternative metals. Additionally, it imposes less structural load on buildings, providing flexibility in design and construction.

Strength and Durability

Despite its lightweight nature, aluminium possesses remarkable strength and durability. Its strength-to-weight ratio is higher than that of the majority of alternatives. Aluminium can sustain the majority of construction tasks despite being lightweight. For instance, aluminium alloys are sturdy enough to support massive glass spans, a typical feature of contemporary skyscrapers and office structures. It exhibits excellent resistance to corrosion, ensuring long-term structural integrity even in harsh environments. This durability reduces maintenance requirements and increases

the lifespan of buildings constructed with aluminium components.

Energy Efficiency

Aluminium's inherent thermal conductivity allows it to transfer heat and cold efficiently. This characteristic is advantageous in construction, as it enables the implementation of energy-efficient designs. Aluminium can be used in windows, doors, and cladding systems to enhance insulation, reducing energy consumption and improving overall building performance.

Recyclability

Aluminium is highly recyclable, retaining its quality and properties throughout recycling. Recycling aluminium requires significantly less energy compared to primary production, making it an environmentally sustainable choice. Its recyclability also contributes to the circular economy, reducing the demand for new raw materials and minimizing waste.



Aesthetics:

Aluminium's sleek and modern appearance adds aesthetic value to buildings and structures. Its reflective surface can create visually striking facades and enhance the overall architectural appeal. The construction industry praises aluminium for its appealing appearance since metal can be treated in various hues and textures, giving architects and designers a wide range of creative options. Alloys made of aluminium are smooth and

glossy and are simple to polish.

Airtight

Aluminium is an airtight metal, unlike the majority of other metals. As they age, other building materials inevitably develop cracks. These cracks not only have a poor appearance but also let undesirable air in. However, unlike steel and wood, aluminium does not break. Instead, it lasts for years airtight. Thanks to this function, large buildings can save money on heating and



cooling, which also increases energy efficiency. Due to its airtightness, metal is the material of choice for many aesthetic elements, such as door and window frames.

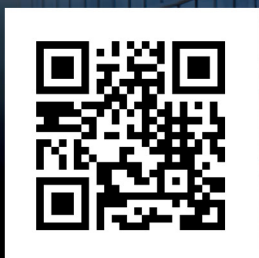
Conclusion

In order to build a green and sustainable building, aluminium is an essential ingredient. Aluminium replaces other metals in green structures due to its recyclability, flexibility, malleability, and strength. According to industry statistics, 92%-95% of construction materials are recycled. Due to its versatility, lightweight nature, strength, durability, energy efficiency, recyclability, and aesthetic appeal, aluminium continues to be a game-changer in the construction industry. Its wide range of applications and numerous advantages make it a popular choice for architects, engineers, and builders when designing and constructing remarkable structures worldwide.

Aluminium is used in almost every modern building's structural architecture. Downtown skylines devoid of soaring skyscrapers would only exist with this remarkably adaptable metal. Aluminium is a mainstay in the building sector for many excellent reasons and is arguably the most sturdy, long-lasting, and attractive metal currently available. The use of aluminium will grow in favour as contemporary architecture advances.



MANUFACTURING FOR A SUSTAINABLE FUTURE



Over the years of its existence, AKFA Group has proven to be a trustworthy and responsible manufacturer. Today, the enterprise has one of Central Asia's most extensive computer-integrated manufacturing facilities.

With 21 years in business and thousands of successful custom projects globally, homeowners, architects, builders, and contractors trust AKFA Group to help deliver innovative solutions and design options.

The church of San Gioacchino in Rome with the famous dome covered with aluminium sheets, completed in 1897

La chiesa di San Gioacchino a Roma con la famosa cupola rivestita di lamiera di alluminio, completata nel 1897



FACE

FEDERATION OF ALUMINIUM
CONSUMERS IN EUROPE



Alberto Pomari

Development Director of FACE

“After the Covid period, Europe’s building & construction industry has grown well, thanks to the Government’s incentive offerings, particularly in Italy.”

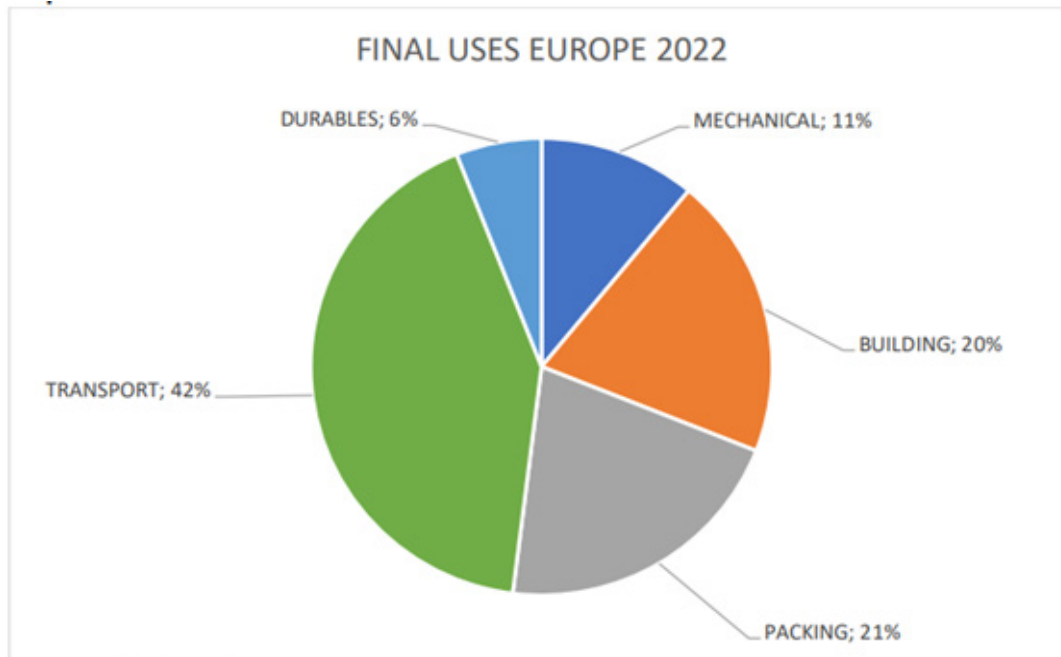
We have with us Mr Alberto Pomari, Development Director of FACE – The Federation of Aluminium Consumers in Europe. The Brussels-based Federation of Aluminium Consumers in Europe (FACE) is the voice of Europe’s aluminium users and consumers,

having members from many of the top aluminium downstream stakeholders. The Federation was founded in May 1999 by independent European aluminium transformers, aiming to promote the continent's downstream aluminium sector and establish the versatility of the metal by showcasing its economic, social and environmental virtues. In 2018, FACE's members used 780,000 tonnes of aluminium.

Let us know from Mr Pomari the current demand and consumption of aluminium in European buildings and construction and what role FACE is playing to drive the growth.

AL Circle: How much aluminium is used in Europe's building & construction sector?

Alberto Pomari: Aluminium in the building and construction sector covers around 20% of the total European aluminium consumption. If we only consider extrusion market, the percentage is about 40%. In general, we can say that 2.5 million tonnes of aluminium are used today in this segment in Europe. Apparently, aluminium in the building sector is suffering the competition with PVC windows frames. PVC is now predominant because of its low cost and availability. Most parts of PVC frames are cheap but often very low-quality. We are not considering other aspects like environmental issues.



Source A&L data base

ALCircle: As a federation representing European aluminium consumers, what initiatives are you taking to promote aluminium usage in the domestic B&C sector?

Alberto Pomari: We are launching and promoting a vital campaign inviting final users to buy aluminium windows. We are talking to the most important producers and dealers to support a strong movement promoting light metal. “UNITY IS STRENGTH” will be the leitmotiv of this campaign. Speaking about the use of lightweight metal in traditional residential construction, FACE aims a lot beyond the enhancement of traditional qualitative applications of light metal in the growth and development of a structural type, not only in residential, monumental, industrial and commercial but also in infrastructures, bridges, street furniture, and temporary structures. The basic concept is that of rewarding the intelligent use of light metal in the construction sector, it should be remembered in perspective that a possible road map of the use of metal provides self-limitation to the uncontrolled diffusion of the use of aluminium, at least until create alternative energy solutions for the primary.

AL Circle: What aluminium product is primarily used in European buildings?

Alberto Pomari: Naturally, extrusions and sheets are the most common materials used in the B&C sector. Today, a significant portion of curtain walls is being constructed using aluminium frames, profiles and sheets. In the window sector, though overtaken by PVC, light metal is very well used in sliding windows, balconies, solar tents, large window frames and so on. In general, aluminium windows are preferred for quality and aesthetic beauty. Aluminium is also irreplaceable for the wide range of solutions available in painted and anodized finishes. In this case much superior to the possibilities offered by PVC.

AL Circle: Has the recession in Europe affected aluminium consumption for buildings & construction?

Alberto Pomari: After the Covid period, Europe's building & construction industry has grown well, thanks to the Government's incentive offerings, particularly in Italy, which have created a strong demand for building revamping in the past two years. Those constructions are continuing even if incentives have stopped. But otherwise, the overall aluminium demand in our sector is suffering in the particular situation of the European economy.

AL Circle: How much will Europe's building & construction sector contribute to domestic aluminium consumption this year?

Alberto Pomari: As I have already mentioned that aluminium is suffering from the competition of new alternative materials, but still being an essential material used in the building & construction sector. We believe this year will be a good one but not as much as the last year. At the end of the day, aluminium will remain a

strategic material for the building industry in Europe. The new laws asking to reduce the CO2 content may convince better to embrace aluminium for buildings & construction.

AL Circle: How much economic growth in Europe do you expect to be contributed by aluminium in 2023?

Alberto Pomari: The economy in Europe is not performing well this year, but aluminium will help the whole market to find solutions and possibly new applications.



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Luca Lorini

Head of Sales, ALTEX

“The construction sector is respectful and committed to the environment and environmental values while serving as the engine and the objective of all the cities in the world.”

In 2000, Luca Lorini embarked on his career in the aluminium extrusion machinery manufacturing industry. He began working

for an Italian company and was involved in various aspects of the business, starting from the factory and eventually progressing to overseeing installations at customers' sites. This role allowed him to travel extensively and experience life in numerous countries across the globe. After gaining valuable expertise in the service department, Luca transitioned to the sales department in 2010.

He began a journey to establish his own sales business, opening sales offices across various countries and forging robust international alliances in 2010. His efforts led to the creation of strong global relationships and cooperative ventures. Later, in 2014, he took a significant step forward by joining forces with a renowned Italian extrusion machinery manufacturer, an enterprise steeped in history and tradition.

Begin working with ALTEX Group in 2022 on developing the sales network and propelling the group to the top as a reference in the extrusion industry. He concentrates his sales approach on the professional and personal supplier/customer relationship for market loyalty while being sensitive to the needs of each customer.

AL Circle: What is your goal in covering the market share of customers looking for customized solutions to win in their markets?

Luca Lorini: People, passion and technology, are at the forefront. These three concepts are the pillars of a group that has established itself as a family of companies, with the aim of respecting the different cultures in the territories in which ALTEX is located, always close to customers. Nowadays, customers are looking for different markets and tailor-made solutions. ALTEX can support them with technical and technological or financial experience.

AL Circle: What would it take for ALTEX to become the global aluminium extrusion market's strategic reference?

Luca Lorini: "The best way to predict the future is to create it."

In the industrial Group ALTEX, we are convinced that this future revolves around the reindustrialization of the business model experienced during the last 25 years in the extrusion machinery manufacturing sector.

Pushed to change and to adapt to the modern, dynamic and demanding market, ALTEX sees the key to customer loyalty in their territories; having offices and local people working for them establishes a long-lasting relationship. Knowing that ALTEX is always available and nearby makes the clients more confident.

If twenty years ago, the digital revolution brought a new way of managing companies, market opportunities and new points of sale; today, sustainability is seen as the new revolution with great opportunities for producers and not. Sustainability has become a necessity for the environment.

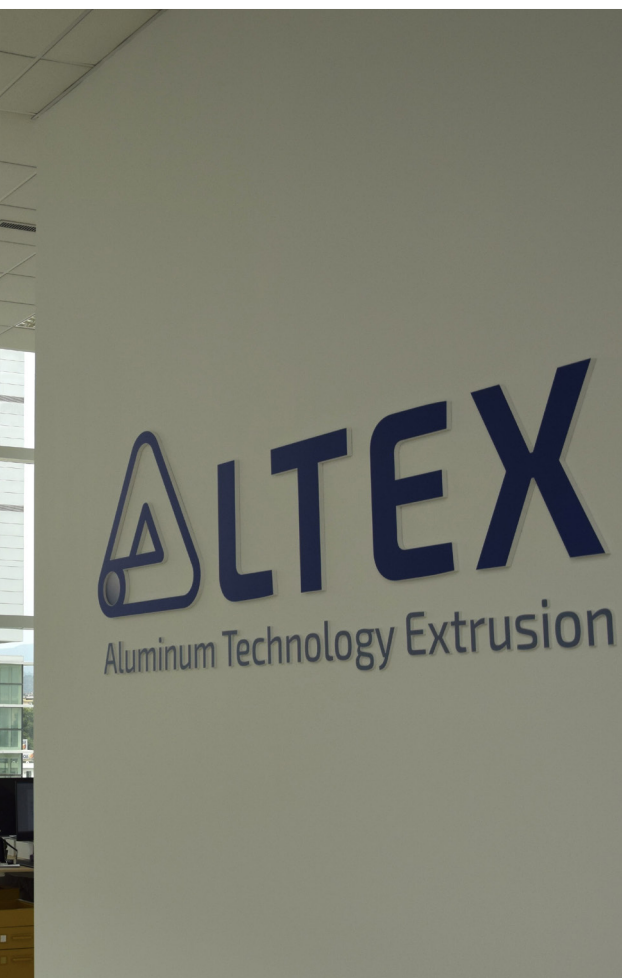
The purpose of giving life to this new Group is to develop different competitive levers for the aluminium extrusion industry, promoting and supporting customers' growth and creating a model for the future industry. ALTEX fully identifies with



these objectives and, in the continuous effort to stay at the forefront with new technologies in all the activities carried out in the company, from administration and commercial management to the manufacture of our products, through their design and development, facilities and services.

AL Circle: What key industries benefit from ALTEX's aluminium extrusion technology, and how does it support their needs?

Luca Lorini: In a historical period characterized by great uncertainty, instability, rapidly changing contexts and markets, we need flexible organizations capable of reacting to new competitive dynamics.



Companies have always tried to reduce costs and waste by automating production processes. Today this new business model, even more, attentive to the productive organization of the entire project, allows continuous investment in research and development. Looking for competitive and efficient solutions available to ALTEX customers, as well as fundamental investments to provide better support directly in the territories.

It is important to build a path, together with the clients, starting from the analysis of the current processes, to identify if and where there are inefficiencies (many times hidden or of which little is known), to arrive at their transformation. ALTEX achieves this

thanks to the support of platforms and appropriate technological solutions. Only in this way can it increase productivity, reduce operational costs and achieve maximum process efficiency, freeing up time and resources and devoting them to what creates value for the company and the client. This is what ALTEX offers to its clients.

AL Circle: What services does ALTEX offer to its customers from various territorial offices?

Luca Lorini: The union seeks to promote and generate more collaboration between the lines of activity, allowing ALTEX to be present in different markets with high-added value and providing greater economic stability to the group.

Internationalization is a key factor within the new business group, which already has several companies worldwide. The Indian representative office is located in Frazer Town, Bangalore, where a commercial and technical team is at the customers' disposal. From the operational headquarters in Italy, ALTEX directly supports its subsidiaries in the territories, guaranteeing the necessary service to follow up with all clients. Each project sees its development under the control and attention of the entire technical team. The importance of each one of the clients is reflected in the attention that ALTEX puts into each of its projects.

More than 40% of ALTEX staff has been dislocated in the territories, having a vision of international growth, maintaining the familiar, close character and involvement with the region.

AL Circle: What is your perspective on aluminium revolutionizing the construction sector?

Luca Lorini: We all believe every day that the footprint we leave must be the basis for the future of our cities, economies and people—sustainable construction with a circular, insulating material, long, useful life and low maintenance. The construction sector is respectful and committed to the environment and environmental values while serving as the engine and the objective of all the cities in the world.

AL Circle: Could you provide information on the plans or innovative projects that ALTEX is currently focusing on in the aluminium extrusion industry?

Luca Lorini: ALTEX, born from the idea of its founders just over a year ago, comprises companies and personnel with long experience in the aluminium extrusion sector. It already occupies a privileged position on the European and world scale, both for its turnover and degree of diversification and international presence.

From South America to Oceania, passing through Europe, different projects for different markets and clients with a common denominator, a Supplier that sustains and guarantees the after-sales service as a fundamental element for productivity, quality and competitiveness of the product.

2023 has already brought different projects for big international aluminium extruders in different countries. Complete lines where the focus is the introduction of new technologies, like the new Quenching solutions for better control of profile cooling, especially needed in producing automotive profiles. ALTEX invests in research to fine-up new machinery to be introduced into the

market, billet ovens with special care for environment and maintenance, finishing cutting lines with customized solutions for a more flexible production rate and many other technological developments. ALTEX's customer target is always searching for new technologies and attentive to the provider's services in front of the client.

AL Circle: How does ALTEX incorporate sustainability into its aluminium extrusion technology?

Luca Lorini: One of our mottoes is: "THE FUTURE OF OUR INDUSTRY IS THE FUTURE OF OUR LIFE". ALTEX proposes a radical change that takes on more the appearance of a real cultural revolution rather than a simple development connected with the management and protection of the "environment". Right now, this is the real challenge we are facing, and it is on this objective that efforts in the field of research and innovation must be concentrated, not only technological but also cultural, economic, financial and social. Starting from our headquarters, we immediately chose offices in modern buildings that respect the environment, have sustainable energy and have close to zero environmental impact. Every ALTEX office in the world has these features. All ALTEX strategic suppliers are controlled with special audits and must guarantee environmental certifications, energy savings in the production cycle, and investments for the green economy. Remaining on the technological side, there is no doubt that one of the first objectives must be the definition of a sustainable industrial policy based on the efficiency of the entire production system.

In other words, the strategic goal is to move from a polluting production (which requires a clean-up industry) to a non-polluting production.



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Rahul Sharma

CEO, Vedanta Limited – Aluminium Business

“India’s construction sector is expected to be the third largest in the world after China and the US, with an expected overall value of USD 1.4 trillion by 2025.”

Rahul Sharma is the Chief Executive Officer of Vedanta’s Aluminium Business. Prior to this, he was the Chief Executive

Officer of Vedanta's Alumina Business and also held the position of Director of Corporate Strategy for Vedanta's Aluminium and Power Business. He joined Vedanta in 1998 and has held various leadership positions at Vedanta Limited and Sterlite Technologies Limited. Before joining Vedanta, he was Chief Marketing Officer (Domestic and International) and Business Head of System Integration Business at Sterlite Technologies Limited.

He is one of the principal figures of India's Metal & Mining industry and has been playing a significant role in driving various policies and creating a strategic framework for numerous government reforms for the sustainable development of exploration, mining, and non-ferrous metal sector in the country. Rahul is also the office bearer of various eminent industry associations, including the current President of the Aluminium Association of India (AAI), Chairman of the Indian Captive Power Producers Association (ICPPA), and Co-Chair of Federation of Indian Chambers of Commerce and Industry (FICCI) Mining Committee.

For his exemplary leadership, he has been conferred with various awards and accolades, including 'The Extraordinaire – Business Leader 2020-21' at the Brand Vision Summit 2022, 'People's CEO of the Year 2020' and 'Business Leader of the Year - 2017' at International Conference on Non-Ferrous Metals-2017 for his contribution to India's Metal and Mining industry.

To know his interview with us, read the short excerpt.

AL Circle: How familiar is the industry with Vedanta Aluminium's role in revolutionising the construction sector?

Rahul Sharma: Vedanta Aluminium is India's largest aluminium producer, manufacturing more than half of India's aluminium i.e., 2.29 million tonnes in FY23. As India's largest producer of value-added products that find critical applications in core industries, we are catering to the customised demand of our customers in the construction sector. Unwavering focus on customer technical services support, R&D and innovation has made it possible for us to offer product solutions and customizations perfectly tailored to the needs of the construction industry. Our world-class billet casting facilities use state-of-the-art Wagstaff Hot Top Air Slip casting technology, one of the best in the world. Moreover, we have partnered with global experts in billets and extrusions who work with us to create step-change enhancements in our offerings, making them truly unparalleled. With our robust value chain, engineering prowess, and technological edge, we are well-resourced to create significant value for the building & construction industry, with the firm belief that aluminium is the future of construction and architecture.



AL Circle: How is Vedanta Aluminium's product portfolio catering to the needs of the building and construction sector?

Rahul Sharma: We offer a wide variety of high-quality aluminium products for downstream manufacturers and extruders in the form of billets and rolled products. These are then extruded into structural components which are further fabricated for usage in a diverse range of applications like reinforcements, roofing, floating ceilings, windows, doors, and many more. In fact, our magnesium-silicon alloys in billets are preferred among extruders as it is conducive to manufacturing the most intricate architectural shapes. With our 580kT billet casting capacity per annum, we are India's largest producer and exporter of top-quality aluminium billets. Furthermore, we have also launched India's first 'green aluminium' brand Restora, aimed at meeting the fast-growing demand from our customers for aluminium with a low carbon footprint. Our product range is the first in India to receive all applicable certifications offered by the Bureau of Indian Standards. Our range of primary aluminium products has also been verified to be environmentally sustainable by Environment Product Declaration (EPD) International, ensuring that for our customers, sustainability starts at the very source.

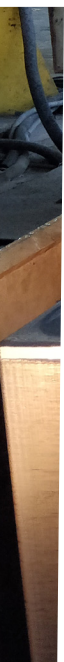


AL Circle: What is Vedanta Aluminium's outlook for the construction sector and the usage of aluminium?

Rahul Sharma: India's construction sector is expected to be the third largest in the world after China and the US, with an expected overall value of USD 1.4 trillion by 2025. According to Invest India, the construction market output in India is expected to grow at 7.1% each year by 2025, driven by critical government projects such as Smart Cities, industrial corridors, data centres, and increasing demand for cold storage and commercial spaces. Almost 25% of the aluminium produced worldwide is used within the construction industry. This is owing to aluminium's unique & versatile properties such as high strength-to-weight ratio, exceptional design flexibility, corrosion resistance, climate resilience, infinite recyclability, etc. Smart Cities, Smart Buildings and Sustainable Infrastructure and Architecture – all of these are areas that will see the intensive usage of aluminium and its alloys in the coming years. In fact, aluminium-intensive buildings are at the forefront of the ongoing transition to 'green buildings' which focus on either reducing or eliminating any impact on the environment.

AL Circle: What specific advantages do you believe aluminium has over other metals in the construction sector?

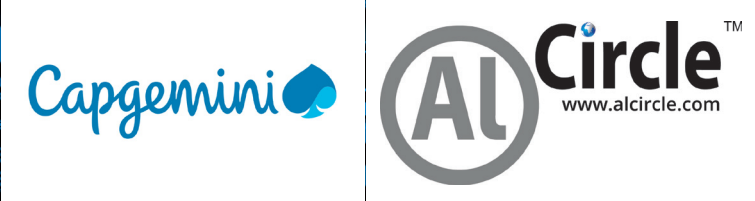
Rahul Sharma: Aluminium is the second most-used metal in infrastructural projects today and ranges from commercial buildings to domestic dwellings. The malleable and ductile nature allows aluminium to be formed into nearly any shape, making it extremely popular for structural applications and building components such as high tensile reinforcements in the form of bars and rods, doors, windows, sliding, roofing, decorations, etc. With its high strength-to-weight ratio, aluminium also offers durability while being an inherently lightweight material. When



used as a base metal in construction, aluminium structures weigh 35-65% less than traditional metals, offering use in a wider range of applications. For example, modern aluminium alloys can effectively support the considerable weight of heavy glass spans, a common feature in buildings designed to harness natural light for energy efficiency. Such features have led to aluminium's wide use in 'green' buildings. Aluminium's high reflectivity is another key feature that makes the metal an ideal roofing material for construction purposes. This property allows it to reflect solar energy and avoid absorbing too much radiant heat, making it easier to keep interiors cooler in summers and warmer in winters.

Globally, there are about 3,000 technological applications of aluminium across various industries, whereas India has explored only about 300 denoting the potential value addition the metal can bring to various industries. The construction industry stands to gain significantly from domestically sourcing high-quality aluminium for co-creating new products and specialized alloys. Aluminium, rightly regarded as the 'metal of the future', is well positioned to fuel the construction sector's journey beyond Smart Cities towards Smart India and achieve infrastructural excellence.





Abhijnan Chakraborty
Program Manager, Capgemini
India



Soumyadip Chakraborty
Director, AL Circle Pvt Ltd

Artificial Intelligence: A journey from the past to the promising future

History of Artificial Intelligence:

The history of artificial intelligence (AI) can be traced back to the early days of computing when scientists and engineers began

to explore the possibility of creating machines that could think for themselves. One of the earliest pioneers in AI research was Alan Turing, a British mathematician who published a paper in 1950 that laid the foundation for the field. Turing argued that it was possible to create a machine that could be indistinguishable from a human being in terms of its ability to think and reason.

In the years that followed, AI research made significant progress. In the 1960s, researchers developed the first AI programs that could solve complex problems, such as playing chess and proving mathematical theorems. In the 1970s, AI research went through a period of decline, as many researchers became disillusioned with the slow progress being made. However, in the 1980s, AI research experienced resurgence, partly thanks to the development of new AI techniques, such as expert systems and neural networks.

In recent years, AI research has made even more progress. AI systems are now being used to perform a wide variety of tasks, including facial recognition, natural language processing (NLP), and machine translation. AI is also being used to develop new products and services, such as self-driving cars and virtual assistants.

Inventor of AI

There is no single inventor of AI. The field of AI has been developed by a wide range of researchers, including Alan Turing, John McCarthy, Marvin Minsky, and Herbert Simon.

Application of AI

AI is used in a wide variety of applications, including:

- **Computer vision:** AI is used to develop computer vision systems that recognize objects, faces, and other features in images and videos.
- **Natural language processing:** AI is used to develop natural language processing systems that can understand and process human language.
- **Machine learning:** AI is used to develop machine learning systems that can learn from data and improve their performance over time.
- **Robotics:** AI is used to develop robots that can interact with the physical world and perform tasks autonomously.
- **Healthcare:** AI is used to develop healthcare systems that diagnose diseases, recommend treatments, and provide other medical services.
- **Finance:** AI is used to develop financial systems that can predict market trends, manage risk, and make investment decisions.
- **Manufacturing:** AI is used to develop manufacturing systems that can optimize production processes, improve product quality, and reduce costs. AI, when tied with Industry 4.0 applications, can also build predictive maintenance models and predict future machine failures before the failures take place.



- Retail: AI is used to develop retail systems that can recommend products to customers, personalize shopping experiences, and manage inventory.
- Transportation: AI is used to develop transportation systems that optimize traffic flow, improve safety, and reduce emissions.
- Smart assistants: AI-based assistants can communicate intelligently and store past data about one's interests and moods. The same may be leveraged to predict future moods, perform tasks based on the prediction as well as to plan for the same in advance.
- Smart homes: Often IoT (Internet of Things), Smart assistants and Smart homes work closely. Data from the intelligent sensors are collected, and actuators or controllers are sent the signals after processing the data. Smart home applications and smart digital assistants like Siri, Alexa, are gaining popularity.



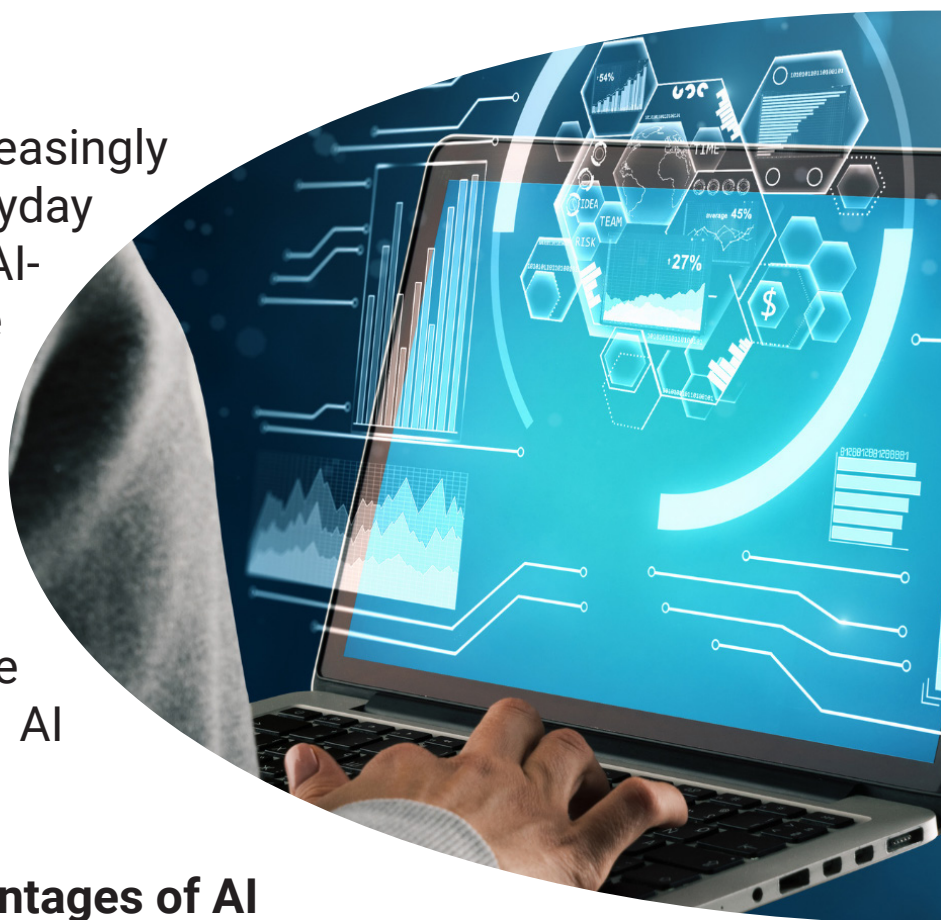
AI in the aluminium sector

AI in the aluminium sector is yet to be leveraged close to its full capabilities. There are many potential application areas of AI in the aluminium sector. Right from data mining to find the potential bauxite deposition to smart mining, from IIoT (Industrial IoT) based smart smelting to predictive maintenance, from intelligent cast house to AI-driven fault prediction – the opportunities are many. Aluminium recycling also has a vast set of AI applications, from sourcing to procuring to processing.

At the corporate level, RPA-enabled data collection along with AI can automate planning exercises by almost 90%, sales-related auctions can be automated by nearly 95%, invoicing and accounts payable processes may be automated almost by 100% and the like. Big smelting and recycling companies across the globe have been leveraging AI and other exponential technologies. Still, the trend has just started – it will be developed further in the near future.

AI in the present context

AI is becoming increasingly pervasive in our everyday lives. We already use AI-powered devices like smartphones, voice assistants, and self-driving cars. As AI technology continues to develop, we can expect to see even more widespread adoption of AI in the years to come.



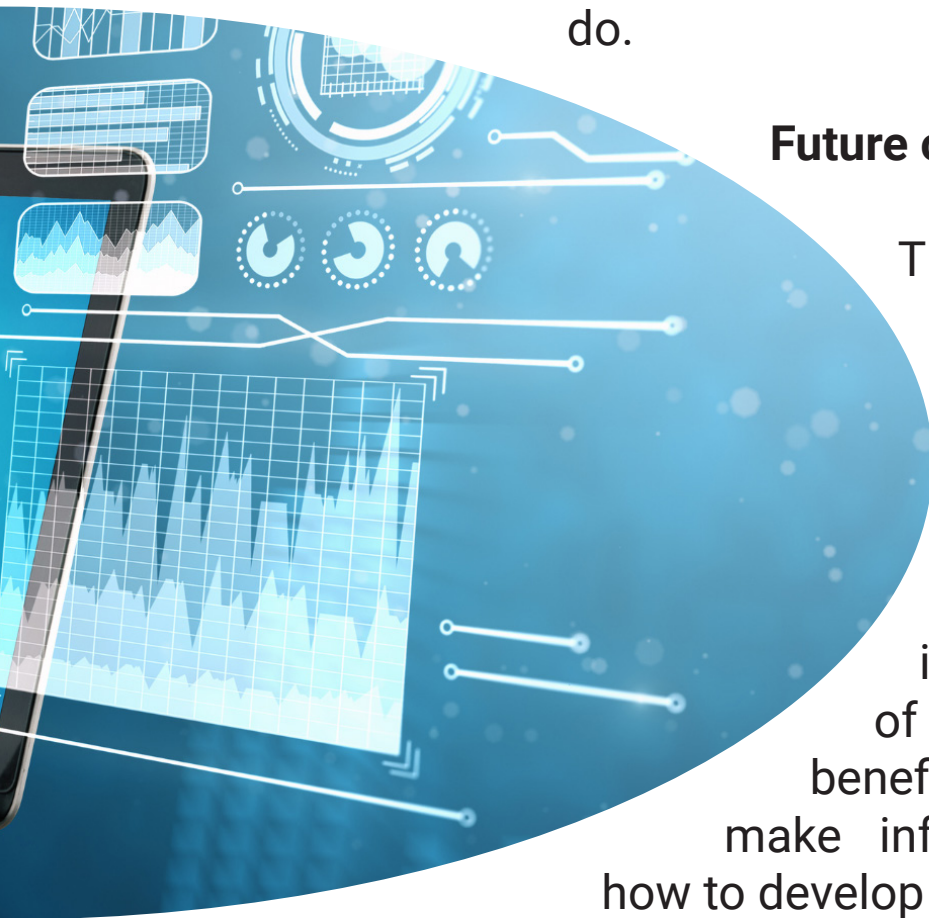
Advantages and Disadvantages of AI

Advantages of AI

- AI can help us solve complex problems that would be difficult or impossible for humans to solve independently.
- AI can help us automate tasks, freeing up our time for other activities.
- AI can help us to improve our decision-making processes.
- AI can help us to learn and grow.

Disadvantages of AI

- AI could be used to create autonomous weapons that could kill without human intervention.
- AI could be used to develop surveillance systems that could track our every move.
- AI could be used to manipulate our thoughts and emotions.
- AI could lead to mass unemployment as machines become capable of doing many of the jobs that humans currently do.



Future of AI

The future of AI is hard to predict. However, there is no doubt that AI is a powerful technology that has the potential to revolutionize many aspects of our lives. It is important to be aware of the potential risks and benefits of AI so that we can make informed decisions about how to develop and use this technology.

Some experts believe that AI could eventually surpass human intelligence, leading to a scenario known as “superintelligence.” Others believe that AI will never be able to replicate human intelligence truly and that its programming will always limit it.

The recent introduction of ChatGPT has also been marked as a major point of reckoning and debate related to AI. A set of

thought leaders are excited about the many possibilities with GPT-4 and above; there is another school of thought about the need to restrict the fast-paced development of GPT so that no major harm can be unleashed upon humanity.

Only time will tell what the future holds for AI. However, one thing is for sure: AI is a technology that is here to stay, and it will profoundly impact our world in the years to come.

Conclusion

Artificial intelligence is a powerful technology that has the potential to revolutionize many aspects of our lives. It is important to be aware of AI's potential risks and benefits so that we can make informed decisions about how to develop and use this technology.

As AI technology continues to develop, we must have a clear understanding of the ethical implications of this technology. We must ensure that AI is used for good, not evil. We also need to make sure that AI is not used to discriminate against or harm any group of people.

The future of AI is uncertain. However, there is no doubt that AI is a technology that has the potential to change the world for the better. It is up to us to ensure that this technology is used for the benefit of humanity.



Here are some of the ways that AI can be used for good:

- AI can be used to develop new medical treatments that can save lives.
- AI can be used to develop new technologies that can help conserve energy and reduce pollution.
- AI can be used to develop new educational tools to help us learn more effectively.
- AI can be used to develop new social programs to help reduce poverty and inequality.
- AI can be leveraged more to bring the specially-abled part of the populace into the main course of life faster and more effectively.
 - AI can help reduce loneliness, support the superannuated part of the population and provide support to reduce mental health issues and treat the same as well.

AI is a powerful tool that can be used for good or evil. It is up to us to decide how we will use this technology.





Dr. Pallavi Deshmukh

Manager – Research & Development, Minex Metallurgical Co. Ltd.

Significance of aluminium and its alloys for the society

Aluminium is a chemical element that was discovered 200 years ago. After an initial period of technological development, aluminium alloys were used in many structural applications, including the civil engineering field. Al is the second most widely specified metal in buildings after steel and is used in all sectors, from commercial buildings to domestic dwellings.

Alloys

Pure aluminium is a low-strength metal and consequently not suitable for building applications, but thanks to the addition of alloying elements such as Cu, Mn, Mg, Zn etc. and thanks to specific production processes, it changes its physical and mechanical properties to meet requirements of a large number of applications.



Durability

Aluminium alloys for buildings are resistant to water, and corrosion and immune to the harmful effects of UV rays, thus ensuring lasting endurance.

Low maintenance costs

Aluminium does not require any special kind of maintenance, whether it is raw or lacquered Al (glaze, finish, lamination and layer).



Finishes

Aluminium can be anodized or lacquered in any colour, so it's possible to get the most varied effects and thus meet the designer's decorative needs.

Reflective properties

Aluminium is widely used for light management: its reflective properties help to reduce energy consumption for lighting and heating.

It is possible to reduce the use of air conditioning in the summer season by using aluminium shielding devices. Aluminium does not burn and is, therefore it's classified as a non-combustible material.

Nevertheless, aluminium alloys melt at about 650°C without releasing harmful gases. And so, more and more often, the outer covers and external surfaces of industrial structures (and not) are made with thin aluminium panel finishes, which are destined to merge only in case of fierce fire, thus allowing heat and smoke to escape and reducing damage caused by the fire.

Benefits of aluminium roofing sheets:

- Aluminium is lightweight.
- Aluminium roofing sheets have high-strength.
- Easily installable
- Aluminium sheets are corrosion-resistant.
- Aluminium has high malleability.
- Aluminium is environment-friendly.
- Aluminium sheets are safe.
- Aesthetically pleasant.
- Cost-Effective



Aluminium in buildings:

Applications of aluminium products in buildings include both structural and non-structural uses. Typical applications are shown in Figure 1. Aluminium in Green Buildings Aluminium metals is generally in alloy forms, whereby aluminium is the predominant metal that is intimately mixed with other elements such as copper, magnesium, manganese, silicon, tin and zinc. Aluminium alloys can be processed into different forms depending on the processing method. Like most other metals, the processing methods involve rolling, casting, forging, drawing, tubing, extrusion, etc. As a result, aluminium products can be categorized into the following types: sheet and plate, foil, extruded products, forged products, wire and cable, casting/foundry products, and paste and powder.



Certified studies have proved that the aluminium alloys, the surface treatments (coatings) and the materials used are all neutral. Aluminium used in the construction industry does not negatively impact the air quality inside buildings, on land or water.

25% of all aluminium produced worldwide is used in construction. Aluminium is a tool for unlimited creativity in the hands of the architect, making it possible to create structures that cannot be made from wood, plastic, or steel.

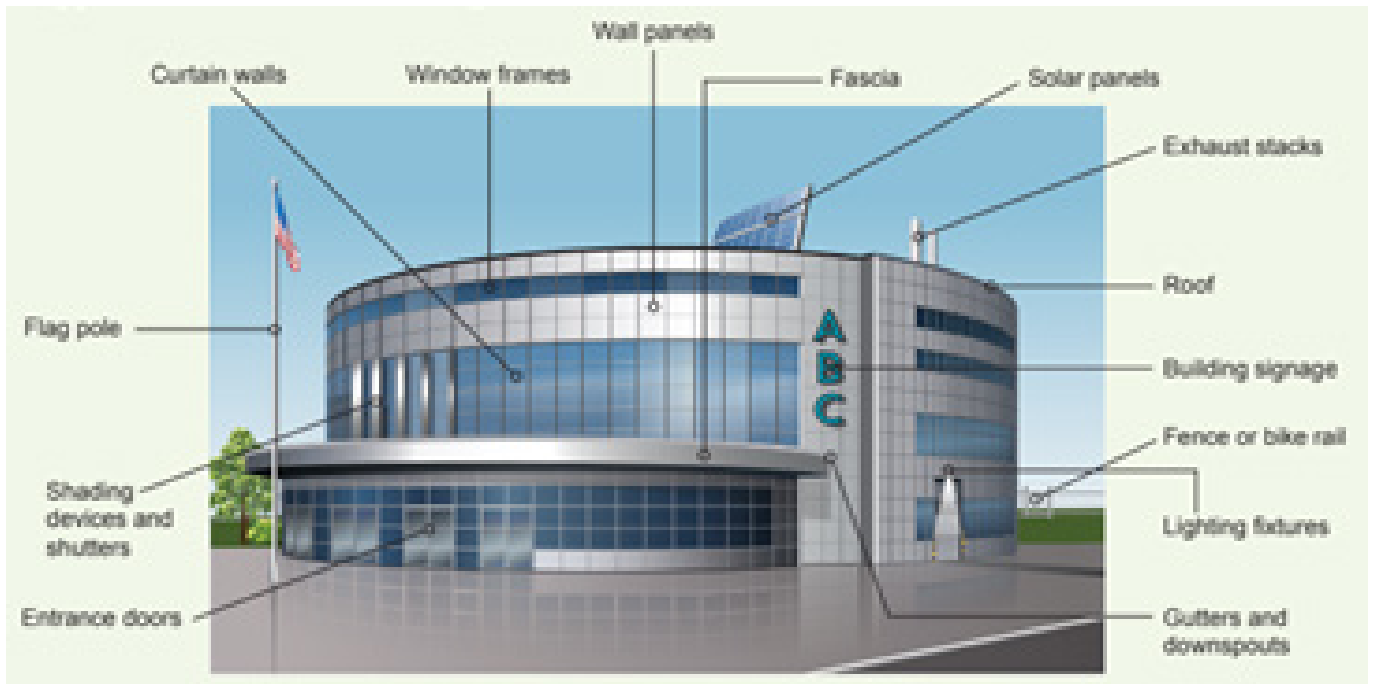


Figure 1: *The curtain walls and ventilation ducting shown in this image take advantage of aluminium's inherent properties: lightweight, strong, flexible, and long-lasting*

Application of aluminium foam in construction:

- Aluminium foam is very light, very rigid, and environmentally friendly
- The density of the aluminium foam is about 1/5~1/10 of pure aluminium, 1/20 of iron, and 1/4 of wood and plastic.
- It is being used in the field of tooling and building materials
- The appearance of aluminium foam in the field of automobile manufacturing can reduce the weight of vehicles and improve fuel efficiency.

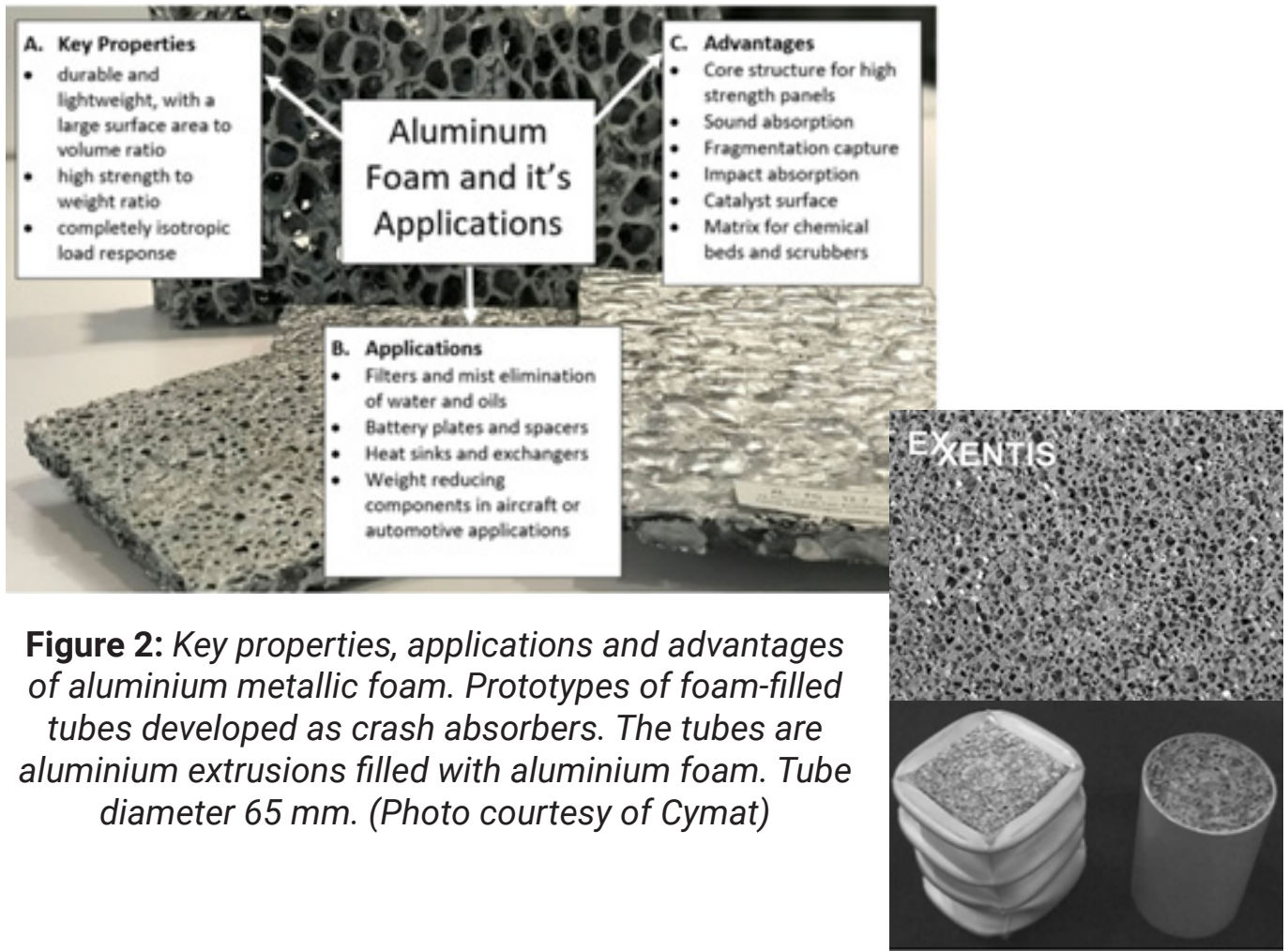


Figure 2: Key properties, applications and advantages of aluminium metallic foam. Prototypes of foam-filled tubes developed as crash absorbers. The tubes are aluminium extrusions filled with aluminium foam. Tube diameter 65 mm. (Photo courtesy of Cymat)

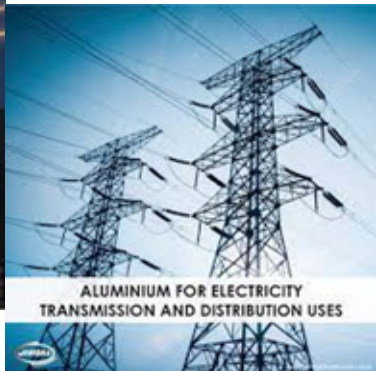
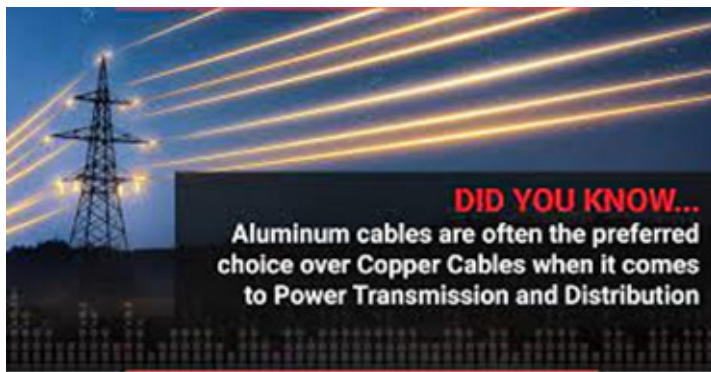
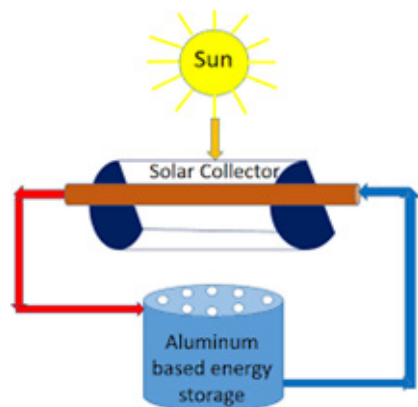
- The first building in which aluminium was widely used in construction was the Empire State Building, the famous New York skyscraper built in 1931 – and the tallest building in the world until 1970. Aluminium was used in all of the building’s basic structures and widely used in the interior as well. One of the building’s calling cards is the fresco on the lobby ceiling, and the walls are made of aluminium and 23 karat-gold.
- As per industry estimates, the current market size of the façade industry in India is INR 15,000 crore with an expected annual growth rate of 20% from 2019-2025. The major drivers of the industry have been growth in real estate in the country, increased commercial construction, urbanisation, key government projects like Smart Cities, urban housing projects and the like.

- Aluminium has the highest strength-to-weight ratio compared to most other metals. This property makes them the material of choice to build aeroplanes. This unique characteristic that aluminium possesses makes it extremely strong, and when combined with its lightweight property, it becomes one of the most suitable roofing materials.

Application of aluminium in electrical conductivity:

			
3.5×10^7 S/m	4.1×10^7 S/m	5.96×10^7 S/m	6.3×10^7 S/m
Aluminium	Gold	Copper	Silver

Given its electrical conductivity, aluminium extrusion is used in the transmission segment. Aluminium is better than copper in terms of cost and weight. Aluminium is preferred over other materials for use in electricity transmission and distribution. Aluminium extrusions are used by Power Grid, NTPC, GE, Siemens, Schneider, BHEL, ABB, and other customers for several applications such as switch gears, control panels, power substations, etc.



Aluminium wiring is corrosion-resistant and provides twice the conductivity per pound compared to copper wiring. And aluminium

wiring requires minimal energy to recycle and loses none of its properties during recycling.

Sustainability of aluminium:

Why is aluminium environmentally friendly?

Known as green metal, aluminium is one of the most environmentally friendly metals because of its sustainability. As the most recyclable industrial material, aluminium can be recycled infinitely to produce the same product.



Recycling aluminium also saves 95% of the energy used in its production from raw materials.



If this were not enough, it is the most common element in the Earth's crust after oxygen and silicon. On top of this,

recycling aluminium requires only 5% of the original energy that the production from virgin raw material would use. Therefore, recycling aluminium reduces by 95% energy consumption compared to its extraction from bauxite, with the environmental advantages that this brings.

A highly durable metal, aluminium is 100% recyclable and can be recycled repeatedly without degrading its inherent value. It is estimated that 75% of the aluminium which has been extracted in the last 100 years is still in use. It is indeed a rigid, long-lasting material with many practical applications, but its quality makes

it very sustainable and simultaneously the culprit behind its longevity between us; an infinite life cycle.

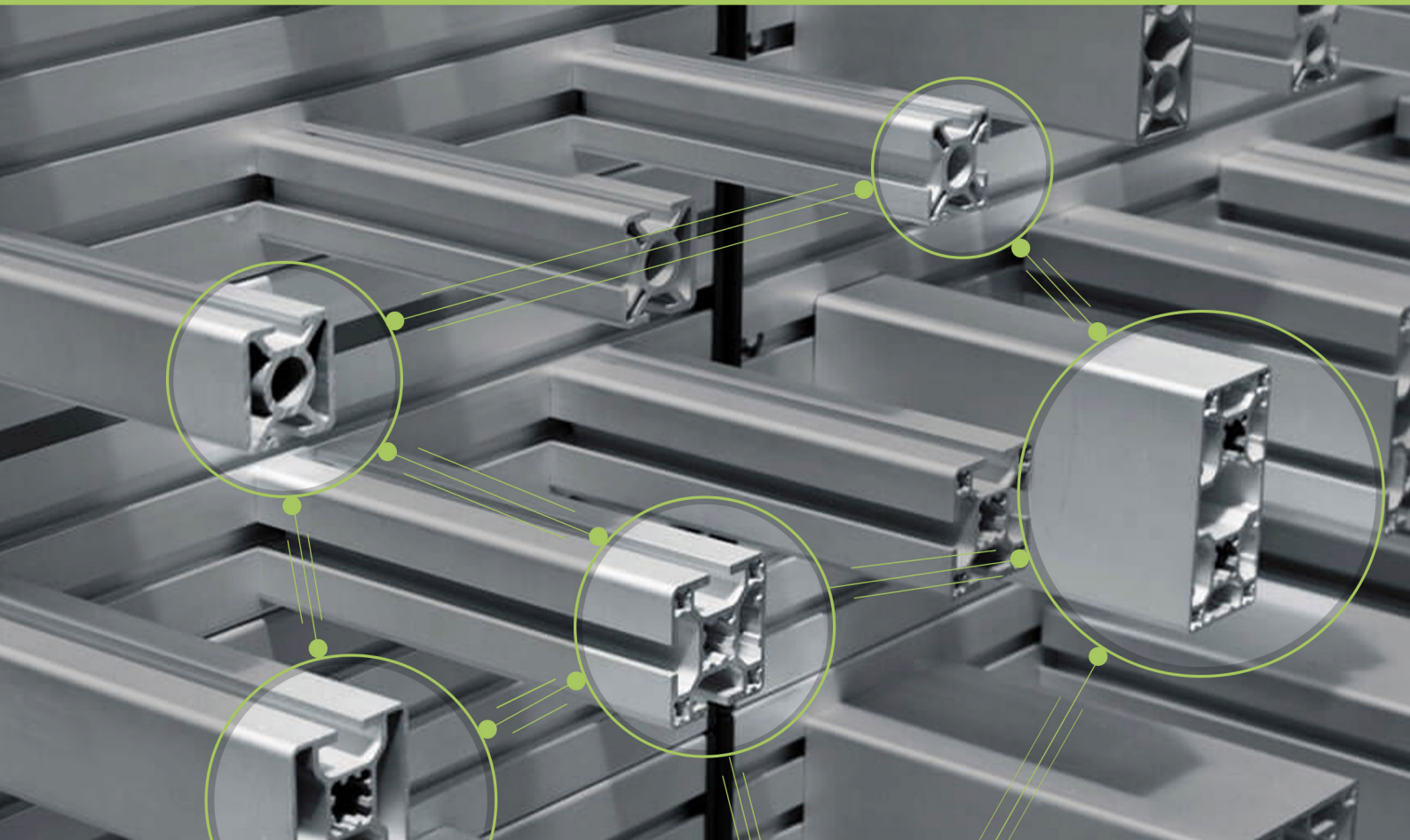
Did you know that 1 billion tonnes of aluminium have been produced since 1886, and $\frac{3}{4}$ parts of this metal are still in use today?



PRESENTS

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Jindal Aluminium



R.K. Jain

Senior Vice President, Corporate Affairs, Jindal Aluminium Limited

Sustainable construction needs sustainable components

The process of construction and operation of buildings can have an all-encompassing direct and indirect impact on the environment, society, and the economy at large. The field of green construction seeks to stabilize the requirements of these zones by making use of an assimilated sustainable method to construct a 'win-win' design approach. During the construction process, buildings

use essential resources, generate waste, release dangerous atmospheric emanations, and severely alter the land function and its capability to absorb and capture water into the ground.

The chief objective of ecological construction is to condense or totally avert the exhaustion of vital resources like water, energy, land and crucial raw materials; preclude the degradation of environmental cause by infrastructure throughout their life cycle, and accordingly build environments that are completely liveable, secure, sustainable and productive.

Architects, builders and designers have to face the manifold challenges to effectively meet the demands for novel and refurbished facilities that are sustainable, secure, healthy and productive while trying their level best to mitigate any undesirable impacts upon the surroundings, the environment, and most importantly the overall economy.

A prime aspect which cannot be missed while considering ecological construction practises is the requirement for sustainable components. One crucial step in this direction is to encourage the practice of retrofitting prevailing buildings rather than constructing new structures. This is a cost-effective step owing to the fact that designing chief restorations and retrofits for existing buildings in order to incorporate sustainable design characteristics tends to lessen further operational values and harmful impacts on the environment and, above all, can augment the resiliency of the building.

Below mentioned is a list of need-of-the-hour sustainable components that are required in sustainable constructions:

Sustainable aluminium used in sustainable construction

Out of the various types of metals that have been used for the purpose of building construction, aluminium is the most preferred metal in the sustainable category. It is considered one of the most superior ecological solutions for construction and then building façades, wall claddings, window frames and panels, to name a few. Aluminium is increasingly developing into the material of choice in modern-day environment-friendly buildings owing to its corrosion resistance and recyclability. The energy utilized for primary production is exemplified, to a large extent, in the metal and, subsequently, in the building construction too. Modern-day buildings hence present massive 'urban mines' of around four hundred million tonnes of aluminium metal that can be mined and salvaged through the



utilization of only five per cent of the initially used energy, not just once but recurrently. An important point that illuminates the reusable properties of the metal is that although it is widely applied in buildings, it does not remain perpetually in place. Buildings are modified sporadically, thereby releasing aluminium for the purpose of recycling.



Aluminium: A key sustainable component

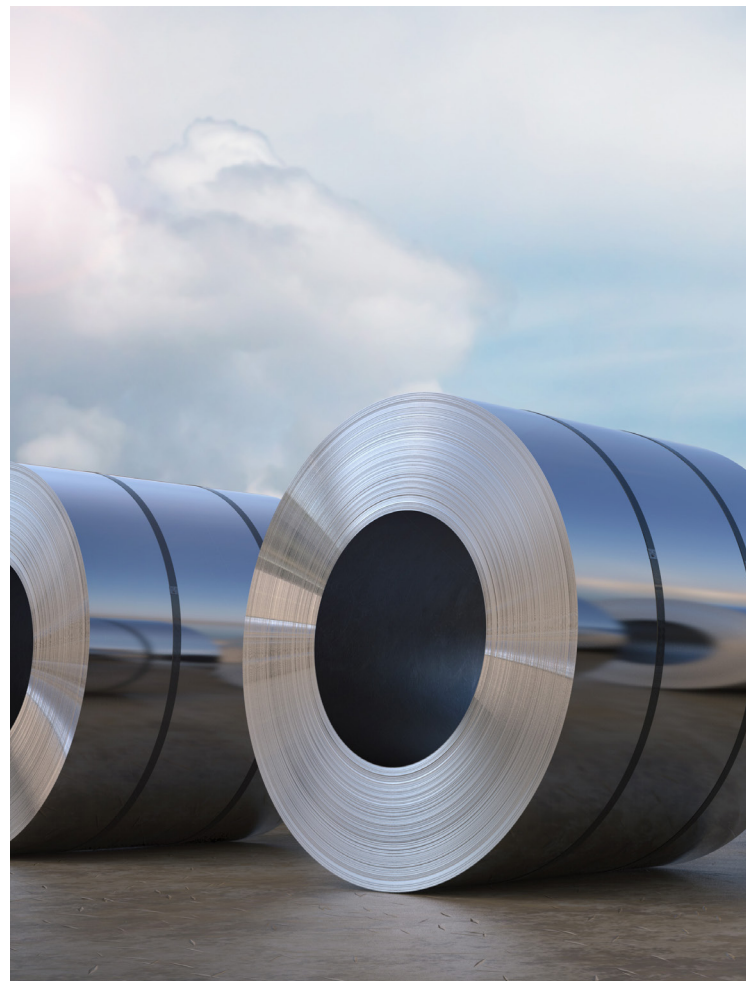
Solar heating and photovoltaic: Owing to its properties like heat conductivity and sturdiness, anodized aluminium, feasibly pooled with photovoltaic reflectors to highlight the sun's rays, seems to be the material of choice to capture the radiation of solar energy. Taking benefit of the material's strength and dexterity, aluminium profiles are principally used in photovoltaic systems and are particularly mounted on building roofs, where weight

necessities to be condensed as much as possible. Aluminium profiles are unambiguously designed to allow the effortless and long-lasting electrification of the whole photovoltaic system.

Hence, aluminium is a significant material that is assisting the development of solar-based energy supply systems, which are making a noteworthy contribution to fortifying the green dimension of buildings.

Aluminium facades: Intelligent, sustainable facades encompassing aluminium systems can help diminish the energy consumption in buildings by up to fifty per cent. The crucial feature of these intelligent buildings is their enhanced interface with the exterior, condensing the demands for heating, cooling, ventilation and lighting energy throughout the seasons.

Aluminium profiles and glass: These components provide the perfect blend to safeguard a high level of natural lighting inside the buildings. For instance, slender thermally broken aluminium profiles for windows with the same dimension can increase transparent areas by up to twenty per cent compared to windows with frames composed of other materials. Besides improving the lighting, these windows insulate the internal space from external atmospheric noise and temperature. By augmenting natural lighting, aluminium profiles help reduce the requirement for artificial lighting, contributing considerably to the structure's sustainability.



Aluminium cladding: These claddings are most utilized for building exteriors. Most of the aluminium cladding for the construction domain is pre-coated to suit the décor of the building to increase its aesthetic appeal. This creates a shielding layer on the core material that defends it against ecological factors. Aluminium is a lightweight metal that is long-lasting, resistant to corrosion, and 100 per cent renewable and claddings made from aluminium can last the lifetime of a sustainable structure and beyond. The effective usage of aluminium cladding contributes to green building design by allowing high ratings in enhancing the buildings' energy efficiency.

Sustainable roofs: Green roofs, like roof shingles composed of salvaged waste materials like aluminium, wood, plastic and fibre are incredibly long-lasting. They are measured to be ecologically friendly because they keep waste out of landfills, and there is no requirement to process raw materials. This further condenses pollution and lowers down consumption of energy.



Water management in green building: In the case of sustainable constructions, lessening the usage of water is attained by the installation of grey water and rainwater catchment systems that reuse water for the purpose of irrigation or toilet flushing; water-efficient utilizations, like low-flow showerheads or spray taps; low-flush toilets. To efficiently manage water, most sustainable structures have adopted Rainwater Harvesting, which is the principle of collecting and using precipitation from the surface of a catchment. Since construction practises are heavily dependent on water usage, making optimum use of water harvested from rain during construction can majorly facilitate conserving the local water resource.

Considering the increased exploitation of the available resources and the added stress it brings to the environment, going sustainable is the need of the hour. Embracing sustainable components for green construction is one way the industry can condense the environmental impact. These components facilitate increasing the sustainability component through their performance properties. Hence these green components are not just a potential but a reality that keeps the environment moving.

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ALUMINIUM
ASSOCIATION

Russian Aluminium Association

Russian aluminium solutions for the construction sector

The construction industry is one of the main consumers of aluminium in the Russian market – 30% of the total consumption in the country or 220,000 – 230,000 tonnes annually.

Russia is one of the largest producers of aluminium - 4 million tonnes of this metal are produced annually in the country

In Russia, aluminium solutions are used both in constructing modern buildings and infrastructure facilities and in projects aimed at preserving architectural monuments and historical heritage. The interest in aluminium is explained by its unique properties. They include low specific gravity, high corrosion resistance and durability: for example, the service life of a bridge with aluminium structures exceeds 70 years. At the same time, aluminium bridge structures mustn't require constant anti-corrosion treatment, unlike steel ones. Recently, with the growing attention to sustainable development – environment and conservation of climate, in particular, with the introduction of the principles of 'green' construction, the possibility of aluminium processing has become of great importance. About 80% of the world's aluminium continues to be used after processing. This is an informed choice of architects, developers and construction companies in favour of environmental materials.

Properties of structures made of aluminium alloys:

- Energy efficiency
- Absence of toxic impurities in the composition of materials
- No harmful emissions during combustion
- Bacteriological purity of the surface
- Fully recyclable and reusable
- Use of technologies, eliminating carbon dioxide emissions into the air, for the production of structural materials

Aluminium solutions are used not only for the construction of new buildings but also for the restructuring of symbolic historical sites. One of the most remarkable examples is the reconstruction of the Polytechnic Museum in Moscow – one of the world’s oldest scientific and technical museums (it was built from 1872 to 1907). For the first time in Russia, when constructing the translucent roof structure of such a large complex of public buildings, the area of which exceeds 3,500 square metres, aluminium structures were used instead of steel ones! The translucent aluminium roof looks modern and beautiful. Besides, it is functional.

Aluminium solutions are also used to construct public amenities: easily erected hospitals and superstructures for kindergartens and schools.

Advantages of aluminium modular buildings:

- Reusable for 25 years.
- Reduction of the scope of works at the construction site down to 50%.
- High return value in the event of recycling.



The Polytechnic Museum’s roof can be used to place large objects of the exposition under it, for example, to hang model airplanes or satellites under the dome.

Aluminium solutions in construction:

- Large-span coverings (coverings for sports facilities, public and industrial buildings with large unsupported spans of 35 to 110 metres)
- Self-supporting structural shells or translucent structures
- Prefabricated modular buildings
- Systems of ventilated facades
- Windows, stained-glass artworks and entrance lobbies
- Modular glazing systems
- Blocks for air conditioning units
- Three-layer sandwich panels
- Seam roofing
- Small-scale architectural structures and lighting poles

Advantages of translucent structures:

- The structures are self-supporting and do not require a supporting steel frame made of steel, owing to which the specific amount of metal is reduced, the facility's aesthetic appeal is improved, and the light transmission is increased.
- The unique nodal solution for joints of sections and the use of durable aluminium alloy enable translucent spatial structures of any shape and size.
- Such structures are used to construct passenger terminals of airports, shopping centres, technological clusters, recreation and entertainment parks, exhibition pavilions, hypermarkets, and office buildings.

One of the new areas of using aluminium is the construction of bridges made of aluminium alloys to ensure optimum metal consumption and commercial efficiency of structures, with less weight compared to similar structures made of steel. Step by step, aluminium is the winning ground in the construction of artificial structures as well as light railway pedestrian crossings. Association member companies have already mastered technologies of aluminium alloys bridge elements production from orthotropic decks and supporting structures to exterior finish. Experts have accumulated monitoring data on bridge service in various weather conditions, which proves their successful operation. Sustainability is another important advantage - when the life cycle of a bridge expires, aluminium structures can be fully recycled.



Bridges made of aluminium alloys have great prospects because domestic manufacturers of aluminium structures are offering new efficient solutions now. Today, 15 bridges with aluminium structures are in operation in Russia. The first aluminium bridge in the country was built in St. Petersburg in 1969, more than half a century ago. The first two aluminium bridges in modern-day Russia were built in 2017.

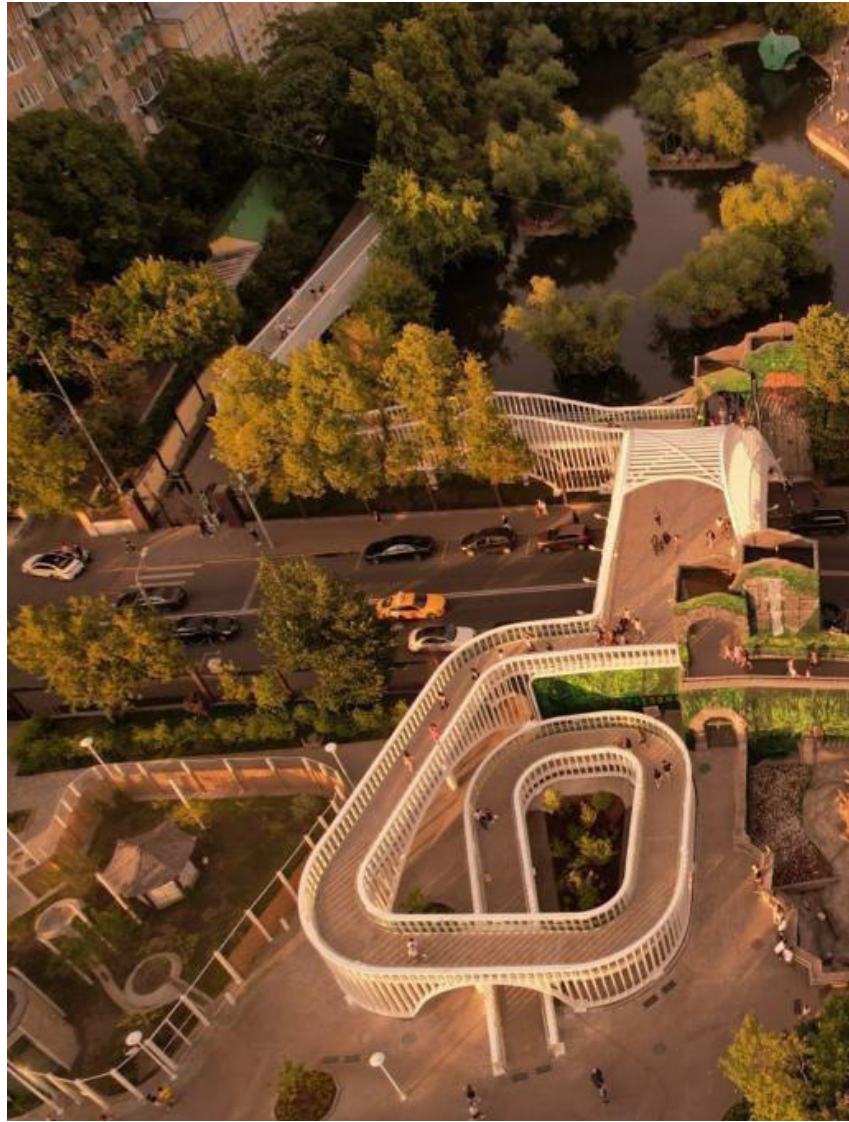


Another new area is the aluminium finishing of metro stations. The first use of aluminium finishing in the Moscow Metro dates back to 1972 – at the Oktyabrskoye Pole station (1972), anodised aluminium was used for lining columns. The track walls were lined with bronze anodised aluminium at the Shchukinskaya station, which was opened three years later. At the Medvedkovo station of the Riga Radius (1978), metal pyramids, stamped from aluminium and anodised to match the colour of light bronze, symbolise ice blocks.

However, aluminium came into common use about a decade ago, when entire surfaces were made of large-sized panels. At the end of the 2000s, technologies made it possible to produce

large-format products, then structural glazing based on aluminium sections appeared.

Aluminium has a number of key advantages over other lining materials. The low weight of prefabricated parts makes it possible to simplify the construction of metro facilities and move prefabricated structures to the construction site. The increased corrosion resistance of aluminium products makes it possible to operate construction facilities in aggressive environments, e.g. near groundwater and in constant mud and slush. Stained-glass artworks, honeycomb panels and patterned panels, protective hoods, sun shields, ceiling-mounted vertical rack panels – aluminium is present in almost all elements of the stations.



The most popular aluminium solutions in the modern metro are large-format stained-glass artworks and honeycomb panels, which make the entire structure monumental. Such panels keep a flat surface; at the same time, they can be used to make camber surfaces in the form of umbrellas. In decorating ceilings, systems made of aluminium sheets and stamped products are popular:



3D punched panels and open-grid ceilings.

Since the establishment of the Aluminium Association in 2015 and with its full support, the Moscow Metro already has more than 20 stations with aluminium solutions in interiors and entrance lobbies. Perforated panels, multicoloured patterns, glassy, glossy and matte surfaces, and straight and curved shapes are all aluminium.





ALUMINUM
EXTRUDERS
COUNCIL



Guy Charpentier

Division Marketing Director –
Bonnell Aluminum
AEC Industry Promotion Chair



Lynn Brown

Market Development
Consultant, AEC

“We expect aluminium extrusion to continue to be a critical element in high-rise buildings – whether office or residential – and a major factor in other building segments, such as mid-rise and institutional buildings.”

AL Circle: How do you envision the future of aluminium in the construction sector? What trends or developments do you expect to see in the coming years?

AEC: Despite rapid growth in transport applications, construction remains the largest end-use sector in North America (the U.S. and Canada), representing around 35% of total consumption.

We expect aluminium extrusion to continue to be a critical element in high-rise buildings – whether office or residential – and a major factor in other building segments, such as mid-rise and institutional buildings.

Extrusions' role in these structures will be driven by efforts to reduce the carbon intensity of buildings, ongoing improvements in building energy and resource efficiency, and increased focus on occupant health and well-being.

- **Reducing carbon intensity:** According to the United Nations Environment Program, buildings and their construction together account for 36% of global energy use and 39% of annual energy-related CO2 emissions; in the U.S., it is reported that residential and commercial buildings account for 40% of energy consumption. Reducing both the embodied carbon (from materials and construction) and the operational carbon (from building operations) must be a priority. Aluminium extrusions can facilitate this. But our concern cannot just be with new structures. 82% of U.S. commercial buildings were built before 2000, and many are significantly older. Many cities are implementing energy standards for these older structures, which will stimulate considerable retrofit activity, in which aluminium extrusions will have a significant role.

- **On-going gains in building energy and resource efficiency:** The development of lower-carbon primary aluminium and improved processes for using higher scrap content billet will continue to reduce the potential embodied carbon of our products. In addition, the use of extruded louvers, light shelves and shades, along with more energy efficiency fenestration framing will help reduce energy use and operational carbon.
- **Occupant health and well-being:** While carbon mitigation must be a priority, we must not lose sight of the fact that buildings are for people, and the way we build them can have a significant impact on their productivity, learning, mental health, and healing. Thus, we cannot overly constrain vision area and access to natural light. Rather the trend is for larger glass lites, necessitating high-strength extruded framing to balance the vision area with the structure needed – particularly for higher-rise projects.

A final development is the growing role of extrusions in infrastructure – bridge decking and railings, highway signage and lighting, etc. Extrusions’ durability, design flexibility and lightweight increasingly make them an important component of such applications.

AL Circle: In your opinion, what are the key advantages of using aluminium in construction projects?

AEC:

Design versatility and performance: The versatility of the extrusion process allows for the manufacturing of “almost endless” shape configurations, which are highly sought after by engineers, designers, and architects for construction designs. Aluminium extrusions are lightweight, strong, high

strength-to-weight ratio, resilient, corrosion-resistant, non-toxic, electrically conductive, non-sparking, non-magnetic, and non-combustible. They can be designed and manufactured for custom projects in a wide range of sizes, shapes, and finishes. Aluminium extrusions are easy to fabricate and assemble, joinable in many ways, and available in various alloys to optimize desired performance.

Customization: Customization is at the top of the list when it comes to the benefits of designing and using aluminium extrusions in construction projects.

Aluminium extrusions are often preferred for the design of many products because of the ability to design custom profiles that meet various aesthetic, functional, and manufacturability requirements. Designing and producing a custom aluminium extrusion profile is also very cost-effective compared to machining a block of any material to the same design. If a building developer or an architect is looking to create a unique statement, customized designs with extrusion offer one way to do that – without significant cost or time penalty. For developers, architects, designers, and consumers, customization and personalization make the product feel unique.

Local availability: The Aluminium Extruders Council has more than 60 extruder member companies operating hundreds of plants, with over 450 extrusion presses ranging from 2” to 26” in circle sizes. These extruders are in 35 states and four Canadian provinces. The availability of domestically produced aluminium extrusions is not an issue, and local availability reduces the carbon burden of transporting final products from plant to job site.

Sustainability: Aluminium is one of the most recycled and recyclable materials in use today. In fact, nearly 75% of all

aluminium produced since the late 1800s is still in use today in some shape or form. Studies have shown that over 90% of extrusion used in construction projects is recycled at the end of life, in part due to the extensive recycling infrastructure in North America. It is estimated that U.S. extruders consume over four billion pounds of aluminium scrap each year. Aluminium recycling only takes approximately 5% of the energy needed to make primary aluminium. That 5% represents a saving equivalent to 90 million barrels of oil each year in the U.S.

And now, we are seeing many producers investing in the manufacturing and supply of low-carbon aluminium to help further reduce CO₂ emissions. This is driven by several factors, including increasing pressure from consumers and investors to reduce carbon emissions, as well as regulatory initiatives aimed at curbing greenhouse gas emissions.

AL Circle: How has the adoption of aluminium in the construction sector evolved over the years?

AEC: Several decades ago, residential window and door applications were a major market for North American extrusions. That market, however, has been largely captured by competitive materials – vinyl at the low end and wood at the high end. Currently there is some increased use of aluminium for residential applications featuring large glass lites and window walls; however, the major uses of aluminium extrusions in the construction market are for high-rise offices and residences in urban areas, institutional buildings and mid-rise/mixed-use developments.

When it comes to the extrusions themselves, there have been important evolutions in the finish, thermal-break technologies, and size:

Finish: Initially, aluminium extrusions were primarily supplied unfinished. This was fine since aluminium is adequately protected by the thin, transparent oxide which covers its surface on exposure to air, requiring no additional protective coating. Finishing technologies began to emerge in the subsequent years, giving architects and consumers new decorative options. Anodic coatings were first developed, adding a durable, porous oxide film on the surface of the aluminium, increasing the protection already provided by the natural aluminium oxide layer. Coloured anodic coatings yield various colour options as an integral part of the oxide film. Paints and lacquers also became popular among architects pursuing a wide selection of colours and gloss ranges. From modified acrylic to polyester polymers to fluorocarbons for high-performance organic coatings on architectural extrusions and panels to powder coating, which is applied in the form of a finely ground powder of colouring agents and resinous materials with additives, paints have contributed to increased aesthetic properties and surface protection performance.

Thermal-improvement technology: During the 1980s, window manufacturers began to learn that aluminium frames were insufficient for insulation purposes. Aluminium's conductivity is a liability when you want to keep heat or cold at bay. For window framing, you want the heat to stay on the outside in the summer and the cold to stay on the outside in the winter to maximize energy efficiency and occupant comfort. Similarly, if you are designing a door for a supermarket freezer cabinet, you want the cabinet to stay cold and the aisle to remain temperate. For such applications, aluminium extrusions are today designed using a variety of thermal breaks or barriers. Such thermal barriers typically employ a polyurethane or polyamide material with a low coefficient of thermal conductivity to separate the inner and outer sections of extrusion, thereby providing increased insulation and

minimizing heat transfer from one side to the other. While energy codes are increasingly demanding, ongoing advancements in thermal break and window technology has allowed aluminium-framed windows to continue offering an energy-efficient solution.

Size availability: Over the years, we have seen an increased number of glazing contractors seek larger extrusions to reduce the need for joining and assembling multiple smaller size parts. Larger extrusions also provide greater structural integrity, specifically when used on monumental architectural curtainwall projects designed with large glass areas. With the reduced need for additional joining and assembling of various profiles, large extrusions contribute to the overall aesthetic of a building's façade. In addition, the fewer components used, the less cost for handling, fabrication, and assembly. Working with various shape configurations mean more dimensional tolerances to be factored into the design and fabrication of the finished curtain wall unit.

AL Circle: What role do aluminium extrusions play in the construction sector, and how do they contribute to its advancement?

AEC: Aluminium extrusions are used in a vast array of products deemed vital components to the construction sector, including healthcare facilities, government offices, manufacturing and utility facilities, and infrastructures. In fact, many national "critical infrastructures", as declared by the U.S. Department of Homeland Security, use products made from, aluminium extrusion. Aluminium extrusions have become increasingly indispensable in manufacturing renewable energy applications used in buildings and infrastructures: photovoltaic mounting systems, wind turbine structures, solar panel and module frames, large-scale concentrated solar power farms, inverter housings, and HVAC

systems.

The building and construction market heavily relies on many products that are used or made from aluminium extrusions:

- Residential, commercial, institutional doors, windows, skylights, thresholds, screens, awnings, canopies, sunrooms, patio enclosures, railing systems, storm shutters, sunshades, and rainscreens.
- Pre-engineered buildings, structures, manufactured housing, mobile homes, interior wall panels and partitions.
- Duct and louvers for ventilation systems.
- Curtain walls, storefronts, and commercial entrance doors.
- Bridges and highway signposts, brackets, railings, and light poles.
- Shower and tub enclosures, venetian blinds, swimming pools.
- Stadium seating and grandstands.
- Residential, commercial, and institutional solar panel framings and brackets.
- Electric vehicle charging stations.

All these products have contributed and continue to contribute to the advancement of buildings in terms of energy and resource efficiency, occupant health and wellbeing, and environmental sustainability.

As the building community pursues the greater use of renewable energy, it is imperative to mention that aluminium extrusions and extrusion-based assemblies play a prominent role in wind power solutions – including the use of bus bar to carry the electricity generated by the turbine to inner-tower structural elements, to meet the energy needs of cities and local municipalities. This is why aluminium extrusions are central to the large-scale deployment of renewable energy in the United States.

AL Circle: Why do you think aluminium recycling is critical to extrusion's sustainability story?

AEC: Aluminium's embodied carbon trails only concrete and steel in construction applications, making it a target of carbon mitigation initiatives. The recyclability of aluminium, combined with a robust infrastructure for collecting, processing and remelting end-of-life aluminium components, along with the substantial use of raw materials with significant scrap content, allows extrusions' embodied carbon to be minimized. An average industry EPD completed by the AEC in 2022 showed that, in the aggregate, the billet consumed by the industry had 53% recycled content. Further, a sensitivity analysis of that data showed that increasing the recycled content to 70% would reduce the industry's Global Warming Potential (measured in CO₂ equivalents) by almost 25%. Use more recycled content, and reduces carbon emissions.

AL Circle: How does aluminium compare to other traditional construction materials regarding sustainability and environmental impact?

AEC: No other material offers recyclability without the loss of properties that aluminium does. In addition, the use of aluminium raw materials (billet) with high recycled content, combined with prime sourced from low-carbon (e.g. hydro-powered) smelters, provides a low embodied carbon material. The appropriate specification of raw materials can lead to extruded products with low embodied carbon. And all are recyclable at the end of life.

Extrusions can also minimize operational carbon, with sunshades, light shelves, louvers, and similar devices helping to enhance the use of natural light and reduce energy usage in buildings.

The robust infrastructure for recycling extrusions makes aluminium recycling a reality, not just a theory. Studies have shown that over 90% of aluminium in buildings is recycled at the end of life, with similar results for aluminium in autos. Over 40 casthouses in North America, most of which are AEC members, are devoted to melting scrap, along with various levels of prime, and producing billet for the next generation of extruded products.

AL Circle: What efforts or initiatives are being undertaken by the Aluminium Extruders Council (AEC) to promote using aluminium in the construction sector?

AEC: One of the Council's key missions is to encourage additional usage of aluminium extrusions. Given the importance of the construction sector to the extrusion market, the Council has active programs to educate potential users about the benefits and practicalities of using extrusion in construction applications and to further enhance the material's sustainability credentials:

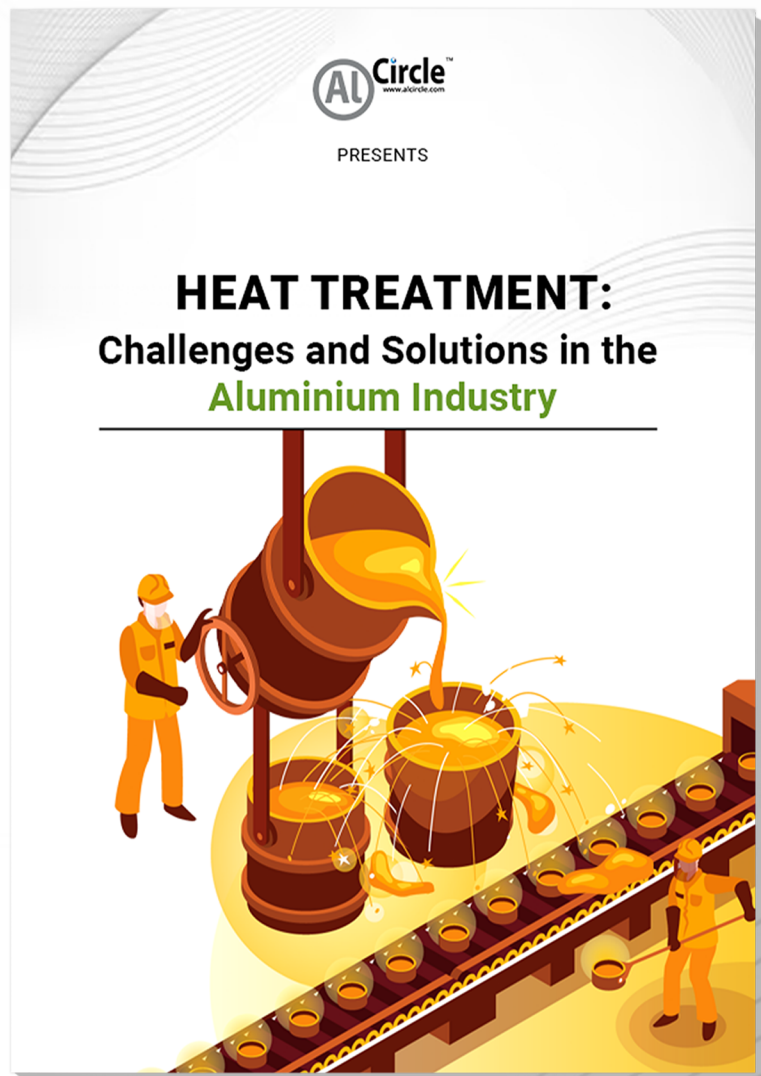
- **Education:** The Council routinely presents webinars and workshops aimed at construction users. These are designed to educate the participants on the extrusion process, various construction (and other) applications, and the process of effectively designing extruded components. Most offer continuing education credit to construction professionals. Similar information on the Council's website is designed to provide a ready-on-use resource covering the same topics. The most recent addition to these educational resources is an extensive module on the benefits of extrusion used in the educational building environment.

Sustainability: The Council recently completed its second industry average EPD, based on data for 38% of North American extrusion production. This builds on the Council's first effort in 2016. Subsequently, the Council commissioned a sensitivity analysis to demonstrate the impact that both scrap content and prime metal source can have on the Global Warming Potential of extruded products; this effort was designed to provide the data needed for productive discussions between product specifiers and extruders on the optimal raw material for a given product or project. In addition, the Council's new Sustainability Team, comprised of members across the value chain, is pursuing initiatives to clarify how pre-consumer scrap should be burdened in EPD and similar calculations and assist extruder members in quantifying and mitigating their carbon footprint.

The Council's approach is anchored in the conviction that extruders cannot act by themselves. Successful use of extrusions requires collaboration across the supply chain of metal and finishing suppliers, extruders, downstream building product producers, architects, and contractors. Thus, we regularly meet with these upstream and downstream partners to determine how best to advance the use of extrusion in construction.

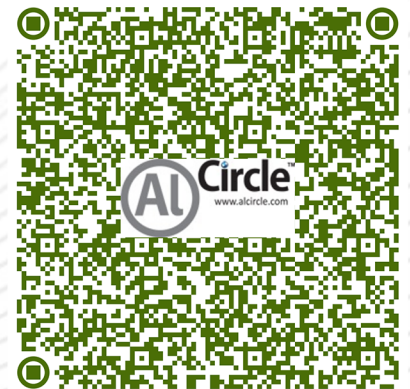
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Release Date : End of July 2023



Aludecor
Metal Composite Panel



Ashok Kr Bhaiya
Owner and CMD of Aludecor Lamination
Pvt Ltd

“Aludecor is the first and only brand in the industry to have collaborated with an Institute like IIT to manufacture the best FR-grade ACPs in the country.”

Ashok Kr Bhaiya, owner and CMD of Aludecor Lamination Pvt Ltd, has an inspiring story of re-introducing ACP in India and reaching

the pinnacle. In 1999, while managing the import-export business, this promising material caught his eye. The millennium was changing then, and so was the lifestyle. He travelled to various parts of the US, Europe & Asian Nations to learn about the production technology and other nitty-gritty used in ACPs. In 2002, he re-introduced this high-potential product in India with state-of-the-art ACP manufacturing facilities, advanced equipment & futuristic technology, along with a coil coating line in Haridwar under the brand name of Aludecor.

AL Circle: How do you foresee the demand for aluminium composite panels for building facades and interiors in India this year?

Ashok Kr Bhaiya: The demand for ACPs has seen an upsurge in its initial days and continues to remain a favourite choice for fabricators, design consultants and even architects. However, different types of composite panels are being introduced in the industry, such as CCP (Copper Composite Panel) and ZCP (Zinc composite panel). In a price-sensitive market, the demand and supply of these composite panels will vary, but ACP will remain irreplaceable, given the balance between its functionality and cost-effectiveness.

AL Circle: The construction sector accounts for 50 per cent of world steel demand. Do you think aluminium will ever come close to it?

Ashok Kr Bhaiya: The range of steel and aluminium applications is vast; however, there are places where steel will remain irreplaceable. But, if you look back into earlier constructions, there are many options which have been replaced by aluminium. Having said that, aluminium is not just used in the construction

industry. The automobile industry has started using aluminium instead of ferrous alloys – and that has created a big demand. Steel is highly durable, strong, and can be up to 97% recycled, while aluminium is 100% recyclable and meets the highest eco-friendliness standards. While aluminium may become more widely used in construction and other industries, it is unlikely to come close to steel in terms of demand anytime soon.

AL Circle: Has the conscious effort towards sustainability in India increased the usage of aluminium in the building & construction sector?

Ashok Kr Bhaiya: Yes. In fact, about 30% of the metal used in the industry comes from recyclable metals. To join the steps of sustainable practices, we have always focused on research and development that contributes to a greener ecosystem. In fact, there has been a huge unmet demand for zinc as well – and it is a sustainable choice of metal. People want forests to remain forests. And it is possible when the need for mining decreases. Recyclability is the way forward, and every industry - in fact, every individual – should get into green habits. Every single step counts when it comes to maintaining the sustainability of our planet.

There has been a conscious effort towards sustainability in India's building and construction sector. You can clearly see the rise in the concept and implementation of sustainable



certification among project builders. There has been a growing emphasis on green building practices, energy efficiency, and reducing the environmental impact of buildings.

Achieving sustainable development in construction requires considering ecological, economic, and social perspectives. It's important to approach construction projects with conscious and responsible methods that take into account environmental impacts, economic viability, and social well-being. This involves incorporating sustainable building practices, using environmentally friendly materials, promoting energy efficiency, minimizing waste generation, and prioritizing the welfare of communities. By addressing these factors, we can achieve sustainable development in the construction industry. Aluminium's lightweight property contributes to reducing the overall weight of structures, resulting in potential energy savings during transportation and installation. It also requires less maintenance and offers good corrosion resistance, ensuring longevity and durability in building facades and structures.



AL Circle: You have allied with IIT Gandhinagar to conduct extensive R&D on the Fire Retardant properties of Aluminium Composite Panels. Can you please share an update on the project?

Ashok Kr Bhaiya: To have the best minds in academia showing interest in Aludecor's products is something that we really were thrilled about. We have focused on the importance of continuous

research and development, and when it comes to our indigenous FR products, the collaboration was indeed fruitful.

The Fire Engineering Research Laboratory (FERL) at IIT Gandhinagar employed their best minds to conduct tests on non-FR and FR ACP sheets manufactured by Aludecor. This collaboration aimed to explore and develop fire-resistant ACP sheets, addressing the crucial aspect of fire safety in building materials. The study aimed to enhance the fire performance of ACP sheets and contribute to the advancement of safer construction practices. We are immensely proud of the fact that Aludecor is the first and only brand in the industry to have collaborated with an Institute like IIT to manufacture the best FR-grade ACPs in the country.

AL Circle: In 2022, you built your third manufacturing unit in Haridwar, India, estimating the creation of 350 direct jobs. Could you deliver on that estimate?

Ashok Kr Bhaiya: Yes. Our employability spreads across various departments, and the number of direct jobs created since 2022 has crossed 350. I want to assure you that we take our commitments and estimates very seriously. We understand the importance of job creation and the impact it has on the local community and economy.

Additionally, we invest in training and development programs to enhance the skills of our employees, ensuring that they have the necessary expertise to thrive in their roles. We also prioritize the necessary expertise to thrive in their roles.



We also prioritize maintaining a healthy and inclusive work environment that fosters productivity, engagement, and job satisfaction.

AL Circle: What are the innovations Aludecor has done for the architectural industry?

Ashok Kr Bhaiya: Over the course of our 20-year journey, we have achieved numerous significant milestones, reflecting our unwavering commitment to innovation and customer service. Our constant drive to push boundaries has resulted in remarkable industry firsts and groundbreaking advancements.



Pioneering the introduction of the Double Coat Double Bake line, we revolutionized the manufacturing process, setting a new standard for quality and durability. As trailblazers in the industry, we established an in-house coil coating facility, empowering us to maintain meticulous control over every aspect of production. Our dedication to innovation further shines through in the development of world-class products such as the revolutionary sand finish ACP, a first of its kind. In our relentless pursuit of excellence, we undertook indigenously researched and developed India's first FR grade ACP, harnessing the capabilities of our state-of-the-art R&D lab.

Setting ourselves apart in the composite panel sector, we take immense pride in being the sole manufacturer of FR core through indigenous means. Our commitment to superior coatings is evident in our textured series, featuring masterpieces like Wabi Sabi and Cortina, showcasing the remarkable advancements achieved in our paint formulations.

Looking towards the future, we eagerly anticipate the introduction of our honeycomb panels, a testament to the ingenuity of our state-of-the-art R&D lab. Remarkably, our honeycomb core is also the result of our indigenous research and development efforts, making us the sole industry player with such a distinctive combination for honeycomb panel manufacturing.

At every step, our unwavering dedication to innovation, cutting-edge research, and development has positioned us as leaders in our field. We remain committed to redefining industry norms, raising the bar, and consistently providing our customers with unparalleled products and solutions.



Sustainability in aluminium: Top 10 green initiatives in the extrusion segment

We have been intrigued with the concept of intricate shapes and designs from the beginning of human civilisation, but there were certain limitations in the construction sector. But the recent emergence of aluminium application in construction has given rise to unique architectural structures. The non-ferrous metal is preferred by builders for its tensile strength and anti-combustible properties. Aluminium is lighter than steel and can be infinitely recycled without losing the actual characteristics of the metal.

But with the world economy witnessing a rise in low-carbon, downstream and recycled products, it has become indispensable to tag the elements with a quality mark. One such quality indicator is the Aluminium Stewardship Initiative (ASI).

ASI is a remarkable global initiative that aspires to promote responsible production, sourcing, and stewardship of aluminium. With a comprehensive sustainability standard and certification program for the aluminium value chain, ASI's primary goal is to nurture sustainability throughout the industry.

The demand for aluminium is expected to increase in the coming years due to significant investments in the building and construction sector, as well as in aluminium LED lighting and other devices. Worldwide, the building and construction sector is the major demand driver of aluminium extrusions, followed by the transportation and industrial sectors.

Some of the top green initiatives that have driven companies to be enlisted against ASI's Performance Standard are:

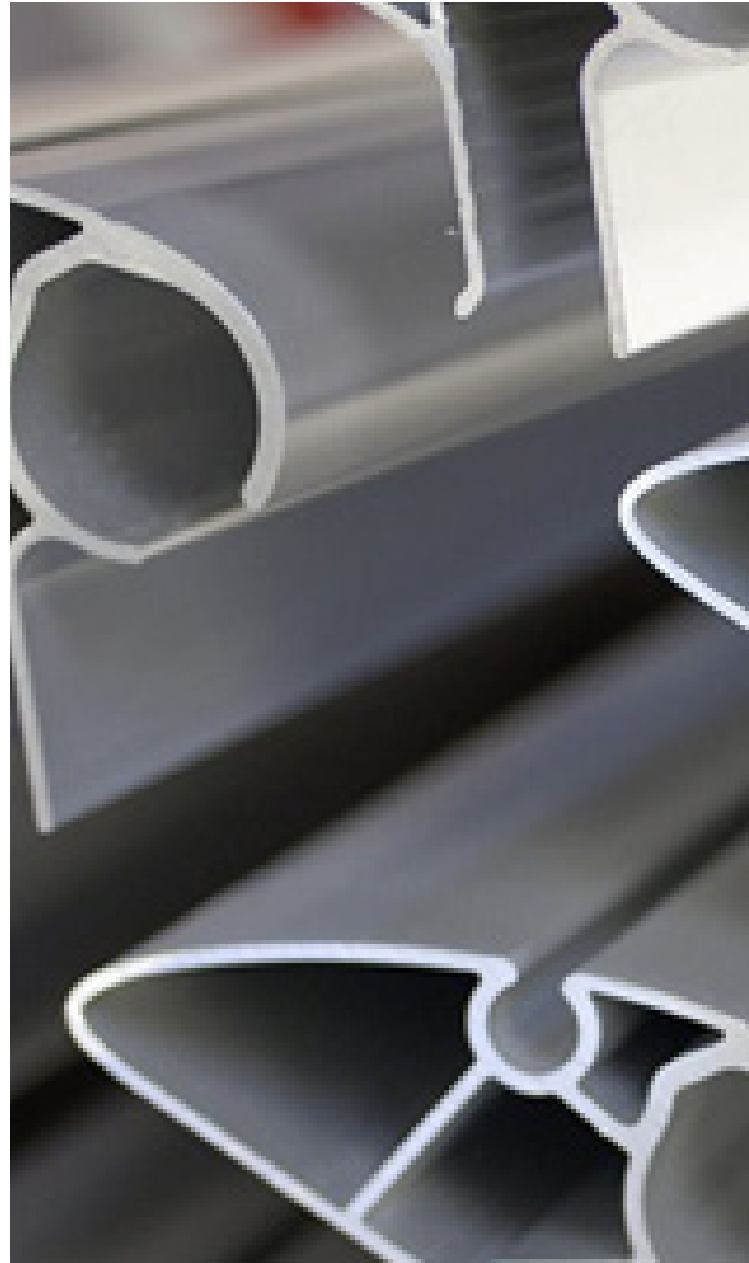
Hydro's operations receive Aluminium Stewardship Initiative certification

Hydro's plant in Reynosa, Mexico, achieved its first Aluminium Stewardship Initiative (ASI) certification, demonstrating its commitment to sustainable practices. This follows the success of its aluminium extrusion plant in Suzhou, China, which was the first in the country to receive the ASI performance standard certification. Located in Shanghai's Suzhou Industrial Park, the plant has undergone multiple expansion projects since it was established in 2004 and currently employs around 350 workers. Hydro's three extrusion operations in Brazil - Itu (SP), Tubaro

(SC), and Utinga (SP) - were also certified by ASI, with approximately 900 employees across the factories. These achievements mark significant milestones for Hydro in promoting sustainable practices within the aluminium industry.

Capral Aluminium, Australia's first extruder to have bagged ASI dual certification

Capral Aluminium Industrial Solutions is Australia's biggest supplier of aluminium products and architectural and building solutions. The company recently received dual ASI certification, making it the first extruded aluminium product manufacturer in Australia to obtain such recognition. Capral's products, including geometric extrusions, machine rods, plates, and sheets, are utilised in various industries, such as residential and commercial construction, transport, marine, and general engineering.



ASI enlists OARC as Production and Transformation member

The Aluminium Rolling Company (OARC) officially registered as a new Production and Transformation member under the Aluminium Stewardship Initiative (ASI). OARC is an aluminium rolling mill in Oman established in 2011. It has a nameplate

capacity of 140,000 tonnes of rolled aluminium annually, potentially increasing production to 200,000 tonnes per year. The plant, located in the Sohar Industrial Estate, has over 300 employees and provides services to clients in the building and construction, transportation, packaging, consumer durables, energy, and HVAC sectors across three continents.



Grupa Kęty S.A. joins Aluminium Stewardship Initiative as new Production & Transformation member

The foundry and extrusion facility of Grupa Kęty S.A. in Kęty, Poland, was awarded the ASI Performance Standard V2 (2017) Certification. This certification recognises their production of billets and manufacturing of aluminium profiles and components. Grupa Kęty S.A. is Poland's biggest manufacturer of aluminium profiles and components, with an impressive annual manufacturing capacity of 90,000 tonnes. Aluminium extrusions are heavily used in construction due to their high endurance and robustness.

Alumex PLC joins ASI as new production and transformation member

Alumex PLC, a company specialising in aluminium manufacturing in Sri Lanka and a subsidiary of Hayleys Group, recently joined the Production and Transformation division of the Aluminium Stewardship Initiative (ASI) as a new member. Known as a pioneer and trusted leader in the local aluminium sector, Alumex PLC is highly regarded for its superior aluminium extrusions crucial in the architectural industry.

Istanbul Ferrous and Non-Ferrous Metals Exporters join ASI as a new Associations member

The Istanbul Ferrous and Non-Ferrous Metals Exporters (İDDMİB) became the latest member of the Aluminium Stewardship Initiative (ASI). İDDMİB operates in a range of industries such as aluminium, steel, copper, castings, hardware, metal kitchen and houseware, armatures, and building materials. It's worth noting that Turkish Aluminium, accounting for 43% of total exports as of 2022, is the largest industry in the Turkish Ferrous and Non-Ferrous Metals segment.

ASAŞ Alüminyum receives ASI Performance Standard Certification for aluminium extrusion and FRPs production

ASAŞ Alüminyum, a company in the aluminium extrusion business since 1992, received the Performance Standard certification from the Aluminium Stewardship Initiative (ASI). This certification acknowledges their high standards in the manufacturing of aluminium flat rolled products, aluminium profiles, composite panels, PVC profiles, and shutter products at their Akyazı and Karapürçek production facilities in Türkiye, as well as their

headquarters located in Istanbul, Türkiye. ASAŞ Alüminyum produces finished and semi-finished rolled and extruded aluminium products used in various industries such as building and construction, commercial vehicles, rail transport, aerospace, automotive, solar panel, electronics, machinery, consumer goods, lighting, and furniture.

ASI welcomes Hindalco's aluminium extrusion facilities in India as a new Production & Transformation member

Aluminium Stewardship Initiative announced it welcomed Hindalco Alupram Works, an aluminium extrusion manufacturing plant in Ernakulum District of Kerala, as a new Production and Transformation member. Also, Hindalco's Kuppam Works was registered against ASI's Production and Transformation title. With its nationwide facilities, Hindalco is one of India's biggest aluminium extrusion suppliers.

ASI certification gives the above brands a profound confidence to operate worldwide and supply high-quality aluminium products to the building and construction sector. Aluminium extrusions are heavily used in making fenestration systems, facades, curtain walls, doors and windows for industrial or residential complexes.

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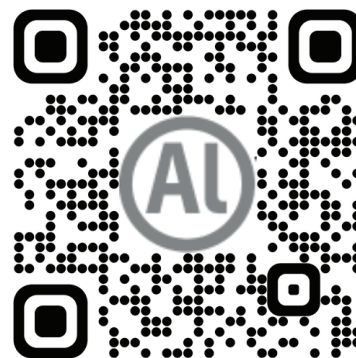
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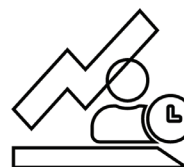
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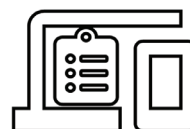
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