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**ASM International -
Fuelling Metal Industry Growth**

Jayesh Mukadam
*Chairperson,
ASM International*

■ **Spotlight still on Vedanta
\$3 billion debt despite
spinoff plan**

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spinoff plan**

■ **Enhancing Molten Aluminium
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Administrative Office

1, Alpha, M. G. Road, Vile Parle (E),
Mumbai - 400 057. India
Tel. : 91-22-2619 2376,
2617 1575 / 2617 1866

Email :

info@metalworld.co.in

Editorial : editorial@metalworld.co.in

Website : www.metalworld.co.in



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D. A. Chandekar Editor

Dear Readers,

In last few decades, the world had seen the emergence of the concept called 'Globalization'. An international body 'World Trade Organisation' or commonly known as WTO, was formed in 1995 to facilitate international trade. The idea was that the countries would gradually decrease the trade barriers and encourage the international trade. This concept got the support of majority of the countries and accordingly the process of lowering the trade barriers started in many countries. India along with many countries is the original signatory of WTO and since it adopted the principles of liberalization and globalization in 1992, the import tariffs were being lowered gradually. This did have a positive impact and India's international trade increased substantially. Further, the entry of foreign products into Indian markets put pressure on domestic manufactureres whereas the consumer got more options to choose from. Of course many countries adopted these principles well before India and also benefitted from it in a big way.

This process of globalization encouraged the manufacturing giants world over to adopt an altogether different format and the system to procure their raw materials or inputs for their production lines. Globalization gave them the axis to almost all the countries and they could choose the right supplier no matter in which country he was located. Thus for these companies, the supply chain really became global and this naturally resulted in higher quality and competitive prices. All were happy, the global vendors, the manufacturing



company and also the customers. All was well till the Russia – Ukraine crisis erupted. The war which was supposed to end in few weeks is still going on and the end is not in sight. The war blocked many sea routes around the world and thus the supply chain of many manufacturing companies got damaged. They were procuring raw materials / inputs from different countries and those could not be shipped due to the ongoing war. Thus the production was held up and the process lines stopped. Along with many other industries, this was true for the iron & steel industry as well. The sourcing for ore and minerals, coal, refractories, ferro alloys, lime etc. was so scattered all over the world, many companies had to suffer. The manufacturing giants realized that the global supply chain did provide a distinct advantage during good days but in a war like situation, it is a big disadvantage. It can completely jeopardize the production lines and put a big question mark on the company's viability. Further, in the turbulent times like this, providing access to overseas companies into one's domestic markets may be damaging to the indigenous producers of the same product. This has supposed to have initiated the process of 'De-Globalization' and is today is being considered seriously by many countries as an effective strategy. On one hand many companies have shifted from their policy of having global supply chain to having a regional (if not local) supply chain. By doing this, they would substantially counter the risk factor in having a seamless production. Also, many countries have started debating the idea of increasing the trade barriers, directly or indirectly, in order to protect the domestic industry. Today, many countries in the world are facing the recessionary trends in their economy and have no other option but to support their local industry in this challenging period. ■

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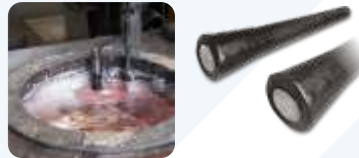
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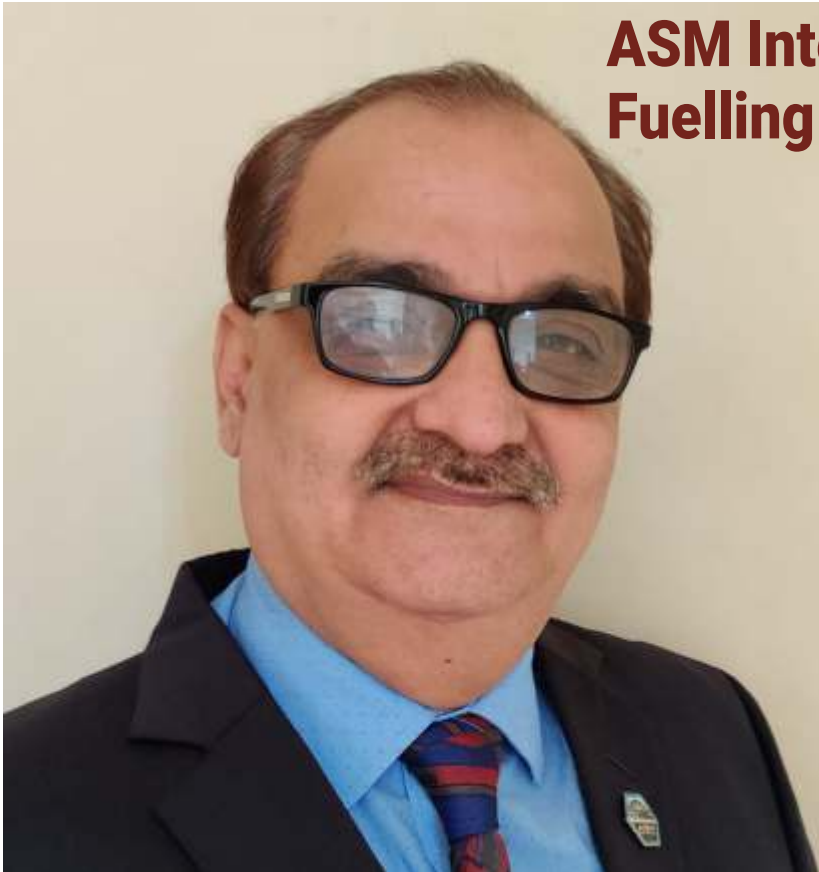


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ASM International - Fuelling Metal Industry Growth

Jayesh Mukadam is a Bachelor's in Mechanical engineering and Master's in Management from Mumbai University with more than 35 years' experience in the field of heat treatment.

He was associated with Mukand Ltd, a prestigious steel plant for 7 years as an employee. He started his own industry – M/S Jaybee Steel Treaters Pvt Ltd more than 30 years ago and is today a preferred heat treatment vendor. The company is into annealing, hardening, quenching, normalising, tempering, etc.

Since long, he has been a part of ASM International, a leading material science society in various capacities. Currently, he is the Chairperson of ASM India Chapter.

He specialises in heat treatment of long and large jobs with polymer quenching.

Jayesh Mukadam
Chairperson, ASM International

How is the present status of metals industry in the country? How do you see the future?

The current state of the metal industry is highly promising and exhibits several positive trends. Steel plants across the board are experiencing robust order bookings that extend well into the next few years. This indicates a sustained demand for steel products and a positive outlook for the industry. Leading steel plants are strategically shifting their focus towards the production of value-added steel products. This move allows them to diversify their offerings and capture higher margins in the market. The industry is in the midst of a significant growth phase, with a multitude of steel-related companies undergoing

expansion initiatives. This expansion is driven by the increased demand and the desire to compete effectively on both qualitative and quantitative fronts. Many of these expanding companies are actively competing with international players, not just in terms of quantity but also quality. This signifies a notable improvement in the standards and capabilities of the domestic steel industry, positioning it as a global contender. In summary, the metal industry is currently thriving, with strong order books, a shift towards value-added products, widespread expansion efforts, and a heightened competitive edge in the international market. These factors collectively paint an encouraging picture for the industry's future prospects.

How is ASM International helping the industry? Globally as well as in India?

ASM International is a prominent materials science and engineering organization that plays a pivotal role in advancing the industry globally and in India through various initiatives and contributions. ASM International provides a wealth of knowledge and resources to the global materials and engineering community. Their publications, conferences, and educational programs disseminate the latest research, best practices, and technological advancements, which benefit professionals, researchers, and industries worldwide. ASM International is actively involved in materials research, development, and testing. Their research activities contribute to the advancement of materials science, leading to



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Face to Face

the creation of innovative materials and processes that can be adopted by industries across the globe. The organization fosters collaboration and networking among professionals and experts in the field of materials science and engineering. This facilitates the exchange of ideas and the establishment of partnerships that can drive industry growth and innovation on a global scale. ASM International offers educational programs and training in materials science and engineering in India. This helps enhance the skills and knowledge of Indian professionals, making them more competitive in the global materials industry. ASM International's resources and publications are accessible to professionals and researchers in India. This knowledge transfer supports local industries in staying updated with the latest trends and technologies in materials science and engineering. ASM International organizes events and conferences in India, providing a platform for industry leaders, researchers, and professionals to exchange ideas, showcase innovations, and address challenges specific to the Indian context. ASM International promotes collaboration between Indian institutions, industries, and

international partners. Such collaborations facilitate joint research and development projects, leading to the creation of advanced materials and technologies that can benefit Indian industries. In essence, ASM



International serves as a catalyst for the growth and development of the materials science and engineering industry both globally and in India. Through education, research, knowledge dissemination, and collaboration, ASM contributes significantly to the industry's progress and competitiveness.

What are your plans and goals in your tenure as the president ?

At our ASM office, we have launched a monthly series of technical talks featuring industry experts in their respective fields. These sessions are designed to provide valuable insights and knowledge to our members. Over the past six months, we've hosted a total of six technical talks, and we even conducted a specialized technical course. These events are tailored to cater not only to professionals with a metallurgical

background but also to those who are new to the field, aiming to provide them with a solid understanding of the basics of metallurgy. In an effort to foster collaboration and knowledge exchange, we're actively working on an Industry-Institute initiative. This initiative aims to strengthen the connection between industry and educational institutions, promoting the practical application of engineering principles and fostering innovation in the field. One of the valuable resources that ASM can offer is access to our handbooks and library, which is located in our Mumbai office. This resource can be incredibly useful, particularly for Micro, Small, and Medium Enterprises (MSMEs) looking to make informed material choices for their projects. The ASM handbooks and library are a treasure trove of information that can aid businesses in material selection and decision-making. Notably, a significant development on the horizon is the upcoming appointment of the first Indian to assume the role of the World President of ASM International, scheduled for mid-October 2023. This historic event is set to put India on the global materials map, further highlighting the country's growing influence and expertise in the field of materials science and engineering. These initiatives and activities underscore ASM International's commitment to knowledge dissemination, education, collaboration, and the advancement of materials science and engineering both in India and on the world stage.

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Spotlight still on Vedanta \$3 billion debt despite spinoff plan



Billionaire Anil Agarwal's Vedanta Resources Ltd. is on a quest for cash. The junk-rated mining conglomerate has approached investors to restructure about \$3 billion worth of bonds due in 2024 and 2025, while splitting its sprawling group to unlock better value for individual businesses. But debt investors aren't convinced, and the group's dollar bonds are tumbling as per the Bloomberg latest report. What is the plan for overhauling the group? Indian unit Vedanta Ltd. last week approved a plan to separate its business into six listed companies: aluminum, oil and gas, power, steel and ferrous, base metals and an incubator for new

businesses including semiconductors. The reorganization is meant to give investors direct exposure to a business of their choice and improve the value of the group's component parts. A streamlined structure could also help Agarwal sell unprofitable or low-growth assets — something the billionaire has long avoided. Vedanta expects to complete the transaction by the financial year ending March 2025. What's the state of Vedanta's finances? The conglomerate has bond repayments of \$3.2 billion coming up over the next two years. About \$2 billion of notes are to be redeemed in 2024 — half of which is due as early as January — and another \$1.2 billion in 2025,

data compiled by *Bloomberg* show.

Company representatives have proposed to pay back a portion in cash, with the remainder of the principal deferred for three years from the original due date. The plan has met with some opposition.

Issuing unit	Amount outstanding	Coupon	Maturity date
Vedanta Resources Finance II PLC	\$1 billion	13.875%	Jan. 21 2024
Vedanta Resources Ltd.	\$951 million	6.125%	Aug. 9 2024
Vedanta Resources Finance II PLC	\$1.2 billion	8.95%	Mar. 11 2025

In order to pay back bonds, Vedanta Resources also started talks with lenders such as Cerberus Capital Management LP for a private loan of \$1 billion. But the proposal to split up Vedanta Ltd. has complicated the effort. Moody's Investors Service and S&P Global Ratings have already downgraded Vedanta Resources deeper into junk. What's Agarwal saying? The Vedanta chairman told *CNBC-TV18* on Tuesday that the group had lined up money for repayment of the 2024 bonds and that an announcement was due soon. If the terms were favorable, Vedanta would refinance the debt, he said. "But we are also looking at whether we can pay from our side."



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Analysis

What's the market saying? While equity investors gave the demerger plan a thumbs up, Vedanta's dollar bonds have tumbled. Of the four notes, three are trading below the 80 cents-on-the-dollar mark typically considered distressed.

How did the company become such a big player? Agarwal, who was raised in the Indian state of Bihar, took over his father's business making aluminum conductors in the 1970s, and then branched into trading scrap metal.

bought out minority investors as part of efforts to streamline the group's structure. Agarwal has renamed Volcan Investments Ltd. to Vedanta Inc.

It is this acquisition spree that led the conglomerate's debt to balloon. Vedanta Resources' total debt stood at \$6.4 billion at the end of June.

Will the demerger go through?

The plan, which hinges on multiple government and regulatory approvals, is "far from a done deal," Standard Chartered's Head of Asia Corporate Credit Research Bharat Shettigar wrote in a note.

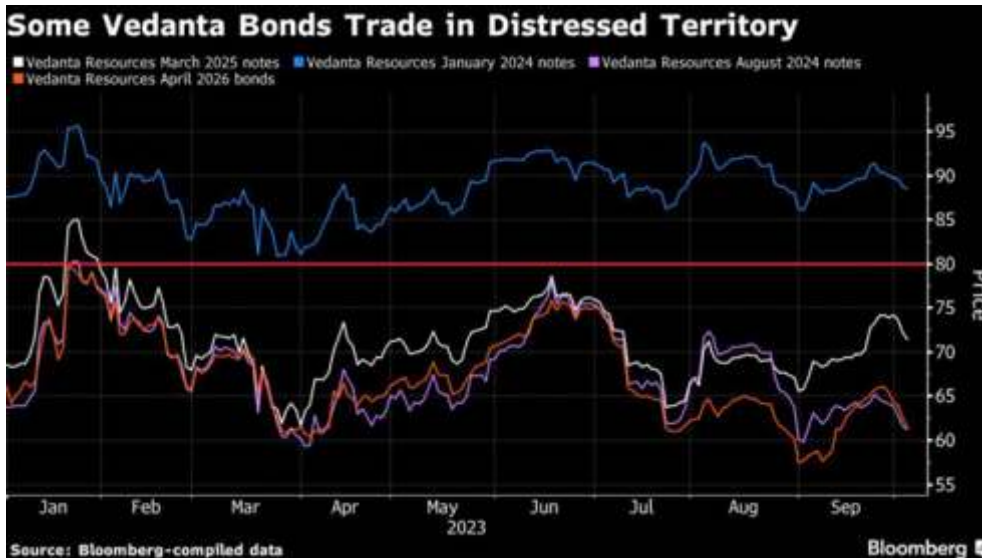
Vedanta Ltd. will follow the rules as prescribed by the corporate and tax laws while it allocates debt to demerged businesses, Ajay Agarwal, president for finance, said in an investor conference call last week. The firm will consult the lenders during the process, he said.

What are the next milestones?

An implementation timeline indicates that lenders will weigh in on the plan late this

financial year, with a filing to the National Company Law Tribunal envisioned by the end of 2023. The NCLT order is due to be received in July, with the listing of the new subsidiaries in September.

As for payments, Vedanta Resources' 2026 bond has an interest due on Oct. 23, according to Bloomberg-compiled data.



The split off doesn't immediately address Vedanta's maturing overseas bonds. The group has yet to provide details on how exactly its debt will be spread under the new structure, or how shares currently being used as collateral will be treated. Vedanta Resources has pledged virtually all of its majority holdings in both Vedanta Ltd. and Hindustan Zinc Ltd., according to exchange data.

"The consolidated debt across all its proposed entities will still remain the same," according to CreditSights analysts led by Lakshmanan R. "We remain concerned that the precarious debt situation at Vedanta Resources is still unaddressed."

He built Vedanta Ltd. through a series of ambitious acquisitions: In 2001, Agarwal bought a controlling



stake in then government-owned Bharat Aluminium Co. and he followed that up with the purchase of another state-run firm, Hindustan Zinc. He successfully bid for iron ore producer Sesa Goa Ltd. in 2007 and for Cairn India. Vedanta Resources also owns copper and zinc operations in Africa.

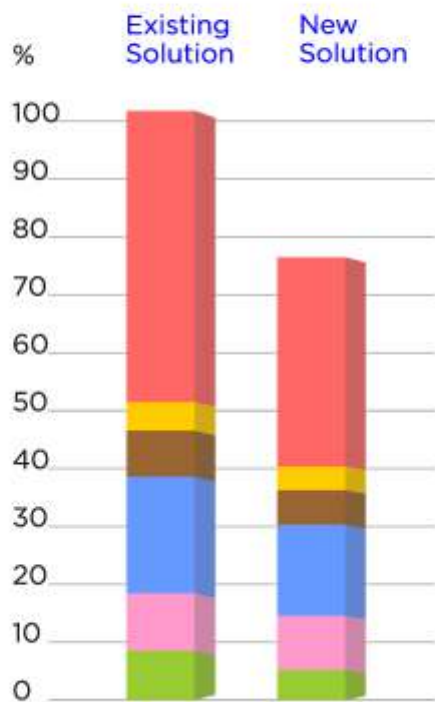
The company was the first in India to list in London back in 2003, before Agarwal took it private 15 years later when his now known Vedanta Inc.

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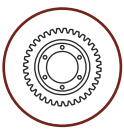
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Global miner - BHP to focus on cost cuts, patient on M&A



Global miner BHP Group is focussing on cutting costs to drive growth while being patient on buying assets, its chief development officer Johan van Jaarsveld said on Thursday in Melbourne.

"This is a cyclical industry, and you sometimes are going to have to wait for 10 years or may be more to get the right opportunity at the right price," van Jaarsveld said.

"If we can save 10% of our cost base, that's \$20 billion in value that's under our control. The last time someone created \$20 billion with an M&A deal – I'd like them to tell me when it was."

While lots of money would be made in lithium over the next few years, BHP was not invested in the sector because the long-term margins were not sufficient, but in nickel, BHP expects to eventually become the world's second biggest producer.

It intends to ramp up to produce 200,000 metric tons a year of nickel, second only to Russia's Norilsk Nickel with its Australian operations producing 120,000-130,000 tons and its Tanzanian Kabanga operations around 60,000-70,000 tons.

Van Jaarsveld backed BHP's view that nickel sulphides remain the most attractive ore to own, because conversion costs to higher purities are cheaper than with laterites, despite a steady decline in nickel production costs in Indonesia, the world's top supplier of nickel from laterite.

He acknowledged this year's 36% slump in LME nickel prices and said the miner regularly reviews its commodity outlook.

"There has been a lot of (price) volatility and I think there has been more coming out of Indonesia than I think a lot of folks expected. As we sit here today, we haven't

changed our view on nickel," he said.

Divestment downside

Van Jaarsveld said a deterrent to acquisitions was the need to later sell off assets.

For example, he said Canada's Teck Resources, whose metals business has attracted interest from a number of major miners including Glencore, arguably has some commodities that BHP would like more exposure to.

For BHP to engage in a buyout, it would need to consider price, ease of jurisdiction, and opportunity to add value, among other factors, but then would need to think about which assets it would have to divest.

"So you've just paid a 30% premium for everything," he said. "This is what makes M&A hard. You can do a great deal and then you have to sell 30% of what you just bought and you're losing all your synergy value."

BHP has been trying to sell two Queensland metallurgical coal mines since August 2020 and is assessing prospects for assets it acquired in its \$6.4 billion takeover of Oz Minerals, such as the Pantera copper and gold project in Brazil.

"BHP's Oz Minerals Brazil is not on the market," van Jaarsveld said.

"The deal only closed in May. We are looking at what we have got," adding "you don't want to sell assets, potentially and then somebody else make a big discovery."



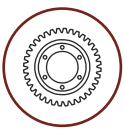
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Enhancing Molten Aluminium Handling with Metallurgical Chemicals and Refractories

Part-1

Aluminum is an essential material for modern manufacturing. It is a lightweight, high-strength, corrosion-resistant metal with high electrical and thermal conductivity, and it is easy to recycle.

Aluminium is a chemical element in the Boron group with symbol Al and atomic number 13. It is a silvery-white, soft, nonmagnetic, ductile metal. It can't be used as it is for commercial usage, require alloying with other alloying element.

Aluminium is very reactive; in molten stage immediately react with atmospheric moisture and forms Al_2O_3 and H_2 . Hydrogen gas remain in molten metal and during solidification try to expel out, this raise to micro porosity sometimes blow holes. Inclusion of oxides leads to failure of finish product. To achieve Mechanical properties like Tensile, Elongation, Hardness etc., metallurgical chemical treatment is a must.

Flux:

Fluxes are inorganic compounds, available in Powder and Granular form. They can be added manually or can be automatically injected.

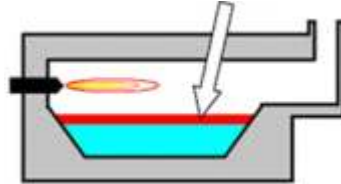


POWDER FLUXES



GRANULAR FLUXES

1. MELTING FLUX:



These fluxes are usually mixture of chloride and fluoride salts. Melting point of flux is in the range of 600 – 620°C. Forms a liquid layer over molten aluminium, avoids exposure of molten metal to atmosphere. Protects the melt from oxidation and hydrogen pickup.

2. DROSSING FLUX:

Drossing-off fluxes agglomerate the oxides allowing easy removal from the surface of the melt. Exothermic fluxes ensure that liquid aluminium trapped in the dross layer is returned to the melt. Fluoride



Vilas B. Jadhav

Director
Ceraflux India Pvt. Ltd.
Kolhapur

compounds- contribute to metal separation owing to their high wetting capacity. When the melt is ready for drossing-off, the flux is spread over the molten metal surface, allowed to stand for a few minutes and then rabbled into the dross for several minutes with a skimmer. For best results the melt should preferably in the range 690-760°C. The dross is then pulled to the door, allowed to drain and transferred to a dross bogie. If the dross in the bogie is raked, further metal will collect in the bottom. Untreated dross may contain 60 to 85% Aluminium metal. However with effective drossing flux treatment the aluminium content of dross can be reduced to 25-40%.

3. REFINING FLUX:

Refining fluxes (Calcium and Magnesium removal): These fluxes are in powder and Tablet form. Used to remove alkali metals from the molten Aluminium.

4. FURNACE WALL CLEANING FLUX:

Wall cleaning fluxes contain compounds that help to soften the oxide build-up that occurs on furnace walls. These fluxes applied by sprinkling manually over the oxide build-up in the furnace area. Flux reacts exothermically with the oxide, Aluminium entrapped in the oxide trickle down in to furnace. Oxide layer get softens and easily get removed

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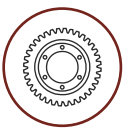
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METALWORLD



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Industry Update

by scraping tool.

5. INJECTION FLUX:

It is a relatively new process in which fluxing compounds are introduced into the molten metal by mechanical device using an inert gas carrier.

6. DROSS METAL RECOVERY FLUX:

The dross removed after cleaning the molten metal still contain some quantity of Al trapped in it. This flux contains appropriate mix of inorganic chlorides and fluorides salts. The exothermic reaction due to fluorides salts with dross enables the recovery of Al.

7. TURNING BORING RECLAMATION FLUX:

These fluxes are recommended for reclaiming Turnings / Borings. Preheat the turning and borings to remove oil, moisture, dirt etc. Add flux in to furnace and melt down to prepare pool of molten flux. Add turning/ boring in to the pool of molten flux. As density of turning and boring is more than molten flux, it goes down into the pool and get melted. Temperature of the melt is kept about 680-710°C.

With this process melting loss can be controlled as low as 5-10%.

8. MAGNESIUM REMOVER FLUX:

Magnesium removal from molten Aluminium scrap is one of the cast shop practices that are evolving continuously, due to its technological importance. Many different technologies as well as many different

products have been developed, so it is possible to establish that this area constitutes a noticeable research field of the Aluminium metallurgy.

These fluxes are available in Powder and Tablet form. It is used to remove excess Mg from molten Aluminium. For best result temp. of molten metal to be maintained in the range of 740-760°C. To remove 1 kg Mg from molten metal it is recommended to use 5-8 kg of Tableted product and 8-12 kg of Powder flux.

Powder flux generates very low smoke during usage compared to tableted product.



MAGREMOVER-60



MAGREMOVER-POWDER

GRANULAR FLUXES:

By using fluxes in granular form rather than as conventional powders, the effectiveness of the flux can be greatly increased, the handling improved and the undesirable, hazardous emissions can be significantly reduced. The

higher cost of granulated fluxes (arising from the additional manufacturing process involved) is compensated by the much reduced quantities needed.

Advantage of Granular Flux over Powder Flux:

1. The dose is 1/3rd approx.
2. Smoke level is much less.
3. Attack on furnace refractory is much less.
4. Working condition is better.
5. Uniformity in chemical composition.

PRODUCT

CERAFLUX GR-2515

APPLICATION

Melting and covering flux. Metal temp. 610-620°C.

CERAFLUX GR-510

Drossing flux, suitable for all Aluminium alloys except Al-Mg alloys having Mg >3%. Central melting system using thick section scrap and ingots. Metal temp. 690-720°C..

CERAFLUX GR-510E

Drossing flux, suitable for all Aluminium alloys except Al-Mg alloys having Mg >3%. Holding furnace in GDC and PDC. Metal temp. 700-720°C.

CERAFLUX GR-510 W

Drossing flux, suitable for all Aluminium alloys except Al-Mg alloys having Mg >3%. Tower furnace. Metal temp. 730-760°C.

CERAFLUX GR-540

Drossing flux, suitable for all Aluminium alloys except Al-Mg alloys having Mg >3%. Skelner furnace using thin section, oily, litho, twitch, trump type scrap. Metal temp 700-740°C.

CERAFLUX GR-2516

General purpose drossing flux, suitable for all Aluminium alloys except Al-Mg alloys having Mg >3%. Metal temp. 730-770°C.

CERAFLUX GR-6512

Sodium & Calcium free cleaning and drossing flux. Metal temp. 700-760°C

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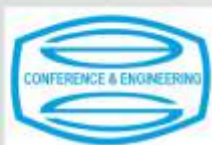
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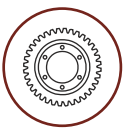


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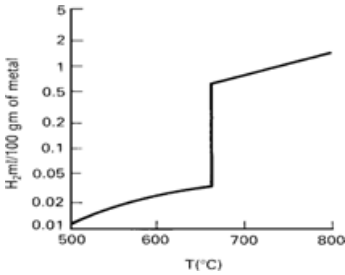
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Industry Update

- CERAFLUX GR-2815** Grain refining granular flux.
Metal temp. 680-770°C.
- CERAFLUX GR-2712** Sodium base modifier for Hypoeutectic alloy temp.>740°C
- CERAFLUX GR-2715** Sodium base modifier for Eutectic alloy temp.< 740°C
- CERAFLUX GR-60** Na, Ca, Li (Alkali Metal) Remover flux. Metal temp. 650°C and above.

DEGASSING OF AL ALLOYS:



$2Al + 3H_2O \rightarrow Al_2O_3 + 3H_2$
H₂O (Moisture from Atmosphere)
Hydrogen(H₂) has a high solubility in molten Al which increase with melt temperature but the solubility in solid Al is very low. As the alloy freezes, H₂ gas is expelled forming gas pores in the casting. The maximum conc. of dissolved hydrogen possible in Al Alloys can be as high as 0.8ml H₂/100gm. By careful attention to melting practices this can be reduced but with the best practice, remelted foundry alloys may be expected to contain 0.06-0.1ml H₂/100gm Al.

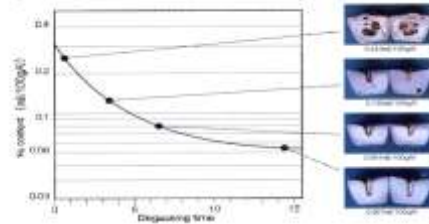
Degassing of aluminium is done by:

1. Hexachloroethane base tablets.
2. Nitrogen gas evolving tablets.
3. Nitrogen gas passing through lance for reverberatory furnaces.
4. On line degassing by using mix. of Nitrogen and

Argon.

5. MDU / Rotary Degassing- Dry Nitrogen gas is purged in to molten metal using rotary degassing system which produce well dispersed small bubbles. These bubbles will ensure effective removal of hydrogen gas.

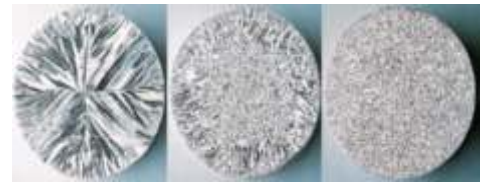
Hydrogen Removal Efficiency (Test Results)



GRAIN REFINING OF ALUMINIUM ALLOYS:

A fine uniform grain structure is desired in Aluminium castings. The type and size of grains formed are determined by alloy composition, solidification rate and the addition of master alloys (grain refiners) containing inter metallic phase particles, which provide sites for heterogeneous grain nucleation.

Addition of certain elements to Aluminium alloys melts can provide nuclei for grain growth. Titanium, particularly in association with boron, has a powerful nucleating effect and is the most commonly used grain refiner.



Effects of grain refinement:

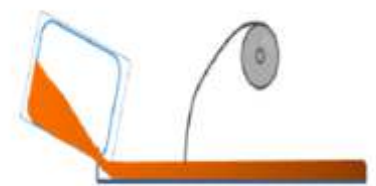
- Increased tear resistance.
- Increased pressure tightness.
- Improved response to thermal treatment.
- Improved feeding characteristics.
- Improved appearance after surface treatments, such as anodising, electrochemical and mechanical finishing.

GRAIN REFINER: ALUMINIUM TiB 5:1

COILED ROD: 9.5mm dia. rod in standard 200 ±20 kgs coils.

PRODUCT :CERALOY TiB 5:1

- Ti Content: 4.5-5.5%
 - B Content: 0.8 – 1.2%
 - Si Content: 0.2% Max.
 - Fe Content: 0.3% Max.
 - Other Impurities each <0.05%
 - Remainder: Aluminium
 - Mean Particle Size of TiAl₃: <50 Microns
 - Mean Particle Size of TiB₂: <2 Microns
- These are developed for addition in to the metal transfer launder in continuous or semi-continuous casting operations enabling continuous grain refinement. Due to its properties rod is suited for start –stop semi continuous addition in automated castings lines.



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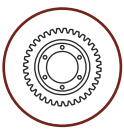
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CUT ROD: 9.5mm rod cut in to 50 cm (100gms) or 100 cm (200gms) pieces. Ideally suited for foundries to make accurate grain refiner addition to ladle and crucibles. Combining easy handling with superior metallurgical products. Exact additions are made by simply stirring the required



CAST BAR 200 GMS



WAFFLE INGOTS 200GMS



For Furnace additions Cast bar or Waffle ingot is added as the melt treatment is completed, usually within 20 minutes prior to casting ensuring reliable grain refinement of ingots.

MODIFICATION OF AL-SI ALLOYS:

Sand cast and gravity die cast alloys cool relatively slowly, resulting in a coarse lamellar eutectic Silicon structure which reduces the strength of the castings. Changing the chemical composition to alter the microstructure of eutectic Silicon Needle to rounded shape is called "modification".

This phenomenon is concern only with Si structure of Al-Si alloys (Si up to 12%).

Benefits with modification: The remarkable improvement in the mechanical properties of the castings. If not modified? Silicon will form needles which will acts as notches or

internal stress points with damaging results on tensile properties.

What are the modifiers? These are the chemical compounds or pure form of sodium, strontium, antimony, barium & calcium. Last three don't have commercial importance.

Process of modification Silicon wetting & growth of needle is restricted by covering of sodium, strontium. (Sodium, strontium gets adsorbed on silicon particles and restricts its growth)

SODIUM AS MODIFIER:

Sodium Salt base Products
Having more affinity for moisture.
Reduces life of crucible and furnace lining with chemical reaction.
Recovery is maximum 60-70% considering standard melting practice.
Not advisable to use in alloys where Mg is more than 1%
Fluidity of melt is slightly dropped.
Fading effect limitation. Effective up to 40 minutes of treatment.
Volatile
No effect after remelting

STRONTIUM AS MODIFIER:

Aluminium base product
Affinity towards moisture is nil.
No adverse reaction.
Minimum recovery is 95%.
Advisable to use in alloys where Mg is more than 1%.
Fluidity of melt is maintained.
Useful for longer time of treatment, up to 5hrs.
Burn off- 1/10th of sodium.
Effect is even after remelting.

ALUMINIUM MASTER ALLOYS:

The mechanical and physical properties of pure Aluminium can be enhanced with the use of alloying elements. Additions of these alloying elements can be made using elemental metals. Density differences between the alloying elements and Aluminium frequently results in segregation, with high density elements sinking to the bottom of the furnace unless the melts is actively stirred. Addition of alloys in base form to Aluminium will be having following problems,
1.Dissolution
2.Consistency
3.Low raw material and hidden cost.

ADVANTAGES OF USING MASTER ALLOYS:

1. Less dissolution time.
2. Consistency in recovery.
3. Increased Productivity.

to be continued...



ICSG expects big copper supply surplus in 2024

The copper market will transition from supply-demand balance in 2023 to a major supply surplus next year, the International Copper Study Group (ICSG) said after its meeting in Lisbon this week.

Production is forecast to exceed usage by 467,000 metric tons in 2024, a significant upward revision from the expected 297,000-metric ton surplus at the time of the Group's last meeting in April.

The Group still thinks the market will be in deficit this

year but April's 114,000-metric ton forecast has been cut to just 27,000 metric tons, which is a marginal number in a 26-million metric ton global market.

The Group's statisticians stress that these forecasts are snapshots in time and note "that actual market balance outcomes have on recent occasions deviated from ICSG market balance forecasts due to unforeseen developments".

The trends behind the headlines are perhaps more significant and the two stand-outs from the latest

numbers are the weakness of Western demand and the strength of Chinese production.

Western slump, Chinese (apparent) boom

When the ICSG last met in April, it expected demand outside of China to rise by 1.6% this year after anaemic growth of just 0.4% in 2022.

Fast forward six months and the prognosis is much gloomier. Copper usage outside of China is now expected to contract by 1.0% from last year's level, "mainly impacted by declines in refined usage in EU countries and



Feature

North America," the ICSG said.

But Western demand weakness is being more than matched by strength in China, where apparent usage is forecast to grow by 4.3% this year.

Emphasis on the word "apparent", since the ICSG uses only reported data such as domestic production, net trade and changes in visible stocks to come up with an estimate of what's going on in China.

However, its assessment chimes with a copper market consensus that Chinese demand has surprised to the upside this year. Copper's usage in green transition sectors such as power and electric vehicles seems to have cushioned the metal from a broader manufacturing downturn over the last six months.

With the latest purchasing managers indices signalling a pick-up in factory activity, China will continue to be the core driver of global copper demand as high interest rates take their toll on manufacturing activity both in Europe and the United States.

The "global economic outlook is challenging", the ICSG concedes but it remains optimistic for next year. It has trimmed only very slightly its 2024 global usage growth forecast from 2.8% to 2.7%.

"An expected improvement in manufacturing activity, the ongoing energy transition and the development of new (semi-manufactured product)

capacity in various countries should support higher growth in world refined usage in 2024", it said.

Surge in refined production
Next year's expected growth in usage is still going to be exceeded by a projected 4.6% jump in global refined copper production.

Indeed, the production surge has already started. The ICSG has revised upwards its 2023 refined output growth forecast to 3.8% from the 2.6% it expected in April.

As with demand, rising metal production is down to China, which continues to expand its smelting and refining capacity.

Operating constraints and smelter maintenance outages in Chile, Indonesia, Sweden and the United States will cap copper production outside of China this year.

But China's smelters are aggressively ramping up production. National output rose by 11.5% year-on-year in the first eight months of 2023, according to local data provider Shanghai Metal Market.

Next year will bring more of the same with extra impetus coming in the form of new smelters and capacity expansions in Indonesia, India and the United States.

The ICSG also expects the amount of copper produced from recyclable materials to increase both this year and next thanks to investment in new secondary smelters and refineries.

Under pressure

The size of ICSG's expected supply surplus next year has

surprised the market. But then so too has its assessment that supply and demand will be broadly balanced this year.

Most analysts are anticipating a surplus over both 2023 and 2024. It's worth noting that the ICSG's most recent monthly bulletin suggests the global copper market notched up a hefty 215,000-metric ton production surplus in the first seven months of 2023.



If Western demand remains weak through the end of the year, it's unclear how the production overhang in the first part of the year will disappear to generate the Group's expected small deficit across the full year.

But while the timing may be debatable, the ICSG's update adds to a growing consensus that the copper market is heading into a period of fast-rising production and uncertain demand in the world outside of China.

It's that bearish combination that is pressuring the copper price, which has this week broken down through the \$8,000-per metric ton level for the first time since May, last trading at \$7,940.

Everyone's agreed that copper has a bright future in the energy transition, but right now it's the immediate balance between supply and demand that is weighing on the market. ■



LME to move on from nickel crisis as traders return

The chief executive of the London Metal Exchange says he's optimistic that the 146-year-old trading venue is beginning to move on from the nickel crisis that threatened to destroy it. It's been a turbulent 19 months since Matthew Chamberlain responded to a runaway short squeeze by suspending the world's benchmark nickel market and cancelling \$12 billion of trades. The controversial decisions drove angry investors away from the LME and left the exchange wading through lawsuits and regulatory scrutiny, while its nickel contract remained in tatters. Now, Chamberlain is sounding a cautious note of

optimism. "A degree of stability" has returned to the nickel market, he said in an interview, pointing to rising liquidity and lower volatility. And in the exchange's other metals contracts, trading volumes are showing early signs of a return to growth after years of decline. "It feels that we are back on that gentle growth trajectory," the CEO said. "We recognize the challenges that have happened but we think we can hold our head up and say ours is an exchange that's attractive to trade on," he said. "There's a lot more work to do, but we can really focus on the future." As the home of benchmark prices for key metals from copper to zinc, the LME lies

at the heart of the global metals world – and any crisis or drama at the exchange inevitably sends ripples through the whole industry. Since taking the helm six years ago, Chamberlain has had his share of fights, from an attempt to close the LME's historic trading floor to disagreements over whether it should keep accepting Russian metal, and of course the handling of the nickel saga. This week, as thousands of traders, financiers and investors descend on London for the annual LME Week gathering, Chamberlain can point to concrete signs that his efforts to restore confidence in the market are starting to bear fruit. Nickel trading volumes have picked up in the past few



Feature

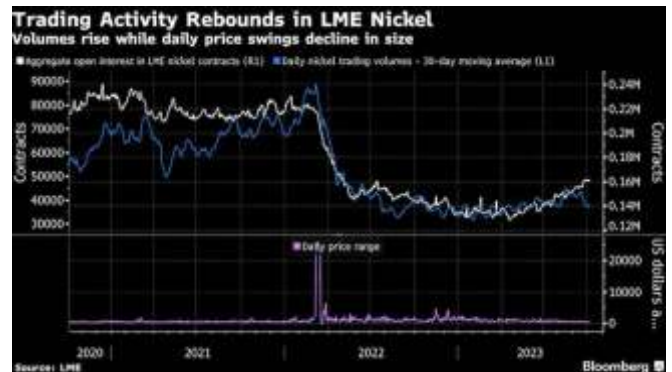
months and the extreme volatility that plagued the nickel market for much of the past year is waning, although the contract still remains a shadow of its former self.

Trading activity in other metals is also on track to halt a years-long decline that's been a constant headwind to Chamberlain's efforts to raise revenues for the LME and its owner, Hong Kong Exchanges & Clearing Ltd. With rivals circling, the turnaround comes at a crucial time.

Management have also sued the LME separately, while the exchange is being investigated by the UK's Financial Conduct Authority over its handling of the crisis. Meanwhile, Chamberlain is pushing ahead with measures to modernize the exchange and fix some areas of its market structure that were criticized in an independent probe into the crisis.

The LME has already announced a series of reforms in the wake of the nickel squeeze, including a

However, Chamberlain is also seeking to encourage dealers to place more of their trades electronically, rather than in the



LME's large telephone-based market or bilaterally in over-the-counter deals. It's much cheaper to trade on an OTC basis, and some in the industry are bracing for the possibility that the LME could raise a levy on the trades.

Chamberlain wouldn't disclose how OTC volumes have changed over the past year, but said that anecdotally it appears the market remains "very active." He confirmed the LME is examining the cost difference, without commenting on what steps it might take to draw more business onto the exchange. Overall, the CEO said he's optimistic that the LME has turned a corner after last year's turbulence.

"While we accept that there is a huge amount more to do, we feel that the market is in a stable place," Chamberlain said. "That gives a little spring to everyone who's involved in the market."



But Chamberlain's challenges aren't over yet. The LME has a significant risk still hanging over it as it awaits the outcome of a legal battle with hedge fund Elliott Investment Management and trading firm Jane Street, which challenged the legality of its decisions during the nickel crisis and are seeking \$472 million in damages. A judgment in the case is expected in the next couple of months.

A group of other firms including AQR Capital

requirement that dealers and clients report their over-the-counter positions.

The rules give the LME greater visibility on a corner of the market that previously represented a huge blind spot – and which the exchange has said was a key driver in last year's crisis, when nickel producer Tsingshan Holding Group Co. and other holders of short positions had racked up billions of dollars in off-exchange trading losses with bilateral counterparties unbeknown to the LME.



Feature

Women4Metals - an initiatives for the Women's Empowerment from Aurubis

An initiative founded by Aurubis.

Women4Metals is an industry-specific women's empowerment initiative in the metal industry that was founded by Aurubis in 2019. Since October 2022, the network has been open to other companies/organizations in the industry who want to join us in making the industry more attractive for women's health.

What are our goals?

- Through this network, we want to attract more women to the metal industry, fill more key positions with women and generally support women on their career paths.
- Further, we would like to put more focus on the female perspective for the further development of the metal industry.
- Women will gain more visibility in the metal industry and in their companies. Our network makes it possible for us to appear together, e.g., at trade fairs or industry meetings.
- With W4M, equal opportunities in the metal industry can be actively demanded and enforced, employer conditions for women should be revised and improved.

What are your key benefits as participating company?

- Increasing your company's visibility in terms of diversity and equality.
- Strengthen your company's attractiveness as an employer on the labor market.
- Raise the visibility of your female employees and increase their job satisfaction by enabling them to network with other women in the industry.

- Use the W4M logo on your website and other channels and link us in your initiatives around the topic of women in the metal industry.
- Be mentioned as a supporting company / organization on the upcoming W4M website.
- As one of the first members of the network, you will benefit from leading the way as one of the pioneers in women in metals. Together, we will work out concrete goals and activities for the network in the kick-off phase.

This could include internal working groups for the further elaboration of specific topics, the hosting of joint events and joint appearances at panel discussions. A close cooperation from the beginning will also enable you to find direct sparring partners among like-minded experts from different companies.





Aurubis to keep European copper premium at record high next year



Credit: Aurubis AG

European copper producer Aurubis AG will keep the premium it charges to deliver metal to customers in the region at a record high next year as it anticipates a rebound in demand.

The company on Thursday said that it has told customers it will keep the surcharge at \$228 a ton, ahead of the start of annual supply negotiations in London next week. The move to maintain the rate – which is charged on top of London Metal Exchange copper futures – comes despite a sustained downturn in Europe's industrial economy.

Copper's demand outlook has been split between deteriorating consumption in sectors like construction, and rising usage in electric vehicles and renewables. Chinese demand has been particularly resilient, with the International Copper Study Group forecasting consumption to grow 4.3% there this year, while weakness in Europe and the US will drive a 1% contraction for the rest of the world.

Aurubis is Europe's largest copper smelter. Its premium sets the benchmark for the rest of the European industry, alongside an offer from Chile's Codelco, which had also hiked its 2023 premium for the region sharply.

"For 2024 we see a pick-up in refined copper demand, especially in the segments related to the green energy transition," Martin Sjöberg, Aurubis' head of commercial, said in an email. "With our continuous and measurable efforts in all aspects of sustainability, we offer responsibly produced copper for the European economy."

While concerns about the demand outlook persist ahead of the LME's annual industry gathering next week, buyers in Europe are also bracing for supply constraints following a fire at a major refinery in Sweden owned by Boliden earlier this year.

Sumitomo Metal Invests \$12.5 Million in Nano One for Battery Material

In a significant development aimed at bolstering battery technology, Japan's Sumitomo Metal Mining has announced a substantial investment of C\$16.9 million in Canada's Nano One Materials. The investment is anticipated to forge lucrative ties between the two companies, focusing on advancing manufacturing technology for battery materials.

This move aligns with the recent agreement between Japan and Canada to strengthen global battery supply chains while ensuring sustainability and reliability.

Sumitomo Metal Mining is renowned for supplying nickel-cobalt-aluminium (NCA) cathode materials for Panasonic's lithium-ion batteries, a crucial component in Tesla's electric vehicles. The firms expect the agreement to enhance the efficiency and sustainability of these essential battery materials.

As part of the investment, Sumitomo Metal Mining will acquire approximately 5% of Nano One, a Canadian firm known for its patented processes for the sustainable production of lithium-ion battery cathode materials. Sumitomo hopes that these processes streamline production, reduce complexity, and ultimately lower costs compared to current technology standards.

The joint efforts of Sumitomo Metal and Nano One will focus primarily upon developing advanced manufacturing technology for battery cathode materials used in electric vehicles. The firm also seeks to reduce manufacturing costs and minimize the environmental footprint associated with electric vehicle battery production with this agreement.

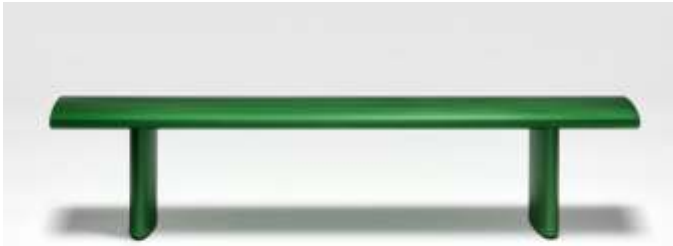
Sumitomo Metal Mining says its commitment to expanding its cathode materials production capacity underlines the importance of this partnership and sets the stage for further expansions in the field of battery technology.

This investment and collaborative effort between Sumitomo Metal Mining and Nano One exemplify the dedication to advancing sustainable and cost-effective solutions within the battery material industry, the firm continued, contributing to the broader goal of establishing dependable global battery supply chains.

As the world transitions towards cleaner and more sustainable energy solutions, such investments and partnerships play a pivotal role in shaping the future of electric vehicles and energy storage systems, noted Sumitomo and Nano One, as they strive to lead the charge in battery innovation.



Hydro showcases sustainable Aluminium Designs at London Festival



Hydro, a leading player in the aluminium and renewable energy sector, is marking its presence at the London Design Festival by exhibiting a sustainable collaboration with famed designer Lars Beller Fjetland.

This partnership earlier bore fruit in the form of the Bello! bench. Made from extruded aluminium boasting 90% recycled content, the outdoor seating solution stands as a testament to sustainable design and innovation. Currently on display at Material Matters at Oxo Tower, the Bello! bench underscores Hydro's unwavering commitment to decarbonising society.

Asle Forsbak, Hydro's Marketing Director, emphasized the importance of design literacy in sustainable manufacturing, citing that "80% of a product's environmental footprint stems from its design phase".

Hydro's mission revolves around achieving net-zero emissions by 2050. The firm holds that collaborations, like their partnerships with icons such as Tom Dixon, Polestar, Porsche, and Cake, can drive the industry towards more sustainable practices.

"Choices made during the design phase dictate a product's recyclability," Forsbak highlighted. The Bello! bench, inspired by penne rigate pasta and composed of 90% recycled aluminium, illustrates this principle in action.

Fjetland, unveiling Bello! in an eye-catching shade of green, echoed Forsbak's sentiments on collaboration, remarking that united efforts result in robust outcomes.

While Hydro's exhibit at the London Design Festival might come as a surprise to many, Forsbak articulated their rationale. "The Bello! bench is our medium to showcase how the melding of industrial design and sustainable practices can yield products that are not just aesthetic but environmentally sound."

Noting the environmental implications of mass production, Forsbak stressed the importance of market-driven sustainability. He said effective change demands a blend of expertise across sectors. "We can't address the sustainability dilemma in isolation. Collaborative efforts are pivotal to decarbonise society," Forsbak stated.

Visitors to the festival can view the Bello! bench at the Material Matters exhibition, with Hydro's stand uniquely constructed from repurposed components from previous exhibitions.

IAI Partners with ICSOBA for Technical Advancement in Aluminium Sector



The International Aluminium Institute (IAI), the prime representative of the worldwide primary aluminium industry, publicized its partnership with the International Committee for Study of Bauxite, Alumina & Aluminium (ICSOBA) to champion technical progression.

The collaboration reinforces IAI's pledge to disseminate top-tier practices and advocate aluminium's contribution to eco-friendliness. IAI Secretary General, Miles Prosser, commented on the importance of the alliance in a related press release.

"Our alliance with ICSOBA mirrors our dedication to synergistic industry endeavours for impactful solutions. ICSOBA's commendable initiatives with industry players will motivate our sector."

IAI, in the preceding year, showcased a report detailing the aluminium industry's alignment with the United Nations Sustainable Development Goals (UN SDGs) titled, 'The Aluminium Industry's Contribution to the UN Sustainable Development Goals'. This exposition shed light on IAI's strides, industry-wide endeavors, aluminium advantages, and combined ventures.

Furthering its commitment, IAI also unveiled the "Sustainable Bauxite Mining Guidelines Second Edition 2022". This guide, enriched by over five decades of mining insights, focuses specifically on bauxite's sustainable extraction.

2023 saw IAI inaugurate Aluminium Forward 2030, comprising 45 member firms, vowing to metamorphose the aluminium landscape. This coalition strives for Net Zero Emissions, concurrently charting a path cognizant of all UN SDGs.

Claude H. Vanvoren, ICSOBA CEO, has high hopes for the collaboration.

"ICSOBA, being the amalgam of eminent professionals from the aluminium domain, is ecstatic about collaborating with IAI for technical discourse. We



anticipate this association to amplify knowledge-sharing across bauxite research, mining, and alumina & aluminium manufacturing.”

This partnership will debut at the 41st ICSOBA International Conference and Exhibition in Dubai, from November 5th-9th, 2023. IAI, alongside its members, will significantly contribute to 15 keynote addresses and over 160 technical documents. IAI dignitaries, including Miles Prosser and Health, Safety & Environment Program Manager, Paul Marsh, are slated to present. The rendezvous on November 5 will also witness the IAI Bauxite and Alumina Committee's congregation. The event will magnetize global experts, scholars, technicians, and aluminium sector representatives.

EU Introduces Pioneering Carbon Border Tariff on Imports



On Sunday, the European Union (EU) initiated the world's first-ever system to levy CO₂ emissions tariffs on imports. This ground-breaking tariff will be imposed on foreign goods like steel and cement, aiming to curtail the influx of foreign products that could sabotage the EU's green transition objectives.

Despite raising concerns among global trading counterparts, the EU's move is a step forward in countering more polluting imports. At a recent forum, Xie Zhenhua, China's primary climate delegate, cautioned against countries employing such unilateral measures.

The system, dubbed the Carbon Border Adjustment Mechanism (CBAM), won't commence collecting CO₂ tariffs at entry points until 2026. The inaugural phase, however, necessitates EU importers to disclose greenhouse gas emissions integrated during the manufacturing of imported goods, notably iron, steel, aluminium, cement, electricity, fertilisers, and hydrogen. From 2026, to maintain parity with EU industries purchasing permits from the EU carbon market, importers will be obligated to buy certificates covering these CO₂ emissions.

Paolo Gentiloni, the European Economy Commissioner, highlighted the initiative's twofold objective: to stimulate a global tilt towards eco-friendly production and to deter European producers from moving to nations with subpar environmental regulations. This move ensures that European businesses don't suffer competitively while they channel investments to achieve the EU's goal of slashing net emissions by 55% from 1990 benchmarks by 2030.

For now, firms across the EU, Britain, and Ukraine anticipate minimal disruptions during this experimental phase. The European Commission has ascertained that this border tariff complies with World Trade Organization stipulations, promising equal treatment to both domestic and foreign entities.

Reiterating the core intent behind CBAM, Gentiloni stated, "It is about safeguarding the EU's climate goal and aiming to elevate global climate commitments." The European steel association, Eurofer, expects the early phase to evaluate the CBAM's robustness against possible industrial production shifts to nations with lenient climate mandates.

Key trading allies, including China, Turkey, and the U.S., have abstained from commenting on this development.

Vedanta Ltd to split into six entities, fueling Growth



Billionaire Anil Agarwal's Vedanta Ltd announced a monumental shift on Friday, dissecting the metals-to-oil conglomerate into six distinct businesses. The decision is anticipated to boost the group's financial stature.

Suffering from financial challenges, Vedanta Resources, the UK-based parent company, faced another setback when S&P Global Ratings downgraded its position to "CCC" from "B-". The company's stocks also experienced a 28% decline this year. The slip was notably contrasted by a 2% uplift in the Nifty Metal index. Setbacks included declining metal prices and Foxconn's withdrawal from a US\$19.5 billion chips joint venture.

The restructuring seems to hold a silver lining for Vedanta Resources. The revamp will make it more streamlined to sell stakes in these businesses, ultimately reducing its debt. Vedanta Resources holds a commanding 63.76% ownership in Vedanta Ltd.

Agarwal said there are multiple structuring options possible. One is that three companies can be listed and the other could be subsidiarisation of each of those assets under Hindustan Zinc, he said. "Once the study is



News Update

complete, we will get to know more about it." If Anil Agarwal is looking to ring fence and derive shareholder value for each of the businesses, then vertical split could be one of the option for Hindustan Zinc Ltd.

Where Vedanta's lenders are not enthused by the proposal of Vedanta Ltd to split the company into six independent units as it's expected to reduce the fungibility of cash flows across businesses and increase earnings volatility.

While Rs 68,000 crore Vedanta is yet to formally approach lenders with proposal on restructuring to spin off into six listed entities, besides looking for rationale for recast and structural details, lenders will seek business plans for each unit, approach to financial management and funding, said an official of a leading nationalised bank. Liquidity, debt levels and capex are key aspects for monitoring and the prudence in financials is crucial, the official said.

What has come under the scrutiny of banks is that the group was looking at merging and delisting at one time and now it is going for carving out businesses and listing them.

Vedanta announced a vertical split of different businesses into six different entities in its pursuit of unlocking value. "This would reduce the fungibility of cash flows across businesses and increase earnings volatility, which could be a concern for lenders," Kotak Securities said in a report.

Past endeavors by Agarwal to privatize Vedanta Ltd in 2020 did not bear fruit. This year, a proposed US\$2.98 billion deal to curtail the debt of the parent company also met resistance from the Indian government.

The upcoming listings encompass Vedanta Aluminium, Vedanta Oil & Gas, Vedanta Power, Vedanta Steel and Ferrous Materials, Vedanta Base Metals, and Vedanta Limited. Anil Agarwal remarked, "By demerging our business units, we believe that will unlock value and potential for faster growth in each vertical."

Stockholders of Vedanta Ltd, boasting a market-cap of US\$10 billion, are set to gain. For each Vedanta Ltd share owned, they will acquire one share from each of the soon-to-be-listed five companies.

Projected to culminate by the financial year 2025, the restructuring awaits approvals. Arun Misra, Hindustan Zinc CEO, is slated to helm Vedanta Ltd. Concurrently, Hindustan Zinc unveiled intentions to segregate its zinc, lead, silver, and recycling ventures and to reevaluate its corporate structure.

Hindalco sign the partnership deal with Odisha Mining for Bauxite Supply



Hindalco Industries Limited and Odisha Mining Corporation have sealed a deal with a Memorandum of Understanding (MoU) to ensure a long-term bauxite supply. Central to this

partnership is the provision of bauxite ore, essential for aluminium production.

Hindalco, a leader in aluminium production, has shared plans to build an advanced 2 million-metric-ton alumina refinery and a state-of-the-art 150-MW power plant in Kansariguda, Rayagada District. This initiative marks Hindalco Industries' second dip into alumina refining in Rayagada.

Odisha Mining Corporation will be key in supplying the bauxite for this venture. The MoU's official announcement came via an exchange filing.

The project's scale is reflected in its funding, with a remarkable proposed investment of about 8,000 crore INR, rolled out in two phases. The first phase, aiming for a 1 million-metric-ton capacity, is set for completion in the 2027 fiscal year, backed by an investment of 5,500 crore INR.

This venture further emphasizes Hindalco Industries' commitment to innovation, sustainability, and industry leadership, the firm

Hydro expects surging demand for Eco-Friendly Aluminium



Hydro, one of the leading aluminium manufacturers globally, predicts a sharp rise in the demand for its low-carbon aluminium in the coming years. The U.S. market, in particular, shows a growing inclination towards recycled material.

Low-carbon aluminium is becoming increasingly important



in the energy transition, particularly in electric vehicles (EVs). Aluminium lightens EVs, compensating for the weight of components such as batteries.

Traditional primary aluminium production, which relies heavily on electricity, is carbon-intensive. Consequently, environmentally-conscious consumers are pivoting towards recycled and low-carbon alternatives. Hydro's version of this material incorporates recycled elements and is produced using hydroelectric power.

Hilde Merete Aasheim, Hydro's Chief Executive, said that "Growth in demand for low-carbon aluminium far exceeds expectations for average consumption." The firm anticipates that the annual demand for its eco-friendly aluminium will surge by 20% until 2030. In contrast, the primary aluminium market is expected to grow by a mere 3% annually during the same timeframe.

While the company remained tight-lipped about the pricing of its low-carbon aluminium, it did indicate that products with lower CO₂ content could fetch higher prices.

Carbon emissions from aluminium production are inconsistent worldwide. For instance, manufacturing one ton of aluminium in China can produce up to 20 metric tons of carbon due to the coal-dependent power generation. In Europe, it's less than seven metric tons. Hydro's primary aluminium, for comparison, emits just four metric tons. Recycled aluminium, on the other hand, consumes 95% less energy than its primary counterpart.

In the previous year, Hydro secured contracts to supply its low-carbon aluminium to major European car manufacturers, including Porsche and Mercedes-Benz.

Despite aluminium's critical role in the packaging, construction industries, and its recognition as a critical mineral by the U.S. and the EU, demand remains robust. This is true even with escalating raw material costs and a slowdown in European construction. Aasheim commented on the sector's appetite for recycled aluminium products, calling it "remarkable."

This year, the global demand for primary aluminium is projected to hover around 70 million metric tons.

Furthermore, Hydro is amplifying its recycling endeavors in the U.S., thanks in part to the U.S. Inflation Reduction Act (IRA). This legislation emphasizes enhancing the domestic supply of pivotal minerals for the energy transition.

HCL Plans to Increase Copper Ore Production Capacity to 12.2 MTPA by FY'29



हिंदुस्तान कॉपर लिमिटेड
(भारत सरकार का उद्यम)
राष्ट्र का ताम्र खनिक

Hindustan Copper Ltd (HCL) said it is implementing expansion projects to increase its mine production capacity from the current level to 12.2 million tonnes per annum (MTPA) by FY 2028-29.

HCL Chairman and Managing Director Ghanshyam Sharma at the AGM told shareholders that the company has access to around 55 per cent of the copper ore reserves and resources in India with an average grade of 0.96 per cent.

"In FY 2022-23, the copper ore production in India was around 3.35 million tonnes. HCL is implementing a plan to increase its mining capacity from its current level of ore production to 12.2 MTPA in Phase-I in the next 6 to 7 years," Sharma said.

He added that the company has achieved ore production of 33.47 lakh tonnes during FY 2022-23 as against 35.70 lakh tonnes produced in FY 2021-22.





Sustainable Mobility – Global Benchmark SIAM's 63rd Annual Convention

New Delhi, 12 September 2023: During 2nd plenary session of SIAM's 63rd Annual Convention themed "Sustainable Mobility – Global Benchmarks", Mr. Vinod Aggarwal, President of SIAM and Managing Director & CEO of Volvo Eicher Commercial Vehicles Ltd addressing the gathering, said, "We need to learn from the global strategies we have been witnessing in the automotive sector and examine their applicability in India. With increased focus on sustainability, prominent avenue for the auto industry's growth lies in the adoption and promotion of clean-energy vehicles. This includes embracing other powertrains, including eco-friendly flexi fuels and making vehicles compliant to it."

Mr. Guenther F. Apfalter, President of Magna Europe & Asia, delivered an insightful presentation on Fuel Cell Electric Vehicles (FCEVs) and Battery Electric Vehicles (BEVs) from a European perspective. Highlighting the evolving landscape of powertrains in Europe and underscored the significance of clean and efficient mobility solutions. Prof. Suani Coelho, Professor, Institute of Energy and Environment and Coordinator of the Research Group of Bioenergy, University of São Paulo, shed light on Brazil's pioneering role in sustainable transportation through biofuels, offering valuable insights into innovative approaches to clean energy.

Moving forward, Mr. Ashim Sharma, Senior Partner &

Group Head of Business Performance Improvement Consulting (Auto, Engg. & Logistics) at Nomura Research Institute, provided valuable insights into Sustainable Mobility Learnings from Japan. His presentation highlighted Japan's leadership in shaping the future of transportation, emphasizing transferable lessons that can enhance sustainability and efficiency worldwide. Mr. Andreas Tschiesner, Senior Partner at McKinsey & Company, presented a thought-provoking Global Perspective on Material Circularity.

About SIAM

The Society of Indian Automobile Manufacturers (SIAM) is an apex national body representing major vehicle and vehicular engine manufacturers in India. It is a society with charitable objectives registered under the Societies Registration Act 1860. Its objectives include enhancing the contribution of the automobile industry in the growth and development of the Indian economy, assisting the automobile industry in meeting its social obligation, encouraging the efficiency of the industry in general, particularly in India, and improving and protecting the environment, including global warming, pollution control and safety of automobile vehicle users and public at large. Recognizing these objectives, SIAM has been granted registration under the Income Tax Act 1961 as an institution with a charitable purpose.

Indian automobile domestic sales up, exports down in August: SIAM

The Indian automotive industry in August rolled out about 23.85 lakh vehicles comprising passenger carriers, three/two-wheelers and quadricycles, according to the Society of Indian Automobile Manufacturers (SIAM).

While the domestic vehicle sales went up last month as compared to the corresponding period the previous year, the exports have come down. According to SIAM, during August 2023, the domestic sales of - passenger carriers (cars, utility vehicles, vans), three-wheelers, two-wheelers and quadricycles) – stood at about 19.45 lakh units up from 18.77 lakh units sold in August 2022.

As regards exports, the industry shipped out about 3.80 lakh units last month, down from about 4.02 lakh units exported during August 2022.

Commenting on sales data of August 2023, Mr Vinod Aggarwal, President, of SIAM said, "Last month saw the highest ever August month sales for Passenger Vehicles and Three-Wheelers, while Two-Wheeler sales remained at levels similar to a year ago. We have also observed

good growth in the Commercial Vehicle segment in August 2023. Based on the performance of last month, we are even more optimistic for demand to pick up during the festive season, enabled by a positive economic outlook and the revival of monsoon after a deficit in August."

Termining the performance of the auto industry as encouraging in August 2023, President of the Society of Indian Automobile Manufacturers (SIAM) – Vinod Aggarwal – expects sales to improve further with the upcoming festive season. Describing growth as good in all segments, including Passenger Vehicles (PV), Commercial Vehicles (CV) & three-wheelers, he said that more consumers are considering buying (EVs) across both rural and urban areas.

Pointing to good traction for EVs among two-wheelers, and three-wheelers and an increasing migration in four-wheelers, he expressed hope that the government's new scheme on electric buses will increase their numbers on



Statistics

SIAM Sub-segment & Company wise Production, Domestic Sales & Exports Report for the month of August 2023 and Cumulative for April-August 2023												Report IV
												(Number of Vehicles)
Category Segment/Subsegment Manufacturer	Production				Domestic Sales				Exports			
	August 2022	2023	2022-23	2023-24	August 2022	2023	2022-23	2023-24	August 2022	2023	2022-23	2023-24
Passenger Vehicles (PVs)												
A: Passenger Cars - Upto 5 Seats												
Micro : Seats upto-4, Length Normally <3200 mm, Body Style-Hatchback, Engine Displacement Normally upto 0.8 Litre												
Specialty												
MG Motor India Pvt Ltd (Dancer EV)												
Total Micro												
Mini : Seats upto-5, Length Normally <3600 mm, Body Style-Hatchback, Engine Displacement Normally upto 1.0 Litre												
Regular												
Maruti Suzuki India Ltd (Ato, Sprazzo)												
Rangeela Pvt Ltd (Kwid)												
Total Mini												
Compact : Seats upto-5, Length Normally between 3600 - 4000 mm, Body Style-Sedan/Estate/Hatch/Notchback, Engine Displacement Normally upto 1.4 Litre												
Regular												
Honda Cars India Ltd (Amaze, Jazz)												
Hyundai Motor India Ltd (Aura, Grand i10, 20i, Santro, Xcel)												
Maruti Suzuki India Ltd (DPM Model # Baleno, Celoria, Ciaz)												
Tata Motors Ltd (Atroz, Tigor, Tiggor)												
Toyota Kirloskar Motor Pvt Ltd (Cinnza)												
Volkswagen India Pvt Ltd (Polo)												
Total Compact												
Super Compact : Seats upto-5, Length Normally between 4000 - 4250 mm, Body Style-Sedan/Estate/Hatch/Notchback, Engine Displacement Normally upto 1.6 Litre												
Regular												
Mahindra & Mahindra Ltd (Verito)												
Total Super Compact												
Mid-Size : Seats upto-5, Length Normally between 4250 - 4500 mm, Body Style-Sedan/Estate/Hatch/Notchback, Engine Displacement Normally upto 1.6 Litre												
Regular												
Honda Cars India Ltd (City)												
Hyundai Motor India Ltd (Verna)												
Maruti Suzuki India Ltd (Ciaz)												
Nissan Motor India Pvt Ltd (Sunni)												
Volkswagen India Pvt Ltd (Vento, Virtus)												
Total Mid-Size												
Executive : Seats upto-5, Length Normally between 4500 - 4700 mm, Body Style-Sedan/Estate/Notchback, Engine Displacement Normally upto 2 Litre												
Regular												
Skoda Auto India Pvt Ltd (Octavia, Slavia)												
Total Executive												
Premium : Seats upto-5, Length Normally between 4700 - 5000 mm, Body Style-Sedan/Estate, Engine Displacement Normally upto 3 Litre												
Regular												
Skoda Auto India Pvt Ltd (S. Jerbi)												
Specialty												
Toyota Kirloskar Motor Pvt Ltd (Camry)												
Total Premium												
Total Passenger Cars												

* Only cumulative data is available till April-June. NA=Not Available. #Only production volume of CDM Model is reported by Maruti Suzuki India Limited.

SIAM Sub-segment & Company wise Production, Domestic Sales & Exports Report for the month of August 2023 and Cumulative for April-August 2023												Report IV
												(Number of Vehicles)
Category Segment/Subsegment Manufacturer	Production				Domestic Sales				Exports			
	August 2022	2023	2022-23	2023-24	August 2022	2023	2022-23	2023-24	August 2022	2023	2022-23	2023-24
B: Utility Vehicles (UVs)												
B: Utility Vehicles/ Sports Utility Vehicles; 4x2 or 4x4 offroad capability ; Generally ladder on frame ; 2 box ; 5 Seats or more but upto 10 Seats.												
UV1 : Length < 4000 mm & Price <20 Lakhs												
Force Motors Ltd (Corners)												
Honda Cars India Ltd (Elevate)												
Hyundai Motor India Ltd (Creta)												
Kia Motors India Pvt Ltd (Seltos)												
Mahindra & Mahindra Ltd (Bolero, Kuv100, Thar, Xuv300)												
Maruti Suzuki India Ltd (DEM Model # Brezza, Fronx, Jaxx)												
Nissan Motor India Pvt Ltd (Magnite)												
PCA Motors Pvt. Ltd (C3 ECO)												
Rangeela Pvt Ltd (Kiger, Torque)												
Tata Motors Ltd (Nexon, Punch)												
Toyota Kirloskar Motor Pvt Ltd (Urban Cruiser)												
Total UV1												
UV2 : Length 4000 to 4400 mm & Price <20 Lakhs												
Force Motors Ltd (Corners)												
Honda Cars India Ltd (Elevate)												
Hyundai Motor India Ltd (Creta)												
Kia Motors India Pvt Ltd (Seltos)												
Maruti Suzuki India Ltd (DEM Model # Ertiga, Grand Vitara)												
MG Motor India Pvt Ltd (Polso)												
Nissan Motor India Pvt Ltd (Kicks)												
Skoda Auto India Pvt Ltd (Kushaq)												
Tajima Kirloskar Motor Pvt Ltd (Model # Maruti Intra for)												
Volkswagen India Pvt Ltd (T-Cross)												
Total UV2												
UV3 : Length >4700 mm & Price <20 Lakhs												
Force Motors Ltd (Corners)												
Honda Cars India Ltd (Hi Lander, V-Cross)												
Toyota Kirloskar Motor Pvt Ltd (Innova Crysta, Innova Hycross)												

* Only cumulative data is available till April-June. NA=Not Available. #Only production volume of CDM Model is reported by Maruti Suzuki India Limited.



SIAM														
Sub-segment & Company wise Production, Domestic Sales & Exports Report for the month of August 2023 and Cumulative for April-August 2023														
												Report IV		
												(Number of Vehicles)		
Category	Production				Domestic Sales				Exports					
	Segment/Subsegment		August 2022	August 2023	April-August 2022-23	April-August 2023-24	August 2022	August 2023	April-August 2022-23	April-August 2023-24	August 2022	August 2023	April-August 2022-23	April-August 2023-24
Manufacturer			2022	2023	2022-23	2023-24	2022	2023	2022-23	2023-24	2022	2023	2022-23	2023-24
Total UV3														
UV4 : Price between Rs. 20 to 30 Lakh														
Force India Automobiles Pvt Ltd (Jeeo Compass)														
Force Motors Ltd (Cureka)														
Hyundai Motor India Ltd (Kona Tucson)														
Kia Motors India Pvt Ltd (Carnival)														
Mahindra & Mahindra Ltd (Altas C7)														
Maruti Suzuki India Ltd (Invivo)														
MG Motor India Pvt Ltd (SUV)														
PCA Motors Pvt. Ltd (C-Across)														
Toyota Kirloskar Motor Pvt Ltd (Model Manufacturers for)														
Total UV4														
UV5 : Price >Rs. 30 Lakh														
Force India Automobiles Pvt Ltd (Jeeo Meridian)														
Hyundai Motor India Ltd (Creta)														
Kia Motors India Pvt Ltd (Mu-X)														
Kia Motors India Pvt Ltd (EV5)														
MG Motor India Pvt Ltd (Sedan)														
Skoda Auto India Pvt Ltd (Kodiaq)														
Toyota Kirloskar Motor Pvt Ltd (Fortuner, Hilux, Land Cruiser)														
Volkswagen India Pvt Ltd (T-Golf)														
Total UV5														
Total Utility Vehicles (UVs)														
Vans														
C-Vans : Generally 1 or 1.5 box; seats upto 5 to 10														
V1 : Hard tops mainly used for personal transport. Price upto Rs. 10 Lakh														
Mahindra & Mahindra Ltd (Maximo Super)														
Maruti Suzuki India Ltd (Esco)														
Tata Motors Ltd (Maxo Express)														
Total V1														
V2 : Soft tops mainly used as Maxi Cabs. Price upto Rs. 10 Lakh														
Mahindra & Mahindra Ltd (Supro)														
Tata Motors Ltd (Maxo Cab)														
Total V2														
Total Vans														
Total Passenger Vehicles (PVs)														
*Only cumulative data is available till April-June. NA=Not Available														

SIAM														
Sub-segment & Company wise Production, Domestic Sales & Exports Report for the month of August 2023 and Cumulative for April-August 2023														
												Report IV		
												(Number of Vehicles)		
Category	Production				Domestic Sales				Exports					
	Segment/Subsegment		August 2022	August 2023	April-August 2022-23	April-August 2023-24	August 2022	August 2023	April-August 2022-23	April-August 2023-24	August 2022	August 2023	April-August 2022-23	April-August 2023-24
Manufacturer			2022	2023	2022-23	2023-24	2022	2023	2022-23	2023-24	2022	2023	2022-23	2023-24
Three Wheelers														
A: Passenger Carriers														
A1: Passenger Carrier														
A1 No. of seats including driver not exceeding 4 & Max.Mass not exceeding 1 tonne														
Audi Auto Ltd (Audi Gemini Atul Rik Atul Rik 1.3 L Atul Rik)														
Bajaj Auto Ltd (Maxima RE)														
Continental Engines Pvt. Ltd (Baxy EVF PRO Baxy Exp)														
Mahindra & Mahindra Ltd (Ultra 100)														
Piaggio Vehicles Pvt Ltd (Ace Auto, Ace City)														
TVS Motor Company Ltd (TVS King AS)														
Total A1														
A2: No. of seats including driver exceeding 4 but not exceeding 7 & Max.Mass not exceeding 1.5 tonnes														
Audi Auto Ltd (Audi Gemini Baxy)														
Force Motors Ltd (Mindor)														
Total A2														
Total A														
Total Passenger Carriers														
E-Rickshaw														
Audi Auto Ltd (Audi Elite)														
Continental Engines Pvt Ltd (Baxy E-Rick)														
Mahindra & Mahindra Ltd (e-Alpha Mini, Treo Year)														
Total E-Rickshaw														
B: Goods Carrier														
B1: Max mass not exceeding 1 tonnes														
Audi Auto Ltd (Audi Gemini Atul Gemini Atul Gemini Atul)														
Bajaj Auto Ltd (Maxima)														
Continental Engines Pvt. Ltd (Baxy Cargo, Baxy Cargo S)														
Mahindra & Mahindra Ltd (e-Alpha Treo, Treo Cargo)														
Piaggio Vehicles Pvt Ltd (Ace King)														
TVS Motor Company Ltd (TVS King Cargo)														
Total B1														
Total Goods Carrier														
E-Cart														
Audi Auto Ltd (Audi Elite Cargo)														
Continental Engines Pvt Ltd (Baxy E-Cart)														
Mahindra & Mahindra Ltd (e-Alpha Cargo)														
Total E-Cart														
Total Three Wheelers														

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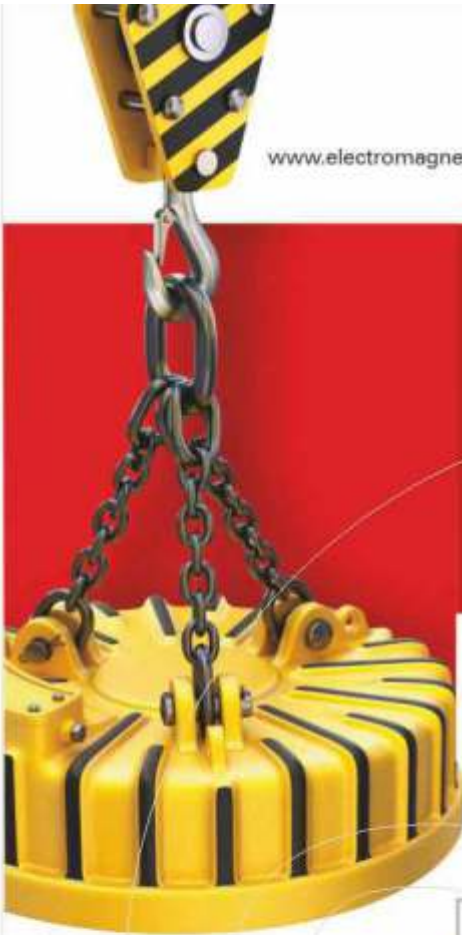
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+91-937-621-9322
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