METALWORLD

Devoted to Foundry & Non-Ferrous Metals Industry

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- **ElkemTopseed® Conditioners – a novel product to improve the efficiency of metal treatment in Ductile iron foundries**
- ***National Metallurgists Day – Random Thoughts***

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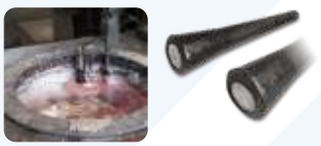

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EDITOR
D. A. Chandekar
B.E. (Met.) DBM, DJMC

EDITORIAL BOARD
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PRODUCTION
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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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Editorial Desk

D. A. Chandekar
Editor

Dear Readers,

The metals industry seems to be gradually coming back on track after being hit by the covid pandemic. The production, demand and the logistics is slowly getting normal and the industry sentiment too is quite positive. The user industries like infra, construction, auto, white goods, engineering are progressing well and are giving good support to the metals demand curve.

The covid however has taught us lot of things and we, not only as human beings but also as industry professionals, have developed different approach towards the life as well as the running of the industry. A lot of emphasis is now being given to development of new technologies and processes which will not only reduce the production and processing cost of metals but also reduce the carbon footprint. In the last two years, we have understood that human life and health are very precious and can not be rectified once damaged or destroyed. Also, if we can not keep our environment clean, it will be detrimental to human existence on this planet. This is the reason more and more renewable energy sources are being tapped and being employed for various applications including. We are trying to slowly reduce our dependence on fossil fuels by using more of solar and wind energy. Also more and more recycling has to be done in order to use as less natural resources as possible and make metals look greener.

This new thinking is sure to induce many changes in the metal making and processing technology in coming years. A lot of research is being carried all over the world on these lines. I am sure the metallurgical institutes and labs in our country will lead this innovation process and surely come out with some 'break through' technology in metallurgical domain. We all know about India's rich heritage in metallurgical field. Metallurgy was very well developed in ancient India. Unrusted iron pillar at Delhi is a glaring example. Also, till 17th century, only Indians knew about zinc extraction process. The steel used for the world famous 'Damascus Swords' was exported from India. The ancient book 'Brihad Vimaanshaastram' elaborates the methodology for the production of many alloys with different properties, still unknown to the modern science. We should examine all this with a scientific lens and carefully chart the future course of action.

I am sure our rich metallurgical heritage will keep on inspiring and guiding us to conceptualise more and more innovations and inventions in the metallurgical field and bring back the old glory !

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Content

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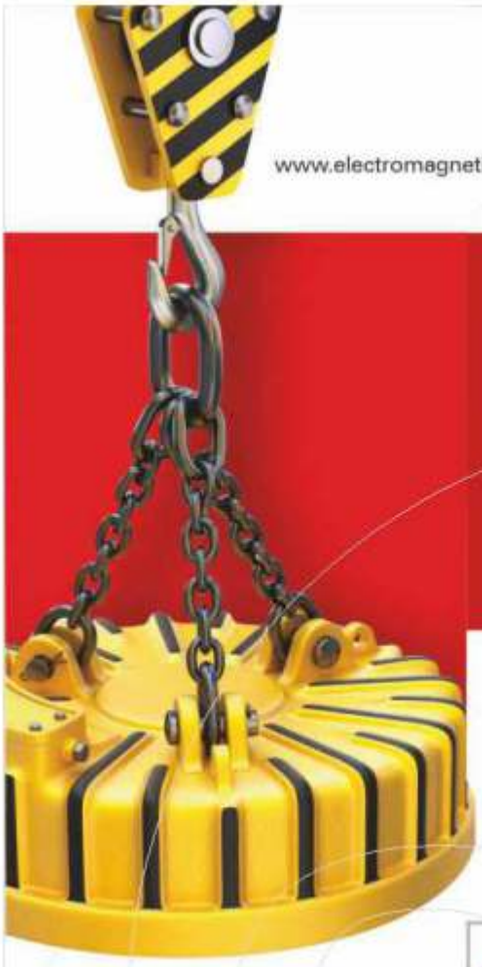

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ElkemTopseed® Conditioners – a novel product to improve the efficiency of metal treatment in Ductile iron foundries

ABSTRACT:

Ductile iron castings are seeing an upward trend in market share in the current Indian foundry industry. The last few decades have witnessed consistent improvements in the Ductile iron production process to make the casting producers more competitive and credible-both in terms of quality and consistency. Several initiatives have contributed to this, including the improved efficiency of the metal treatment processes.

Considering the dynamic nature of the market, stringent customer requirements, competitive cost economics, and strange raw material situation, a continuous and steady improvement in the foundry processes only can keep a foundry healthy and adept to rising demands.

This paper discusses the use of proprietary conditioner – ElkemTopseed® as a Cover-alloy during Magnesium treatment in the treatment ladle. Several benefits like reduced treatment cost, improved process consistency, elimination of unknown variables, etc. were realized due to this process modification against conventional covering materials.

KEYWORDS:

Ductile iron, metal treatment, cover alloy.

INTRODUCTION:

One of the most important processes in Ductile iron casting manufacturing is a metal treatment. There are several factors that contribute to the effectiveness of a metal treatment process. Some of these can be base metal chemistry, trace element levels, covering materials, treatment alloys, and general process parameters like time, temperatures, heat retention measures, etc.

Of all the above-mentioned parameters, covering materials and trace elements are generally the most neglected parameters in a foundry and need much more attention than usually given to them.

BACKGROUND:

A leading automotive foundry in India had been facing issues of high cost of metal Treatment and metallurgical rejections in one of their ductile iron casting. Despite using the FeSiMg and Inoculants from a reputed supplier and good quality of furnace charge materials, the metallurgical defect could not be eliminated. The high amount of rejection and high production cost was a point of concern and the foundry approached Elkem for the resolution of this problem.

Mr. Kumar Kislay
Head, Research & Innovation Centre
Elkem South Asia, Nagpur

PRELIMINARY INVESTIGATION:

The initial technical discussion between the foundry team and Elkem representatives was done to understand the process and samples were collected for the Chemical and Micro structural analysis.

The analysis was conducted at the Elkem Technical Service lab, which is an extended part of Elkem Technology. The Chemical analysis revealed the excessive presence of elements like Chromium, Zinc, Antimony, and Vanadium. The in-depth metallurgical analysis of the casting sample revealed intercellular flakes, degenerated graphite nodules as well as trace carbides.

On tracing back, and after analyzing the chemical

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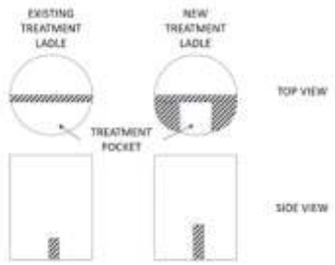
composition of each raw material and alloys used by the foundry at the Elkem lab, the covering scrap (Steel punching, button scrap, etc.) was found to be the source of these tramp elements in the foundry, and coincidently, as with many other foundries, the covering material was never checked for composition. The unknown and inconsistent original source of this covering scrap further made it difficult to control the variable for the foundry.

TRIAL PLAN:

The Elkem technical team made the visit to the foundry and collaborated with the team at the foundry. Based on the inputs and the discussions, a trial plan was finalized.



The treatment pocket had now become narrower and taller than the existing design, and this ensured better packing density and improved FeSiMg treatment effectiveness. A slight delay in the start of the Mg reaction due to the thicker cover on the top meant more metalhead over the Mg vapors formed during the reaction and hence better Mg recovery.The covering scrap, which was found to have a high amount of trace elements was now replaced

Parameter	Existing	Elkem Trial
Composition	SGI 500/7	SGI 500/7
Tapping Temp.	1530 deg C	1515 deg C
FeSiMg	1% of 7% Mg grade	0.9% of La-based 6.2% Mg grade
Cover alloy	1% button scrap	0.6% ElkemTopseed®
Inoculant	0.3% Ba based	0.3% ElkemBarinoc®
Pouring time	8 minutes	8 minutes

Table 1: Trial plan

The treatment ladle was modified using the recommendations of the Elkem Treatment pocket calculator, and the rough schematic can be seen below:

by ElkemTopseed® 2505 grade. The chemical composition of ElkemTopseed® 2505 was as shown in Table 2.

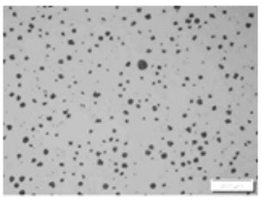
Tj&	Cb&	Db&	Br&	Gf &
59&	3/1%	2/3&	1/: %	57&

Table 2: Typical Chemical composition of ElkemTopseed® 2505

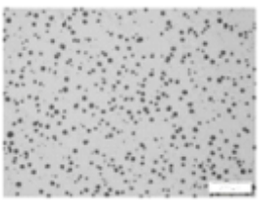
RESULTS & DISCUSSION:

The trial samples were analyzed for chemical composition and metallurgical properties.

Despite reduced FeSiMg addition, the residual Magnesium was found to be within the range and the microstructure – both in terms of Nodularity and Nodule count was observed to be better than the regular practice – see micrographs in Image 2.



Current practice



Elkem Trial

Image 2: Micrographs from casting lug attached to the last mold poured..

High magnification analysis is done before and after etching also did not reveal the presence of any degenerate graphite or Carbides in the trial samples, thus confirming the effectiveness of the metal treatment.

The Chemical analysis (Spectrometer) coin samples were analyzed later at the

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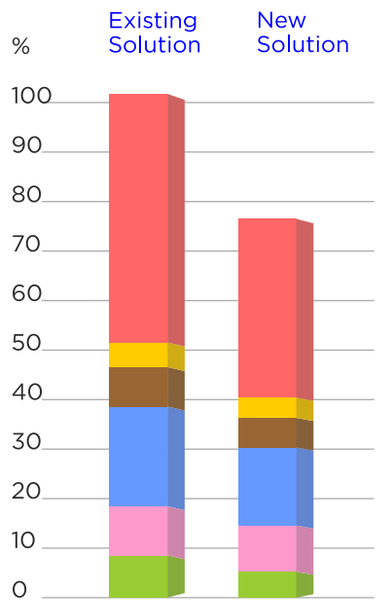

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Elkem laboratory and the presence of subversive trace elements was completely under control thus avoiding its impact on casting quality.

The Barium and Calcium content in the cover alloy improved the nucleating potential of the metal thus increasing the graphitization (Improved Nodule count and Nodularity), which also meant that there would be a potential to optimize the Inoculant addition in the future.

The foundry further realized that the use of Elkem Topseed® 2505 as a cover alloy created a very dry and flaky slag which was easy to remove after the Mg reaction and hence did not stick or deposit in the treatment pocket. This meant that the ladle lining life could be increased thus reducing the refractory cost, the ladle downtime, and the risk of slag inclusion in the casting.

CONCLUSION:

The use of ElkemTopseed® as a cover alloy during the Mg treatment helped the foundry achieve the following:

- Control over tramp/trace elements, Oil, contamination, etc. coming from covering scrap
- Improved Mg recovery during the treatment.
- Delayed, quiet, fewer fumes and less violent Mg reaction, thus making the process cleaner and 'green'
- Improved metal nucleating potential
- Reduced cost of power, metal treatment, and ladle refractory
- Conditioning of slag for easy removal and avoiding slag inclusion defect.
- Reduced rejection rate due to better process control and consistency. ■

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Our Renewable Future Will Run On Copper

Renewable energy is considered by some to be one of the most effective tools to reduce global carbon emissions and fight climate change. However, building technologies like solar and wind power plants or electric vehicles (EVs) can be mineral-intensive.

Copper is considered an essential metal for renewables. The metal is highly conductive, can easily be shaped into pipes, wires, or sheets, and can remove heat far more rapidly than other metals. In fact, copper itself is a sustainable material. The metal is 100% recyclable and can be used repeatedly without any loss of performance.

As Visual Capitalist details below, Teck highlights how global copper demand in both the clean power and the clean transport sectors is expected to double in the next decades.

The Wind and Solar Boom

Copper has long been a common component in most electrical wiring, power generation, transmission, distribution, and circuitry because of its high conductivity and durability.

New energy technologies, however, require even more copper. Photovoltaics (PV) solar power systems contain approximately 5 tonnes (t) per megawatt (MW) of copper, while grid energy storage installations rely on 2.7 to 3.6t per MW.

Solar isn't the only renewable energy source that relies on copper, as a wind farm can contain between 4 million and 15 million pounds of copper.

Copper Drives EVs

The clean transport sector also consumes lots of copper. In fact, the metal is used in every major EV component, from the motor to the inverter and the electrical wiring. While an average gasoline-powered car uses about 20 kg of copper, mainly as wiring, a fully electric car has roughly 80 kg of copper. Therefore, copper demand for EV batteries alone is expected to jump from 210K tonnes in 2020 to 1.8M tonnes in 2030.

But demand for the metal won't just come from the cars themselves. Copper used for EV charging stations is also expected to rise more than 1,000% by 2030, compared to 2020.

Meeting the Copper Demand

As the world moves towards alternative energy sources, copper will remain in high demand.

Even though the metal is 100% recyclable, recycling alone will not be enough to meet demand and ensure a stable supply of copper. Continued mining for new copper will be needed.

Teck is one of Canada's leading mining companies committed to responsibly producing copper needed for a low-carbon future.

Copper Inventory in Major Chinese Markets Dipped 1,000 mt over Weekend

As of Monday November 29, the copper inventory across China's major trading markets dipped 1,000 mt from last Friday to 89,400 mt. The inventory increase over the weekend was mainly in Shanghai and Jiangsu. And the inventory decline was seen in Guangdong, Chongqing and Tianjin. The inventory in other regions changed little.

The higher premiums in east China compared to other regions drove inflows of copper cathode. This, coupled with the concentrated shipments of imported copper, increased the inventories in Jiangsu and Shanghai. The downstream demand in Guangdong, Chongqing and Tianjin improved noticeably after the copper prices plunged, while the arriving shipments did not increase substantially.

The inventories in Jiangsu increased 1,000 mt to 12,400 mt, the inventories in Shanghai added 700 mt to 63,500 mt, the inventory in Chongqing fell 1,600 mt to 9,500 mt, the inventory in Tianjin dipped 200 mt to 2,000 mt, and the inventory in Chongqing dipped 800 mt to 500 mt. Inventories in other areas changed little.

There will be large volumes of shipments arriving of imported copper this week. And the arriving shipments of domestic copper continue to grow. The consumption is largely stable. As such, the inventory is expected to grow slightly this week.

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Indonesia export bans prompt tin price surge

Indonesian President Joko Widodo has been announcing from different forums that his country may stop the export of bauxite next year, copper ore in 2023 and tin in 2024.
On the heels of the announcements, the tin price has surged, MetalMiner Insights data shows.
The LME three-month tin price closed Monday at $39,450 per metric ton. The price is up 6.6% month over month.
For long, Indonesia has been a major exporter of metal ores, mostly to Asian countries, including China and Japan. The ban on nickel exports had triggered investments, mostly from China, into Indonesian nickel processing.
As part of efforts to improve the country's external balance & attract investments into the resource processing industry, Indonesia may stop tin exports in 2024, the Indonesian President reiterated last week at the Indonesian central bank's annual gathering.
The president has made similar statements in recent public appearances about the country's long-term dependence on raw commodities, reducing its export earnings and employment opportunities.
The idea is that the ban on exports of raw commodities would attract investments in downstream industries. It would also improve Indonesia's trade and current account balances.
The nickel ore ban has already led to protests by the European Union. The latter has filed a complaint with the World Trade Organization.
The Indonesian president, though, remains unfazed by the move, keeping his eye firmly on foreign investments.

China implications

Copper concentrates from Indonesia go mainly to China, followed by Japan. But exports accounted for just 2.1% of China's total imports of 19.2 million tons in January-October this year.
According to a report by SMM, the country's supply of copper concentrate would be sufficient for at least two years, which would reduce the impact of the potential ban on Indonesian copper exports.
U.S.-based miner Freeport-McMoRan, operator of Indonesia's massive Grasberg copper mine, has decided to build a copper smelter in east Java province. This was part of the commitment Freeport-McMoRan had made to the Indonesian government in 2018 to extend its mining rights at Grasberg. The smelter's construction is likely to end by December 2023.
This and other smaller smelters means Indonesia will have the ability to process all its copper concentrates into refined copper. As such, it will not need to export copper concentrates after 2024.

Tuticorin copper smelter facing severe damage, needs critical maintenance work

Vedanta's Sterlite Copper smelter plant in Tamil Nadu's Tuticorin is facing severe corrosion and faces threat of total structure collapse, the company has informed the Supreme Court.

The copper smelter plant which has been shut down since May 2018 is deteriorating fast and is in dire need of care and maintenance work, an affidavit filed by Vedanta before the Supreme Court states.
Urging the apex court to urgently hear Vedanta's plea for granting company access to the plant to carry out essential maintenance work, the affidavit highlights the damage caused to the facility on being inundated after

heavy rains lashed parts of Tamil Nadu.

Acid leak at the facility in the early months of 2021 was allegedly brought to the notice of the concerned authorities, Vedanta says. However, no action was taken to address the same, the company claims. “The incidents of acid leakages, if left unaddressed, may adversely affect the environment,” the affidavit filed by Vedanta says.

The local level monitoring committee which has identified the damage caused due to stormwater and rainwater stagnation in the facility has failed to give access to the company to carry out essential maintenance work.

Several communications made by the company to the state government have also borne no fruit, the affidavit details.

With the Tuticorin region expected to continue to receive heavy rainfall, the need for carrying out maintenance work for the plant's assets and structure becomes critical, the company stresses.

This copper smelter was closed down by the Tamil Nadu government in 2018 shortly after civilian protests against the plant took a violent turn resulting in 13 deaths in police firing. The closure was directed on grounds of violation of prescribed environmental norms.

On being challenged by Vedanta, the National Green Tribunal (NGT) allowed opening of the plant while finding the closure ordered by the state government to be disproportionate. This order was set aside by the Supreme Court and directed the company to approach the Madras High Court if it wished to seek any interim reliefs.

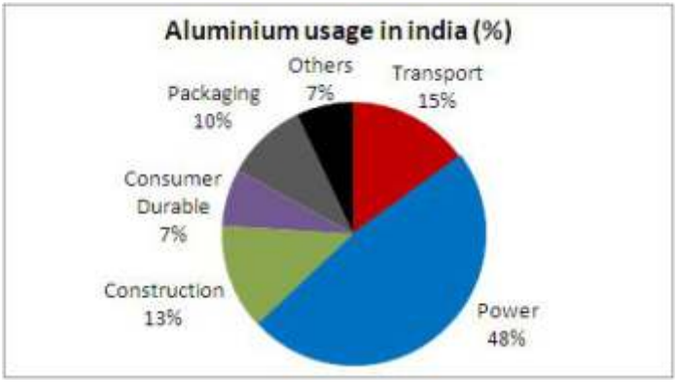
Neither Madras High Court, nor the Supreme Court have allowed reopening of the plant. Vedanta's plea seeking access to the plant periodically to carry out essential maintenance work remains pending before the Supreme Court. It is this plea that the company is seeking an urgent hearing of citing “steeply deteriorating” condition of the plant and the structures in it.

Hope for Hindalco, Nalco investors as aluminium demand may outstrip supply

Aluminium has seen high volatility in the global metals market in the past two months. In mid-October, LME prices hit multi-year highs of $3,198 per tonne.

Prices then corrected steeply to $2,550 in early November before stabilising and moving up to around $2,700.

Volatility is likely to continue. Most analysts expect demand to drop, due to a drop in global growth rates and China cooling down as well. But there are estimations that supply could tighten as well, due to high energy costs.



Substitution of Primary Aluminium by Aluminium Scrap to be Slow Unless Consumption in Related Fields Offers a Boost

Recently, the market has begun to discuss the impact of aluminium scrap on primary aluminium consumption next year. However, the impact of aluminium scrap on primary aluminium will not be as significant as imagined. It also has many limitations.

The main reason is that all aluminium scrap is alloyed products, and the cost of aluminium purification is high. So the recycled aluminium scrap can only be used in downstream processing.

In terms of aluminium rods and primary alloys, there is not large volume of aluminium scrap for use due to the high element composition requirements. Almost only primary aluminium or even low-iron, high-purity aluminium can be used for production. The recycled aluminium scrap can only be used in three sectors, including traditional secondary cast aluminium alloy, secondary aluminium rod, and aluminium plate/sheet, strip and foil. The current proportion is approximately 7.5:1.5:1.

The end user consumption of secondary aluminium is mainly related to auto parts.

The relatively mature ADC12, A380 and other aluminium alloy ingot brands can be directly produced using 100% aluminium scrap for a long time. There is no advantage in the cost of primary aluminium. However, in terms of automobiles, traditional fuel-powered vehicles are slowly being replaced by new energy vehicles.

New energy vehicles can only be produced with primary aluminium currently due to higher material performance

requirements and stringent element requirements. Regarding secondary remelting rods, most secondary aluminium rods are 6063 alloy. Almost all the secondary aluminium rods produced with 100% aluminium scrap are non-standard aluminium rods, which can only be used for the production of non-standard building materials. And their consumption is closely related to real estate. In addition to 6063 aluminium rods, a small amount of 6061 secondary aluminium rods are currently used in the production of secondary aluminium templates. The consumption is also closely related to the real estate industry.

1/8 series of aluminium scrap can be used as a direct substitute for A00 aluminium ingots due to its high aluminium content. The source is mainly aluminium cable scrap and 1 series regular plate/sheet and strip scrap, which account for only a small volume in the entire aluminium processing industry. And there is no potential for a big increase.

Therefore, aluminium scrap is unlikely to have a big impact on primary aluminium in the short term unless the consumption of fuel-powered vehicles and the real estate sector surges, the sorting capacity of the recycling link improves substantially, or the purification technology of aluminium scrap makes breakthroughs. The substitution of primary aluminium by aluminium scrap will still be a relatively slow process.

The $5 billion hoard of aluminium the world wants but can't have

On an industrial park about an hour's drive toward the South China Sea coast from Ho Chi Minh City sit giant mounds of raw metal shrouded in black tarpaulin. Stretching a kilometer in length, the much-coveted hoard could be worth about $5 billion at current prices.

In the esoteric world of aluminum, those in the know say the stockpile in Vietnam is the biggest they have ever seen — and that's in an industry that spends a lot of time building stockpiles while analysts spend a lot of time trying to locate them. But as far as the increasingly under-supplied market is concerned, it's one that may never be seen again.

Why it's unlikely to move anytime soon involves Vietnam's customs authorities. How its existence has become so significant, meanwhile, opens a window on a ubiquitous, yet erratic commodity at a time when makers of everything from car parts to beer cans are competing for more of it as they emerge from the coronavirus pandemic and China throttles supply.

Ni surges to nearly 7-year highs on solid supply-demand

Nickel prices on the London Metal Exchange (LME) surged to near-seven-year highs at the end of November 2021, driven by low warehouse stocks that pointed to tight supply and China's efforts to support its economy that strengthened outlook for demand.

The three-month nickel contract on the LME rose to $21,025/t in the official morning session on 23 November, the highest since 13 May 2014 and a 9.6pc increase from 18 November, when nickel was at $19,187.50/t. The price fell on 26 November to $20,062.50/t, as the discovery of a new highly mutated coronavirus variant shook market sentiment, but direction in the current quarter has been strong, hovering at about and then above the key $20,000/t threshold.

Nickel has been the outlier among the tradeable LME base metal contracts this quarter. From a low of $17,805/t on 5 October, the three-month nickel contract jumped by

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18.08pc to the $21,025/t high it touched this week. In contrast, the three-month aluminium contract has been on a downward trajectory this quarter, falling from a high of $3,199/t on 18 October to a low of $2,521/t on 5 November on low demand, with automakers affected by semiconductor shortages content to limit purchases through to the end of this year.

Nickel has evaded this slowdown in demand. Finland-based stainless steel producer Outokumpu pointed to a long order book for this quarter, despite disruptions in the wider automotive industry and elevated raw materials, energy and consumables prices. Spanish stainless steelmaker Acerinox also mentioned strong demand and a positive backlog despite the global semiconductor shortage.

The three-month copper contract jumped sharply at the start of this quarter to $10,272.50/t on 18 October amid a swift decline in inventories and tightened supply prospects, but it has since fallen back to settle under the $10,000/t mark after the LME moved to impose new rules and regulations on the market.

One of the main drivers for nickel's outperformance of the rest of the base metal sector is the sharp drop in availability as inventories in the LME warehouse system have continued to decline this quarter. Global on-warrant nickel stocks fell by 43.07pc in this period to 59,562t on 26 November, the lowest level since December 2019. On-warrant nickel inventories in LME-registered warehouses have fallen by 70.77pc from 203,778t on 21 April.

On the demand side, China's stainless steel sector has responded strongly to recent moves by the country's authorities to calm concern over economic slowdown. China's State Council has urged local governments to raise special bond sales to boost domestic demand and step up construction projects, in a bid to stall an economic slowdown.

Positive demand signals and easing concerns over the property sector in the world's second-largest economy have also strengthened the outlook for nickel prices. Chengdu, a city in the southwest of China, has reportedly rolled out measures to support property developers by boosting liquidity, ensuring they receive funds from pre-sold properties and fresh loans. The local government is the first to do so, with analysts expecting more to follow, rekindling confidence in the sector.

Overall global nickel availability has also been hampered by disruptions to most large global producers this year. Output at 16 major nickel-producing assets is estimated to be 123,000t behind guidance in 2021, according to analytics firm Cape Noir's managing director, Piers Montgomery. Major assets — including those of top producers Vale, Glencore and Norilsk (Nornickel) — are scheduled to miss 2021 production guidance as set out in their respective fourth-quarter 2020 results.

Montgomery said the disruption to nickel output this year has been a driver for a surge in prices and that the current supply crunch is likely to be a short-term phenomenon that will be alleviated by the large volumes of new refined nickel supply coming on line in Indonesia over the next 18 months.

This view was echoed by Yang Bo, a nickel expert at the Xiangyu Group Research Institute, who said earlier this month that the world's nickel supply and demand growth is likely to be in sync in 2022, given the development of new projects on the nickel production and consumption sides.

The growth in 2022 from the supply and demand sides is expected to be 300,000-350,000t. The supply increase will come mainly from Tsingshan's nickel matte project in Indonesia, Huayou Cobalt's nickel-cobalt mixed hydroxide precipitate (MHP) projects in Indonesia and Ningbo Lygend's Indonesia MHP plant. The new energy battery materials and stainless steel sectors will account for most of the growth in demand.

Adani pushes to first Australian thermal coal shipment

Indian developer Adani remains on track to ship its first coal this month from its 10mn t/yr Carmichael thermal

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coal mine in the Galilee basin in central Queensland, despite protestors targeting train and port infrastructure.

Activists have this week attached themselves to the rail line connecting Carmichael to Abbot Point, blocking early deliveries of coal from the project to the port. Another protestor today scaled one of the two shiploaders at the 50mn t/yr Abbot Point coal export terminal and stopping the loading of a vessel.

Adani subsidiary Bravus began testing and commissioning trains on the rail line a few weeks ago, which includes transporting coal to the port. It is unclear if the coal being loaded at Abbot Point is Carmichael coal, with Bravus only commenting that Carmichael in on track to export coal this year.

Several other coal producers that operate in the northern Bowen basin, ship through Abbot Point, including Switzerland-based mining and trading firm Glencore's 3.5mn t/yr Collinsville and 5.5mn t/yr Newlands coal mines.

The Carmichael mine is the first coal mine to be built in the Galilee basin, which sits to the west of the Bowen basin. It has attracted scepticism, partly because of its distance from a port and the low quality of thermal coal compared with other existing operations and development opportunities in Australia. But Bravus has overcome skills shortages and heavy rainfall to push the project towards completion. Carmichael coal will have a calorific value of around NAR 4,950 kcal/kg, lower than the standard 5,500-6,000 kcal/kg in Australia's Hunter valley and Bowen basin.

Thermal coal prices rebounded last week, having eased from record highs in mid-October but still above long-term averages. Argus last assessed the high-grade 6,000 kcal/kg NAR thermal coal price at $174.80/t fob Newcastle on 26 November, up from $154.38/t on 19 November but down from $251.43/t on 15 October and up from $65/t a year ago. It assessed lower grade 5,500 kcal/kg coal at $99.80/t fob Newcastle for NAR 5,500 kcal/kg on 26 November, up from $95.56/t on 19 November but down from a high of $164/t on 22 October.

The heat-adjusted premium on a NAR 6,000 kcal/kg basis for higher grade thermal coal increased to $65.93/t on 26 November from $36.17/t on 28 October but was down from $79.57/t on 15 October. The spread is still much wider than average and up from as low as $1.65/t last year before China's informal ban on Australian coal took full effect. The higher ash content means that Carmichael coal should attract a greater discount than the NAR 5,500 kcal/kg coal, although it is unclear what marketing agreements are in place for Adani to deliver the coal to India.

India has become the fourth-largest buyer of Australian thermal coal this year, after Beijing initiated its ban. India took 14.33mn t of Australian thermal coal during January-September, up from 3.49mn t in the same period of 2020, according to data from the Australian Bureau of Statistics

Zinc Prices are unlikely to Fall Further amid the Strong Cost Support on the Smelting Side

Focuses of this week include: Q3 GDP annual rate readings, the December ZEW economic prosperity index in the Eurozone; China CPI annual rate in November and the annual rate of M2 money supply in November. On events side, Bank of Canada will issue interest rate resolutions on December 8.

The COVID pandemic is an uncertain factor for LME zinc. It is necessary to pay attention to whether major overseas economies will take lockdown measures; and the measures taken by the Fed should serve as an alert. If the Fed accelerates the tapering of bond purchases, it will suppress zinc prices. On fundamentals, the electricity prices remain as the focus of overseas market.

The comprehensive electricity prices in Europe hit a record high last Monday before falling. Smelters in Europe suffered losses of $100/mt based on the latest electricity price last Friday. LME inventory in Europe fell 1,475 mt to a low of 3,525 mt and the overall LME stocks declined 9,925 mt to 153,350 mt. The overseas market features weak supply and strong demand and LME cash-to-three-month backwardation remained high. The market held bearish sentiment. The support of zinc prices came from rising

costs caused by electricity price hike.

The pressure from continued decline in TCs and rising electricity prices on smelters were increasing. Some smelters in Hunan planned to control their output amid cost pressure. The increase in the output in December is expected to be less than the previous estimate. The market may pay attention to the output data due December 6. On the consumer side, environmental protection warnings in north China came again. Handan and Tangshan have issued warnings of heavy air pollution last week, requiring companies to reduce production. Meanwhile, the transportation has also been affected.

It is reported that enterprises in Fengrun District of Tangshan were required to suspend natural gas-involving production in December. The consumption for galvanised products is expected to be impacted this week. The consumption in east and south China gradually recovered and the operating rates at companies increased slightly. The domestic zinc market is likely to see supply-demand balance in December and zinc prices will be supported by costs. The most-traded SHFE contracts prices are expected to stand at 22,800-23,800 yuan/mt this week, and spot premiums of Shanghai zinc are expected to record 20-50 yuan/mt over the January contract.

Increased focus on infrastructure to support zinc demand: International Zinc Association

Zinc prices have gained on back of production cuts and supply concerns. In an interview to CNBC-TV18, Andrew Green, ED of International Zinc Association said he expects zinc demand to increase substantially given the increased focus on ramping up of infrastructure globally.

China to curb pollution by non-ferrous metals sectors, lead battery facilities

China has proposed stricter limits on heavy metal pollution, targeting the non-ferrous raw materials sectors involved in processing, lead-battery manufacturing and galvanizing.

By 2025, the targeted sectors will have to reduce heavy metal emissions by 5% compared with 2020 levels. The heavy metal pollutants included are lead, mercury, cadmium, chromium, arsenic and thallium, the country's environmental ministry said on Monday November 22. The list of sectors subject to the new heavy metal

pollution targets are: non-ferrous metal mining (including associated minerals), mined material processing (copper, lead, zinc, nickel, cobalt, tin, antimony and mercury), non-ferrous and industrial metal smelting (copper, lead, zinc, nickel, cobalt, tin, antimony and mercury smelting, including secondary smelting), lead-acid battery manufacturing, and electro-galvanizing.

China's exports bring little relief to tight lead market

Image courtesy : Reuters

China exported 15,545 tonnes of refined lead in September, the highest monthly tally since 2007. The country has turned significant net exporter for the first time since 2018.

This export surge was widely expected. China has been sitting on historically high stocks of lead, while supply in the rest of the world has been super-tight.

The London Metal Exchange (LME) lead contract has experienced extreme time-spread turbulence, the cash premium flexing out to $218.50 per tonne at one stage in August, the widest it's been since 1990.

An arbitrage-driven flow of metal from an over-supplied China is the obvious solution to rebalancing the currently polarised global market.

Feature

National Metallurgists Day – Random Thoughts

Dear Fellow Members:

Today (14 November) it is our day, the National Metallurgists Day. Reality : other than our fraternity, no one else knows about this day. While wishing you & your family all the best, let us hope that our metallurgical community grows bigger and stronger in the coming years.

With all the negative and depressing news in the recent past behind, it is time now to look at the future with hopes and renewed optimism. We also need to consolidate our energy and strengths to push the subject of materials, minerals and metals to the centre stage. Why is it that world leaders and national governments talk more often about Climate Change, Ozone Depletion, Sustainability etc. and yet remain silent on emphasizing the important role of metals and materials in our daily lives? Policy planners always take materials and metals for granted, without realizing the ground realities. Today all countries talk about Electric Vehicles using Lithium ion batteries. How many countries, other than ABC triangle countries (Argentina, Bolivia & Chile) are endowed with Lithium deposits? Also

large quantities of recycled Lithium will come back for reuse at the end of life cycle after several decades. Regarding Cobalt, it is not easy to procure this material from a perennial, politically unstable state of Congo. Nickel is another scarce commodity and India is totally import dependent. In sum & substance, metals are prehistoric and there is no life without metals!

Our Institute as well as the Chapters need to be more vibrant & vocal in enhancing the image and benefits of the world of materials. They need to use both the print media as well as the social media widely for outreach, enhanced visibility and creating a better awareness about the aims and objectives of our Institute. Eventually IIM should be as well known as The Institution of Engineers (India), Computer Society of India, Indian Medical Association etc.

Our linkage with the industry - primary, secondary and downstream - is very little & weak. Chapters as well as the Institute need to engage with the industry regularly & actively; we should go out of the way to woo them, for mutual benefits & wealth creation.

Individually we all should guide school - going senior children, may be in your family or those of your friends & relatives, to consider making a career in mining and metallurgy. In fact Chapters should go more often to nearby schools and address Class 9, + 10 students and teachers, conduct quiz programmes on materials, thus creating a liking or passion for this profession.

All of you, I am sure, may be having many such ideas. You should also pen them down and share with other members, Chapters as well as the Institute. More, the merrier! ■

L. Pugazhenthy
Past President, IIM (2008-09) & Executive Director, ILZDA

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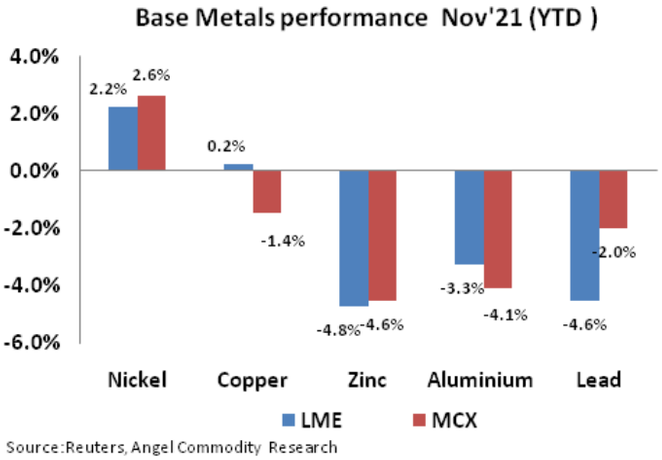
Statistics

Base metals scale lower in November 2021



Base metals Industrial metals have been a favorable investment option in 2021, with most of them giving double figure returns (YTD). Mounting supply uncertainties coinciding with promising demand prospects has led to the solid rally in the industrial metal prices this year.

Aluminium and Zinc have one of the top picks as lowering supply from major producer China has kept the supply market tight in times of booming demand.

The demand for Industrial metals is set to proliferate in the years ahead following the transition away from fossil fuels. A shift towards a clean and green ecology by many nations i.e. towards a low carbon future is going to keep the demand for industrial metals elevated.

However, mounting inflations worries, disruptions in China's property sector, increasing bets towards a potential interest rate hike by the US Federal Reserve and discovery of the new variant of the covid19 virus pressured the Base metal prices in the month gone by.Disruptions in China's property, construction and manufacturing segments (the major consumers of Base metals) pressured market sentiments. Moreover, enforcement of production limitations and power usage curbs hampered the domestic demand for industrial metals in China which further pushed prices lower.

Liquidity concerns reflecting the debt worries in China's property segment and chances of sooner than expected increase in interest rates undermined the outlook for the Base metal complex.

Zinc Prices ease

Zinc prices eased after a solid rally in in early October'21 in line with the fall in most of its peer metals. Zinc slipped lower by 4 percent on the LME and MCX last month

despite disrupted supply amid resumption in global economic activities.

Along with the Limited supply of Zinc from major producer China, production cuts announced by major suppliers like Glencore, Nyrstar and Trafigura kept the Zinc supply chain tight.

Also, the recent power crisis witnessed in major economies pressured smelting capacities around the globe and helped Zinc prices advance to record levels in October'21. Disrupted supply came in line with the resumption in global economic activities which further strengthened market sentiments. Easing pandemic forced restrictions raised expectation of revival in global demand which added to the upside in Industrial metal prices.

However, the rally in Zinc and other industrial metals soon ended reflecting the increasing inflation concerns and China's move to ease power prices. Easing coal prices in China, which is a key component used for powering smelters and other production activities, somewhat took the pressure off the supply chain.Also, slow growth in China's industrial sector further pressured the Base metals.

Increasing energy usage limitations hampered China's steel production which clouded the outlook for Zinc which is majorly used for galvanization.

Supply worries persist

The supply threats for Zinc continue to intensify following reports suggesting a halt in operations at Glencore's zinc sulphide operations in Italy for

Maintenance work. The Zinc plant has an annual capacity of 100,000 tonnes.

Also, the Swedish miner Boliden stated earlier this week that its Tara Mine in Ireland (one of Europe's largest Zinc reserves) had to stop the output activities after large amounts of water enter the mine while drilling of the ventilation shaft. The Mine produced 127,000 tonnes of Zinc concentrate in 2020.

Even the reports from the International Lead and Zinc Study Group (ILZSG) showed that the deficit in the global zinc market deficit climbed up to 44,000 tonnes in September'21 from a deficit of 14,000 tonnes in August'21.

Outlook

While the supply worries from China have eased in the past few weeks; weaker demand prospects from their property sector still remains a considerable headwind for industrial metals.

Moreover, a stronger US Dollar following bets over an early hike in interest rates by the US Federal reserve might further pressure the Base metals complex. Higher interest rates could trim the liquidity in the financial markets. Markets are expected to have a keen eye on the developments in the US economy for cues on FED's upcoming move.

Bleak demand from China, worries over the Omicron virus and bets over a tighter monetary policy might keep Zinc prices under pressure in the coming weeks.

We expect Zinc prices to trade lower towards Rs.260 per kg in a months' time frame. (CMP : Rs.274)

SIAM Statistic

Semiconductor shortage dent Oct PV sales

As per SIAM monthly data for the month of October 2021, sales of passenger vehicles fell to 2,26,353 units in October as compared to 3,10,694 units sold during the corresponding month of 2020.Challenges pertaining to electronic components' availability, coupled with high operating and ownership costs due to rising commodity prices dragged passenger vehicles' sales lower on a year-on-year basis in October. On a sequential basis, October's PV sales were higher than September's level of 1,60,070 units.

Segment-wise, a total of 1,03,829 passenger cars were sold in the domestic market in October, down from 1,82,692 units sold in the like period of 2020.

The sales of other sub-categories such as utility vehicles (UV) and vans also degrew on a year-on-year basis. As per the data, UV sales fell to 1,12,112 units from 1,14,390 units, while the off-take of vans declined to 10,412 units from 13,612 units in the year-ago period.

In terms of two-wheelers, sales were lower in October 2021 at 15,41,621 unit s from 20,53,814 units sold in the like month of 2020.

The overall domestic automobile sectors' off-take representing the sales of passenger vehicles, two-wheelers, three-wheelers and quadricycles fell to 17,9 9,750 units from 23,91,192 units sold during the same period of last year.

However, the data showed a YoY rise in exports. The overall exports, including PVs, two and three-wheelers and quadricycles rose to 456,698 units from 454,637 units during the same period of last year.

"Manufacturers were banking on the festive season to recover from the severe drop in sales they have faced in the early part of financial year 2021-22," said Rajesh Menon, Director General, SIAM.

“However, shortage of semiconductors and steep hike in raw material cost have been a major spoilsport for the industry.”

Commenting on the October 2021 sales data, Mr Rajesh Menon, Director General, SIAM said "The Passenger Vehicles sales in October 2021 were down by (-) 27.15% and Two-Wheelers were down by (-) 24.94% compared to October 2020. Though the numbers of Three-Wheelers in October 2021 sold were more than the previous year, it is still less than half of what was sold in October 2019.

Manufacturers were banking on the festive season to recover from the severe drop in sales they have faced in the early part of the financial year 2021-22. However, shortage of semiconductors and steep hike in raw material cost have been a major spoilsport for the Industry.”

Rajesh Menon, Director General, SIAM

SIAM						
Segment wise Comparative Production, Domestic Sales & Exports data for the month of October 2021						
						(Number of Vehicles)
Category	**Production**		**Domestic Sales**		**Exports**	
Segment/Subsegment	**October**		**October**		**October**	
	2020	**2021**	**2020**	**2021**	**2020**	**2021**
Passenger Vehicles (PVs)*						
Passenger Cars	205,939	126,001	182,692	103,829	29,276	26,639
Utility Vehicles (UVs)	121,547	120,544	114,390	112,112	11,126	12,719
Vans	13,630	10,634	13,612	10,412	126	308
Total Passenger Vehicles (PVs)	**341,116**	**257,179**	**310,694**	**226,353**	**40,528**	**39,666**
Three Wheelers						
Passenger Carrier	60,323	62,419	16,623	22,692	41,909	41,844
Goods Carrier	10,891	10,482	10,061	9,082	761	852
Total Three Wheelers	**71,214**	**72,901**	**26,684**	**31,774**	**42,670**	**42,696**
Two Wheelers						
Scooter/ Scooterettee	620,991	469,375	590,507	467,161	37,280	38,619
Motorcycle/Step-Throughs	1,715,210	1,349,273	1,382,749	1,017,874	332,281	334,781
Mopeds	81,578	64,438	80,268	55,356	1,452	672
Electric Two Wheelers	249	1,310	290	1,230	-	-
Total Two Wheelers	**2,418,028**	**1,884,396**	**2,053,814**	**1,541,621**	**371,013**	**374,072**
Quadricycle	**486**	**269**	**-**	**2**	**426**	**264**
Grand Total of All Categories	**2,830,844**	**2,214,745**	**2,391,192**	**1,799,750**	**454,637**	**456,698**
* BMW, Mercedes, Tata Motors and Volvo Auto data is not available						
Society of Indian Automobile Manufacturers (12/11/2021)						

SIAM						
Summary Report: Cumulative Production, Domestic Sales & Exports data for the period of April-October 2021						
						Report I
						(Number of Vehicles)
Category	**Production**		**Domestic Sales**		**Exports**	
Segment/Subsegment	**April-October**		**April-October**		**April-October**	
	2020-21	**2021-22**	**2020-21**	**2021-22**	**2020-21**	**2021-22**
Passenger Vehicles (PVs)*						
Passenger Cars	780,128	987,848	689,059	784,959	129,785	208,907
Utility Vehicles (UVs)	500,360	881,410	452,221	765,803	65,519	114,240
Vans	46,670	64,678	49,380	63,305	378	1,193
Total Passenger Vehicles (PVs)	**1,327,158**	**1,933,936**	**1,190,660**	**1,614,067**	**195,682**	**324,340**
Three Wheelers						
Passenger Carrier	239,893	377,231	50,087	85,915	192,959	295,202
Goods Carrier	38,752	48,760	36,052	41,280	2,543	5,506
Total Three Wheelers	**278,645**	**425,991**	**86,139**	**127,195**	**195,502**	**300,708**
Two Wheelers						
Scooter/ Scooterettee	2,197,824	2,631,077	2,276,856	2,395,104	103,700	224,080
Motorcycle/Step-Throughs	6,709,296	7,646,846	5,429,605	5,369,358	1,376,215	2,387,679
Mopeds	326,531	303,980	331,434	287,915	3,937	7,534
Electric Two Wheelers	1,051	6,714	993	6,860	-	-
Total Two Wheelers	**9,234,702**	**10,588,617**	**8,038,888**	**8,059,237**	**1,483,852**	**2,619,293**
Quadricycle	**1,391**	**3,286**	**-27**	**8**	**1,411**	**3,593**
Grand Total of All Categories	**10,841,896**	**12,951,830**	**9,315,660**	**9,800,507**	**1,876,447**	**3,247,934**
* BMW, Mercedes, Volvo Auto data is not available and Tata Motors data is available for Apr-Sep only						
Society of Indian Automobile Manufacturers (12/11/2021)						

Statistics

SIAM

Category & Company wise Summary Report for the month of October 2021 and Cumulative for April-October 2021

Report II

(Number of Vehicles)

Category	Production				Domestic Sales				Exports			
Segment/Subsegment	October		April-October		October		April-October		October		April-October	
Manufacturer	2020	2021	2020-21	2021-22	2020	2021	2020-21	2021-22	2020	2021	2020-21	2021-22
Passenger Vehicles (PVs)												
FCA India Automobiles Pvt Ltd	961	1,896	5,182	10,369	832	1,324	2,593	6,827	164	660	3,086	4,052
Force Motors Ltd	276	57	659	72	330	58	668	58	-	-	-	-
Ford India Private Ltd	8,951	NA	49,301	39,337	7,084	NA	24,727	15,818	1,837	NA	27,926	18,022
General Motors India Pvt Ltd	5,639	NA	22,036	-	-	-	-	-	5,075	NA	21,705	-
Honda Cars India Ltd	10,272	8,817	36,305	57,750	10,836	8,108	35,700	47,976	84	1,731	1,098	10,471
Hyundai Motor India Ltd	65,700	42,500	250,750	348,000	56,605	37,021	219,130	279,515	12,230	6,535	44,271	73,529
Isuzu Motors India Pvt Ltd	11	179	44	900	-	58	-	385	-	15	22	111
Kia Motors India Pvt Ltd	23,161	20,419	86,729	131,086	21,021	16,331	67,988	104,714	4,213	4,001	20,837	27,214
Mahindra & Mahindra Ltd	19,203	19,480	70,972	123,009	18,621	20,130	70,096	113,485	796	942	3,471	5,620
Mahindra Electric Mobility Ltd	-	-	5	-	1	-	1	-	-	-	16	-
Maruti Suzuki India Ltd	176,942	130,763	618,464	848,988	163,656	108,991	587,345	702,083	9,462	21,086	41,011	124,708
MG Motor India Pvt Ltd	3,850	3,270	15,524	21,761	3,750	2,863	13,965	21,783	-	-	-	-
Nissan Motor India Pvt Ltd	1,375	6,434	10,468	44,064	1,105	3,913	4,431	22,304	75	3,013	7,251	21,627
PCA Motors Pvt. Ltd	-	37	-	612	-	64	-	548	-	-	-	-
Renault India Pvt Ltd	10,656	8,229	35,713	63,977	11,005	8,910	40,679	53,088	165	659	2,932	13,027
SkodaAuto India Pvt Ltd	1,157	2,188	6,071	13,853	1,421	3,065	5,944	15,412	-	-	12	-
Tata Motors Ltd*	NA	NA	62,517	151,353	NA	NA	70,081	149,525	NA	NA	125	795
Toyota Kirloskar Motor Pvt Ltd	6,600	8,098	24,480	40,709	12,373	12,440	36,937	66,722	-	9	-	62
Volkswagen India Pvt Ltd	6,362	4,812	31,938	38,096	2,054	3,077	10,375	13,824	6,427	1,015	21,919	25,102
Total Passenger Vehicles (PVs)	**341,116**	**257,179**	**1,327,158**	**1,933,936**	**310,694**	**226,353**	**1,190,660**	**1,614,067**	**40,528**	**39,666**	**195,682**	**324,340**
* Only cumulative data is available for Apr-Sep		NA= Not Available										

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Category & Company wise Summary Report for the month of October 2021 and Cumulative for April-October 2021

Report II

(Number of Vehicles)

Category	Production				Domestic Sales				Exports			
Segment/Subsegment	October		April-October		October		April-October		October		April-October	
Manufacturer	2020	2021	2020-21	2021-22	2020	2021	2020-21	2021-22	2020	2021	2020-21	2021-22
Three Wheelers												
Atul Auto Ltd	2,573	2,027	8,346	8,614	2,205	1,945	7,324	7,660	106	196	649	812
Bajaj Auto Ltd	40,174	45,495	166,321	260,709	12,529	19,825	41,230	78,472	28,793	28,221	131,180	187,440
Continental Engines Pvt Ltd	466	746	1,305	1,819	497	608	1,290	1,790	-	-	60	-
Force Motors Ltd	177	405	805	2,165	-	-	-	-	280	476	812	2,100
Mahindra & Mahindra Ltd	3,133	2,824	4,189	14,476	3,118	3,527	4,147	14,312	72	60	278	252
Piaggio Vehicles Pvt Ltd	9,965	7,588	39,328	36,541	7,511	4,804	28,546	20,992	1,640	1,288	8,518	14,343
Scooters India Ltd	-	-	-	-	-	-	11	-	-	-	-	-
TVS Motor Company Ltd	14,726	13,816	58,351	101,667	824	1,065	3,591	3,969	11,779	12,455	54,005	95,761
Total Three Wheelers	**71,214**	**72,901**	**278,645**	**425,991**	**26,684**	**31,774**	**86,139**	**127,195**	**42,670**	**42,696**	**195,502**	**300,708**
Two Wheelers												
Bajaj Auto Ltd	476,082	394,824	1,813,458	2,294,475	268,631	198,738	1,004,806	1,029,438	201,659	192,565	829,878	1,291,085
H-D Motor Company India Pvt Ltd	-	-	1,098	-	12	-	600	-	-	-	921	-
Hero MotoCorp Ltd	804,742	538,228	3,139,510	2,977,734	791,137	527,779	3,103,787	2,834,293	15,711	20,191	82,409	176,806
Honda Motorcycle & Scooter India Pvt Ltd	501,680	393,555	1,901,233	2,266,937	494,459	394,645	1,989,754	2,091,567	32,721	37,584	98,180	212,817
India Kawasaki Motors Pvt Ltd	56	429	515	2,082	138	455	543	2,177	-	-	-	-
India Yamaha Motor Pvt Ltd	87,636	78,192	356,844	423,236	60,176	57,573	274,874	280,883	23,236	24,225	82,974	158,614
Mahindra Two Wheelers Ltd	92	-	240	-	77	-	123	3	-	-	64	-
Piaggio Vehicles Pvt Ltd	10,881	8,586	36,659	49,894	7,629	6,150	25,269	30,724	3,272	848	12,186	18,019
Royal-Enfield (Unit of Eicher Motors)	72,508	54,139	273,088	278,465	62,858	40,611	259,203	250,881	4,033	3,522	15,476	40,319
Suzuki Motorcycle India Pvt Ltd	76,555	67,493	266,213	419,744	67,225	56,785	242,516	351,657	9,640	12,401	26,880	78,779
Triumph Motorcycles India Pvt Ltd	28	75	215	377	92	108	402	702	-	-	-	-
TVS Motor Company Ltd	387,768	348,875	1,445,629	1,875,673	301,380	258,777	1,137,011	1,186,912	80,741	82,736	334,884	642,854
Total Two Wheelers	**2,418,028**	**1,884,396**	**9,234,702**	**10,588,617**	**2,053,814**	**1,541,621**	**8,038,888**	**8,059,237**	**371,013**	**374,072**	**1,483,852**	**2,619,293**
Quadricycle												
Bajaj Auto Ltd	486	269	1,391	3,286	-	2	-27	8	426	264	1,411	3,593
Grand Total of All Categories	**2,830,844**	**2,214,745**	**10,841,896**	**12,951,830**	**2,391,192**	**1,799,750**	**9,315,660**	**9,800,507**	**454,637**	**456,698**	**1,876,447**	**3,247,934**
Society of Indian Automobile Manufacturers (12/11/2021)												

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