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Photos of IIM Delhi Chapter Building

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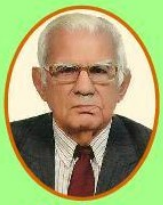

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CHAPTER ACTIVITIES

A meeting of the Executive Committee of the Delhi Chapter was held on 27th November 2021. Various issues relating to the Chapter were discussed in the meeting. One of the important issues relating to the Chapter was holding of MMMM 2022 which is tentatively scheduled to be held in August 2022 at Pragati Maidan, New Delhi.

As esteemed members are aware the Minerals, Metals, Metallurgy and Materials (MMMM) event is a flagship event of our Chapter. This event consists of International Exhibition and Conference in the area of MMMM. This activity is held once every two years. Your Chapter has been holding this activity since 1996. This event is held in collaboration with international exhibition agency.

So far our Chapter has held twelve MMMM events. However, the MMMM 2020 which was scheduled to be held in August 2020 could not be held on account of Covid-19.

Our chapter is now planning to hold MMMM event in August 2022 at Pragati Maidan, New Delhi in collaboration with HYVE (formerly ITEI). It is for information of our members that negotiations are under way to organise next MMMM event.

RECENT DEVELOPMENTS IN CALCIUM TREATMENT IN STEELMAKING: A SOURCE OF TECHNICAL EFFICIENCY AND COST-SAVINGS

Abstract

Developed for more than 30 years, continuously improved, cored wire is nowadays a reliable solution for the improvement of sustainability, safety, health, quality and cost saving. Cored wire allows the addition of ferroalloys and treatment of liquid steel, especially concerning the calcium treatment. Amongst all the processes in secondary metallurgy, calcium treatment is certainly the most critical one before casting. Besides the traditional CaSi and CaFe wires, new types of wire have been designed for becoming the new reference in calcium treatment. PapCal (calcium insulated wire) and HDx (high density calcium wire) are a very versatile range of products. Indeed, according to the steelmaking process parameters (steel grade, treatment temperature, ladle size, calcium content targeted in tundish and even injection conditions), their technical specifications may be adapted in order to optimize the calcium treatment as high as possible.

1 Introduction

Developed for more than 30 years, continuously improved, cored wire is nowadays a reliable solution for the improvement of sustainability, safety, health and doing quality and cost saving. Cored wire allows the addition of ferroalloys and treatment of liquid steel, especially concerning the calcium treatment.

Although the technology may appear pretty simple, the quality of a wire depends on numerous technical process parameters: consistency of powder metric weight, powder blends, lock seaming, and packaging. Initially designed for the addition of CaSi for calcium treatment in secondary metallurgy, cored wire is widely used for any sort of applications and processes (steel de-oxidation, addition and Trimming, machinability improvement, re-nitriding, inclusion shape control) with any kind of chemical elements.

2 Material and Methods

The calcium content in steel is the most common measurement in order to estimate the calcium treatment effectiveness. Calcium content is measured thanks to OES method (Optical Emission Spectroscopy). This method is based on the detection of radiation emitted by the atoms which have been preliminary excited after vaporization made by an arc spark discharge. It is important to note that Ca content measured by OES corresponds to the total Ca content in steel, that is to say the sum, at cast temperature, of dissolved Ca in steel, Ca contained in sulphide and oxide micro inclusions. In first approximation, it can be considered that the higher the total Ca content is, the higher the Ca content in oxide inclusions is. Samples (lollypops) are taken by the steel maker 2 min after calcium injection in the ladle and then in tundish. Ca yield can be then calculated by dividing Ca content measured in steel (in ppm) by added Ca content (length of injected cored wire multiplied by calcium metric weight, divided by tons of steel in ladle) (in g per ton, that is to say in ppm).

3 Results and Discussion

Amongst all the processes in secondary metallurgy, calcium treatment is certainly the most critical one before casting. The number of publications written on this topic in literature sounds as an evidence of this. Those papers deal with numerous domains as various as the phenomena involved in inclusion shape control by calcium, chemical composition, size and density of inclusion population, steel cleanliness as well mechanisms of deposit formation in SEN (Submerged Entry Nozzle). Indeed, castability is directly related to the inclusion population in steel beforehand treated by calcium. In the case of aluminum-killed steels, the endogenous inclusions are alumina Al_2O_3 or spinels Al_2O_3-MgO. Figure 1 shows these alumina inclusions are solid inclusions below casting temperature. This will irredeemably lead to clogging in continuous caster since Al_2O_3 react with SEN refractory. To

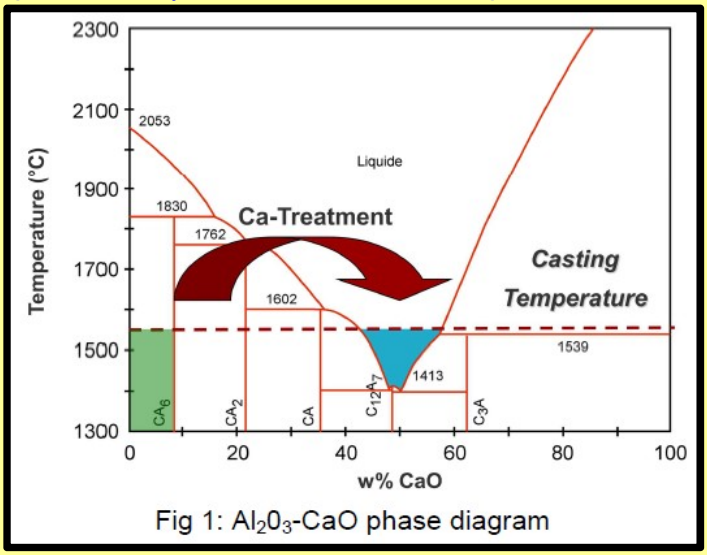

Fig 1: Al_2O_3-CaO phase diagram

avoid any troubles during casting, inclusions must be liquid. Only a small area on phase diagram (Fig. 1) shows liquid inclusions whose chemistry is around $(CaO)_{12}.(Al_2O_3)_7$. Ternary $MgO\text{-}CaO\text{-}Al_2O_3$ diagram shows also in this area that inclusions containing a small MgO content may present a lower melting temperature.

In those conditions, calcium treatment does clearly appear as a tough process to be performed correctly. Indeed, many parameters may drastically impact the calcium treatment such as chemical composition of slag (especially the contents of FeO / MnO which are very reducible oxides), aluminum, silicon, oxygen and sulphur contents in liquid steel, temperature of molten steel and so on. As previously mentioned, lots of studies deal with this topic, but not many of them analyse the ways to add calcium into liquid steel. This may however be a real challenge since calcium does violently react in liquid steel (calcium presents a boiling temperature much lower than molten steel). This study shows the latest improvements made in this domain of secondary metallurgy.

3.1 Best Practices for Calcium Treatment

Except uncommon applications such as addition through a lance, calcium is usually fed into liquid steel thanks to cored wire. The most common products are nowadays CaSi, CaFe or even AlCaFe cored wires which are used according to chemical specifications of steel grades. Indeed, CaFe wires would be, for instance, preferred to CaSi wires because of Si-pick-up prohibited for low Silicon content steel grades. Nevertheless, in order to succeed in a right calcium treatment, a special attention should be paid to the cored wire itself as well the injection conditions of this wire. That's why AFFIVAL does continuously conduct R&D projects on both aspects: calcium-based wires and feeding equipment. Besides the traditional CaSi and CaFe wires, new types of wire have been designed for becoming the new reference in calcium treatment. These new wires, which are obviously patented, show the main feature to be intrinsically composed of a thermal insulation layer. Figure 2 shows a schematic view of such a wire. The insulation layer is sandwiched between two steel strips.

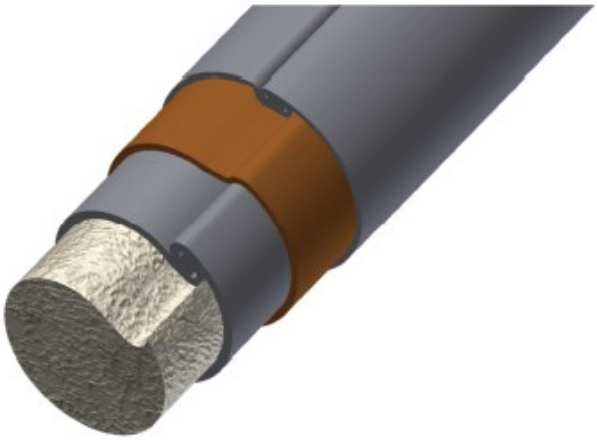

Fig 2: Calcium insulated wire (PapCal®)

Since pure calcium does violently react while fed into liquid steel, the targeted aim is to reduce, as long as possible, the exposure of calcium core to temperature rise. It has been shown that the explosion of calcium reaching its boiling temperature was delayed by one

second (compared to a standard pure calcium wire) in case of a wire made of two steel strips (total thickness about 0.7mm) and an thermal insulation of 0.4mm thick. The wire integrity being extended, calcium is released much more deeply in liquid steel. This does obviously lead to enhance the calcium treatment performances (gaseous calcium bubbles have more time to react with endogenous inclusions).

Core of the wire may be made of traditional calcium granules (compacted in the inner steel strip) or, of an extruded calcium wire. The latter may then wrapped directly by the thermal insulation and the outer steel strip. This kind of wire (HDx) shows very good mechanical properties which allows to improve the conditions of injection. PapCal and HDx are a very versatile range of products. Indeed, according to the steelmaking process parameters (steel grade, treatment temperature, ladle size, calcium content targeted in tundish and even injection conditions), their technical specifications may be adapted in order to optimize the calcium treatment as high as possible. Thereby, numerous specifications are possible with a combination of three following features:

- Calcium metric weight (55, 70 or 85 g/m)
- Number of steel envelops (1 or 2)
- Thickness of steel casing (from 0.5 to 1.1 mm)

All of these wires are composed of a thermal insulation layer. Figure 3 shows metallurgical results obtained with an HDx wire made of one steel strip, 0.6 mm thick, and a calcium metric weight about 70 g/m. Tests have been run on Al-killed and Al/Si-killed steel grades tapped in 160 tons ladles. Standard calcium treatments were respectively performed with CaFe and CaSi wires.

Concerning Al-killed steels, Ca-yield was about 13% with CaFe wire while Ca-yield is about 25% with K0906 (+90% improvement) in the same conditions (minimum Ca content in tundish: 20ppm). In a comparable way for Al/Si-killed steels, CaSi recovery was 23% while K0906 performances are higher than 38% (+65% improvement). Thanks to these metallurgical performances, total treatment costs have been tremendously decreased by 32% although standard wires are reputed to be cheap. Another technical

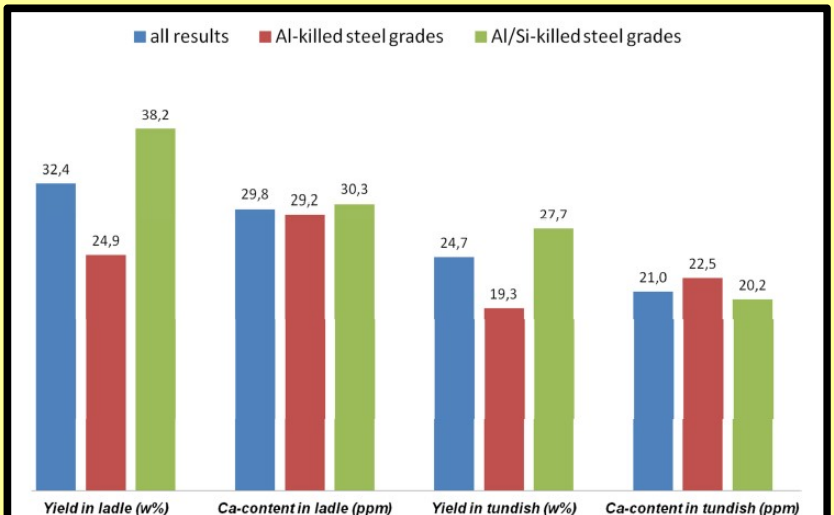

Fig 3: Metallurgical performances of K0906 wire

advance concerns the feeding equipment. AFFIVAL develops the patented concept of Vertical Injection with a new type of feeding machine. Installed right above the ladle, the equipment is able to straight and simultaneously to feed the wire into molten steel. In these conditions, wire overcomes the ferrostatic pressure and calcium is then released very deeply in ladle. A combined use of this equipment with new calcium wires, PapCal or HDx, represents the State-of-the-Art in calcium treatment. Obviously, decreasing the consumption of calcium while steelmaking process is secured with low standard deviation, leads to treatment costs as low as possible for the end-user.

4 Conclusion

A failure in calcium treatment may have catastrophic consequences. It is thereby necessary to secure the process with reliable solutions. Sources of technical efficiency, these new developments do also perfectly fit the approach of Total Cost of Ownership (TCO). Although more expensive than standard products, these new wires PapCal and HDx enable to bring cost-savings to the end-users by reducing drastically the consumptions and securing the steelmaking process.

Source: www.researchgate.net

SAIL EXPLORING CATEGORIES UNDER PLI SCHEME FOR SPECIALTY STEEL: CHAIRPERSON SOMA MONDAL

State-owned SAIL is expected to make investments under the PLI scheme for specialty steel as the steel giant is in process of "examining categories under the scheme." SAIL is evaluating the guidelines of the scheme and would reach a conclusion with respect to investments under it accordingly, company's Chairperson Soma Mondal said.

Replying to an e-mailed query on SAIL's investment plans under the PLI scheme, she said "SAIL is presently in process of examining various categories under the PLI scheme, for feasibility and which may synergize with SAIL's current capabilities...The process of evaluation is ongoing based on the detailed guidelines, it would take some time to crystalize the specific investment plans." Mondal also informed that post identifying product category under the scheme, if required, SAIL's Research & Development Centre for Iron & Steel and the Centre for Engineering and Technology shall work in tandem with steel plants of the company to develop the products using required technologies.

On July 22, the Union Cabinet chaired by Prime Minister Narendra Modi had approved a Rs 6,322-crore PLI scheme to boost production of specialty steel in India, attract additional investment of about Rs 40,000 crore and generate fresh 5.25 lakh job opportunities. On October 22, the scheme was notified by the government and uploaded on the website of Ministry of Steel. Three days later, Steel Minister Ram Chandra Prasad Singh along with Minister of State for Steel Faggan Singh Kulaste called a stakeholders' meet where they informed that applications from parties looking to invest under the scheme will be invited

from the second week of November.

In the meeting organised by the ministry, Singh also asked the stakeholders to submit their concerns with respect to the scheme and said a meeting of empowered group of secretaries (EGS) will be called to address the issues of the companies looking to invest under the scheme. The five categories of specialty steel which have been included in the PLI scheme are coated/plated steel products, high strength/wear resistant steel, specialty rails, alloy steel products, steel wires and electrical steel. Industries like automobile, electrical, defence, pipes etc. are consumers of these grades of steel, and India is importing the same. The government aims to save Rs 33,000 crore forex which goes out of India annually in exchange for import of specialty steel.

When asked about a particular product category which SAIL is looking to develop to attract customers from segments like auto, consumer goods etc., the Chairperson said "as mentioned, the process of examining various categories for feasibility and fit with the company's plans is presently underway. It would only be possible once further courses of action are frozen." She further said making specialty steel is a collaborative process with end-users and transforms the usual supplier-customer relationship into more of a partnership so that steels can be designed and made for specific users/segments.

www.economictimes.indiatimes.com

COMPETITION BETWEEN INDIAN, CHINESE STEEL PLAYERS TO INTENSIFY IN EXPORT MARKETS: ICRA

The competition between Indian and Chinese steel players could intensify at global level, amid subdued steel demand in China, according to ICRA. In China -- the largest steel consuming country -- steelmakers could brace for an extended period of weak demand as the economy goes through the process of rebalancing of an overheated property market, which was a key growth engine driving the country's steel demand for the last two decades, the ratings agency said in its latest report. According to ICRA, in 2020-21, China emerged as the single-largest importer of steel from India. However, with the Chinese steel demand growth waning in the current fiscal, the share of steel exports to China by Indian mills has plummeted to just 8 per cent in the first half of the ongoing fiscal from 30 per cent in the preceding financial year.

"As demand dries up back home, a steadily rising trend in Chinese steel exports suggests that competition in the export markets between Indian and Chinese mills could intensify going forward," it said. The demand has been affected as a few Chinese property developers faced financial issues, and the Chinese property industry accounts for around 15 per cent of global steel demand. To prevent the housing market from overheating and to mitigate broader systemic risks to its economy, the Chinese government introduced the "Three Red Lines", which put in place a mechanism to prevent the piling up of excessive borrowings on the balance sheet of property developers, it said.

Jayanta Roy, Senior Vice-President and Group Head, Corporate Sector Ratings, ICRA, said, directly and indirectly, real estate related activities reportedly contribute around 25-30 per cent to the Chinese GDP and around 30 per cent to the Chinese domestic steel demand.

"Therefore, with the Chinese property sector accounting for around 15% of global steel demand, the ongoing readjustment away from a property driven model of growth in China is likely to have an adverse impact on the steel industry for an extended period. This could signal the start of mean reversion for the commodity, with spreads gradually starting to gravitate towards long-period median levels," he said.

Source: The Economic Times

STEEL PRICES WILL REMAIN VOLATILE BUT UPTREND TO CONTINUE: TATA STEEL MD

There is going to be a structural shift as well in demand and China will no longer be the big driver of demand as it has been for the last 15 years. Other regions are going to certainly pick up the slack and more than make up for it, says TV Narendran, MD, Tata Steel.

- **If I look at the year on year comparison and the realisations, it seems the purple patch for the steel sector continues?**

  Yes, we are in a good place as far as industry is concerned from a demand perspective with multiple governments across the world focussing on infrastructure including our own. Also, costs are on the higher side, given the input cost at record levels. Plus. China despite a bit of a slowdown is not exporting much and cutting production month on month. So overall the sector is in a good place.

- **We have seen a lot of volatility in iron ore prices. So what happens to the steel prices given that the raw material prices are fluctuating so wildly?**

  There is volatility in steel prices. If we look at the steel prices in the last three to four months in Southeast Asia, hot rolled coil prices fluctuated between $850 and $950. It went up and down twice. It seems there is volatility because of raw material prices but even today, the raw material prices are at a high level so coking coal prices for Indian importers are in the $380 to $400 range and for China it is in the $550 to $600 range. When one buys coal at that price, it is very difficult to sell steel at much cheaper prices than is available today. That is the big change.

  Secondly, iron ore prices have dropped but seems to have stabilised around $100; and third point is that because China is cutting steel production every month, it is not going to be exporting a lot of steel. That gives a lot more stability to global trade and steel and hence steel prices have stayed at a higher level than we have seen in the

last 10 years.

- **Can I say that while volatility will continue after the last one year's price appreciation, in terms of a directional trend, steel prices are headed higher?**

  What we have guided for this quarter is for instance, in India prices will be about Rs 2,500 higher than last year and in Europe. it will be about 25 to 30-35 pounds per tonne higher. Also we have long-term contracts both in India and in Europe with segments like the auto industry, where prices are being renegotiated. As auto industry demand picks up, it helps us in the mix. So for multiple reasons, we expect realisations to be trending up for this quarter as well.

- **Finally good news coming from Europe in a sense has been the swing factor. From brokerage reports, our understanding of your number is that the normalisation of demand has helped the European business?**

  In Q1, everyone was disappointed because in Europe, Tata Steel Europe has a larger proportion of long-term contracts and we are a very strong player in both the auto and packaging industry. As a consequence, we were not able to see the benefits of rapidly increasing prices in Q1, but as the contracts got renegotiated as we started getting better prices from the stock market, we could see the improvement. So European EBITDA has doubled in Q2 compared to Q1 and is expected to stay strong for the rest of the year.

- **But for the quarter gone by, would you say the domestic demand was not satisfactory?**

  You mean domestic demand in India?

- **Domestic demand in India -- Tata Steel India business**

  Yes. Normally the July-September quarter is the weakest quarter for demand in any year because in the monsoon time, construction activity slows down and construction accounts for 60% of the steel consumption in the country. This part for us was no different but typically it is a strong quarter for the auto industry. This time, it was not a great quarter for the auto industry because of the semi-conductor crisis for the passenger cars and commercial vehicles were slow to pick up. But in the last few weeks, we are seeing that the commercial vehicles business is picking up and that is good for steel because the steel intensity in commercial vehicles is much higher than in passenger vehicles. Overall we are expecting the next two quarters to be better from a demand perspective in India. Otherwise Q2 demand in India shrunk by about 2.5% compared to Q1.

❖ **Do you think whatever you have lost in Q1 would be more than made up in next two quarters?**

In terms of volume, to a large extent we will make up. We will still be a little bit short because of Q1 but overall, Q3 volumes in India will be flat compared to Q2. In Europe, we will be better than Q2 and in fact Europe Q2 volumes are expected to be closer to the Q1 volumes. Overall for the year, we had given a guidance of much higher volumes than last year. It will be in the 1.5 to 2 million tonnes range.

❖ **The India standalone business now also includes the BSL business. So what happens to the India business post the BSL merger?**

Post BSL merger, the Meramandali site which is the Angul site of Bhushan Steel becomes like another site for us just like Jamshedpur and Kalinganagar. We have a third site and so it becomes an integrated part of the Tata Steel ecosystem which is good in one way because we have just had some amendments in the MMDR Act which means you pay a higher royalty even if it is a wholly owned subsidiary. This way, when you merge it, then it is part of our existing enterprise. In some sense, we will avoid leakage and it also drives greater efficiency from multiple points of view because there are many synergies that we have already driven as different legal entities. There are many efficiencies that we can drive as one enterprise. This was part of the plan. It took us a bit longer than we thought because we had to go through the approval process at the NCLT level.

❖ **Your cash flow generation is still strong and your debt reduction is an ongoing process. But looking at your optimism on the steel cycle and your operating leverage benefits, are you looking at retiring debt at a significantly faster pace than what you had earlier indicated?**

When we started off three-four years back, we said a minimum of a billion dollars a year. Obviously we are doing much better than that. We did much better than that last year and we will do much better than this. We have already done almost $2 billion in the first six months. So we are going quite strong on that. The guidance we are giving is that our net debt to EBITDA will be less than one by the end of the year. We were at four or five levels a few years back. At less than one, we are extremely comfortable.

❖ **Is it a good idea to reduce debt that much because the interest rate environment globally is low. Tata Steel can raise money globally. What stops you from not reducing the debt and start putting that money back in capex?**

We believe we will be able to retire this debt as well as spend Rs 10,000 to 12,000 crore a year on capex and that is what we have guided. We will be very prudent

about our capex. We will continue to support growth. We will continue to grow in India. We are adding another 5 million tonnes in the next couple of years with the Kalinganagar expansion and we have the opportunity to take the India volumes to 35 to 40 million tonnes in the next 10 years.

All that can happen through organic growth. We have that possibility and if we have the net debt to EBITDA at less than one, we will have the headroom for anything else that we want to do. But we are conscious about spending our capital wisely. We will certainly protect our market share and grow aggressively in India. We will be very prudent about how we spend money outside India and we want our businesses outside particularly the European business to be able to stand on its own which we are on track for.

❖ **How should one read into this whole emphasis which Tata Steel has on ESG. ESG has become the new normal for all manufacturing companies but it also will come at a cost which means in the short term, less capacities will get created and will lead to more inflation. It will also lead to more uptick. Where do you think the balancing will happen?**

You have raised a very valid point because obviously there is a hesitation about investing in assets which are not seen as green, which could lead to a demand-supply gap in some areas if we do not manage the transition well. The way we look at it is an approach for Europe which is driven by what is happening in Europe. Europe is ahead of everyone else in the world in terms of setting goals and creating policies to support those goals. In Europe, there is a transition plan which is being developed for our UK and Netherlands business in consultation with the government.

Primarily this transition cost has to be supported by the government and has also to be supported by the customers who should then pay more for green steel. In the European context, the support is there. In India, with the net zero goals and the 2030 goals that have been announced, we are looking at the policy roadmap and how it will evolve because again this transition will cost money and the policy roadmap has to support that so that we are not unfairly treated in this transition.

In India, we have already announced aggressive goals. We have said that our carbon footprint will be less than two. We are already the benchmark in India as far as the carbon footprint for steel industry through the blast furnace route is concerned. We will bring it to less than two tonnes per tonne of steel by 2025 and less than 1.8 tonnes per tonne of steel by 2030. Those are quite aggressive goals and much below where we are today at around 2.3. We have set the short-term goals aggressively and we will pursue that. It is very important and as a responsible corporate we want to be a role model in this.

- **But in the short term, because of limited capacity addition, price inflation is going higher. Whether it is for steel or coke or iron ore, ultimately everybody wants to be conscious and this consciousness is coming at a cost which is leading to disruption. As a result, inflation and price hikes have kicked in. Where do you think the balancing will happen?**

  That is primarily the point which is being made even by the Government of India when it says that the developed world which historically had a much bigger carbon footprint should fund the transition for the developing world. In some sense, the commitment made at Paris was that at least $100 billion a year will be made available to the developing world to help this transition to mitigate some of these costs. Maybe richer countries can afford to bear some of these costs, but in developing countries where a large number of people are still just about getting electricity, one cannot suddenly keep increasing the energy prices because of this. We need to find a way out. So that is why the transition needs to be managed very well. It is not a simple transition and governments have to work closely with industry to make sure that it is not passed on to the common man.

- **ET Now: The Tata Steel management has indicated that Asian steel prices will remain range bound, Indian prices will rise and European steel prices will remain resilient. Can Europe be the swing factor which we have been waiting for? What does the word resilient in Europe mean for you?**

  TV Narendran: There are two, three things in Europe. Over the next few months , the auto industry in Europe will pick up. They have been struggling because of semiconductor issues which is good for us because a lot of our steel goes to the auto industry. The second important development for Europe is the sorting out of section 232 issues with the US, which means steel can flow from Europe to the US in a manner that it used to flow a few years back. Even from a Tata Steel point of view, we used to sell about a million tons of steel from Europe into the US, which has come down about 50% in the last couple of years.

  The US is a good market. We have good customers there, good equity there and so we look forward to that. It will give a better balance for the European business as the US opens up as a market and the auto industry comes back. The resilience comes from the positives that we see. Even this year, the steel consumption in Europe will be 14-15% higher than the previous year and will go back to pre-pandemic levels very quickly.

- **Can a combination of Indian demand coming back along with US infrastructure spend, make up for the drop in Chinese demand?**

  Absolutely. Even the World Steel Association forecast is that steel consumption will

grow at about 4.5% and this is assuming there is no growth in consumption in China. The 4.5% is coming from the rest of the world, which is probably the first time in more than a decade. Going forward, this will be the story because China is going to cut consumption and production and China has already peaked from a percentage of world steel production and consumption.

Its highest was about 58%, it is expected to drop down to maybe 52-53%. So countries like India, Southeast Asia are going to be three billion more in the next few decades. By the end of the century, we will have four billion people in Africa. There are multiple parts of the world which are going to require a lot of infrastructure. There will be a lot of developmental expenses and on top of that, the developed world like the US is announcing infrastructure spend like never before. So, there is going to be a structural shift as well in demand and China will no longer be the big driver of demand as it has been for the last 15 years. Other regions are going to certainly pick up the slack and more than make up for it.

❖ **We have seen a lot of volatility historically in steel prices and that explains why steel stocks still trade at PE multiples in single digit or early teens. It is largely because of the cyclical nature of the industry. Do you see a three, four year period of a predictable steel cycle with minor volatility here or there?**

There will be volatility because of the nature of the industry. It is a global industry. Steel flows across the borders but there will be volatility at a higher band than we have seen in the past. So if we saw volatility earlier in the $300- 500 range, now we will see volatility in the $700-900 range. That is my view because there are these structural changes which have happened and the costs have gone up in multiple ways. So there will be some volatility.

The second thing is that volatility may reduce going forward if China continues to export less because they used to be the biggest factor driving the volatility because of the opaqueness of the markets in China and the impact it had on the global markets. For about 20 years, the volatility increased as China became a bigger and bigger player. As China exports less, makes steel for its own domestic use and insulates itself from the global markets, the industry outside of China will have a more stable future.

❖ **Your view is steel prices will remain volatile but the bias will remain strong. Could high energy costs, high inflation puncture this thesis?**

Ultimately in an industry like this, a few things will happen. If inflation spikes. central banks will increase interest rates, cost of capital may increase and to that extent, expansions may slow down. If expansions slow, that is not going to help bring down steel prices. So to me, there is that part one needs to watch out for. But this time, the

big difference between now and 2008, when steel prices went very high was people were rushing to invest. We are not seeing people rushing to invest in steel, apart from in India. India is the only country adding steel capacity. So there is far more prudent allocation of capital and growth which means that going forward, we will not see the instability that we saw in the last 10 years. So that is why I am a bit more optimistic.

Yes, higher inflation may lead to higher costs, capital would not be any cheaper but in India capital was never cheap. There is an advantage for incumbents who have land and who can grow fast through brown field expansion. India is the only place which is adding capacity. So I think it is a very interesting place in time. I am certainly bullish for the steel industry in India and of course for Tata Steel.

Source: The Economic Times

INDIA'S TOP STEELMAKERS HIKE PRICES BY RS 3,000 - RS 3,500 A TONNE DUE TO RISING COST INFLATION

India's leading steel makers have raised prices of the benchmark hot-rolled coil by up to Rs 3,500 a tonne on the back of rising cost inflation due to soaring coal prices. “This was an expected move by the Industry. The cost inflation is too high. Our fuel costs have gone up by more than 70% yoy and a fall in iron ore price is minimal,” said an executive at one of India’s top steelmakers. The benchmark HRC prices are quoting around Rs 72,500 levels. Industry sources said that JSW Steel, ArcelorMittal Nippon Steel and Jindal Steel and Power have raised prices by around Rs 3,000 - Rs 3,500 a tonne. Other steelmakers are expected to follow suit.

JSW Steel, while announcing its September quarter earnings, said that the company was considering an energy surcharge. “Price increases will happen either through a surcharge or through price hikes in HRC until coking coal prices normalize,” JSW Steel’s joint managing director Seshagiri Rao told ET a few days back. Another steelmaker said that in the short to medium term, the cost impact worldwide on mills will be $200-250/t. “Even if 50% of our cost is passed on to customers, the market is looking at a $100-120/t price increase,” said a top industry official, requesting anonymity.

Global coking coal prices have breached all-time highs. As per data from steel price research firm SteelMint, prices of Australian premium coking coal have jumped to around $430/t on FOB (freight-on-board) levels this week compared to $110-120/t in April'21. Added to this, India’s thermal coal availability has taken a hit, with state-owned Coal India Ltd, prioritizing the coal supply to power sector. Coal India usually loads around 210-230 rakes per day for both power and non-power categories. Around 50-60 rakes per day go for non-power categories and half of those go to steel and aluminium.

Iron ore prices, a significant raw material for the steelmakers, were falling in the past 3 months. However, these have started to move up again. Domestic iron ore in Odisha is up

20% MoM to Rs 7,000/t (63% grade fines). “We might see NMDC’s notified prices also bottoming out. Besides, the latest iron ore e-auction trends are positive, indicating that demand stays firm,” said Edelweiss recently. However, some steelmakers also said that there is a demand push around the corner. “There will be no impact on production. Indian flat steel demand-supply dynamics look robust,” said a steel industry executive. Demand drivers like construction will grow at 6.8% next year and capital goods at 4.5% and the auto sector too will see a rebound, the executive cited above said.

www.economictimes.indiatimes.com

NMDC’S IRON ORE OUTPUT JUMPS 43% TO 21 MT DURING APRIL-OCTOBER

State-owned NMDC has recorded 43 per cent jump in its iron ore output to 21.04 million tonne (MT) during the April-October period of the ongoing fiscal year, according to an official statement. During the period, sales of the country's largest iron ore miner also registered 43 per cent growth to 22.08 MT, the Ministry of Steel said in a statement.

In the same period of preceding 2020-21 financial year, NMDC produced 14.66 MT of iron ore, while sales stood at 15.43 MT. In October 2021, the company's output grew 37 per cent to 3.33 MT from 2.43 MT in the same month in 2020.

The company's sales during the month were at 3.58 MT, higher 42 per cent from 2.52 MT in October last year. "NMDC is continuously outperforming itself with production and sales figures. The monthly output is the highest ever in any October month since inception...on the back of strong domestic demand," the statement said.

NMDC CMD Sumit Deb said, "As India's largest iron ore producer, NMDC's performance is an indication of the prevailing positive market sentiment of the mining and manufacturing sector." NMDC, under the Ministry of Steel, is the country's largest iron ore miner. Besides iron ore, it is involved in the exploration of a wide range of minerals like copper, rock phosphate, lime stone, dolomite and gypsum.

Source: The Economics Times

JSPL HOPES TO CLOCK RS 50,000 CRORE IN SALES IN FY22, AIMS TO CUT DEBT

Naveen Jindal-led Jindal Steel and Power (JSPL) plans to clock around ₹50,000 crore of sales revenue by the end of FY22 with 8 Mt of production. The company also plans to bring down the company's net debt to ₹8,000 crore from a peak of around ₹22,146 crore as of FY21. "Revenue has been going up for us, our business plan is to reach revenue of ₹50,000 crore by the end of FY22 with an output of 8 million tonnes," the company's managing director VR Sharma told ET. Total revenue from operations during the September quarter of FY22 was at₹13,611 crore, up 67% year-on-year (YoY). The company reported an operating

profit (Ebitda) of ₹4,594 crore, up 91% YoY.

"Our target is also to bring down the net debt of JSPL to ₹8,000 crore; the net to Ebitda ratio should be somewhere around 0.45 times," Sharma said. While the demand is stable in the domestic market currently, during the September quarter, there was sluggish demand due to monsoons and a slowdown in construction activity. The auto sector was also hit due to the chip shortage. "Demand is stable now; we were able to maintain a good Ebitda due to exports. However, that was offset slightly by higher coking coal and ferroalloy prices," Sharma said. Global coking coal prices have reached all-time highs. As per data from steel price research firm SteelMint, prices of Australian premium coking coal have jumped to around $430/t on FOB (freight-on-board) levels this week compared to $110-120/t in April 2021.

Added to this, India's thermal coal availability has taken a hit, with state-owned Coal India Ltd prioritizing supplies to the power sector. Iron ore prices, a significant raw material for steelmakers, were falling over the past three months. However, these have started to move up again. Domestic iron ore in Odisha is up 20% MoM to ₹7,000/t (63% grade fines). The company continues to benefit from buoyant export markets as the share of exports in overall volumes increased to more than 40% in 2QFY22 compared to 34% in Q1FY22 (38% in Q2FY21). JSPL recently won the Kasia iron ore mine in Odisha. Kasia Mine has a resource capacity of 278 million tonnes of iron ore and it consists of an average Fe grade of approx. 62.5%. "Kasia iron ore mine will be operational by December and our raw material security is likely to go up by 50% in the next few months with the new mine. For the rest, we have a long-term agreement with Odisha Mining Corporation," Sharma said. The mine is 17 km away from JSPL's Barbil pellet plant. Sharma said that the steel prices are presently at elevated levels due to cost inflation and will come down in the next two to three months. Benchmark HRC prices are around ₹67,000 - 70,000 a tonne.

Source: The Economic Times

LIGHT AND STRONG STEEL FOR CARS

IIT-Madras team develops superior-grade steel alloy

Since the fuel consumption of a vehicle depends on its weight, scientists are constantly trying to develop alloys that are lightweight, yet strong. Prof. Subramanya Sarma Vadlamani, Department of Metallurgical and Materials Engineering, IIT Madras, and his team have developed such a metal alloy. They mixed manganese, carbon, aluminium, silicon, nickel and niobium with steel in a particular ratio. Then they subjected the alloy to melting and thermo-mechanical processing, to produce ultra-fine grains. The team analysed the various properties of this newly developed steel. They found that the steel had a yield strength of around 720 MPa — the amount of stress it can sustain before becoming deformed or changing its shape. The steel had a tensile strength of around 1,350 MPa, which means it can withstand 1,350 MPa of stress before fracturing. The steel was found to stretch or

elongate around 26 per cent at the maximum stress. These attributes, in combination, make the developed steel much superior to the similar grades of steel that have been reported earlier. When coated with zinc, this alloy becomes corrosion-resistant. The team plans to engage with steel and auto industries for the commercial use of their research results.

Source: BusinessLine

AMNS INDIA PLANS TO MAKE HIGH-STRENGTH, COATED STEEL UNDER PLI SCHEME

Steelmaker AMNS India is planning to manufacture speciality steel under the PLI Scheme, its Chief Marketing Officer (CMO) Ranjan Dhar has said.

The Rs 6,322-crore production-linked incentive (PLI) scheme was notified by the government on October 22, 2021. The scheme aims to boost the production of speciality steel in India, attracting fresh investments of about Rs 40,000 crore and generating 5.25 lakh new job opportunities.

The five categories of speciality steel that are included in the PLI scheme are coated/plated steel products, high strength/wear-resistant steel, speciality rails, alloy steel products, steel wires and electrical steel. These grades are being imported for domestic use.

"Yes, we have planned our capacity expansion programme. PLI scheme surely gives a boost and direction to it," he told PTI, replying to a question whether his company is looking to avail the benefits being offered by the government under the scheme.

At this stage, AMNS India is looking at high-strength and coated steel, and may look at expanding to other categories as well, Dhar said.

With the production of these categories of steel that require special technology, the company is looking to capture segments applications in solar, high-end automotive, critical high strength applications like API etc., he said.

On the technology arrangements to produce such special grades of steel, he said the company's new investments are coming loaded with the expertise of parent companies. "There is hardly any technology or product which our parents ArcelorMittal & Nippon Steel don't have. AMNS has a natural advantage in this aspect".

The CMO also said that AMNS India has already stated its vision to expand capacity in India in stages from 14 million tonnes (MT) to 18 MT and 30 MT.

We are not looking at the PLI scheme for the purpose of our position as a steelmaker, but more importantly, to the direction our Capex for the use of our customers in India so that the import dependency is reduced and we export more value-added products as a nation.

Simply put, we are looking at the PLI scheme to cater to the needs of India for its growth towards a USD 5 trillion economy and beyond.

Source: The Economics Times

ALUMINIUM PRICES TO STAY HIGH UNTIL NEXT YEAR, OWING TO HIGH ENERGY COST: GLOBAL ANALYSTS

Price of aluminium will stay high until next year, since smelters have been compelled to cut production due to increased energy costs. Global analysts stated that, the total price of aluminium in 2021 is expected to stand at US$2,450 per tonne and US$2,300 per tonne in 2022, up from US$2,300 per tonne and US$2,100 per tonne in the previous year.

The price of aluminium, which is required for making almost everything from soda cans to aeroplane components, had stabilised after reaching a 13-year high of US$3,221 during the third quarter, due to the supply concerns caused by China's power crunch.

In order to decrease the pressure on the power grid, aluminium smelters in China were asked to limit or stop their production. In addition, worldwide producers were also asked to reduce their production as energy cost covers around 40 percent of the total production cost.

However, a government crackdown in China on coal stockpiling and speculative trading has caused coal prices to fall to levels where power companies can afford to supply energy, eliminating the need for power rationing or limiting power use. As a result of this, aluminium prices have fallen to roughly US$2,686 per tonne and is expected to continue to fall in the coming months as supply pressures relax.

Despite this, Global analysts expect substantial volatility in aluminium pricing as energy consumption limits remain an issue in China's aluminium industry as the winter months approach, as well as in the longer term as the nation pursues its decarbonisation policy. Global analysts predict prices to drop somewhat in 2022, averaging US$2,300 per tonne lower year-over-year, as Global demand growth slows following a strong recovery in 2021. Prices will be supported in 2022 by solid demand fundamentals and ongoing supply issues.

First, through solid industrial activity, the Global economic recovery will continue to support aluminium demand. Outside of China, rebounding construction industry values and increased vehicle manufacturing will boost aluminium demand in 2022 across all major aluminium consumption areas.

According to the Global analysts, investor supply fears will also remain high, because the coup in Guinea can lead to the shortage of raw material bauxite, as well as continue the ongoing tensions between Australia and China and fresh concerns about a Russian aluminium export tax.

Aluminium prices are expected to rise in the next years, reaching an average of $2,200 per tonne by 2025, thanks to a faster move to a green economy and a rebound in the global car sector following Covid-19.

Automakers will continue to increase the amount of aluminium in cars, which will become increasingly vital for light-weighting electric vehicles and extending vehicle range. Global analysts anticipate Chinese output to level off after 2025, helping to reduce the global aluminium surplus by restricting upside growth.

China's smelting capacity is expected to reach its peak in the coming years. The Global analysts does not expect Beijing to extend a cap in the carbon-intensive aluminium smelting capacity to meet its commitment of net-zero emissions by 2060.

Smelting capacity in China is likely to peak in the coming years. Global analysts believes Beijing will not extend a restriction on carbon-intensive aluminium smelting capacity in order to attain its 2060 goal of net-zero emissions. As part of their new Five-Year Plan objectives, Chinese authorities appear to be taking a harsher stance on GHG (greenhouse gas) emissions in the metal industry (2021-2025)

Source: Alcircle

HINDALCO POSTS PAT OF INR 3,417 CRORE IN Q2

The subsidiary of Aditya Birla Group, Hindalco Industries revealed an upsurge of 783% in consolidated net profit to INR 3,417 crore in Q2 FY22 from INR 387 crore in Q2 FY21.

Hindalco's consolidated revenue for Q2 stood at INR 47,665 crore as against INR 31,237 crore in the same phase last year, denoting a rise by 53% Y-o-Y. The Q2 FY22 report unveils EBITDA was INR 8,048 crore, a jump by 56% from INR 5,171 crore in Q2 FY21. However, the consolidated net debt to EBITDA ratio enhanced further to 1.93x on 30 September 2021 compared to 2.59x on 31 March 2021.

Hindalco commented by saying: "The results were driven by an exceptional performance by Novelis and India Business, supported by favourable macros, strategic product mix, higher volumes, and stability in operations."

The world leader in aluminium rolling and recycling, Novelis posted quarterly adjusted EBITDA of $553 million, an upswing by 22% Y-o-Y, driving on the shoulder of higher volumes, favourable product mix and metal benefits.

Novelis attained an adjusted EBITDA per ton of $571 in Q2 FY22, compared to $493 in the previous year, a growth of 16% Y-o-Y.

Hindalco reported revenue of $4.1 billion, an escalation of 38% Y-o-Y, entitled to a rise in shipments, the surge in global aluminium prices and market premiums. The total shipments

of flat-rolled products (FRPs) were recorded at 968 Kt, soared by 5% Y-o-Y, due to the robust demand across end-product markets especially beverage packaging and speciality products, moderately offset by pursued blows in the automobile sector on account of the semiconductor chip shortfall.

The company's Indian aluminium business EBITDA was towering at its best of INR 3,247 crore in Q2 FY22, compared to INR 1,188 crore for Q2 FY21, a shoot up by 173% Y-o-Y, majorly due to favourable macros, upgraded product mix, higher volumes and better operational efficiencies. EBITDA margins attained more than a decade high of 42% and pursued to be among the best in the industry, while revenue was INR 7,812 crore in Q2 FY22 as against INR 4,796 crore in the previous year period.

Metal production of the Indian aluminium business documented production of 322 Kt as against 307 Kt in the corresponding quarter. The sales of aluminium were enhanced by 12% YoY at 338 Kt as against 303 Kt in the existing year.

Satish Pai, Managing Director of Hindalco Industries, said: “Our record-breaking performance this quarter is an affirmation of our fully integrated business model, which powers our performance in both upstream and downstream markets.”

“Our product-rich portfolio strategy continues to deliver results across diverse market scenarios. The recent Ryker copper rod unit acquisition is in keeping with our downstream CAPEX plans announced earlier this year."

Source: Alcircle