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MARKET RECEARCH ON INDIAN STAINLESS-STEEL INDUSTRY

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ABSTRACT

A comprehensive study of the Indian stainless-steel industry (grade 304 and 316L) and the new opportunities coming to India due to Chinese economic slowdown.

As Indian economy is shifting its focus on manufacturing sector through 'Make in India', steel industry cannot be left in the hands of private players. Though Indian government has taken some steps to make the Indian steel more competitive cost wise and quality wise, those are not sufficient enough to achieve full production capacity. Apart from short term measures like increase in safeguard and anti-dumping duty, long term changes like sufficient supply of raw material of steel at low cost, bringing steel and its alloys in the lower bracket of GST can also be introduced.

Effect of Chinese slowdown in India

For two decades preceding 2010, Chinese economy was growing at more than 7% fuelled bythe manufacturing sector. With plummeting global demand and saturation of per capita income, China's economy has lost the competitive advantage of cheap labor and massproduction.

1. Current Standing

From a position of eighth in 2003, India is currently standing as the world's third largest producer of steel with a production of 91.46 MMT in the latest fiscal and is expected to become the second-largest producer by 2020. The steel sector contributes nearly 2% of the country's GDP and employs over 6 lakh people.

Increased Demand

While steel continues to have a stronghold in traditional sectors such as construction, housing, and ground transportation, special steel is increasingly being used in engineering industries such as power generation, petrochemicals, fertilizers and automobile manufacturing.

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Per-capita Consumption

Currently, the average per capita consumption of steel in India is 60 kg whereas the world over average consumption is 222 kg. This implies that there is huge scope for the growth of steel industry in India as it is anticipated that the domestic consumption shall more than double in the coming decade.

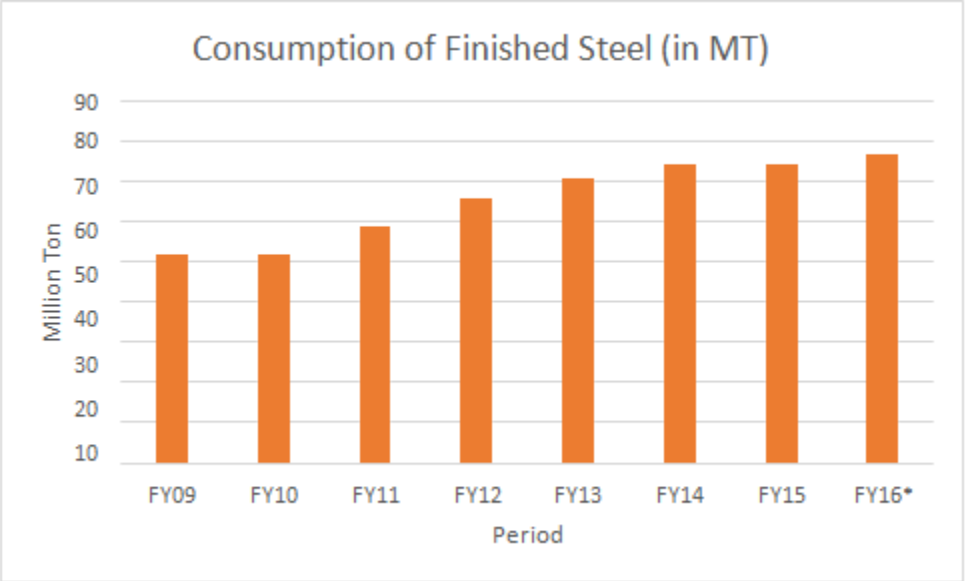

Figure 1: Trend of Domestic Consumption of Finished Steel in India

1.2 Government Initiatives

The government is actively taking up initiatives in support of steel industry. These initiatives not only cover aspects of trade and modernization of Public sector units but also are spread over wide aspects from the improvement of raw material exploration and acquisition, setting up research facilities and improving scrap disposal system.

- 100% FDI:
  The government has allowed 100% FDI through automatic routing system, whereinprior approval from Government or Reserve Bank of India is not required.

- Zero Export Duty:
  Central Board of Excise and Customs has announced zero export duty on some special grades of steel, thus helping Indian players to be competitive in global market.

- Steel Research and Technology Mission of India, SRTMI:

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The government is planning to set up a research institute, SRTMI, in collaboration with existing steel players (both private and public) with an initial investment of Rs.200 Crores.

- National Mineral Exploration policy, NMEP:
  Ministry of Steel has launched NMEP with a view of attaining a comprehensive exploration of resources which would further be used as inputs for steel manufacturing.

- Metal Mandi:
  Ministry of steel in collaboration with Metal Scrap Trade Corporation, MSTC, has launched an e-platform called Metal Mandi under 'Digital India' to improve trade of finished and scrap steel products.

- Mines and Minerals Development and Regulation (MMDR) Act:
  This amendment was passed in view to enabling companies to transfer captive mines which are under lease in a way similar to mines that are won by auction.

2. What makes India lose out the edge against China?

2.1 Economies of scale

With the economic slowdown in the world starting from the US, an economies like China chose to follow the Keynesian model of economics to thwart the effect of the depression and use the times for a better nation building. Real estate was the sector of thrust for the Chinese government which can lead to more jobs and better housing for the poor. Consequently, industries were set up and the impetus was given to steel industries, export of cheap iron ore from countries like India lead to dual benefits. Firstly, procurement of cheap raw materials which were then used by the Chinese companies. Secondly, the selling back of the finished steel cheaply back to these countries led to the killing off any future competition by the Chinese. The building of houses and the continuously growing the world demand led to unprecedented growth in the industry with China now producing half of the World's steel at 881 MT per year.

In India on the other hand, the steel industry has always faced the heat of poor policy and unwillingness on the part of the government to give the sector the leeway to grow is coming back to bite. The industry is still producing one-tenth the production of China despite having the huge iron ore reserves. As per a study, India can start competing with Chinese prices once the production reaches greater than 300 MT.

2.2 Export Impetus

Value Added Tax (VAT) being the only tax levied in the economy is exempted in the case of

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exports to help sustain the Chinese steel retain the cheapest steel tag in the world. It is important for the country to keep selling the steel even if it means incurring losses to themselves and the government to retain the markets.

India can follow the same strategy to allow the steel industries to become competitive at the global level and after GST implemented in 2017 will help streamline the process better eliminating the cascading effect of taxes. There have been recent reports on the degrading quality of Chinese steel and countries like the US have started putting anti-dumping duty to disallow the low-grade steel entering their economy. India can also leverage on this as India has friendlier relations with the US.

2.3 Research & Development

One of the major reasons of China being able to continuously innovate was the education focussed on developing more mining and metallurgical engineers in the recent past. Having expertise helps not only to optimize the current processes but also to bring about the incremental changes in the way work is performed currently.

While in India people after these streams are forced to switch careers after their education and also the attrition rate is high. In these high times, having expertise is not optional anymore. We have the potential to grow at a much higher pace and we need to be suitably equipped to bring about technological revolutions.

2.4 South Korea and Japan catching up soon

In the above points we emphasized the need to ramp up the production process and then reach economies of scale to be able to reduce the prices. If we analyze closely, we don't have fear only from China but also from S. Korea and Japan who are also producing steel cheaply and contributes to 50% of our imports. Free Trade Agreements in order to attain more cooperation is affecting negatively in this case. So, it is of utmost importance that we become competitive at global scale.

Grades of Stainless Steels

Broadly there are 5 different groups of Stainless Steel, namely – Austenitic, Ferritic, Martensitic, Duplex, and Precipitation Hardening. Properties of commonly used Stainless Steel are as following:

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Various Series of Stainless Steel

Series	Major Grades	Ni. (%)	Cr. (%)	Mn. (%)	Cu. (%)	N (%)	Specific Property due to Alloying element
300 Series Austenitic (Cr - Ni)	304/304L 316/316L 321 310 301	6 %- 22 %	16 % - 24 %	2% Maximum	Nil	0.07 % - 0.21 %	➢ Nickel Contents Provide Austenite Structure. ➢ Corrosion resistance. ➢ Toughness, ➢ Ductility and Strength. ➢ Addition of other alloys like Mo. Ti. Makes them useful in extreme environments and they can withstand high temperature.
200 Series Austenitic (Cr - Mn)	201 202 204 Cu JSl Aus(4%) J4 (1%)	0.30 % - 4.50 %	15 % - 19 %	5.50 % - 10.00 %	0.00 % - 4.00 %	0.10 % - 0.25 %	➢ Contents of Nickel is replaced with Manganese, Copper and Nitrogen. ➢ Austenite structure in the absence of Nickel. ➢ Hence it is a cost effective solution and also protects from Nickel Fluctuation.
400 Series Ferritic	409L 430 410 420 439 436	0.75 % Maximum	10.50 % - 19 %	1.00 % Maximum	Nil	0.03 % Maximum	➢ Nickel is almost absent. ➢ Lot of other range of alloying elements are added like Titanium, Niobium. ➢ Makes these steels comfortable in withstanding high temperature. ➢ Presence of Chromium ensures the Non Corrosive nature of these steels.

Global Stainless-Steel Demand

Global SS demand as per region can be seen in the below chart. Needless to say, China has major share with being just little shy of 50%. With production share consistently higher than consumptionshare, China is a consistent exporter of SS in the world, just like many other metals and industries.

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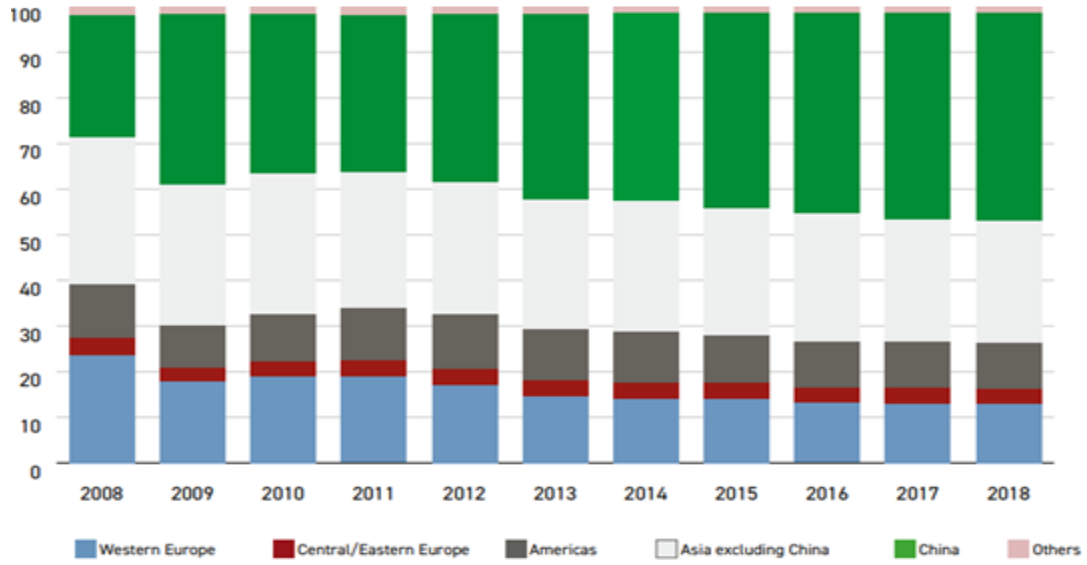
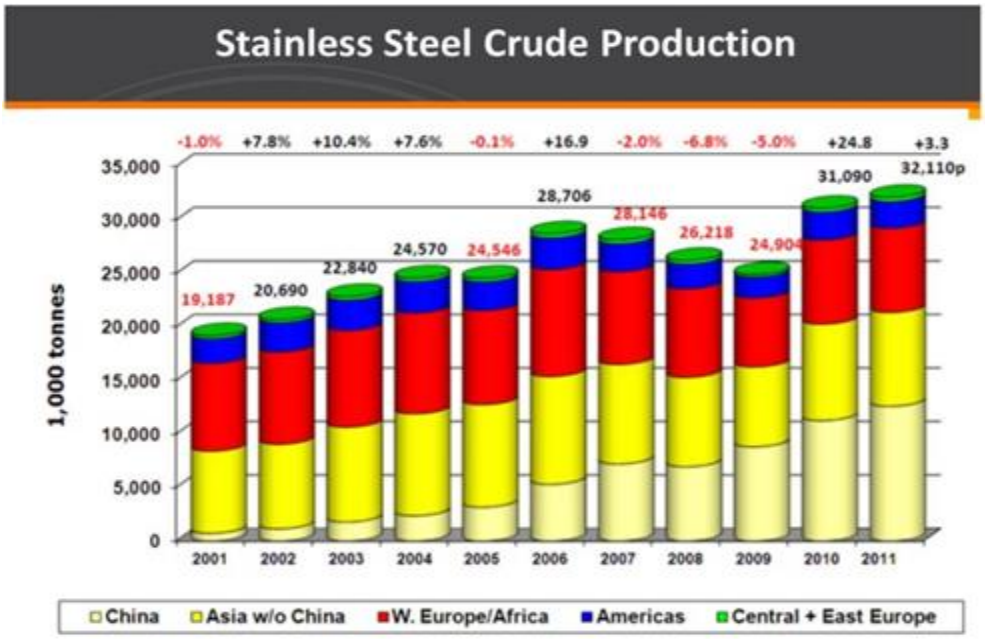


Global stainless-steel production



The consumption pattern of Stainless Steel has changed over last couple of decades. It has not only been increasingly consumed in the existing end user industries, but it has been started to be used in newer industries as well. This is one of the major reasons, it is the metal growing at one ofthe fastest rates since 1980.

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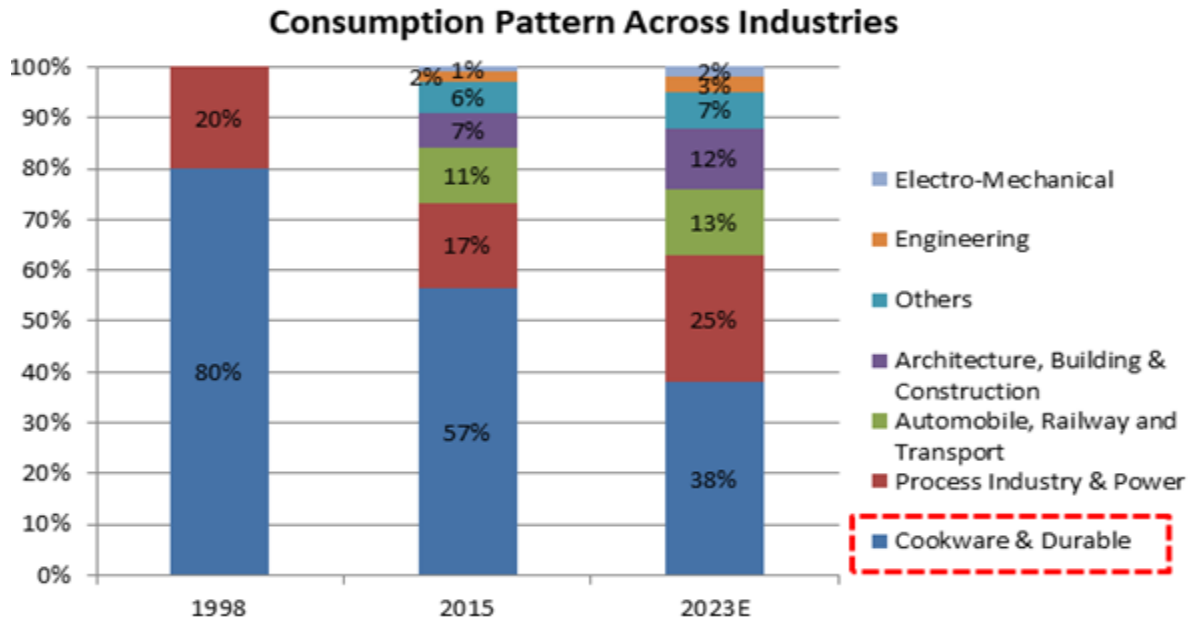

Indian Stainless-Steel Industry Production

India produced 3.92 million metric tons. India registered stainless steel melt production of 3.92 million metric tons in calendar year 2019. This may have been enough to help India continue to keep its second-place ranking — after China — on the list of largest stainless-steel-producing nations of the world for the third consecutive year.

Jindal stainless steel production in the fiscal year 2019-2020

The revenue in financial year 2019-20 remained almost flat at Rs 12,320 crore, JSL said in an exchange filing. The sales volume in 2019-20 stood at 9,15,900 tonnes, rising by 7 per cent, while the stainless-steel production was at 9,73,995 tonnes in the fiscal ended March 31, 2020.

Top Indian stainless-steel companies

1. Tata Steel Ltd

- Total Sales: Rs 1,60,769 Cr.
- Total Capacity: 34 MnTPA.
- Capacity in India: 19.4 MnTPA
- Capacity Overseas: 14.6 MnTPA

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2. JSW Steel Ltd
    - Total Sales: Rs 84,050 Cr.
    - Total Capacity: 18 MnTPA .
3. Steel Authority of India Ltd
    - Total Sales: Rs 57,496 Cr.
    - Total Capacity: 21 MnTPA
4. Essar Steel India Ltd
    - Total Capacity:10 MnTPA
5. Jindal Steel & Power Ltd
    - Total Sales: Rs 39,652 Cr.
    - Total Capacity: 11 MnTPA.
    - Capacity in India: 8.6 MnTPA.
    - Capacity in Oman: 2.4 MnTPA.
6. Rashtriya Ispat Nigam Ltd. (RINL)
    - Total Sales: Rs.20844 crore
    - Total Capacity: 7.3 MnTPA.
7. Electrosteel Ltd.
    - Total Capacity: 7.3 MnTPA
8. Jindal Stainless Ltd
    - Total Capacity: 0.8 MnTPA
9. Jindal Stainless (Hisar) Ltd
    - Total Capacity: 0.7 MnTPA

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India's imports and exports

In India there are basically only three big importers of Nickel, like Jindal, BRG and Salem.

As the standards specify 4% and 8% Nickel respectively in 202 and 304 Grade of SS (most commonly used SS variations in daily life). In India JT grade is effective having much lower nickel percentage (as low as 0.2%).

So, all the tube manufacturers (ERW type of pipes, 95 % of the SS sections are ERW sections) purchase SS CR coils from very limited source, there are individual coil and sheetmanufacturing units. The stringent monopolistic nature of Indian HR coils market has resulted Chinese Coils flushed in. Today more than 80% of the 2nd Grade Pipe Manufacturers are using Imported SS CR Coils, having very low Nickel Percentage. Even pipes and sections are being Imported from China.

There are two major process of pipe/tube manufacturing, viz. TIG type and HF Type. The later has better production capacity.

India's stainless-steel production and Consumption

India registered a total stainless-steel melt production of 3.92 MT in CY2019, witnessing an increase of 5% year-on-year, as per the latest figures released by International Stainless-Steel Forum (ISSF), the Brussels-based body of World Steel Association. While India retained its spot for the second largest stainless steel producing nation in the world after China, for the third consecutive year, growth in production has slowed down to 5% as compared to 7-8% achieved in previous years. The global stainless steel melt production in CY2019 was recorded at 52.5 MT, registering an increase of 2.9% year-on-year as per latest data released by ISSF. For CY2019, China's production figure accounted for more than 50% of the global stainless-steel production and stood at 29.4 MT. in stainless steel consumption growing at 8-9% CAGR in the country. However, this demand is increasingly being captured by imports, with 20-25% of the flat product market relying on imports. The current pandemic situation, wherein our manufacturing is locked down but other major producing countries continue to operate and build inventories, is worrisome. There are trade sanctions in Europe and elsewhere to protect markets and the Indian Government must take prompt action to safeguard our interest and save livelihoods at this critical time."

Companies in India that Manufacture Stainless steel

1. TUBEWELL

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Tube Well is offering Stainless Steel Capillary Tube Suppliers are in small bore sizes and precise thickness are available as per the requirements of clients. It & is widely used in instrumentation Industries. SS 304 capillary tubes and 316 Stainless Steel Capillary Tubing areavailable in precise cut to lengths are also highly effective in a wide range of temperatures. SSCapillary Tubing are the preferred choice for most applications due to greater corrosion resistance and precision. Stainless steel 316 capillary tubing is generally used for high pressureapplications.

SS 316L CAPILLARY TUBE SS 304 CAPILLARY TUBE

They offer Stainless Steel Seamless Capillary Tubing that are mostly used for Hydraulic control lines, Liquid/ Gas Transportation Lines, Medical devices and equipment's, Chromatography applications, Measurement devices, Remote thermometer systems Small precision stainless steel antenna, Watches, Car antenna tube, Laser engraving equipment etc. SS Capillary Tubes includes grades Stainless Steel 304 Capillary Tube, Stainless Steel 304L Capillary Tube, Stainless Steel 316 Capillary Tube, Stainless steel 316L Capillary Tube and Stainless Steel 201 Capillary Tube those are used in various industrial applications. TubeWell is one of the reputed exporters of Stainless-Steel Capillary Tubing in countries like Malaysia, Philippines, Zimbabwe, Brisbane, UK, South Africa, Australia, UAE and Sydney.

They specialise in the supply of high quality seamless capillary tubing in stainless steel 304 and 316 grades which are highly resistant to corrosion. SS Capillary Tubes sizes range from 0.30 mm to 8.00 mm. They can be availed in thin, standard or heavy wall. Stainless Steel Capillary Tubing diameters of refrigerant capillary tubes range from 0.30 mm to 31.75 mm O.D. And 0.06 mm to 1.65 mm thickness and the length ranges from 1.0 mm to 6.0 mm. Tube Well is PED approved manufacturer & Govt. of India recognized Export House and an ISO 9001: 2008 accredited company. Their offered Stainless Steel 304 Capillary Tubes are cleaned, polished, passivated and are ready for immediate use. Also, well-known SS 304 capillary tubes and Stainless-Steel Capillary Tube Manufacturer in India. Buy 316 SS Capillary Tubing at affordable price in India from us as compare to market price in cities of India such as Aurangabad, Gurgaon, Indore, Khopoli, Kolhapur, Jaipur, Kolkata, Ahmedabad (Gujarat), Faridabad, Nagpur, Raipur.

2.. KAMAL STEEL

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KAMAL STEEL is one of the reputed manufacturers, supplier & exporter of Stainless-Steel Capillary Tube. They specialize in the supply of high quality Seamless Capillary Tubing in stainless steel 316 and 304 grades which are highly resistant to corrosion. 316 SS Capillary Tubing is the preferred choice for most applications due to greater corrosion resistance and precision. We ensure the highest surface quality in all of our SS Capillary Tubing. They also offer 304l stainless steel capillary tube Tubes are polished, cleaned, passivated and are ready for immediate use. We are also well known 316 SS Capillary Tubing Tube Manufacturer in India.

They offer Stainless Steel 304L Capillary Tube in small bore sizes and precise thickness are available as per the requirements of clients. Stainless Steel Capillary Tubes sizes range from 0.30 mm to 8.00 mm. They can be availed in standard or heavy wall. Stainless Steel 316 Capillary Tube diameters of refrigerant capillary tubes range from 0.30 mm to 31.75 mm O.D. And 0.06 mm to 1.65 mm thickness and the length ranges from 1.0 mm to 6.0 mm. It is widely used in instrumentation Industries. Stainless Steel 304 capillary tubes and Stainless Steel 316 capillary tubes are available in precise cut to lengths are also highly effective in a wide range of temperatures. SS 304 capillary tubing is widely used for high-pressure applications.

Their offered SS capillary tubes are mostly used for Liquid/ Gas Transportation Lines, Hydraulic control lines, Medical devices and equipment's, Chromatography applications, Measurement devices, Remote thermometer systems Small precision stainless steel antenna, Watches, Car antenna tube, Laser engraving equipment, etc.

SS Capillary Tube includes grades SS 304 Capillary Tube, SS 304L Capillary Tube, Stainless Steel 316 Capillary Tube, Stainless steel 316L Capillary Tube and Stainless Steel 201 Capillary Tube those are used in various industrial applications. Rashtriya Ispat Nigam Ltd (RINL)

3. Rashtriya Ispat Nigam Ltd (RINL)

Rashtriya Ispat Nigam Ltd (RINL), which operates the Vizag Steel Plant, has said its export sales went up 16 per cent to Rs 865 crore in 2014-15, even as the company faced a sharp rise in imports of long steel products from China which severely affected its performance during the year.

Speaking at the 33rd Annual General Meeting of the company in Visakhapatnam on Tuesday. P Madhusudan, CMD, RINL who chaired the meeting, said the imports of steel from China increased considerably during the second half of the fiscal, impacting product price realisations. Imports from China was up 202 per cent during the year in the non-flat category (longs). RINL being an exclusive longs steel producer, was severely affected with the margins and profits declining sharply in H2FY15.

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However, the company managed to register a turnover of Rs 11,665 crore with a net profit of Rs 62 crore during 2014-15. In volume terms, RINL registered a growth of 3 per cent in crude steel production despite the operations of the plant being badly hit by the Hudhud Cyclone in October '14. After Hudhud, the plant operations could be normalised in the quickest possible time and RINL managed to restore the growth momentum between December2014 and March 2015.

RINL also completed a number of projects like expansion in capacity to 6.3 million tonne per annum (mtpa), modernization of one of the Blast Furnaces (BF-1), completion of 20.6 MW Waste Heat Recovery Power Generation Unit of Sinter Machine, the first of its kind in the country.

Location

The steel plant is in the southern part of Visakhapatnam city, Andhra Pradesh state of India.

The company has blast furnace grade Limestone captive mine at Jaggayyapeta (Krishna District), a captive mine for Dolomite at Madharam (Khammam), a manganese ore captive mine at Cheepurupalli (Vizianagaram). It also has a mining lease for river sand on the river Champavathi.

Operations

RINL operates a 7.3 million tonne per annum capacity steel plant in Visakhapatnam. During the initial periods, the company suffered huge losses. Later the profits have gone up by 200% making it the only steel industry to achieve such a target. Its annual capacity is expected to reach almost 7.5 million tonnes by 2020. RINL plans to invest ₹60,000 crore (US$8.4 billion) to increase the capacity to 20 million tonnes by 2027.

RINL has successfully commissioned its next phase despite some major setbacks with blasts in its new blast furnace. Another unit of RINL is coming in Uttar Pradesh. With an investment of 1688 Crores, RINL is establishing a plant for Rail wheels under make in India initiative. This plant will be equipped with ultra-modern technology. It will produce 1 lakh wheels per year.

4. Sagar Prakash Alloys

Sagar Prakash Alloys is brand of Sagar Metals established in 1972 and promoted by Mr.A.S. Mehta with over 48 years of experience in Industrial Solution Provider having stock of Many Reputed Mill from USA, Europe, Japan and India. We are an ISO 9001:2015 Certified Company engaged in manufacturing, supplying and exporting superior quality products like Fasteners, Bars, Circles, Forgings, Pipe Fittings, Flanges, Pipes, Tubes, etc. in various ferrous and non-

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ferrous materials like Stainless Steel, Duplex and Super Duplex Steel, Nickel Alloy, Monel, Inconel, Hastelloy, Titanium, Aluminium, Copper, etc.

From basic to complex, our products are supplied to a wide range of industries, including Off-Shore Oil Drilling Companies, Power Generation, Petrochemical Industries, Gas Processing, Specialty Chemicals, Chemical Equipment, Sea Water Equipment, Pulp and Paper Industry, Food Processing Industry, and many more.

We purchase raw materials from approved manufacturers and suppliers In addition, we perform effective product quality control at various levels. We also conduct third-party quality testing with the help of a range of esteemed organizations. We are backed by a team of experts. We firmly believe in consumer-focused approaches in our business activities and always strive to fulfil the needs of the customer.

5. Prosaic

steel and alloys

6. Tycoon

piping solution

7. Apollon

Steel INC.

All these Companies supply stainless steel within India and in international markets and specialise in grade 304 and 316l grade of stainless-steel capillary tubes.

Stainless steel Growth drivers in India

ABC

- SS roofing sheets
- Decorative and colour coated SS
- Street furniture
- Escalators, elevators
- Claddings
- Railings
- Airports

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- Railway station up gradation

ART

- Luxury Bus bodies
- Auto chassis, trims, suspension parts, fuel tanks, catalytic convertors
- Railway wagons and coaches
- Metro coaches

Process & Engineering

- Nuclear grade SS for fuel containment and waste handling
- Super critical boilers in power plants
- Water treatment and drinking water supply
- Desalination applications

Consumer Durables

- India as hub for white goods manufacturing
- SS used as components

Stainless Steel Application arriving Shortly in India

Railway Passenger Coaches
Water TanksHospital Furniture
PlumbingCycle rim
LPG Cylinder
Rim Bus Body

General Pricing for ss tubes

Approximate price of Grade 304 Stainless Steel Pipe

Size	Min Price	Max Price
1/2 inch	Rs 195/Kg	Rs 250/Kg
2 inch	Rs 185/Kg	Rs 220/Kg
3 inch	Rs 195/Kg	Rs 220/Kg

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Stainless steel prices in India

Stainless steel capillary price 0.5-3mm – 120-150 rupees per kg. Stainless steel 304 pipe price 200-240 rupees per kg.

304 SS Sheet is sold by Kg & Piece. Most of the products ranges from Rs 150 to Rs 400 per Kg and Rs 100 to Rs 300 per Piece.

Stainless Steel Pipe and Tube Manufacturing Process at a Glance

In the nineteenth century, moving plant innovation was the main method used to fabricate stainless tubes and pipes for modern reason. The moved segments of sheet were shaped into a round cross area with the assistance of pipe rolls. The lap welding was then done on these moved strips through the produce welding process.

Thankfully with the appearance of improvement and innovation, different procedures appeared for the assembling of stainless tubes and pipes in India.

Stainless Steel Pipe and Tube Manufacturing Process

Rolling and welding

Firstly, the stainless-steel strips are made to experienced different quality checks and are trimmed at edges. They are then sustained to the tubes plant by stainless steel funnel producers in India. The strips go through the quantity of rollers according to the required size. In the tubes-process, the strip is bit by bit changed over into the tubular shape. The fitted welding machine is then used to weld trim edges of the strip utilizing TIG welding process.

The cleaning and warming stage

The seamless carbon steel tube along these lines fabricated are sliced to the required lengths relying on the mechanical interest. These stainless pipes and tubes are then subjected to cleaning to expel the soil. Further, a warmth treatment is given to these moved pipes and tubes to evacuate the burdens that may happen because of welding and arrangement forms. Heat treatment is given on the persistently moving hearth heater.

Icy drawing process

Now and again, the required size may not be acquired from the plant straightforwardly. At that point, the cool operation procedure can be utilized to get the coveted size. In frosty drawing

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process, the tubes or pipes are covered with oxalic and cleanser arrangement. This arrangement goes about as an ointment to diminish contact while frosty drawing operation. Exposed to the harsh elements drawing process, the tube or pipe is drawn over the seat utilizing Die plugs.

Completing procedure

The drawn-out tube or ss channel is then subjected to cleaning, heat treatment, pickling and rectifying. The electronic ink plane checking machine is utilized to do the stamping on the completed pipes or tubes. The channel or tube is set apart with grade of material, size, heat number and the stamp of outsider examination before going on to stainless steel funnel exporters. The stainless tubes or pipes subsequently created will experience certain testing and quality checks.

Heave Tubes and Metal is one of the main stainless steel pipes manufacturers in India. Our condition of workmanship assembling unit is equipped for creating wide range and measurements of stainless steel pipe and alloy steel tubes. We supply our clients with the most elevated amount of stainless steel items.

Where to set up stainless steel plant?

Stainless steel is manufactured by steel melting, hot rolling mill & then cold rolling mill with finishing lines like slitting, cut-to-length lines.

Again, stainless steel melting process is done by two methods; one from stainless/steel scrap, another from ore root. both use intensive electric, gas & oil power for scrap root, better to install near the port & market place so that the transportation cost is minimum.

