ALL INDIA INDUCTION FURNACES ASSOCIATION

AIIFA

NEWSLETTER

Voice of Indian Sustainable Steel Manufacturing Sector

VOL. No. XXIII
ISSUE No. 11, Nov. 2023

What's Inside

AIIFA SECRETARIAT:

504, Pearls Omaxe, Tower-1
Netaji Subhash Place,
Pitampura
Delhi-110034, INDIA
Tel: 011-42725051/27351345
M: 9810410186/9810410815
Email: aaiifa6@gmail.com
Website: www.aaiifa.org
Twitter:
SteelEx_AIIFA
Instagram: steelex_aiifa
Facebook: SteelEx AIIFA
YouTube: AIIFA NEWS

LIFTLINE INDUSTRIES

YOUR ONE-STOP SUPPLIER FOR ALL NEEDS


Sintering Pre Heater

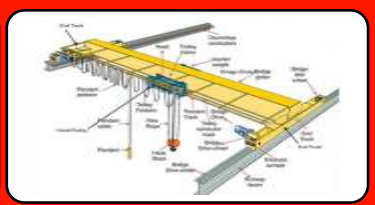
- Sintering Pre Heater
- Ladle Pre Heater
- Tundish Pre Heater

Electromagnet

- Scrap Lifting Circular Electromagnets
- Billet and Bars Lifting Rectangular Electromagnets
- Scrap Lifting Elliptical Electromagnets

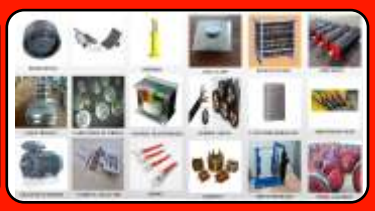

Cable Reeling Drum

- Cable Reeling Drum
- Lining Vibrators
- Electrical Control Panel

EOT Crane

- Single Girder EOT Crane
- Double Girder EOT Crane

Spare Parts & Accessories

- Spare Parts & Accessories of EOT Cranes
- Spare Parts & Accessories For Induction Furnace

Manufacturer & Exporters of EOT Cranes, Scrap Lifting Circular Electromagnets, Billets & Bar Lifting Rectangular Electromagnets, Induction Furnace Electric Sintering Heater, Ladle Electric Pre-Heater, TundishElectric Pre-Heater & All Components and Accessories related to EOT Cranes, Electromagnet & Steel Industries.

LIFTLINE INDUSTRIES

Works Office
Plot No-11, Nichi Mangali, Chandigarh Road,
Ludhiana – 141123, Punjab, India

Phone
+91 7626938310
+91 7626918013
+91 8700055427

Email
liftline8013@gmail.com
info@liftlinecranes.com
sale.liftline@gmail.com

Website
www.liftlinecranes.com

Global scrap market 2023 and its trends with future Business

Yogesh Mandhani
President, AIIFA

Ferrous scrap is an essential raw material, the use of which will allow different countries to achieve their climate goals. There was no increase in consumption in the first half of the year, but all forecasts suggest that the role of ferrous scrap in steel production will only grow in the coming years. At the same time, Ukraine continues to increase scrap exports to Europe, which already has no particular problems in scrap, being the largest scrap exporter in the world.

Global market

Despite the importance of scrap as a raw material, the global ferrous scrap market faced negative trends in the first half of the year.

According to the Bureau of International Recycling (BIR), scrap consumption in all major countries and regions decreased compared to the same period last year. China remains the largest consumer, although even there the use of scrap decreased by 2.9% y/y – to 116.2 million tons.

In addition, global imports of scrap in the first half of the year decreased by 8% y/y – to 27 million tons compared to the same period of 2022. The top three leading countries in scrap imports in

Türkiye – 9.6 million tons (-22% y/y);

Bharat – 5.25 million tons (155%);

USA – 2.5 million tons (6%).

A decrease in consumption and import of scrap is directly related to a decrease in steel production. Thus, global steel production in the first half of the year decreased by 1.1% – to 943.9 million tons, while in different regions the dynamics were even worse: steel production in the EU in January-June fell by 10.9%, and in North America – by 3.5%. The steel market is negatively affected by high credit rates, which slow down business activity, inflation, and currency devaluation in different regions of the world, as well as high energy prices.

European scrap

The European Union is one of the largest consumers of scrap in the world. According to SteelMint, the volume and dynamics of ferrous scrap consumption in the EU were as follows:

2020 – decrease by 10.3%, to 77.5 million tons;

2021 – growth by 14%, to 88.5 million tons;

2022 – decrease by 11%, to 78 million tons.

scrap. In 2022, the EU exported 17.4 million tons of scrap, and in the first half of 2023 – 9 million tons (+4.5% y/y).

There are different views on scrap supply in Europe. EURIC, a specialized European association representing the EU recycling industry, currently sees no risks of scrap shortage for European steel producers.

At the same time, according to the estimates of the Association of Rebar Producers and Exporters (IREPAS), due to the transition of steel producers in Europe to electric arc furnaces (EAF), the EU may turn into a scrap importer in less than 5 years. In 2022, the share of EAF in European steel production was only 43.7%, but its share will grow substantially in the next 3-5 years.

The EU is officially preparing to include scrap in the list of strategic raw materials. The authorities of some European countries are making efforts to protect their market. For example, the Italian authorities have complicated the conditions for exporting scrap, which is now considered a critical raw material, and its export from the country is subject to declaration. Ukraine, as a future member of the EU, needs to take these regulatory factors into account, as they will affect us when we join the EU.

Turkish Factor

Turkiye is one of the world leaders in the consumption (30 million tons in 2022) and import of scrap, which is due to the high share of electric steelmaking capacity in the local steel industry (71.5% in 2022). Turkiye in particular consumes the lion's share of European exports of these raw materials. In 2021, the EU exported 19.1 million tons of scrap, including 13 million tons to Turkiye. In 2022, the same figures were 17.4 million tons and 10.7 million tons respectively.

However, in 2022-2023. Turkiye was reducing its scrap consumption. In January-September 2023, Turkiye's scrap imports fell by 16.4% y/y – to 14.1 million tons, while in 2022, the country reduced its raw material imports by 16.5% y/y – to 20.9 million tons. The decline in imports was due to the fall in domestic and European demand for Turkish flat steel in 2022, as well as unrealized expectations of active demand for steel after the earthquake in February 2023, rising inflation, and devaluation of the lira.

Ukrainian Scrap

Despite the growth of scrap collection in 2023, the collection of raw materials is below the level of consumer demand. According to the UAVtormet association, the volume of scrap collection in Ukraine in January-October 2023 increased by 13.4% compared to the same period of 2022 – up to 993 thousand tons. Domestic consumption for the same period amounted to 797 thousand tons. At the same time, according to the calculations of

Ukrmetallurgprom, in 2023 it is planned to smelt about 6.2 million tons of steel (for 10 months produced 5.2 million tons), for which steelmakers need 1.9 million tons of scrap. In total, Ukrainian scrap collectors forecast the collection in 2023 at the level of 1.25-1.3 million tons, but their forecasts are often overly optimistic, while there is not much time left until the end of the year.

There is a systematic growth in ferrous scrap exports throughout 2023. The dynamics of ferrous scrap exports have been wavy in recent years. According to UAVtormet, scrap exports for 10 months of 2023 amounted to 146.9 thousand tons, which is 3.9 times more than for the same period last year. At the same time, in 2022, exports of raw materials decreased by 11.4 times y/y – to 53.6 thousand tons, and in 2021 – increased by 17.2 times, to 615.7 thousand tons.

The volume of scrap exports in 2023 turned out to be much higher than market expectations. At the beginning of this year, UAV tormet predicted the volume of scrap exports in 2023 at the level of 50-80 thousand tons, and in September this figure rose to 180-200 thousand tons.

The main export destination for Ukrainian scrap is the EU. The largest importers of Ukrainian scrap in January-September were Poland, which received $32.7 million (86.6%), Greece – $2.7 million (7.2%), and Bulgaria – $1.1 million (2.9%). According to Eurostat, in the first half of 2023, scrap exports from Ukraine to the EU amounted to

89.8 thousand tons of raw materials, including 82.2 thousand tons to Poland.

Ukraine's European integration has led to a geographical export collision. The cost of the certificate of origin (EUR.1) for scrap exports to Europe is €3 per ton, while external deliveries to other regions of the world will face a customs duty of €180 per ton. On the one hand, Europe does not depend on Ukrainian scrap and is the largest exporter, but on the other hand, Ukraine will soon become an EU member and the ferrous scrap market will be common within the EU, but with regulation at the country level.

Since the EU is a net exporter of scrap, supplies of similar raw materials from Ukraine do not play a big role for the European market.

UAVtormet believes that Ukraine will be able to export about 500 thousand tons of scrap to Poland from next year. Such a volume of export at the insufficient level of scrap harvesting can lead to a shortage of raw materials in the domestic market and bury the hopes of the European Commission on the greening of Ukrainian steel production. In March 2023, Interpipe Steel's electric steelmaking complex has already briefly suspended operations due to a scrap shortage.

Therefore, steelmakers are in favor of toughening the conditions for exporting scrap to Europe, in particular, for temporary limitation of scrap export and elimination of gray schemes.

The role of scrap in the Ukrainian steel industry will inevitably increase in the conditions of post-war economic recovery. The issue of renewal and modernization of steel capacities will arise in the context of Ukraine's membership in the European Union.European steelmakers are moving towards the construction of electric arc furnaces and direct reduced iron (DRI) plants. Ukrainian steelmakers may also choose this option, as Ukraine has suitable iron ore reserves for DRI production. However, DRI is mixed with scrap in electric arc furnaces, so the availability of scrap will determine the decarbonization possibilities of Ukrainian metallurgy in the long term.

DEMAND OUTLOOK

Scrap is a strategic raw material for achieving carbon neutrality goals by the global steel industry. Steelmakers around the world are now making plans or already implementing projects to increase EAF utilization, so global scrap consumption will increase. It is expected that while the ratio between steelmaking in oxygen converters and electric arc furnaces is now 70/30, it will change to 60/40 by 2030.

More than 300 million tons of scrap per year will be needed to provide additional production at EAF technology during the transition to environmentally friendly steel.

For its part, China plans to increase the use of scrap in steel production to reduce its dependence on imported iron ore and cut carbon emissions. According to MIIT, the PRC could have 100-200 million tons of new EAF capacity by 2030.

POSCO Research Institute estimates that global scrap consumption will reach 778 million tons by 2030, up 15.1% from 2021. For their part, Fact.MR analysts expect the global steel scrap market to grow at an average annual rate of 4.9% and reach 1.05 billion tons by 2033.

The growth in demand for scrap will be observed worldwide, but it will be mainly formed by the increased needs of fast-growing and developing economies, such as China, Bharat (in this country scrap availability problems are already predicted), and others. In particular, scrap consumption in China, the world's largest steel producer, is estimated to grow from 260 million tons in 2022 to more than 350 million tons in 2030.

In many countries, ferrous scrap is already defined as a strategic raw material rather than a waste product. Most countries will focus on domestic consumption rather than exports, which will increase domestic and regional scrap trade and measures to encourage scrap imports by the largest consumers. By contrast, the largest exporters will increasingly restrict scrap exports.

Using scrap for steelmaking in electric arc furnaces is the easiest way to reduce CO2 emissions in the steel industry by utilizing existing production technologies. However, the problem is that globally not enough scrap is collected to fully switch to electric arc steelmaking. Therefore, countries are already beginning to compete for access to scrap and this competition will increase in the future.

And demand will increase for high-quality scrap with minimal harmful impurities. In theory, scrap can be melted into steel an infinite number of times, but in practice, with each such remelting, the content of harmful impurities in scrap increases, which then deteriorates the quality of finished products. Therefore, the prospects of the scrap industry are also related to the development and implementation of technologies for sorting scrap and purifying it from impurities.

The future of the global steel industry directly depends on the state of the scrap industry. On the one hand, steelmakers and scrap collectors are partners. On the other hand, their interests often diverge, so it is important to find a balance between them through government economic policy.

**Source: GMK Center*

Use of Energy Efficient Operating Practices in Stand Alone Rolling Mills

Kamal Aggarwal
Hon. Sec. General, AIIFA

1.0 ABSTRACT:

Iron and steel industries is the one of the largest consumers of energy. Due to steady increase in the input cost, the cost of production has increased many folds. Cost of energy accounts nearly one-third of production cost of steel in India. Hence it is imperative to upgrade the design of equipment/process and the operational parameters in rolling of steels for optimal uses of energy and better quality of product, to survive in present competitive scenario of steel industry. Most attention is required in reheating furnace and mill technology of the rolling mill.

2.0 REHEATING FURNACE:

Reheating furnace plays an essential role in the hot rolling mill production plant. The purpose of a reheating furnace is to provide properly heated billets at the discharge end of the furnace, before they are further processed in the mill. It is therefore desirable to improve the furnace efficiency for saving more energy and have more yields of possible way of improvement is by controlling the reheating process precisely.

The energy optimization in a reheating furnace in rolling becomes essential to reduce the cost of product and to be price competitive. It enhances the profitability and also improves the quality of the product. Optimization of the process parameters for improving productivity and thus reduction of specific heat consumption is the most important and least cost approach for energy saving. The present walking beam furnace has been developed with state of art technology with low specific fuel consumption of 280 Kcal/ton and scale loss limited to 0.6%.

2.1 TYPE OF FURNACE:

Both the basic types of furnaces viz,

a) Batch furnaces: As the name indicates, in batch furnaces, the entire batch of materials (billet/bloom/slabs) is charged and heated to the desired temperature at a time.

b) Continuous furnace: Material is charged from one end and the heated material is discharged from another end.

- **Pusher type.**
- **Walking beam furnace.**

2.2 Purpose of heating metal for rolling is –

1) Softening of metal suitable for rolling.
2) Providing a sufficiently high initial temperature so that rolling process is completed in fully austenitic temperature region.
3) Surface scaling for removal of surface defects.

For the energy efficient rolling practice, the reheating furnace plays a vital role. It not only improves the yield of the product, but improves the mechanical properties of the final product. The modern furnaces are fully computerized to avoid over/under heating for achieving fuel efficiency.

2.3 Problem associated with Heating:

- Achieving the desired minimum temperature consistent with achieving the correct temperature and metallurgical properties at the finishing stand of the mill.
- Minimizing temperature difference between surface and center to a desired level as low as 15oC.
- Minimizing local cold spot (skid mark) due to water cooled skids.
- Avoiding over heating and burning of metal.
- Elimination of scratches on the bottom surface of boom/billet/slab in pusher type furnace.
- Avoiding thermal stresses and cracks.
- Minimizing scale formation, decarburization.

❍ Effect of Sulphur in fuel, which cause severe scaling.

3.0 Operational energy efficient improvement practices in furnace and mill

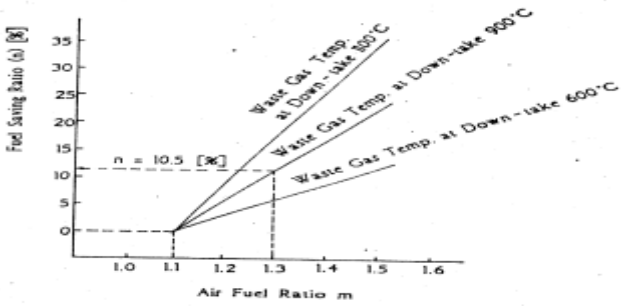
Operational improvement are the most vital factors for fuel saving and improvement in the quality of heating. Any improvement or the modification in the design of furnaces has to be appropriately adopted in the operational practice to gain the benefits. Successful implementation of most of operational improvement depends upon the operating personnel. Such important practice is -

- Optimal operation of combustion system

The basic requirement for good combustion of fuel in reheating furnace is :

- ❍ Complete combustion of fuel
- ❍ Desired flame configuration
- ❍ Minimum oxygen in the outgoing product of combustion
- ❍ No occurrence of overheating of furnace elements
- ❍ Minimum pollution.

The excess air in flue gas should be kept at minimum level. The excess air should be set in such a way that there is no un-burnt fuel in the flue gas. To achieve complete combustion of fuel with minimum excess air, factors such as type of burner, fuel, combustion air pressure and its preheat temperature are very important. The walking beam furnaces have oxygen analyzer to trim and control the oxygen in flue gas. The heat loss is higher at higher excess air resulting in higher fuel consumption. The scale loss is also high at higher excess air. Figure-1 shows the rate of fuel saving against excess air-fuel ratio (m).



- Optimization of thermal regimes

The basic requirement of heating of stock in the reheating furnaces is that the metal should reach the desired level of temperature within the permissible tolerances. It is also necessary to make the metal ready only when it is to be discharged for rolling. Heating the metal much before it reaches discharge end leads to high fuel consumption and scale loss as the stock remains in high temperature zone for a longer period. In case of continuous pusher type or walking beam furnaces, it is necessary to maintain required temperature profiles along the length of the furnace such that the metal will be ready when it reaches the discharge end. In case of batch-operated furnaces, the stock is heated at prescribed rate of rise of temperature (known as RAMP heating mode or step heating mode) with the help of programmable temperature controllers.

- Furnace pressure regimes

The pressure inside the reheating furnace is normally maintained at 0.5 to 1.0 mm WC, to avoid ingression of atmosphere air. This is achieved by operating the chimney damper in auto/computer mode in walking beam. The pressure inside the reheating furnaces is normally maintained positive at skid level in soaking zone. When the furnace pressure exceeds the normal limits, flame shoots out of the doors causing heat loss and damage of furnace walls. More detrimental effect is the loss of combustion air. Thus, both high and low furnace pressure will result in increased fuel consumption.

- Hot charging of material

Hot charging of the material is one of the most efficient fuel saving measures. However, this requires suitable facilities in the shop and good synchronisation of rolling with the feeding mill. In hot charging, the available sensible heat of the stock can reduce the heat requirement in the furnace considerably, thus improving fuel saving. The walking beams furnace have facilities to chose the charging temperature of slabs/billets/blooms and computer accordingly chose the heating curves and set zones temperatures for optimum

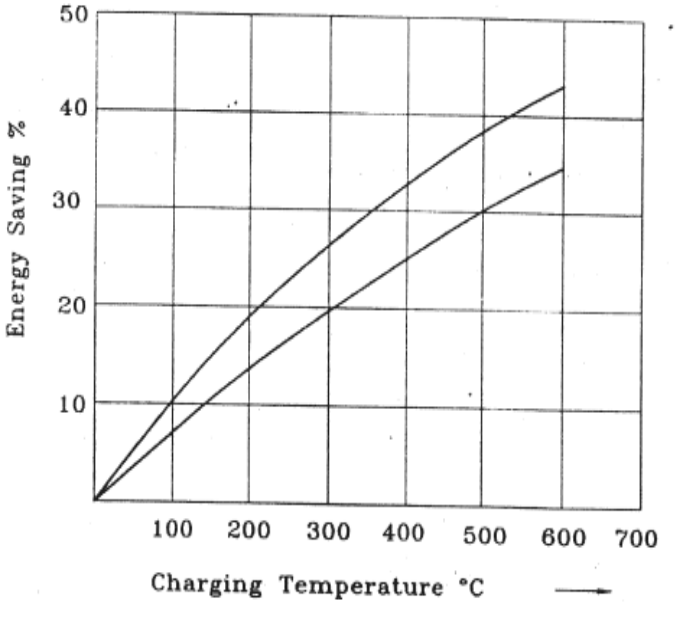


Fig-2 shows the how hot charging makes a furnace energy efficient.

It is important to note that the benefits of hot charging are tangible only when the thermal regimes are adjusted suitably, otherwise only overheating/melting of stock takes place. The regimes can be adjusted only when a considerably number of blooms/slabs are charged continuously. It is practically impossible to work out regimes for hot charging where it is intermittent and temperature of input stock is widely varying. In some plants to supply consistently uniform temperature of stock, hot boxes are used.

- Furnace productivity

Furnace productivity is one of the important factors, which affects the specific fuel consumption in the furnace. There is an optimal level of productivity at which the furnace should be operated to derive maximum thermal efficiency. The under loading of the furnace results in high fuel consumption. To avoid the under loading, it is essential to run minimum numbers of furnaces.

- Hearth Coverage

Optimisation of rolling schedule can increase the hearth coverage of a furnace, leading to increased furnace throughput and reduced energy consumption. However, the potential reduction in energy consumption will depend significantly on design of furnace and the feasibility of improving hearth coverage. Fig-3 shows the effect of hearth coverage on furnace productivity and specific fuel consumption.

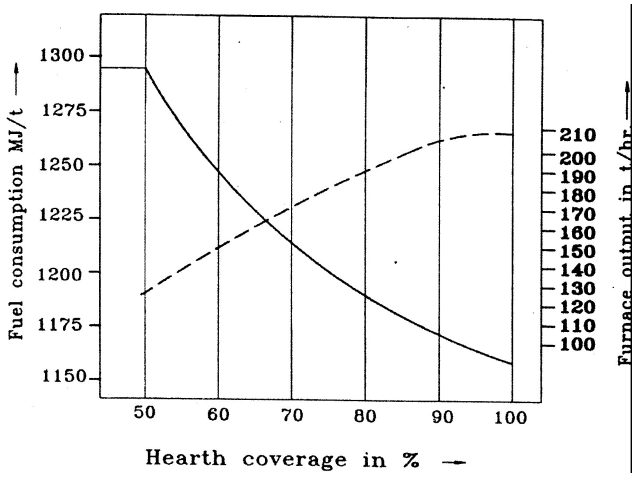


Fig-3 Effect of hearth coverage on furnace productivity and sp. fuel consumption

- Use of Coil Box

During rolling in the finishing stands of the HSM the tail end of the transfer bar will experience a temperature drop. Normally, it is necessary to compensate for this temperature drop by increasing the speed of mill during rolling, which results in increased energy use. The coil box reduces temperature loss and reverses the transfer bar between the roughing and finishing mills thus eliminating the temperature rundown and reducing the electrical energy requirement of mill by ~10%. The use of a coil box also allows lower drop out temperature from the furnace, which would result in a ~5% reduction in fuel saving at the furnace for a 50oC reduction in drop out temperature.

- Unfired preheat Zone

The length of modern walking beam reheating furnaces is in the range of 40-50m and there is 18-20m unfired preheating zone. One of the biggest influences on furnace efficiency is the length of unfired preheat zone. Within this zone, excess energy in the waste gas is transferred to the slab/blooms/billets while still retaining sufficient energy to allow economic preheating of combustion air. In a conventional furnace operating with cold charge slabs/blooms the waste

gas temperature on the entry to the recuperator is in the range of 850 - 1000oC, whilst for a furnace with 20m unfired preheat zone this is reduced to the order of 700oC it means that energy released to the waste gases can be reduced by ~30%, leading to an overall reduction in energy use of ~10%. The benefits of a long unfired preheating zone decreases when the temperature of charged slabs/blooms increases.

- Recovery of waste energy

After the transfer of sensible heat into the slabs/blooms/billets being heated in unfired zone of walking beam, the next largest energy sinks are the sensible heat in cooling water and in waste gas. Efficient furnaces will operate so as to minimise these, after which economic recovery is carried out. Minimizing the losses to cooling water and the waste gas encompasses conventional energy conservation technologies, such as increased levels of skid pipe insulation, as well as standard combustion improvement such as excess air control and combustion air and fuel preheating via recuperator. Of these latter techniques, combustion air preheating is most commonly practiced. The advantages of preheating of combustion air are saving in fuel, increase in flame temperature. Figure-4 shows the rate of fuel saving by preheating of combustion air. Energy recovery from skid system can be used to heat water or to produce steam depending on the necessities of the mill. Fig-4 shows the fuel saving of 20% at the combustion temperature 400oC and the waste gas temperature of 900oC.

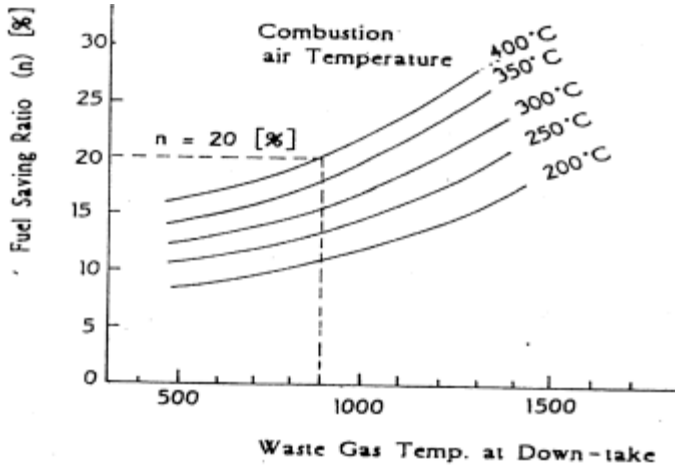


Fig-4 Rate of fuel by preheating combustion air

- Thermal cover of roll table in the mill

Thermal cover along the tables between the roughing and finishing mills will save ~70% of the transfer bar temperature drop, considering a transfer bar thickness of 25mm, a roughing mill exit temperature of 1060oC and a finishing mill entry temperature of 1030oC. As with coil box, thermal cover may also allow lower furnace drop out temperatures.

- Computer/combustion Control model

Computer/combustion control model optimise the sensible heat that slabs/blooms/billets absorbs and can be applied along the full length of a furnace to achieve the desire drop out temperature with minimal fuel use. When firing zones are not fully isolated and, therefore, not subject to individual control, this leads to inefficient fuel use due to uncontrolled flow of waste gas within the furnace atmosphere. Computer models can combine information concerning fuel CV, excess air in furnace atmosphere and firing zone temperatures as well as other parameters such as slab/bloom/billets entry temperature, maximum hearth coverage and mill status etc. The main advantage of process control system is their ability to optimize the ramping of furnace set point temperatures over time during unscheduled delays on mill. Additional advantages include the potential to decrease furnace set point temperatures during periods of low production and the observed reduction in scale build up, resulting from lower mean discharging temperatures, leading to increased yield application of these models can reduce the energy consumption by 3-7%.

- Discharge Temperature

The fuel consumption in a reheating furnace depends not only on the mean discharge temperature, which itself dependant on the size of the slabs/blooms as well as the quality of the steel but also on production time, the schedule downtime and the delay time. Thus, higher discharge temperature will increase fuel consumption, scale formation and reduce furnace

efficiency. Adherence of optimum thermal regimes and delay strategy will ensure optimal discharge temperature resulting in reduction in fuel consumption and scale formation.

Burning and Reheating temperature for different carbon content in steel

Description	Temperature for different carbon content						
Carbon content in percentage	0.1	0.2	0.3	0.5	0.7	0.9	1.1
Burning Temperature in oC	1490	1470	1410	1350	1280	1220	1180
Reheating Temperature in oC	1350	1320	1280	1250	1180	1120	1110

- Using higher mill speed

To save the power consumption, the spare capacity of motors can be utilized to increase the mill speed of rolling. This also saves the specific heat consumption as time taken for rolling cycle will be less and due to higher finishing temperature of the finished product, it will require to have the less discharge temperature.

- Using bigger diameter roll

Roll housing always has a cushion, which can be utilized for bigger diameter roll.

The selection of max./min. diameter vis-a-vis stand size

Type of stand	Dia of pinion	Stand opening Max.	Stand opening Min.	Dia of roll Max.	Dia of roll Min.	Take-off Max.
	mm.	mm.	mm.	mm.	mm.	mm.
Horizontal	500	600	480	535	480	55
Vertical	450	520	380	420	380	40
Horizontal	400	500	380	420	380	40
Horizontal	350	470	340	370	340	30
Vertical	350	460	340	370	340	30

- Running mill concept

Generally, it is seen that at the start of the shift, mill is stopped by the take over shift by operational personnel to know the pass/tackles condition, tightening of the tackles and to know the roll gap, as well as by mechanical staff to know the equipment condition for mill checking, without knowing that furnace is ready to deliver the metal and stoppage at this juncture will affect the furnace health and also causes wastage of the energy. Running mill concept is evolved to avoid such practice and if it not very much required, then these activities can be clubbed during roll/pass changing time.

- Establishing communication system between furnace and mill proper

It is very important for an energy efficient mill to establish a well effective communication system between mill and furnace. Any planned/ emergency stoppage should be communicated at least 30 minutes before to furnace heater to take the appropriate action in time to reduce the intake of gas to the furnace. Like wise delays from finishing, which will cause stoppage of mill should also be communicated in advance to furnace. The advance communication system will help in this regard to achieve the establishment of the effective system.

- Idle running of the mill

Idle running of mill for longer time should be avoided to save the power consumption of the mill.

- Automatic stoppage of mill drives/roll tables

Provision is to be made in the mill for automatic stoppage of the mill drive and roll table if some cobble or incase of interruption in the rolling.

Decarbonising the Indian Steel Sector

P. Mishra
Sr. Executive Director, AIIFA

Steel is one of the core pillars of today's society and one of the most important engineering and construction materials. However, the **steel industry is among the three biggest producers of carbon dioxide**. Consequently, steel players across the globe are increasingly facing a **decarbonisation challenge to reduce its carbon footprint** from both environmental and economic perspectives.

India is currently the world's 2nd largest steel producer after China. Various analyses show potential for a **multi-fold increase in steel consumption by 2050**. Production of steel in India is set to increase significantly over the next few decades, to meet the increasing domestic and international demand.

Decarbonisation of the steel sector has a big role to play in emission of low-carbon India as an essential ingredient for the country's green future.

What is the Current Scenario of India's Steel Sector?

Production Scenario:

- Steel is a key sector for the Indian economy **(responsible for 2% of the country's GDP in FY 21-22).**
- India is the world's **2nd largest producer of crude steel and 2nd largest consumer of finished steel.**
- The **National Steel Policy 2017** has set a target to reach **300 million tonnes (MT) of annual production by 2030** from the existing level of 120 MT.
- As the economy grows, **India's crude steel production is expected to increase to about 435 million tonnes (mt) by 2050.**

Emission Scenario:

- **Direct emissions** (excluding emissions from purchased electricity use) from **iron and steel**
- **Production** stood at approximately **270 million tonnes of CO_2 equivalent ($MTCO_2e$)** in **2018,** comprising approximately **9% of total national** greenhouse gas emissions.
- Steel contributes almost **1/3rd of direct industrial CO_2 emissions, or 10% of India's total energy infrastructure CO_2 emissions** and about **11% of the country's total emissions.**

What is the Significance of Decarbonising Steel Sector?

- In the accelerated transition, **forex savings of approximately $500 billion would accrue by 2050 from reduced spending on coking coal alone.**
- A **greener steel industry** can enable **India to be a global green steel manufacturing hub.**
- Decarbonisation of steel making will also lead to **decarbonisation of allied industries** such as cars, infrastructure and buildings.
- Decarbonising the steel sector is also **important from the perspective of the emerging regulatory landscape internationally;** due to the **EU's upcoming Carbon Border Adjustment Mechanism (CBAM),** Indian steel exports to the EU could fall by as much as 58% without any additional effort to decarbonize steel sectors.

What are the Initiatives to Decarbonise India's Steel Sector?

- The National Green Hydrogen Mission identifies a significant role for **green hydrogen in decarbonising the steel sector** to meet India's climate goals.
- The Ministry of Steel seeks to reduce CO2 in

the steel industry through **promotion of** Green Steel (manufacturing steel without using fossil fuels). This can be done by using low-carbon energy sources such as hydrogen, coal gasification, or electricity instead of the traditional carbon-intensive manufacturing route of coal-fired plants.

- **Steel Scrap Recycling Policy, 2019 enhances the availability of domestically generated scrap to reduce the consumption of coal** in steel making.
- India also joined the UK to co-lead the Industrial Deep Decarbonisation Initiative under the banner of the **Clean Energy Ministerial.** It is expected to **stimulate global demand for low-carbon industrial materials, including steel.**
- **National Solar Mission** launched by MNRE in January 2010 **promotes the use of solar energy and also helps reduce the emission of steel industry.**

What are the Challenges to Decarbonising the Steel Sector?

Challenges in Hydrogen replacing Conventional Ways:

- There are two basic steel production routes: - **Blast Furnace (BF) route,** where **coke is the primary fuel**, and **Direct Reduced Iron (DRI) route**, where the **fuel can be coal or natural gas.**
- India presently produces around 90% of crude steel through the BF and coal based DRI routes. While hydrogen has the potential to fully replace coal or gas in the DRI process, it is seen to have a limited role in being able to substitute coke in the BF route.
- **Hydrogen-based steel-making remains uncompetitive for hydrogen prices above $1/kg,** especially in **absence of a carbon cost for emissions.**

Challenges in Scaling up Net-Zero Technologies:

- **Cost:** Global estimates suggest that the investment for setting up DRI steel plants with upstream green hydrogen generation could reach Rs 3.2 Lakhs/tonne.
- Additionally, the **cost of green hydrogen at Rs 300-400/kg is higher** than the cost of grey hydrogen at Rs 160-220/kg.
- Similarly, **Carbon Capture and Storage (CCS) plants** also have a **high capital cost.**
- **Supporting Infra:** There is an **inadequate support network for the storage,** production, and transportation of hydrogen.
- For CCS, there is a **lack of data on the availability of potential geological storage sites** and their capacities.
- Limited use cases also pose a **challenge in scaling up CCS technology.**

What Steps can be Taken to Decarbonise the Steel Sector?

Introducing CO_2 Pricing and Rapid Development of Hydrogen:

- Introduction and calibration of CO2 pricing in the next few years will **encourage investments in low carbon technologies** and **accelerate adoption of hydrogen-based steel-making.**
- It will also accelerate investment in other green technologies in the steel value chain such as green hydrogen and renewables-based electricity.
- A **carbon price of $50 per tonne of emissions can make green steel competitive by 2030,** even at a hydrogen price of $2/kg, and can catalyse the shift from coal-based to hydrogen-based steel-making.

Policies for Material Efficiency:

- **Scrap-based steel-making has the lowest carbon emissions** of all current commercial steel-making technologies, but is dependent on price and availability of quality scrap to be economic and to achieve scale.
- **India relies on scrap imports**, which will become a challenge in the future as quality scrap demand increases globally for steel-making.
- To **scale up domestic scrap-based steel-making, policies incentivising scrap collection and recycling** would need to be implemented, to set up dismantling, collection and processing centres.

Encourage Green Steel Consumption in End-Use:

- The government is **encouraging the use of green steel**, it shall **set up targets for embodied carbon in public and private construction,** and in automotive uses.
- This will **support creation of a domestic green steel market for domestic steel-makers,** who can initially tap export markets where green steel commands a premium.
- International regulations, such as the **CBAM, can provide further impetus to the private sector to accelerate the transition to green steel.**

Investing in Carbon Capture, Utilisation and Storage (CCUS):

- CCUS is currently an expensive but an important lever for reducing emissions.
- To make it a viable decarbonisation solution for the steel industry, **more R&D efforts are required to reduce capture costs,** besides **creating hubs in steel producing centres like in Odisha and Jharkhand.**

***Source Internet**

PRESS RELEASE

December 4, 2023

Blast furnace operators likely to suffer a sequential 135 bps margin erosion in H2 Fy2024, while secondary producers are likely to see higher margins by 75 bps: ICRA

- ***Domestic long and flat steel prices corrected by 4.7% and 6.7% respectively in the current quarter so far, taking away much of the gains recorded in the first half of the fiscal***
- ***Given the sharper dip in flat product prices, and the recent spike in coking coal consumption costs, blast furnace players will suffer more than secondary mills in terms of profitability***

ICRA expects the operating environment of the domestic steel industry to get more challenging in the second half of the current fiscal as elevated raw material costs and weakening steel prices nibble at profit margins. While domestic hot rolled coil (HRC) prices corrected by 6.7% since early October 2023, rebar prices witnessed a more moderate fall of 4.7% in the same period. According to ICRA's latest steel sector research note (link), the overall industry's operating profit margins in H2 FY2024 are expected to be lower compared to H1 FY2024, largely driven by weaker profitability from the blast furnace operators. On the cost environment, while seaborne coking coal prices have been especially volatile since Q2 FY2024, thermal coal prices have remained more rangebound. Coupled with the higher resilience of long steel prices, the operating profit margins of secondary steelmakers are projected to be higher by ~75 basis points in H2 over H1 of FY2024, even as primary producers, which are primarily blast furnace players, are slated to witness a drop in operating margins by ~135 basis points over the same period.

Commenting on the industry trends, **Mr. Jayanta Roy, Senior Vice-President & Group Head, Corporate Sector Ratings, ICRA** said***: "Due to supply-related constraints in Australia, spot premium hard coking coal cargoes unexpectedly rallied up by 50-55% in a short span of three months, reaching an interim high of US$ 363/MT (fob Australia) in mid-October 2023. While blast furnace operators have been diversifying their coal sourcing by progressively reducing the share of coking coal imports from Australia from 71% in FY2022 to 52% in H1 FY2024, this steep increase in Australian spot prices is forecast to raise their average coking coal consumption costs by an estimated US$ 20-25/MT in H2 FY2024 compared to H1 FY2024."***

On the demand side, powered by the Government's infrastructure-oriented growth model, since the beginning of FY2022, steelmakers have been witnessing the strongest period of consumption growth recorded over the last 15 years. During April to October of the current fiscal, with the Government frontloading infrastructure spending ahead of the upcoming Union Elections, domestic steel consumption growth remained strong at 15.0% year-on-year (YoY). This has helped the steelmakers to optimally sweat their assets, helping lift the industry's capacity utilisation levels to reach a decadal high of 83% in FY2024.

On the trade front, as the external environment remains challenging in most of the large global steel- consuming and producing hubs, India slipped to become a net steel importer for back-to-back four months between July 2023 and October 2023. Since exports play a crucial role on domestic steel prices by balancing supply with demand, this development has been keeping domestic mills on tenterhooks.

Commenting on this trend, **Mr. Roy added: *"Domestic steel prices were at a premium to seaborne prices for most of the first half of the fiscal. However, the correction in domestic prices in the current quarter has brought in greater price-parity with international steel prices now. This somewhat mitigates the risks of a further spike in steel imports in the coming months. That said, with India remaining among the few bright spots in global steel markets at present, as per our analysis, India's current year net finished steel exports is poised to reach the lowest level since FY2019."***

***Steelmakers have been on a capacity expansion spree, with around 38.5 million tonne per annum (mtpa) of new steelmaking capacity being expected to come onstream by FY2027. This rapid pace of fresh capacity creation has been unparalleled. However,* with the commodity upcycle moderating since FY2023, mill cash flows have reduced from their record highs, thus increasing the domestic steelmakers'** *dependence on external financing to meet committed expansion plans. This trend has been visible from the 22.1% and 7.4% growth in the sector's bank borrowings in FY2023 and H1 FY2024. However, given the aggressive deleveraging during the previous upcycle, the industry's leverage (total debt to operating profits) is still expected to remain at a comfortable level of around 2.0-2.5 times in FY2024, against a historic low watermark of 1.1 times in FY2022. Therefore, steel companies remain resilient to withstand a worsening macroeconomic environment, leading ICRA to retain the sector's outlook at Stable.*

Source: ICRA

Steel News

India to see 'healthy growth' in steel demand at 8.6% in 2023: Worldsteel

Date: 17/10/2023

The demand for steel in India is expected to register a 'healthy growth' of 8.6 per cent against the overall global rise of 1.8 per cent in 2023, worldsteel said on Tuesday.

It forecasts that global steel demand will grow 1.8 per cent in 2023 and reach 1,814.5 MT after having contracted by 3.3 per cent in 2022. In 2024, the demand will see an increase of 1.9 per cent to 1,849.1 MT, the World Steel Association (worldsteel) said.

For India, the global body said, "after a growth of 9.3 per cent in 2022, steel demand is expected to show healthy growth of 8.6 per cent in 2023 and 7.7 per cent in 2024." The Indian economy remains stable against the pressure of high interest rate environment, and the steel demand is expected to continue its high growth momentum.

Growth in India's construction sector is driven by government spending on infrastructure and recovery in private investment. Infrastructure investment will also support the capital goods sector growth, worldsteel said in its Short Range Outlook (SRO).

Healthy growth momentum will continue in automotive. The consumer durables sector is the only sector that is underperforming due to higher inflation/interest rates that constrain discretionary spending. However, it will improve in 2024 with festive season spending and progress in the Production Linked Investment (PLI) schemes, it said.

Mximo Vedoya, Chairman of the worldsteel Economics Committee, said, steel demand has been feeling the impact of high inflation and interest rate environment.

Since the second half of 2022, activities of steel using industries have been cooling sharply for most sectors and regions as both investment and consumption weakened. The situation continued into 2023, particularly affecting the EU and the US.

Considering the delayed effect of the tightening monetary policy, the body expects steel demand recovery in 2024 to be slow in advanced economies. Emerging economies are expected to grow faster than developed ones, he said.

"We expect the situation in China's property market will stabilise in the latter part of the year and its steel demand will record slight positive growth thanks to government measures. The 2024 outlook for China remains uncertain depending on the policy directions to tackle the current economic difficulties. We note that the Chinese economy is in a structural transition phase that may add volatility and uncertainty.

"Other uncertainty is linked to regional conflicts and unrest such as in Russia and Ukraine, Israel and Palestine, and elsewhere. This could contribute to rising oil prices and further geo-economic fragmentation, both of which are downside risks," Vedoya said.

It is worth noting that despite the weakening of construction activities due to high-interest rates, infrastructure investment is showing positive momentum in many regions, even in advanced economies, reflecting the effect of decarbonisation efforts, he said.

Source: Business Standard

Steel Authority of India Ltd (SAIL), under the Ministry of Steel, has five integrated and three special steel plants across various locations in the country.

Date: 20/11/2023

State-owned steel maker SAIL has started working on plans to expand its installed capacity by 15 million tonnes (MT) in the first phase, the company's Chairman Amarendu Prakash said.

Its current installed steel-making capacity is about 20 million tonnes per annum (MTPA), Prakash said.

"It has been kicked off. In the first phase, we are expanding it to 35 MT. So, phase 1 is of 15 MT," the chairman said in a reply to a question on SAIL's expansion plans.

On the timeline and investment amount involved in the expansion plan, he said the company is actively working on detailed project reports (DPRs) and sharing any number will be a difficult task at present.

When asked about the funding model, Prakash said SAIL will use its own funds and also seek market support to fund the expansion.

"It (the funding) will be a mix of both internal accruals and market. The steel industry is a huge capex-intensive industry. So, we will be in the market for funds," he noted.

The company will not only expand its installed steel-making capacity but also set up new technologies and develop logistics infrastructure for the movement of raw materials and finished products, the top official said.

Steel Authority of India Ltd (SAIL), under the Ministry of Steel, has five integrated and three special steel plants across various locations in the country.

Source: Metal Junction

SUSHIL'S®

AN ISO 9001 : 2008 CERTIFIED CO.

www.jindaltransformers.com

SUSHIL ELECTRICALS

Works & Office : F-9, Phase-VII, Focal Point, Ludhiana - 141 010 (Pb.) INDIA
Tel. : 0161 - 2676733, 2677822 Mobile :+91 - 98140 - 21233
E-mail : info@jindaltransformers.com, sushilelectricals@yahoo.com

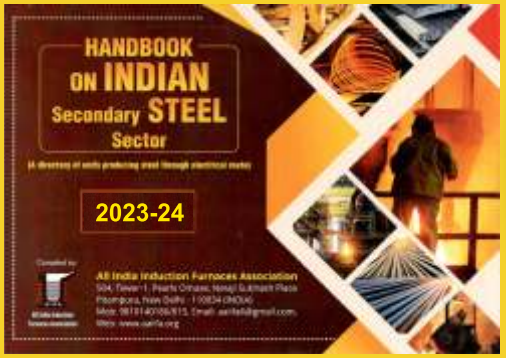
Scrap Lifting Circular Electro Magnet - PLC Controlled

Ladle and Sintering Preheater with Bottom Heater

Automatic Servo Voltage Stabilizer & H.T. Transformer

Heavy Duty Punch Grid Resistance Box

Manufacturer & Exporter of Scrap Lifting Circular Electro Magnet PLC controlled, Heavy Duty Elliptical Electro Magnets, Billets & Bar Lifting Rectangular Electro Magnets, Automatic Servo Voltage Stabilizers, Silicon Power Rectifiers, IGBT Base Rectifiers, Ladle & Sintering Preheater with Bottom Heater, Power & Distribution Transformers and Heavy Duty Punched Grid Resistance Box etc.



NEW!!!
HANDBOOK ON INDIAN SECONDARY STEEL SECTOR
(a directory of units producing steel through electrical route)

Broadly Covered the following Parameters:

Segment covered:	Electric Arc Furnace, Electric Induction Furnace, Rolling & Re-Rolling Mill, Sponge Iron and Ferro Alloy units
Distribution of Units:	State-wise
Details Covered:	Name of Unit, Factory Address, office Address, Director/ Contact Person with Name, Phone, Mobile No., Email Ids etc.,
Additional Information:	Consultants, Equipment Manufacturers, Experts from individual sector

Details of on line payment is given below :

Yes Bank : G.F., D. Mall, Netaji Subhash Place
A/c No. : 018494600000338
IFSC : YESB0000184

Claim your copy today:

Contact:
All India Induction Furnaces Association
504, Tower-1, Pearls Omaxe, Netaji Subhash Place
Pitampura, Delhi - 110034 Mob : 9810410186
Email: aaiifa6@gmail.com; web: www.aaiifa.org

Note: Price of Handbook Rs. 20,000/- exclusive of GST with effect from 1st April 2023

ELECTROTHERM®

"The most preferred Steel Plant maker up to 1 Million Ton / Annum"

Induction Melting Furnace

Ladle Refining Furnace

Continuous Casting Machine

Rolling Mill

Toll free # 1800-257-7400

Total Solution for High Quality Steelmaking through Melting-Refining-Casting-Rolling

State-of-the-art Digital inverter technology through Fibre Optic Communication (DiFOC) system in Power Supply Units up to 40,000 KW coupled with Ultra-efficient furnace up to 80 ton capacity.

40 MW / 80 ton

ERF® (Electrotherm Refining Furnace) with ELdFOS® technology, a special metallurgical equipment for carrying out de-phosphorization and de-sulphurization in the same equipment.

10 ton to 200 ton

- Direct rolling of billets
- Enormous metal saving due to reduced scale loss
- Substantial energy saving
- Reduced material handling
- Improved yield from rolling mill
- Enhanced productivity of plant
- Environment friendly
- Higher profitability

80 mm to 400 mm

- Highly advanced and proven European Technology to maximize production, manufactured in India
- Renowned and acclaimed technical as well as OEM partners
- Wide range of supply from conventional to the most advanced equipment
- Proven competency in efficient handling of green field, brown field or revamping projects
- Higher productivity / yield
- Superior product quality

Compact Mill for Bar & Wire-Rod, Structural and Narrow Strip Mill

Engineering & Technologies

ELECTROTHERM® (INDIA) LIMITED
72, PALODIA, (VIA THALTEJ) AHMEDABAD, GUJARAT- 382 115, INDIA
Phone: + 91 2717- 660 550, Email: mkt@electrotherm.com
Website: www.electrotherment.com