

Industry chapter **Stainless Steel Tubes and Pipes**

Final report

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1. Global macroeconomic overview

1.1 GDP growth

Global growth, after averaging 3.8% annually between 2000 and 2019, contracted 2.7% in 2020 as the Covid-19 pandemic disrupted economic activity. However, the contraction was considerably lower than that estimated by the International Monetary Fund (IMF), with a strong rebound in manufacturing, shift to new ways of working, and fiscal and policy support arresting a further slide.

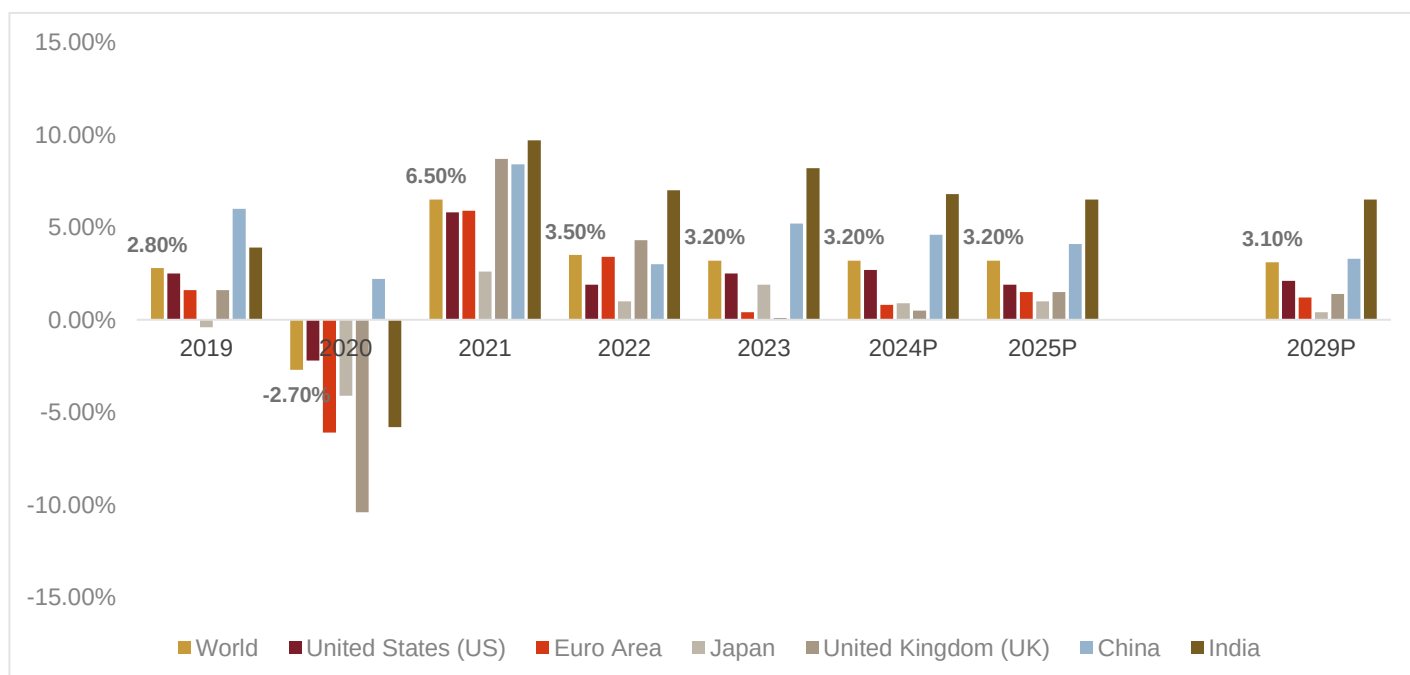
In 2021, growth rebounded to 6.5%, led by vaccine-powered normalisation and continued fiscal support. However, in 2022 and 2023, it slowed to 3.5% and 3.2%, respectively, owing to challenges such as supply-constraint-driven high inflation, tightening financial conditions, long-term effects of the pandemic and geopolitical uncertainties.

The pace of global growth is projected to continue to trend below the historical annual average of 3.8% (2000 to 2019) this year and the next, on account of restrictive monetary policies and withdrawal of fiscal support¹.

1.1.1 Five-year historical data and growth forecast

The IMF has projected on-year global GDP growth of 3.2% for 2024 as well as 2025, considering the current geopolitical uncertainties, increasing geoeconomic fragmentation, tighter inflation-tackling monetary policies and fiscal support withdrawal amid high debt and extreme weather conditions.

Economic review and outlook



P: Projected (years mentioned on the horizontal axis correspond to the calendar years)

Source: CRISIL MI&A, IMF, World Bank, S&P Global

Note: Unless mentioned otherwise, the years correspond to calendar years throughout the report.

¹ IMF – World Economic Outlook April 2024

Real GDP (on-year growth)	2019	2020	2021	2022	2023	2024P	2025P	2029P
World	2.80%	-2.70%	6.50%	3.50%	3.20%	3.20%	3.20%	3.10%
United States (US)	2.50%	-2.20%	5.80%	1.90%	2.50%	2.70%	1.90%	2.10%
Euro area	1.60%	-6.10%	5.90%	3.40%	0.40%	0.80%	1.50%	1.20%
Japan	-0.40%	-4.10%	2.60%	1.00%	1.90%	0.90%	1.00%	0.40%
United Kingdom (UK)	1.60%	-10.40%	8.70%	4.30%	0.10%	0.50%	1.50%	1.40%
China	6.00%	2.20%	8.40%	3.00%	5.20%	4.60%	4.10%	3.30%
India	3.90%	-5.80%	9.70%	7.00%	8.20%	6.80%	6.50%	6.50%

P: Projected (years mentioned on the horizontal axis correspond to the calendar years for the world and countries except India; for India year 2019 refers to fiscal 2020 and so on)

Source: CRISIL MI&A, industry, IMF

However, the GDP trajectory has varied for key economies, as detailed out below:

US

The country's GDP, which expanded from 1.9% in 2022 to only 2.5% in 2023, would have been higher if not for high inflation and, consequently, the raising of higher interest rates by the US Federal Reserve (Fed) to cool the print, which impacted spending. The economy is expected to continue to grow at a relatively benign 2.7% in 2024 and thereafter slow to 1.9% in 2025² with a slowdown in wage growth, continued fall in disposable incomes and accumulated savings and the Fed's tight monetary policy.

Euro area

While the pace of growth slowdown in this region was less pronounced than in the US in 2023, it was only a marginal 0.4% because of lower policy rates vs the US and NextGeneration EU bonds supporting economic activity. The slowdown in 2023 was due to spillover effect from geopolitical issues in Europe, with some economies more affected, and tighter financial conditions. The prices of gas, which is the key source for electricity and heating, rose owing to constrained availability amid high demand, leading to increased manufacturing expenses. That said, in 2024, the IMF expects GDP growth to increase to 0.8% before rising to 1.5% in 2025. But key economies in the region are expected to post diverging trends. Germany's economy is expected to contract faster than expected, whereas France and Spain are expected to see some recovery, helped by tourism.

Japan

Pent-up demand, surge in inbound tourism and accommodative policies, as well as rebound in auto exports pushed up the country's growth rate to 1.9% in 2023. However, in 2024, a negative shift in the terms of trade (ratio of export to import prices) from higher energy import prices, as well as lower consumption, as price inflation outpaced wage growth, is expected to crimp economic growth rate to just 0.9%, which is expected to rise slightly to 1% in 2024 as domestic demand stabilises.

UK

Growth declined from 4.3% in 2022 to 0.1% in 2023, reflecting tighter monetary policies to curb stubbornly high inflation and lingering impact of the terms-of-trade shock from high energy prices. That said, growth was somewhat supported by a fiscal package announced in September 2022. In 2024, though, the GDP growth is expected to remain at 0.5%.

² All forecasts are by the IMF unless otherwise stated

China

In 2021, China's GDP grew 8.4% on-year, recovering strongly from the previous year's on-year growth of 2.2%, on the back of pent-up domestic demand and strong growth in exports owing to slowdown in global industrial activities. China will continue to contain its macroeconomic stimulus following a property-driven downturn, and is, therefore, expected to see 4.60% economic growth this year and 4.10% the next.

India

After a pandemic-induced 5.8% contraction in 2020, the country's GDP bounced back, growing 9.7%, 7.0% and 8.20% on-year in 2021, 2022 and 2023, respectively. The growth trend is expected to sustain over the next 5 years, with the IMF projecting an annual rate of 6-7%.

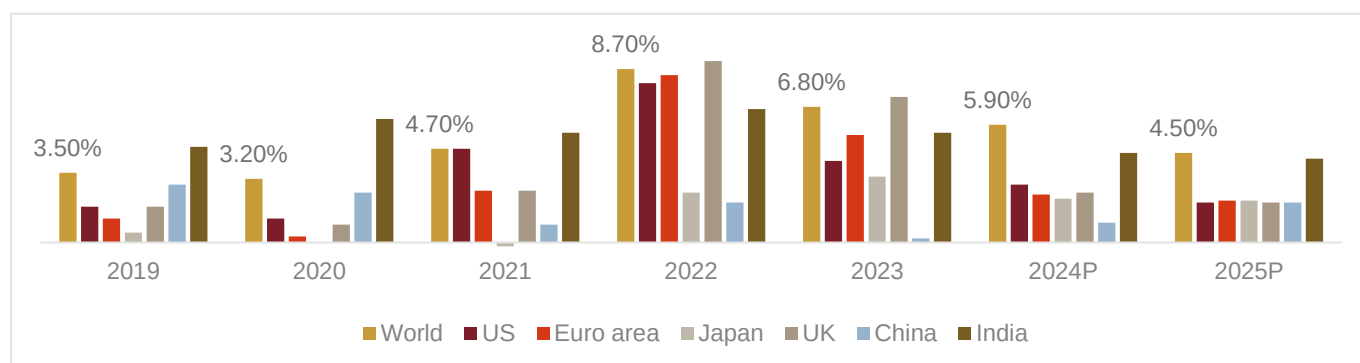
1.2 Inflation overview

Global consumer price inflation, after ranging 3-5% between 2019 and 2021, jumped to 8.7% in 2022 because of sharp increase in prices of oil, natural gas, fertilisers and other commodities in the wake of geopolitical conflicts early on in the year. Supply chain disruption exacerbated the situation. However, in fiscal 2023, global inflation slowed to 6.8% because of the resolution of supply-side issues in a few industries.

1.2.1 Five-year historical data and growth forecast

The IMF projects global inflation to slow down to 5.9% and 4.5% in 2024 and 2025, respectively, owing to demand stabilisation and reduction in price-related pressures. Particularly in 2024 and 2025, inflation is expected to ease because of broad-based decline in global core inflation due to the effect of anticipation of tight monetary policies, a relative softening in labour markets and fading pass-through effect from the previous fall in prices.

Inflation review and outlook



Source: CRISIL MI&A, IMF, World Bank, S&P Global

P: Projected (years mentioned on the horizontal axis correspond to the calendar years)

Consumer prices (on-year growth)	2019	2020	2021	2022	2023	2024P	2025P	2029P
World	3.50%	3.20%	4.70%	8.70%	6.80%	5.90%	4.50%	3.40%
US	1.80%	1.20%	4.70%	8.00%	4.10%	2.90%	2.00%	2.10%
Euro area	1.20%	0.30%	2.60%	8.40%	5.40%	2.40%	2.10%	1.90%
Japan	0.50%	0.00%	-0.20%	2.50%	3.30%	2.20%	2.10%	2.00%
UK	1.80%	0.90%	2.60%	9.10%	7.30%	2.50%	2.00%	2.00%
China	2.90%	2.50%	0.90%	2.00%	0.20%	1.00%	2.00%	2.00%
India	4.80%	6.20%	5.50%	6.70%	5.50%	4.50%	4.20%	4.00%

P: Projected (years mentioned on the horizontal axis correspond to calendar years for the world and countries except India; for India year 2019 refers to fiscal 2020 and so on)

Source: CRISIL MI&A, industry, IMF

The overall inflationary trends for major economies are detailed below.

US

The consumer price inflation eased from 8% in 2022 to 4.1% in 2023, and is expected to further fall to 2.9% in 2024. The on-year increase in consumer prices is projected to remain in the 2-2.1% range till 2029. The continuous fall in inflation from the high of 2022 is because of weakening economic growth and ongoing supply-side relief amid expectation of potential Fed interest rate cuts going forward.

Euro area

Consumer price inflation eased from 8.4% in 2022 to 5.4% in 2023, and is expected to further fall to 2.4%, 2.1% and 1.9% in 2024, 2025 and 2029, respectively. The expected fall in inflation below 2% in the medium to long term is due to easing wage growth, lower energy prices and normalised commodity price expectations.

Japan

Inflation in Japan, which has traditionally remained below 1%, jumped to 2.5% in 2022 and 3.3% in 2023 due to a sharp increase in food prices and expensive imports because of weakening of yen. Going forward, inflation is expected to ease a bit but remain at 2-2.2% over the next 5 years due to high expectations of wage increments and depreciated yen.

UK

Inflation jumped sharply to 9.1% in 2022, before easing to 7.3% in 2023. Going forward, inflation is expected to ease to the pre-pandemic levels and reach 2% in 2029. This, as a result of steep fall in oil and gas prices, and softening in core price and service price pressures.

China

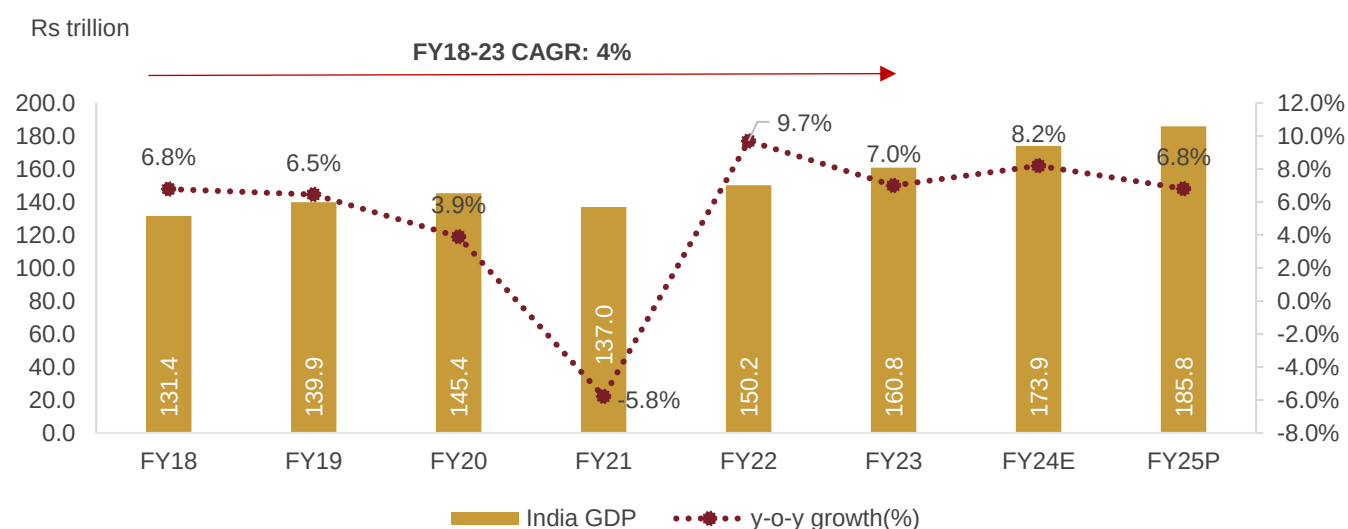
Consumer price inflation eased from 2.5% in 2020 to 0.9% in 2021 due to the government's effective action to bolster production of daily necessities and smoothen the sharp fluctuation in commodity prices. In 2022, however, inflation increased to 2% because of increase in pork prices. In 2023, inflation slipped again to 0.2% owing to weak domestic demand in the wake of a higher unemployment rate, slower income growth and the real estate market downturn. Going forward, inflation is expected to rise to 1% in 2024 and 2% in medium to long term to reach near-optimum levels because of moderation in the demand-supply gap.

2. India's macroeconomic overview

2.1 GDP trend and composition by sectors

India's GDP increased at a 5-year compound annual growth rate (CAGR) of 4% to Rs 160.8 trillion in fiscal 2023. During this period, fiscal 2021 recorded an on-year decline of 5.8% because of pandemic-induced lockdowns. However, the post-pandemic period turned out to be positive, with GDP growing 9.7% and 7.0% on-year in fiscals 2022 and 2023, respectively, thanks largely to strong pent-up demand across sectors, primarily manufacturing and construction.

Real GDP trend (at constant 2011-2012 prices)



P: Projected; E: Estimated, FY: Fiscal year

Source: Central Statistical Office (CSO), CRISIL MI&A

In fiscal 2024, India's GDP is estimated to have grown 8.2% on-year³ owing to strong output from the service and manufacturing sectors and robust infrastructure spending. Although there will be support from the demand side on account of expectation of normal monsoon and easing inflation, CRISIL expects GDP on-year growth to moderate to 6.8% in fiscal 2025 owing to rising borrowing costs, geopolitical tensions, and fiscal consolidation, leading to lower capital expenditure (capex) by the government.

On-year demand-side real GDP growth (%)

At constant 2011-2012 prices	FY19	FY20	FY21	FY22	FY23	FY24E
Private consumption	7.1%	5.2%	-5.3%	11.7%	6.8%	4.0%
Government consumption	6.7%	3.9%	-0.8%	0.0%	9.0%	2.5%
Gross fixed capital formation	11.2%	1.1%	-7.1%	17.5%	6.6%	9.0%
Exports	11.9%	-3.4%	-7.0%	29.6%	13.4%	2.6%
Imports	8.8%	-0.8%	-12.6%	22.1%	10.6%	10.9%

Source: CRISIL MI&A, CSO

E: Estimated; FY: Fiscal year

³ Notably, there could be another growth revision for fiscal 2024

India's economic growth in fiscal 2024 is expected to have been pushed largely by private sector investments, estimated to have grown ~9% on-year. Several government-led schemes, such as Make in India and Atmanirbhar Bharat, and the government's push for turning India into a manufacturing hub have supported private sector investments in the existing and new age sectors.

On-year supply-side gross value added by economic activity

At basic prices	FY19	FY20	FY21	FY22	FY23	FY24E
Agriculture and allied	2.1%	6.2%	4.0%	4.6%	4.7%	1.4%
Industry*	3.1%	-0.5%	-6.3%	8.3%	5.7%	7.3%
Manufacturing	5.4%	-3.0%	3.1%	10.0%	-2.2%	9.9%
Construction	6.5%	1.6%	-4.6%	19.9%	9.4%	9.9%
Services^	7.2%	6.4%	-8.4%	9.2%	10.0%	7.6%

* Industry includes mining and quarrying, electricity, gas, water supply and other utilities

^ Services related to trade, hotels, transport, communication, broadcasting, finance, real estate, public administration, defence and professional and others

E: Estimated; FY: Fiscal year

Source: CRISIL MI&A, CSO

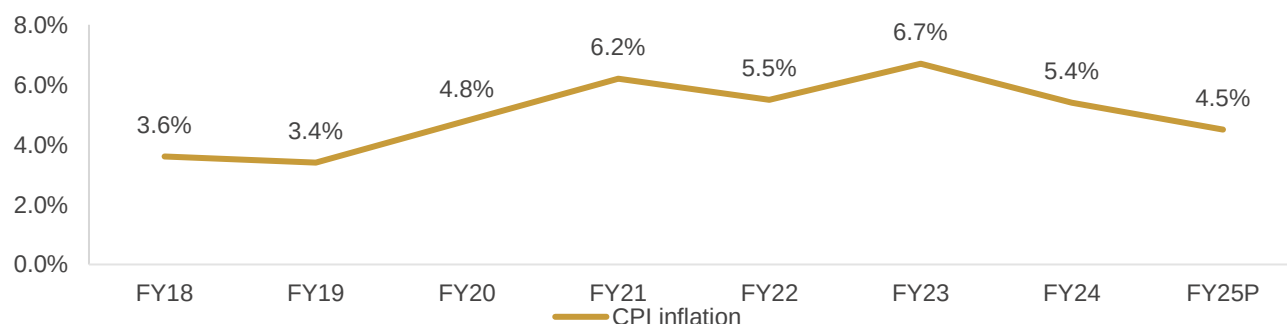
On the supply side, India's GDP is estimated to have grown last 2024 owing to strong growth in construction, manufacturing, and services sectors, which benefitted from robust capital investments from the private sector.

2.2 Performance of key macroeconomic indicators

Consumer Price Index inflation trend

India's average Consumer Price Index (CPI) inflation rate remained ~4.70% between fiscals 2018 and 2022. However, in fiscal 2023, it increased to 6.70%, mainly led by surging food prices before moderating slightly to an average of 5.4% in fiscal 2024. Although core and fuel inflation numbers have remained low, the food inflation has been keeping CPI inflation above the Reserve Bank of India's medium-level target rate of 4%. For instance, according to the CPI figures for March 2024, food inflation stood at 8.5%, primarily due to strong accelerations in inflation in foodgrains, meat and fish and slower pace of deflation in edible oils during the month.

In fiscal 2025, the CPI inflation is expected to moderate further to 4.5% on an average, on the back of an expected dip in food inflation, aided by a favourable monsoon and high base effect.

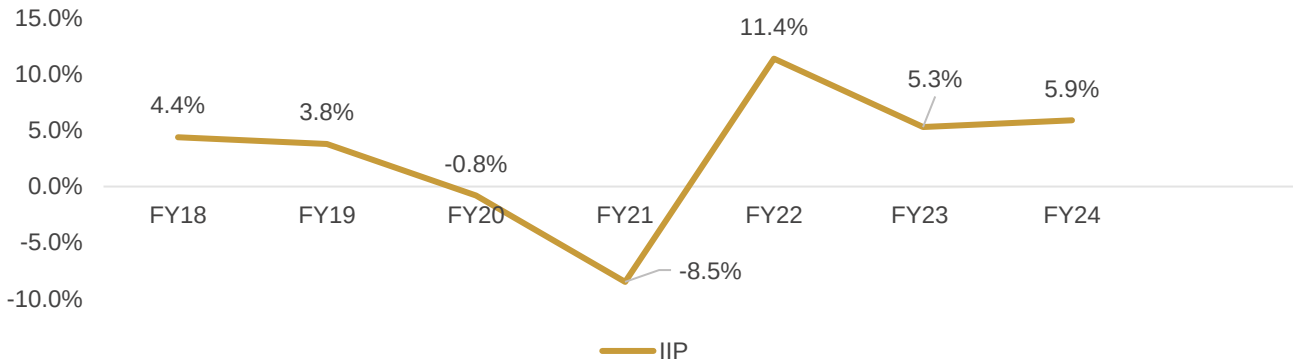


Source: National Statistical Office (NSO), Ministry of Industry and Commerce, CRISIL MI&A

P: Projected

Index of Industrial Production growth trend

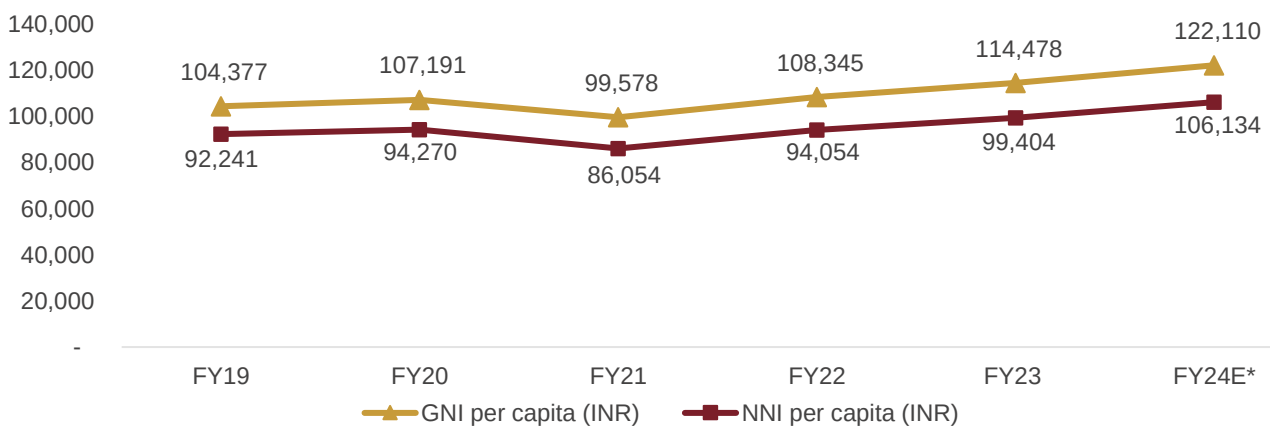
India's Index of Industrial Production (IIP) averaged 3.8% between fiscals 2018 and 2023 before surging to 5.9% in fiscal 2024. The uptick in the index was mainly led by strong pick-up in the manufacturing of electrical equipment and basic metals. Further, an uptick in consumer durables sector aided the IIP growth.



Source: NSO, Ministry of Industry and Commerce, CRISIL MI&A

Per capita GDP and income growth trend

A country's gross national income (GNI) is derived at by adding receipts from overseas to the GDP and subtracting the payments made overseas in the form of wages, salaries and property income. Net national income (NNI) is obtained by subtracting asset depreciation from GNI. The growth trend in both GNI per capita and NNI per capita has largely been positive except for fiscal 2021, when they declined 7% and 9%, respectively on-year. The decline was primarily due to dip in GDP during the fiscal. However, in fiscal 2022, GNI per capita and NNI per capita grew ~9% each on-year, owing to recovery of demand, labour market and consumer sentiments. The growth largely remained rangebound with both the indicators increasing 5-7% on-year in fiscals 2023 and 2024E*, on account of economic stabilisation and a positive growth outlook.



Source: NSO, Ministry of Industry and Commerce, Ministry of Statistics and Programme Implementation, CRISIL MI&A

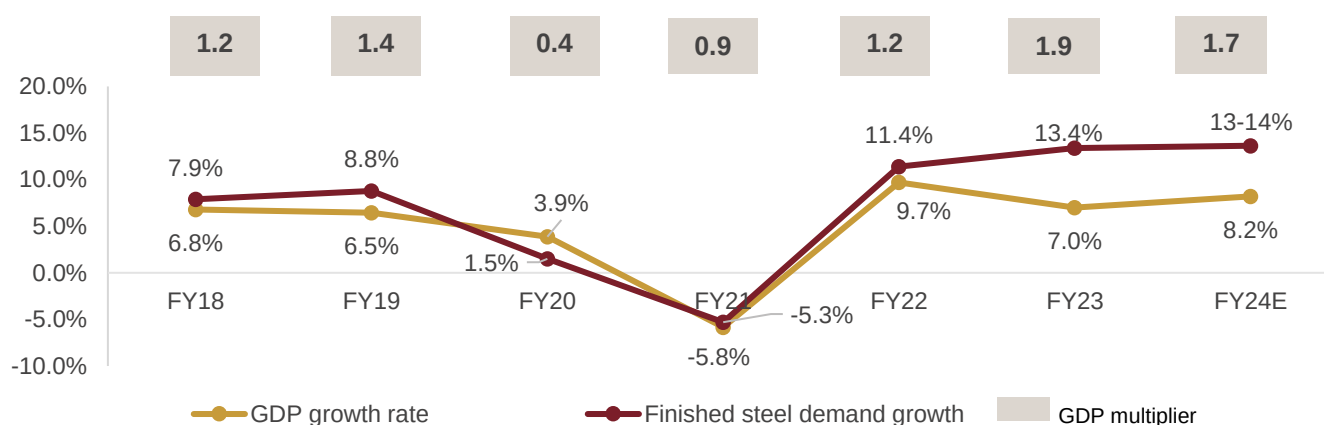
E*: Estimated as per second advanced estimates by NSO

2.3 Correlation of rise in steel demand with GDP growth

Given the huge population and low per capita steel consumption in India, the steel industry has a huge potential to become one of the economic growth drivers of the country. A comparative analysis between the growth in steel demand and country's GDP shows that the former has majorly outpaced the latter between fiscals 2018 and 2023, except fiscals 2020 and 2021. While fiscal 2020 saw slowdowns in major steel consuming sectors of automobile, construction, and infrastructure, fiscal 2021 witnessed Covid-19 pandemic-induced lockdowns.

Fiscal 2023 saw the growth rate ratio of steel demand to GDP reaching 1.9, owing to the recovery of economic activity from the lows of the pandemic and a strong pent-up demand from key steel consuming sectors. Despite a slight moderation to 1.7 in fiscal 2024, the said ratio/GDP multiplier has managed to remain higher than its pre-pandemic levels.

Finished steel demand vs GDP growth



Note: Figures in boxes represent multiplier of steel demand to GDP growth

Source: CRISIL MI&A, industry

E: Estimated

2.4 Macroeconomic factors impacting the Indian steel sector

Since the steel industry accounts for a significant share in India's manufacturing sector and economic development, its performance is influenced by macroeconomic factors, such as GDP growth, inflation, exchange rates and gross fixed capital formation (GFCF). The impact of the factors is analysed below:

GDP growth: Growth in the industry is closely linked to that of GDP. As GDP grows, the demand for steel products from the construction, infrastructure and other manufacturing sectors also increases. Having expanded 11.4% and 13.4% in fiscals 2022 and 2023, respectively, steel demand is estimated to have grown 13-14% on-year in fiscal 2024, backed by government infrastructure spending, strong demand from the automotive and consumer goods sectors.

Inflation: Rising inflation pushes up input costs associated with raw material, energy and transportation, which can impact the profitability of steel manufacturers. Additionally, it can lead to increased interest rates, which hike borrowing costs for businesses and consumers, thereby affecting demand for steel products.

Exchange rates: The exchange rate of the Indian rupee against other major currencies impacts the industry. A stronger rupee can lead to a decrease in the cost of imported raw material, which can reduce the cost of production for steel manufacturers and vice versa.

GFCF: It measures investment in fixed assets, such as machinery, buildings and infrastructure. In fiscal 2023, GFCF surged to Rs 53.46 lakh crore from Rs 40.83 lakh crore in fiscal 2018. It is estimated to have further increased to Rs 58.93 lakh crore in fiscal 2024. Between fiscals 2018 and 2024, the Indian steel sector witnessed significant growth in production and capacity expansion, mainly driven by investments in capacity expansion, modernisation, and technology upgradation.

2.5 Key government schemes for end-use industries

National Steel Policy 2017

The National Steel Policy (NSP), approved in May 2017 by the Union Cabinet, seeks to boost domestic steel consumption, ensure high-quality steel production and create a technologically advanced and globally competitive steel industry.

NSP's vision for demand, supply and trade is:

- To increase steel consumption across the infrastructure, automotive and housing sectors, resulting in a potential rise in per capita steel consumption to 158 kg by fiscal 2030 from ~65 kg in fiscal 2017
- To achieve 300 million tonnes of steelmaking capacity by 2030 through additional investments of Rs 10 lakh crore
- To produce steel domestically for high-end applications, such as electrical steel (cold-rolled grain-oriented), special steel and alloys for power equipment, aerospace, defence and nuclear applications
- To eliminate reliance on steel imports and increase exports to ~24 million tonnes by 2030

Indian steel industry: Historical trend and vision under NSP

Parameter (million tonnes)	NSP 2005	NSP 2017	FY23	FY24*
	FY20	FY30		
	(Target)	(Target)		
Crude steel capacity		300	161.29	178
Crude steel production	110	255	127.20	144.04
Finished steel demand	90	230	119.89	136.25
Finished steel import	6	0	6.02	8.3
Finished steel export	26	24	6.72	7.5

Note: FY24 estimates are based on provisional data released by Joint Plant Committee (JPC) in its MIS Report for April-March 2023-24

Source: CRISIL MI&A, NSP 2005, NSP 2017

Production Linked Incentive scheme

Keeping in view India's vision of becoming 'Atmanirbhar', an incentive outlay of Rs 1.97 lakh crore (over \$26 billion) under the PLI scheme for 14 key sectors is underway to enhance the country's manufacturing capabilities and

exports. The implementation of the scheme across the sectors aims to attract investments (domestic and foreign) in the areas of core competency and apply cutting-edge technology; ensure efficiencies; create economies of scale and boost exports to make India an integral part of the global value chain.

Particulars	Units	Amount
PLI scheme led investment	Rs lakh crore	1.03
PLI scheme production/sales	Rs lakh crore	8.61
PLI scheme led exports	Rs lakh crore	3.20
PLI led Employment generation	In lakh	6.78

Note: All figures in the table are until November-December 2023

Benefits through PLI scheme

Large scale electronics manufacturing (LSEM) sector

- Manufacturing of various electronic components, such as batteries, chargers, printed circuit board (PCB), camera modules, passive components and certain mechanics have been localised in the country
- PLI beneficiaries account for only ~20% of the market share. However, they contributed to ~82% exports of mobile phones in fiscal 2023
- Production of mobile phones surged by more than 125% and exports increased ~4x since fiscal 2021
- Foreign direct investment increased ~254% since the inception of the PLI scheme for LSEM

Pharma sector

- India manufactures unique intermediate material and bulk drugs, including Penicillin-G, significantly reducing imports of raw material in the sector
- India has commenced the localised production of 39 medical devices, such as CT-scan, linear accelerator, rotational cobalt machine, C-arm, MRI, catheterisation laboratory, ultrasonography, dialysis machine, heart valves and stents, among others

Telecom and drone sectors

- India has achieved an import substitution of 60% in the telecom sector
- PLI beneficiary companies have achieved a 370% increase in sales of telecom and networking products in fiscal 2024 vis-a-vis base fiscal 2020.
- The drone industry has witnessed a significant increase in investment at a CAGR of 90.74% over the past three fiscals

Food processing sector

- There has been a significant increase in the sourcing of raw material from India, benefitting Indian farmers and small-scale industries
- Sales of organic products has increased, enhancing the visibility of Indian brands in the global market.
- The scheme has also led to increased millet procurement – which increased over five times between fiscals 2021 and 2023

2.6 Investment scenario in the domestic infrastructure segment

The government's focus on infrastructure development was evident in the budget 2024-2025 allocations as:

- Rs 11.11 lakh crore, which is around 3.4% of India's GDP, has been allocated for capital expenditure for infrastructure sector
- The gross budgetary support for Railways sector has been set at Rs 2.52 lakh crore, which is significantly higher than previous years' allocations
- The centre extended the long term interest-free loan to states, with an outlay of Rs 1.50 lakh crore to boost infrastructure
- The government allocated Rs 26,000 crore for multiple road connectivity projects across states

This will include the Bharatmala Pariyojana, which aims to develop 65,000 km of national highways, and the creation of expressways to facilitate faster and more efficient transportation.

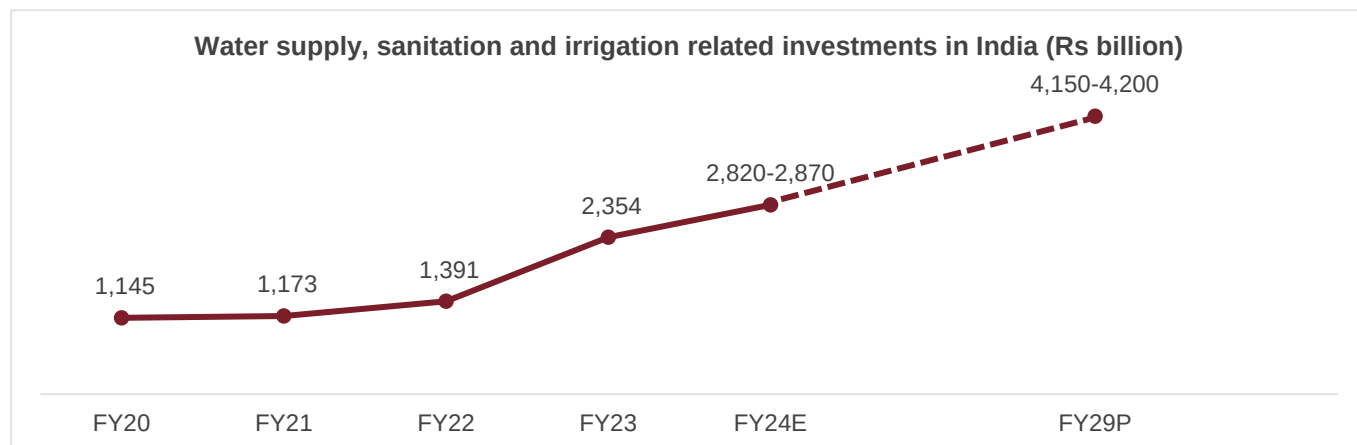
- Industrial nodes will be set up on industrial corridors in the country; for example, an industrial node at Gaya will be developed on Amritsar-Kolkata Industrial Corridor
- The government also launched the fourth phase of Pradhan Mantri Gram Sadak Yojana for 25 rural areas in the country to provide last mile connectivity
- The government allocated Rs 2,377 crores for ministry of ports, shipping and waterways

This allocation aims to enhance port infrastructure, improve cargo handling capabilities, develop new ports to accommodate the growing maritime trade, and to develop inland water ways for transportation

Note: Overall, the infrastructure segment accounts for ~28-30% of the aggregate finished steel demand. Within the segment, roads and highways, and the railways (including metros), account for 50-60% of steel demand. Other significant contributors include sectors, such as irrigation, dams, water supply and sanitation.

Investment in steel tubes and pipes and related infrastructure segments

Various projects and schemes initiated by the central and several state governments have been driving demand for steel tubes and pipes. They are expected to continue to consume steel tubes and pipes in the near to medium term. Water supply, sanitation, irrigation, and flood control have consistently been the top end-use sectors for the steel pipe industry. They are expected to drive demand for steel tubes and pipes over the next few years as well, through government-led schemes such as Jal Jeevan Mission and Har Ghar Nal Yojana.



Note: E – estimated; P – projected

Source: CRISIL MI&A, industry

In India, annual investment in water supply, sanitation and irrigation increased to an estimated Rs 2,820-2,870 billion in fiscal 2024 from Rs 1,145 billion in fiscal 2020, clocking a CAGR of over 25%. The rise in investment was led by increased initiatives of central and state governments to enable access to piped water for domestic consumption, flood control, and effective irrigation practices. Investment is projected at Rs 4,150-4,200 billion in fiscal 2029, logging a CAGR of ~8% from fiscal 2024 on the back of the government mission to ensure 100% coverage of piped water supply across the country.

State-wise investment scenario

State	Coverage under Jal Jeevan Mission (%)	Other projects
Uttar Pradesh	85%	Automatic water stations, Namami Gange, minor irrigation projects
Maharashtra	87%	Dug well and bore well Programme
Karnataka	79%	Development of canals, water purification plants
Odisha	75%	Multiple mega-piped water supply projects
Telangana	100%	Minor and major irrigation projects
Madhya Pradesh	65%	Development of canals, irrigation projects
Rajasthan	53%	Development of canals, irrigation projects
Gujarat	100%	Development of canals, irrigation projects
Andhra Pradesh	73%	Development of canals, irrigation projects
India	78%	

Source: e-Jal Shakti portal of Government of India, industry, CRISIL MI&A

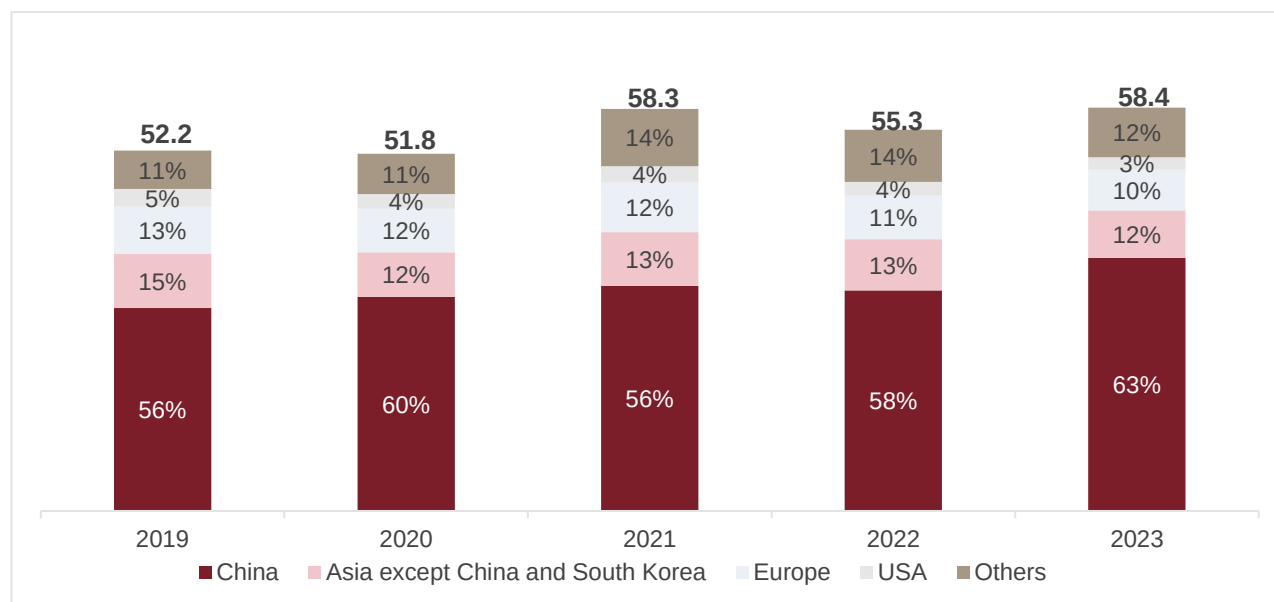
As of August 2024, the coverage of Jal Jeevan Mission stood at ~78% in India. Among states with the highest budget for water supply, sanitation, irrigation and flood control, Rajasthan, Madhya Pradesh, Odisha, Andhra Pradesh and Karnataka have the lowest coverage of Jal Jeevan Mission. On the other hand, Telangana and Gujarat have 100% coverage of Jal Jeevan Mission.

3. Global stainless-steel industry

3.1 Production

Global stainless-steel melt production increased to 58.4 million tonnes in 2023 from 52.2 million tonnes in 2019, logging a CAGR of approximately 3%. Production remained rangebound in 2020 and declined about 5% on-year in 2022. Stainless-steel production suffered in 2020 due to pandemic-led lockdowns in various parts of the world.

Global stainless-steel melt production (million tonnes, % share)



Source: CRISIL MI&A, Worldstainless.org

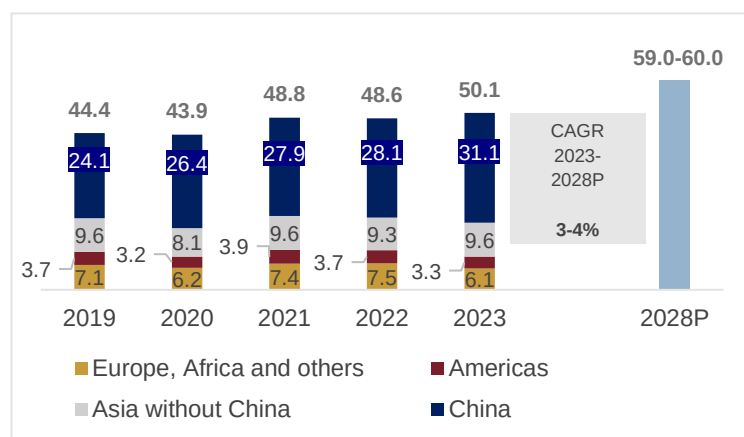
Global stainless-steel melt production increased 13% on-year to 58.3 million tonnes in 2021 owing to a jump in production volume in key steel-producing countries such as India, Russia, and Brazil. The increase in production volume in these countries caused the share of China in global production volume to decrease from 60% in 2020 to 56% in 2021. However, the production share of China increased to 58% in 2022 as global production normalised due to geopolitical uncertainties-led supply-chain bottlenecks.

In 2023, global stainless-steel production increased 6% on-year. Meanwhile, China's production surged 15% on-year, increasing the country's share to 63% in global production volume, owing to the resolution of supply-chain issues and lifting of the country's Covid-19 containment measures.

3.2 Demand

Global demand for stainless steel increased from 44.3 million tonnes in 2019 to 47.4 million tonnes in 2023, clocking a CAGR of about 2%. The share of flat products in total stainless-steel demand was in the range of 82-84% during the period.

Global stainless-steel demand (million tonnes)



Note: BCI – Building, construction, and infrastructure

Source: Worldstainless.org, CRISIL MI&A, industry

The global demand for stainless steel is expected to grow at a CAGR of 3-4% over the next five years to 59-60 million tonne in 2028. This growth in global stainless-steel demand will be supported by growth in consumption from key end-use sectors such as consumer goods, energy and chemicals, building and construction, and automobile.

Metal products and electrical machinery: These sectors form the major end-user of stainless steel, accounting for the largest share in its global demand (45-50%). Stainless steel is consumed in these sectors for the manufacturing of various consumer goods, including kitchen essentials, medical and surgical equipment, and cabinets of consumer durables such as refrigerators and washing machines. These sectors are expected to grow on account of urbanisation, rising disposable income and affordability among consumers, primarily in developing countries.

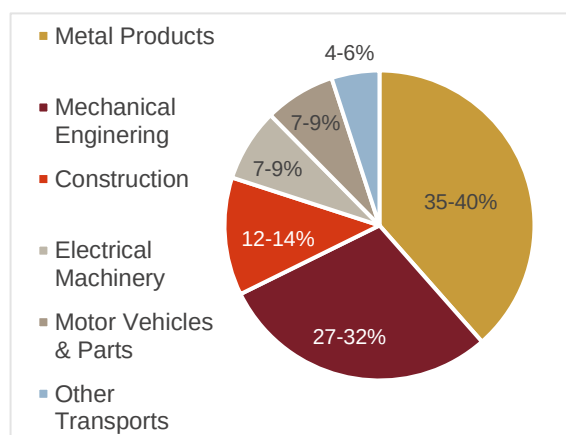
Mechanical engineering: Mechanical engineering accounts for 27-32% of global stainless-steel demand, driven by its diverse applications in machinery and equipment. Stainless steel's strength, durability, and resistance to corrosion and high temperatures make it an ideal choice of material for manufacturing industrial machinery, tools, and equipment. Particularly, it is used in the production of various components such as pumps, valves, bearings, and gears, which require reliability and longevity. Additionally, stainless-steel's hygienic properties make it indispensable in food processing and pharmaceuticals industries.

Construction: This sector account for 12-14% of global stainless-steel demand. Fast-growing developing economies such as China, India and Indonesia are focusing strongly on infrastructure development. Further, developed economies such as Japan, Australia and Korea also allocate a significant portion of their annual budgets to the infrastructure segment. The rising infrastructure expenditure will increase consumption of stainless steel, which is a major commodity deployed in the infrastructural segments of seaports, airports, railway bridges, etc.

The building and construction sector across countries is also expected to boost stainless-steel demand on account of its usage in roofing, furniture, etc. Owing to lack of required infrastructure, developing countries are expected to invest more than the developed ones in the infrastructure, building and construction sectors, and thus, will lead the demand for stainless steel from these sectors.

Automobile & other transport: Motor vehicles, parts and other transports drive approximately 12-15% of global end-use demand for stainless steel. Stainless steel is used in manufacturing various parts of automobiles, such as gaskets, screws, windscreen components, springs, and seatbelt components. Further, with an increased focus on reducing automobile weight, stainless steel, which has a high strength-to-weight ratio, will be used extensively in future automobile variants. Aerospace relies on stainless steel for fasteners, landing gears and engine components

End-use industry split (2023)



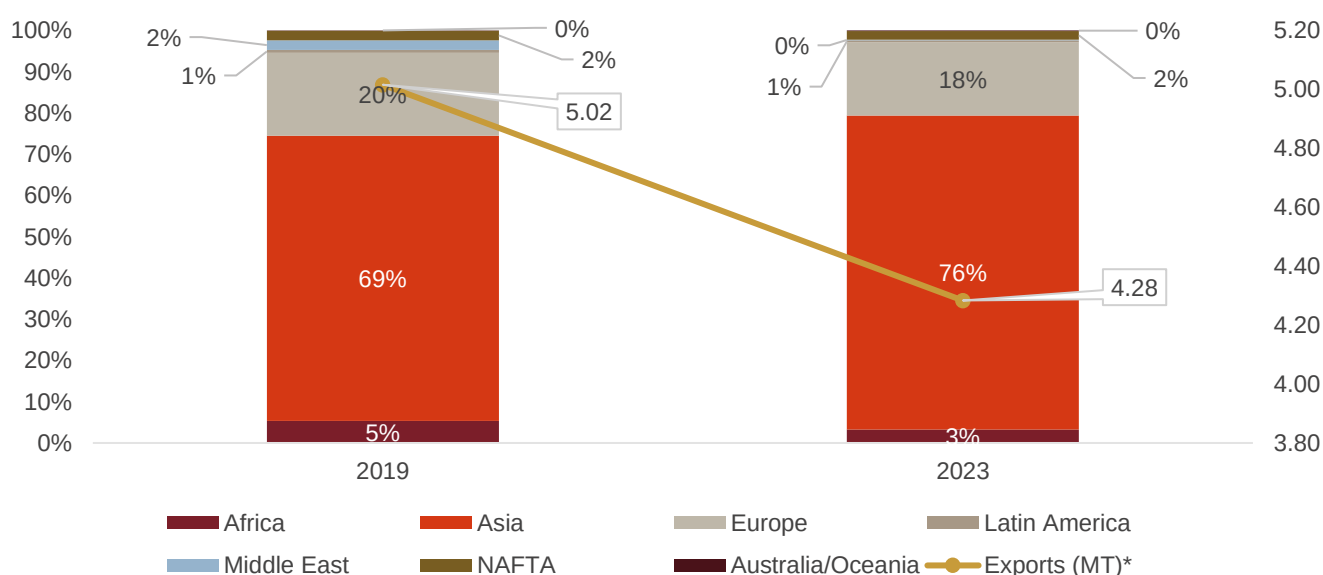
while railway sector uses it for railway coaches and structural components. As emerging economies grow their transport industries, the consumption of stainless steel in this sector will continue to rise.

The Asia-Pacific region, which includes China and India, has accounted for 75-80% of global stainless-steel demand on an average in each of the last five years. In 2023, demand in China stood at 31.1 million tonnes per annum, while the rest of Asia consumed around 9.6 million tonnes per annum. The cumulative stainless-steel demand in Americas was around 3.3 million tonnes per annum.

The high share of the Asia-Pacific region in global demand is driven by presence of several fast-developing economies with high population, current low per capita consumption, increasing per capita income, and their focus on infrastructure development.

3.3 Global trade

Stainless steel exports trend: 2019 and 2023 (export volume in million tonnes)



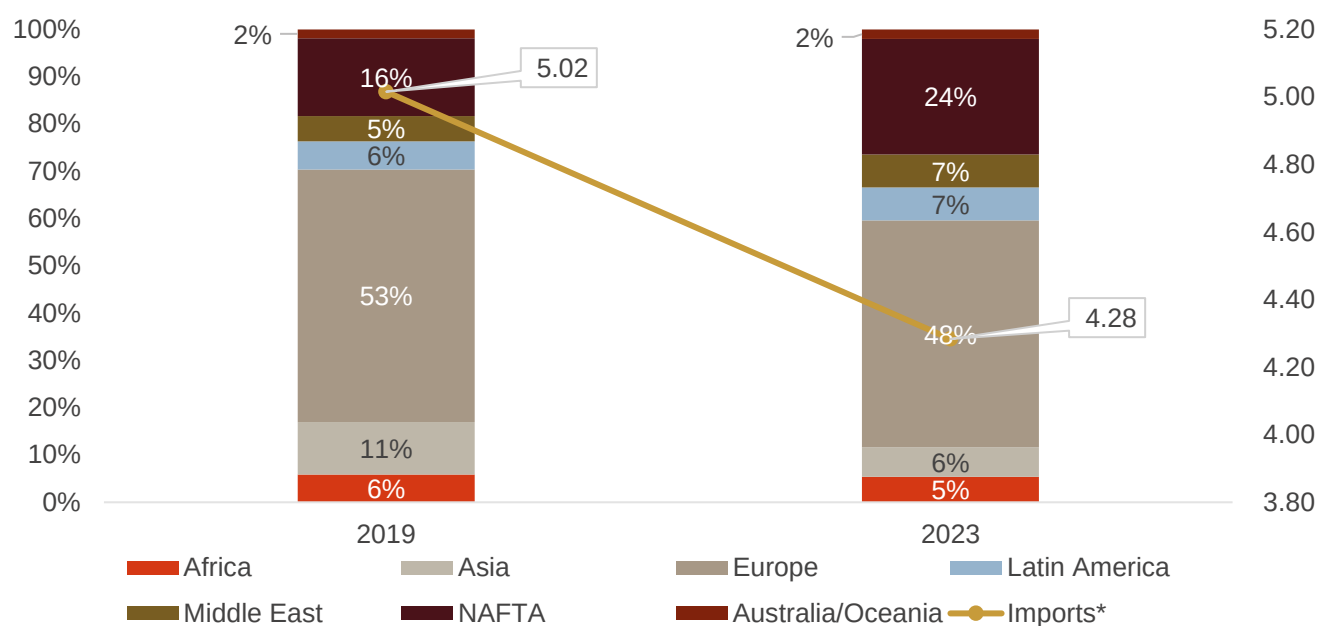
Source: CRISIL MI&A, worldstainless.org

NAFTA: North American Free Trade Agreement regions

*Note: The export figures for these regions do not include any trade within the same region

The majority of stainless-steel exports during the period between 2019 and 2023 were from Asia, especially China, India, Korea and Indonesia, as a result of which the share of Asian region in the overall global exports of stainless steel increased from 69% in 2019 to 76% in 2023. This growth in the share of Asia in the global stainless-steel exports is on the account of increased production capacities, capacity utilization rates, production of stainless steel at lower costs due to low labour and real estate related expenses and resulting economies of scale in these regions.

Stainless steel imports trend: 2019 and 2023 (import volume in million tonnes)



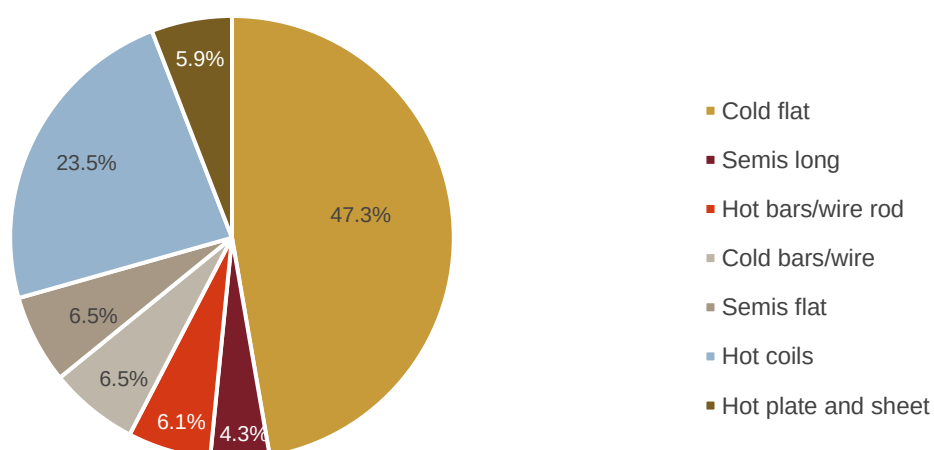
Source: CRISIL MI&A, worldstainless.org

NAFTA: North American Free Trade Agreement regions

*Note: The import figures for these regions do not include any trade within the same region

Share of Asia in global stainless-steel imports declined from 53% in 2019 to 48% in 2023 primarily due to higher domestic production capacity supported by higher focus on self-sufficiency in these countries. Further, the low cost stainless steel being produced in Asian countries has resulted in their increased supply to the regions of Europe, Africa and NAFTA, wherein production volumes have decreased over time.

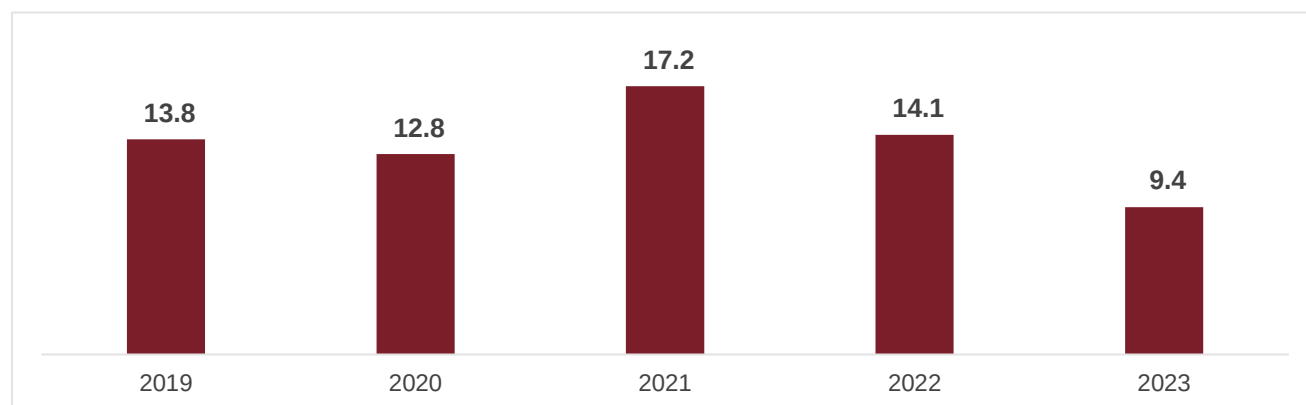
Global stainless-steel trade by product (% share) (2023)



Source: CRISIL MI&A, worldstainless.org

Cold flat products continued to lead the volume in the global trade flow with a share of ~47% in the overall global stainless steel products trade flow in 2023. Stainless steel hot coils followed next, with a share of 23.5% in the overall global stainless steel products trade flow.

Global trade (exports) of flat-rolled products of stainless steel (2019-2023) in million tonnes



Source: United Nations Comtrade, CRISIL MI&A, industry

Please note that for determination of traded volume, the HS codes 7219 and 7220 have been considered

Description of the HS codes: 7219 - Flat-rolled products of stainless steel, of a width of 600 mm or more; 7220 - Flat-rolled products of stainless steel, of a width of less than 600 mm.

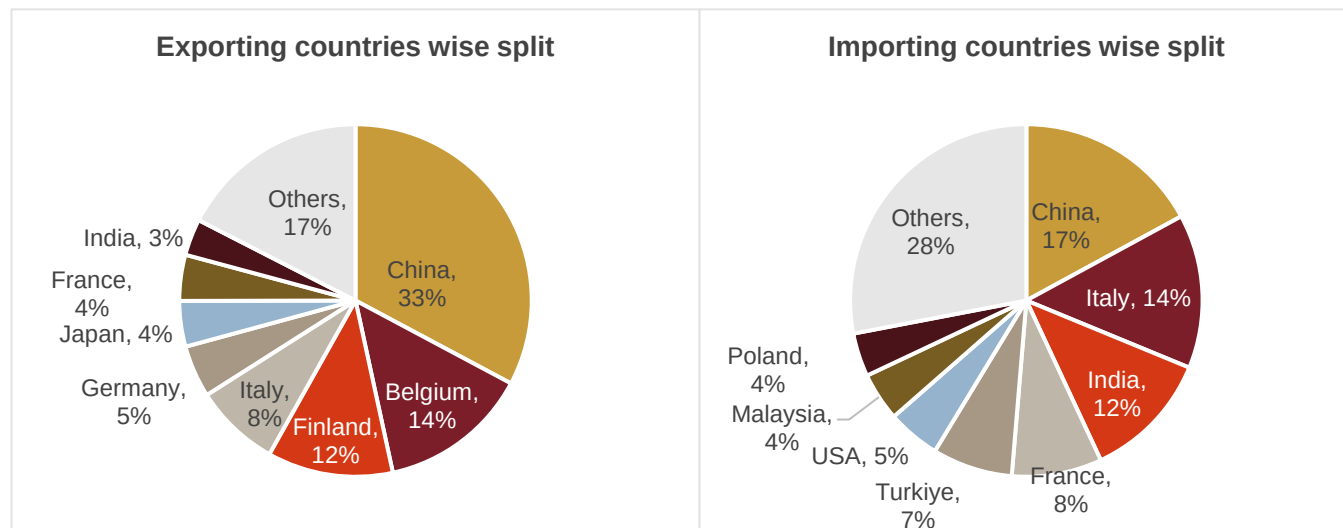
Note: The trade volumes in the above chart include all the traded volume between every country of the world (including traded volume within and outside of continents)

Global trade volume for stainless steel flat rolled products amounted to 9.4 million tonnes in 2023, registering an on-year decrease of 18% and a negative CAGR of -9% between 2019 and 2023.

The traded volume peaked in 2021 by registering an on-year growth of approximately 34% on the account of increase in export volume from major stainless steel producing countries like China and Indonesia. These two countries increased exports to compensate for pandemic led steel manufacturing slow-down in the rest of the world. In 2022, the traded volume, however, declined by 18% owing to decrease in exports from a few countries (e.g. Republic of Korea) which started exporting stainless steel flat products only in 2021 to benefit from the rising demand of foreign products from rest of the world. The exports from countries such as India also decreased in 2022 owing to diversion of the domestically produced stainless steel towards fulfilling an increased domestic demand.

In 2023, the traded volume further decreased to 9.4 million tonnes primarily because of decrease in exports from Indonesia owing to production suspensions at the Indonesian unit of Chinese company Delong, an explosion at a nickel smelting unit, and long running maintenance activities at steelmaking facilities across the country.

Traded volume split – by exporting countries – and by importing countries - 2023 (100%=9.4 million tonnes)



Source: United Nations Comtrade, CRISIL MI&A, industry

In 2023, China was the top exporter of flat rolled products of stainless steel.

The stainless-steel producers in China have been focussing heavily on the expansions and catering to the export market for the last 3-4 years. Further, lower manufacturing costs due to the high economies of scale help China compete in the international business, thereby enabling it to maintain a dominant position in the export market.

Further, due to consistent on-year increase in demand for stainless steel in the country, China also imports steel in large volumes, making it the top importer of flat rolled products of stainless steel, as well.

Belgium, Finland, and Italy were the next largest exporters after China in 2023. Top importers after China included Italy, India, and France in the year.

4. Indian stainless-steel industry

4.1 Overview

India is a prominent producer of stainless steel. The domestic stainless-steel industry has a healthy mix of large and mid-sized corporates, including public sector and micro, small and medium enterprises (MSMEs), across the country.

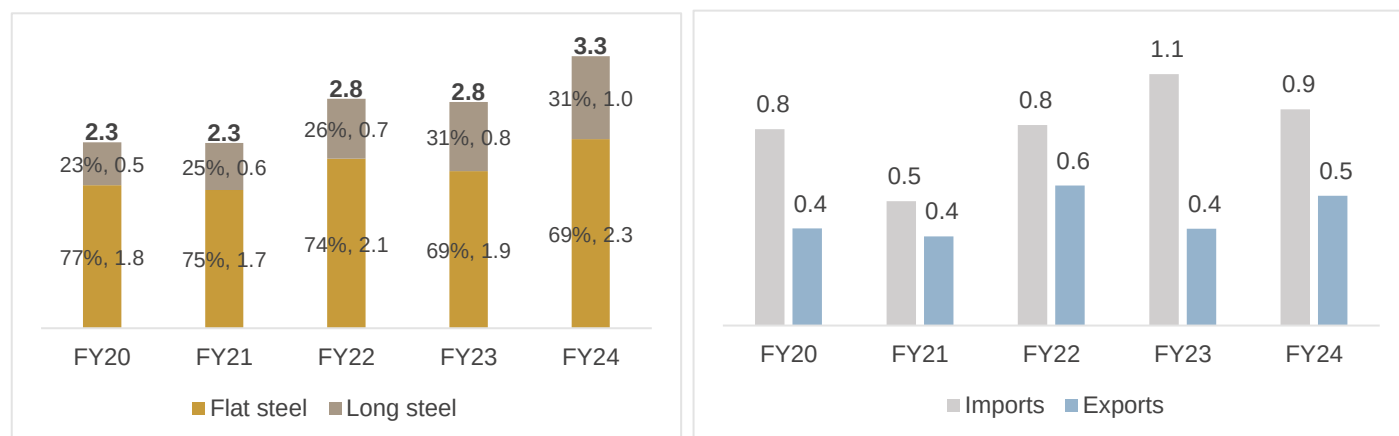
Large players that produce a wide range of stainless-steel long and flat products include Jindal Stainless Group, Viraj Group, Steel Authority of India Limited, Rimjhim Ispat, Shah Alloys, Panchmahal Steel, Sunflag Steel, Ambica Steels, Synergy Steel, Mukand Ltd, and Laxcon Steels. MSMEs majorly have induction-furnace facilities and are primarily in the segment of 'patta', which is a narrow strip of chromium-manganese stainless steel with less than 1% nickel. This industry segment is mainly focused on kitchenware and is highly fragmented, comprising small-scale players, generally located in the northern and western regions of India.

The Indian stainless-steel industry is fully globalised, with large imports and exports of major raw materials and end products, and with end-product prices driven by both raw material prices and international prices of stainless steel.

4.2 Production and trade

Domestic stainless-steel production grew from 2.3 million tonnes in fiscal 2020 to 3.3 million tonnes in fiscal 2024, clocking a CAGR of about 10%. During this period, production of stainless-steel flat products logged a CAGR of about 7% and that of stainless-steel long products, a CAGR of about 18%.

Stainless-steel domestic production (% share, million tonnes) and trade (million tonnes)



Source: Joint Plant Committee (JPC) reports, CRISIL MI&A, industry

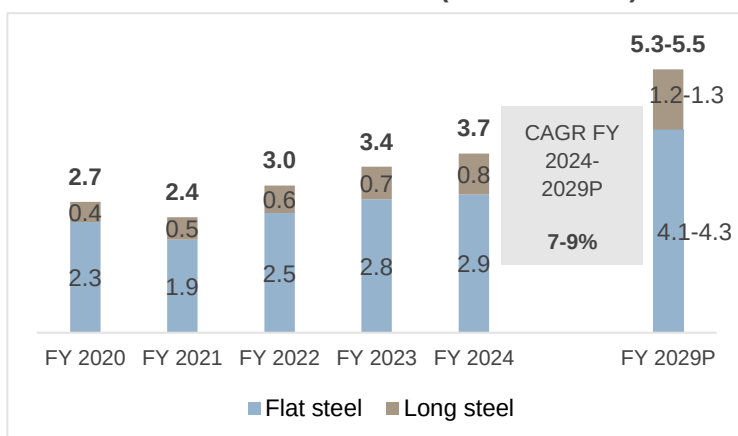
India's stainless-steel production volume remained rangebound in fiscal 2021 owing to subdued domestic demand. However, in fiscal 2022, to cater to pent-up demand, production volume surged 24% on-year to 2.8 million tonnes. In fiscal 2023, though domestic demand increased, a sharp increase in imports kept domestic production rangebound. Imports surged in fiscal 2023 primarily on account of high import volume of cheaper Chinese and Vietnamese stainless steel. On the other hand, exports from India decreased in fiscal 2023 due to tough competition from cheaper foreign-made steel in the export market.

Domestic production volume increased 20% on-year in fiscal 2024 due to the government's strong emphasis on localised manufacturing and higher domestic demand for stainless steel.

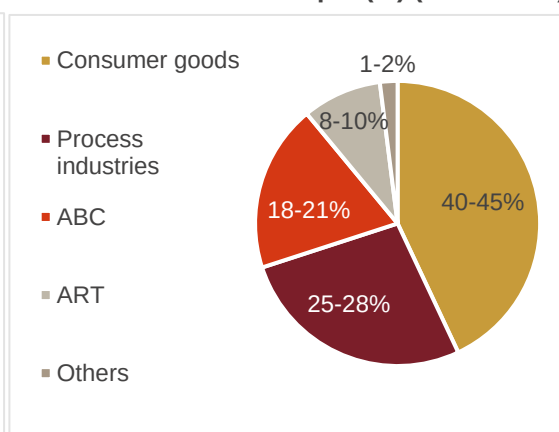
4.3 Demand

Domestic stainless-steel demand grew at a CAGR of approximately 8% between fiscals 2022 and 2024. Fiscal 2021, which was hit by pandemic, witnessed an on-year demand decline of around 12% owing to subdued consumption from key end use sectors like consumer goods and infrastructure. However, the demand for stainless steel increased robustly on-year by 27% in the following fiscal on the account of revival in consumer demand of white goods and durables and increase in government led capital expenditure towards infrastructure development. In fiscals 2023 and 2024, the demand increased on-year by 13% and 8%, respectively, primarily led by strong on-year demand growths of 19% and 25%, respectively in fiscals 2023 and 2024, in the long segment of stainless steel on the account of increased focus of government towards infrastructure development in the run-up to the 2024 general elections. This demand increase was also supported by the building and construction sector which grew owing to rapid urbanizations, government led initiatives like “Housing for All”, improving consumer sentiments, and increasing industrialization on the back of government’s push for local manufacturing.

Domestic stainless-steel demand (million tonnes)



Stainless steel demand split (%) (fiscal 2024)



Source: Joint Plant Committee (JPC) reports, CRISIL MI&A, industry

ABC: Architecture, building, and construction; ART: Automotive, railways, and transportation

Domestic stainless-steel demand is expected to grow at a CAGR of 7-9% during fiscals 2024-2029 to 5.3-5.5 million tonnes per annum in fiscal 2029. The major end-use industries that are expected to support this healthy domestic demand growth include consumer goods, process industries, infrastructure, building, construction, and automobile.

Demand support from application in various end use industries

Consumer goods sector

Consumer goods sector which broadly includes the categories of kitchenware and consumer durables, accounts for the highest share in demand of stainless steel in India (40-45% as of fiscal 2024). Kitchenware includes various cooking utensils, high-quality cutlery, and kitchen sinks, and consumer durables includes washing machine drums, casings and panels for microwave ovens, refrigerator, etc. This sector is expected to grow at a CAGR of 7-9% over the next five fiscals on the account of increasing urbanization, expanding prevalence of e-commerce market, and growing disposable income levels with the consumers.

Process industry sector

Processing industries sector, primarily comprising of chemical, oil, and gas industries, accounts for around 25-28% of domestic stainless-steel demand. Since the operations in these industries take place in harsh environments, stainless steel being highly corrosion-resistance and chemical-resistant material is extensively used in manufacturing

different machineries, valves, pipes, and tanks. The expected expansion of capacity of industries in light of government's strong push towards localized manufacturing will support the sector to grow at a CAGR of 7-9% between fiscals 2024-2029, and hence will support growth in demand for stainless steel.

ABC - Architecture, building and construction sector

Stainless steel is used in manufacturing various load-bearing components in pedestrian channels, roads, and railway bridges in the infrastructure segment. Due to its high strength, flexibility and resistance to corrosion, stainless steel is also used in the building and construction segments, primarily in manufacturing cladding in the exterior of buildings and handrails and counter tops in the interior of the buildings. The sector is expected to grow at a CAGR of 7-9% between fiscals 2024-2029 on the back of government's strong push towards infrastructure development in light of schemes like national infrastructure pipeline (NIP) and "housing for all", increasing disposable incomes and affordability levels of the consumers, increasing urbanization, and easier financing options.

ART – Automobile, Railways, and Transportation sector

Stainless steel is used in manufacturing various automobile components in conventional, hybrid and electric vehicles such as exhaust systems, heat exchangers, tubes and pipes, fasteners, transmission systems, and some components of skin panel. With an increasing focus of automobile companies to make fuel-efficient conventional vehicles and high-range electric vehicles, stainless steel, due to its high strength to weight ratio is increasingly being used to reduce weights of the vehicles. Further, owing to longevity and durability, stainless steel is used in making fasteners, electric systems, and other key components in trains. Therefore, an expected growth in automobile production at a CAGR of 9-11% over the next five fiscals will support the growth in demand for stainless steel as well.

Demand support from the potential advantages of using stainless steel instead of other materials

The demand for stainless steel will continue to be supported by the quantum of advantages it offers as compared to the other materials across various end-use industries.

High corrosion resistance

This property gives stainless steel longevity and durability in challenging environments, thus making it ideal for applications in marine, chemical processing, and oil and gas industries, where an exposure to harsh environments is common.

Hygienic and ease of cleaning

This inherent property makes stainless steel indispensable in the consumer goods and food and beverage sector, ensuring product purity and safety.

Aesthetic, sustainable, and low maintenance

These property makes stainless steel popular in the areas of interior designing and building facades. Further, the high recyclability makes it a sustainable and eco-friendly material in comparison to its potential substitutes.

High strength to weight ratio

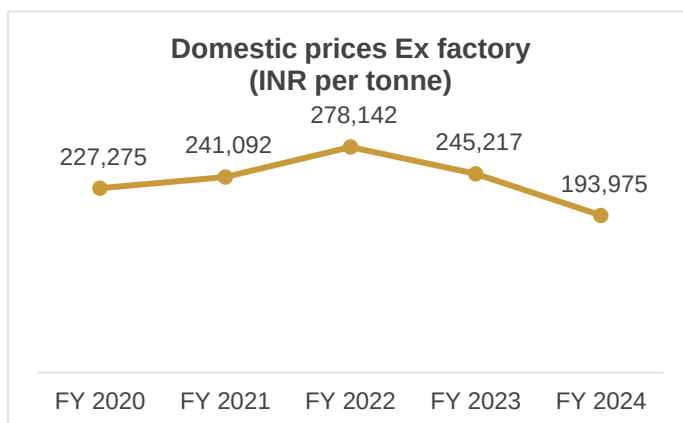
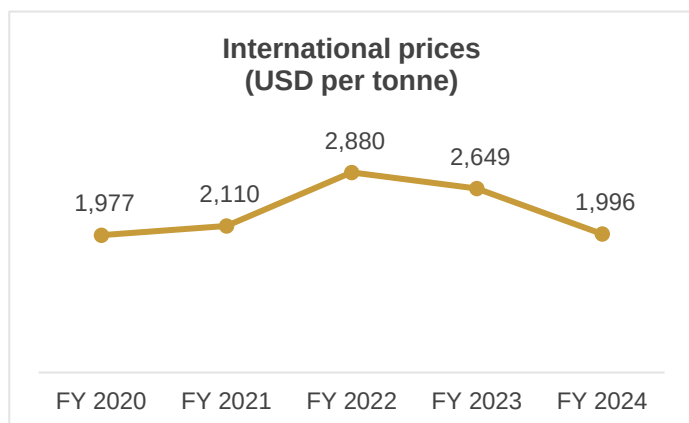
Stainless steel has a high strength to weight ratio, which enhances its appeal in automotive and transportation sectors. This helps in reducing fuel consumption and environmental impact. This property makes stainless steel popular in the areas of interior designing and building facades.

4.4 Price trend of stainless steel

Global prices (USD per tonne) and Domestic prices (Rs per tonne) [FY 2020 - FY 2024]

Consulting

The following charts describe the movement of prices of hot rolled stainless steel of grade 304 over the last five fiscals. For drawing comparison between international and domestic prices of the commodity, the prices correspond to the average of monthly prices between April and March of the respective fiscal in both scenarios. For instance, the price against FY 2020 in both the charts given below represents average of prices from April 2019 to March 2020 and so on.



Source: Bloomberg, Metal bulletins, CRISIL MI&A, industry

On - year change	FY 2021	FY 2022	FY 2023	FY 2024
International prices	7%	36%	-8%	-25%
Domestic prices	6%	15%	-12%	-21%

Source: Bloomberg, Metal bulletins, CRISIL MI&A, industry

Both international and domestic prices followed similar growth trend over the last five fiscals. The prices increased in fiscals 2021 and 2022 owing to pandemic led supply side issues leading to demand-supply imbalance.

In fiscal 2022, Indian steel industry recovered from the supply side issues and started production at near-optimum utilization levels, thereby cutting down the dependence on steel imports. Though the domestic stainless-steel prices increased on-year in fiscal 2022 but its magnitude remained lower than the on-year price increase in the international prices in the fiscal as a result.

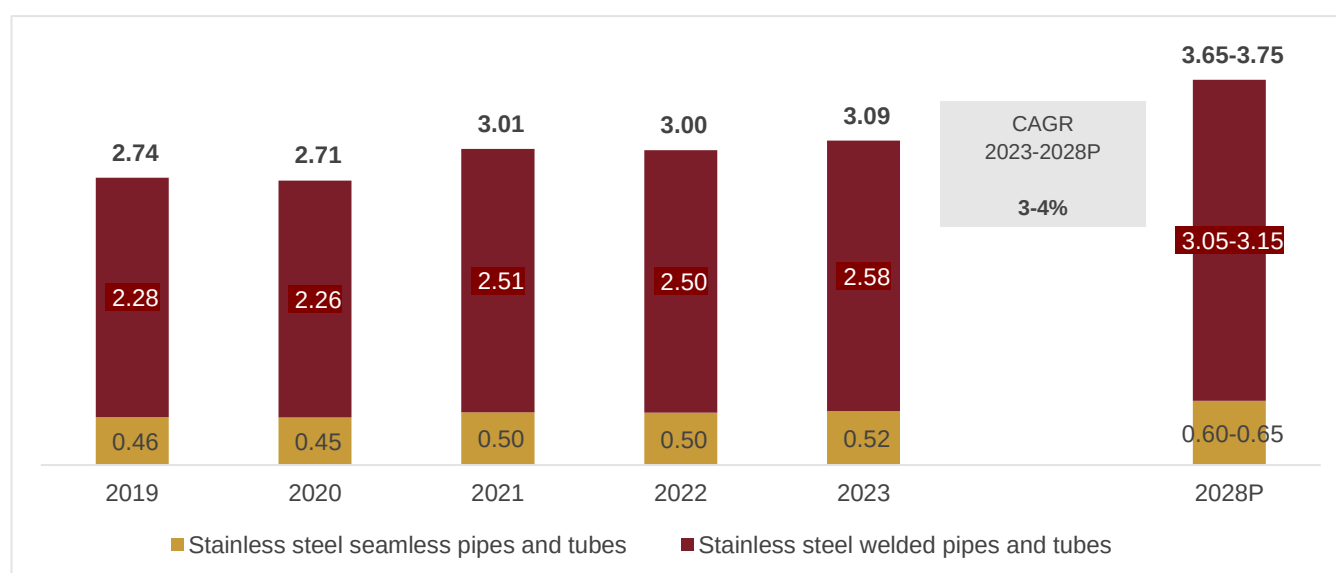
The prices, however, cooled down in the next two fiscals due to resolution of supply side issues, fall in demand in key countries of Europe and Americas, and fall in prices of key raw materials used in steel production.

5. Global stainless-steel tubes and pipes industry

5.1 Demand

Global demand for stainless steel tubes and pipes increased from approximately 2.7 million tonnes per annum in 2019 to approximately 3.1 million tonnes per annum in 2023, clocking a CAGR of about 3%. The share of stainless-steel welded tubes and pipes in the overall global demand falls in 80-85% range with the stainless-steel seamless tubes and pipes accounting for the rest 15-20% share in the demand.

Stainless steel tubes and pipes - global demand in million tonnes per annum

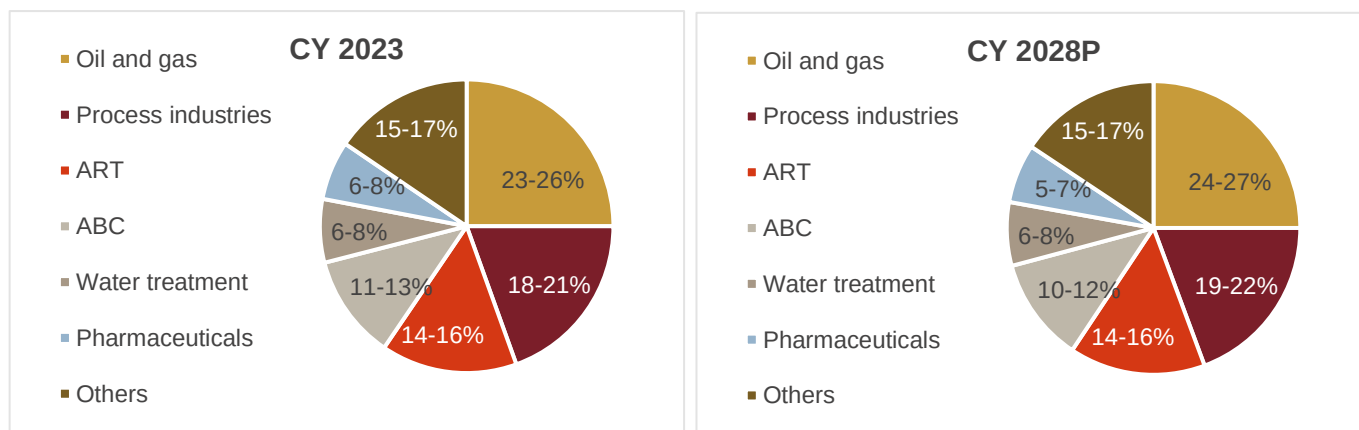


P: Projected

Source: CRISIL MI&A, industry

Between 2023 and 2028, the demand for stainless steel tubes and pipes is expected to increase at a CAGR of 3-4% to approximately 3.65-3.75 million tonnes in 2028.

Stainless steel tubes and pipes - global demand split (CY2023 and CY2028)



P: Projected

Source: CRISIL MI&A, industry

ART: Automobile, railways, and transportation; ABC: Architecture, building and construction

Global demand drivers

The growth in the demand will be supported by the usage of stainless-steel tubes and pipes in various end use sectors such as oil and gas, automobile, chemical manufacturing, infrastructure, building and construction.

Oil and gas: This sector is the major end-user of stainless-steel tubes and pipes, accounting for 23-26% of its global demand in 2023. Stainless steel seamless tubes and pipes primarily cater to the exploration segment of sector whereas the stainless-steel welded tubes and pipes are used in the transportation segment in the sector. Considering their high resistance to corrosion, the stainless-steel tubes and pipes are preferred over the mild steel tubes and pipes in the locations with harsh environments such as in offshore oil rigs, marine applications, and refineries. The growing demand of oil and gas from fast-growing developing economies and increasing consumption in the global aviation and petrochemicals sectors are expected to boost the exploration and transportation segments of the sector, thereby supporting the demand growth of stainless-steel tubes and pipes.

Process industries: Process industries, primarily comprising chemicals and food processing industries, accounted for around 18-21% of global demand of stainless-steel tubes and pipes in 2023. This sector is major end user stainless steel tubes and pipes primarily owing to high resistance of stainless-steel material to harsh environments of the manufacturing plants. Particularly, stainless steel tubes and pipes are used to manufacture the overall piping structure within the plant to transport chemicals, gases, and fluids and also to manufacture parts of storage tanks and heat exchangers.

ART: Globally, automobile sector is also increasing the usage of tubes and pipes of stainless steel due to their high corrosion resistance property and high strength to weight ratio as compared to other forms of tubes and pipes. These tubes and pipes are majorly used in manufacturing exhaust systems, door systems, and fasteners in automobiles and other transport vehicles of different categories, leading to this sector accounting for 14-16% of global stainless-steel tubes and pipes demand in 2023.

ABC: This sector accounted for around 11-13% of global demand of stainless-steel tubes and pipes in 2023. These pipes are primarily used in making water supply, drainage, gas supply, fire safety, heating and cooling systems and in designing the interiors of the residential and commercial buildings. Further, these pipes are also used in many structural applications such as columns, beams, and scaffolding.

Stainless steel tubes and pipes - global demand split by regions

China is the biggest consumer of stainless-steel tubes and pipes in the world, accounting for around 40% of its overall global demand. Such a high demand of these pipes in the country is on the account of high water, oil and gas transportation requirements to cater to a large population and high volume of manufacturing plants across industries. Further, China's government and local authorities have also been focussing on cutting water losses during pipeline transportation and reducing health related risks posed by poor quality of drinking water. Since stainless steel has high resistance to corrosion and are highly hygienic for health, the country has been resorting aggressively to using stainless steel tubes and pipes for water transportation to improve and expand the water supply network over the years. This has primarily led to a consistent increase in the usage of stainless-steel tubes and pipes, thus making China its single largest consumer in the world.

Other Asian countries such as India, Indonesia, Malaysia and middle east countries are also top consumers of stainless-steel tubes and pipes. Most of the countries in the region are developing at a high rate and as a result, are experiencing rapid urbanization and industrial growth, leading to an increased demand for stainless steel tubes and pipes. The growth in the stainless-steel tubes and pipes demand is also getting robust support from growth in sectors like infrastructure development, water supply and sanitation, oil and gas, chemical, and food processing.

Europe is also a leading consumer for stainless steel tubes and pipes. Turkiye, a highly earthquake prone country, and Ukraine, which has been struggling for geopolitical stability require massive infrastructure related investments

which also includes investments in stainless steel tubes and pipes installation for construction, water supply, oil and gas transport, etc.

Risks to demand and growth inhibitors

Fluctuating raw material prices: The raw materials used in the manufacturing of stainless-steel tubes and pipes include nickel and chromium which have volatile prices. The sudden change in prices of these raw materials affect stainless steel pipe manufacturers from the perspective of production costs. As a result, there is a high risk that small scale producers temporarily or permanently shut down their stainless-steel pipe production operations. This could create a demand supply balance and force the end use industries to opt for substitute materials.

Policies: Stainless steel tubes and pipes are resource intensive and could face difficulty in adhering to potentially stringent environmental norms, policies and regulations going forward. Also, import or export related restrictions and tariffs can disrupt global supply chain and hence impact the demand for stainless steel tubes and pipes globally.

Global economic downturn: Economic slowdowns across globe or even in a few important areas of the world can impact the operations of key end use industries such as oil and gas, construction, and automobile and hence can lead to a sudden fall in demand for stainless steel tubes and pipes as well.

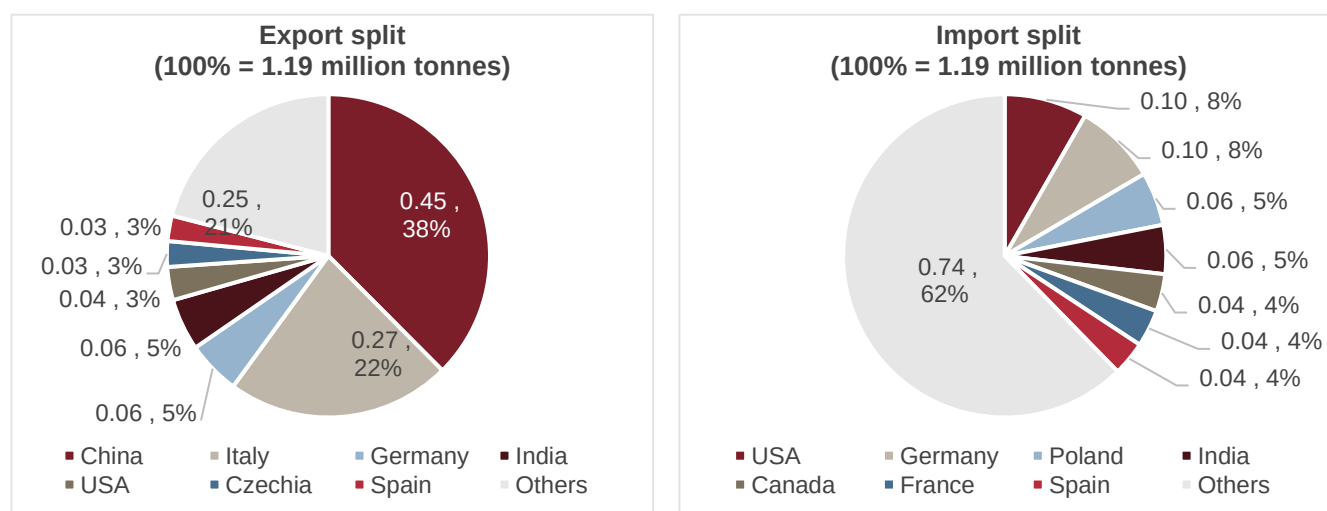
These factors may cause a dent in the global stainless steel tubes and pipes demand, however, the industry can averse most of the risks through constant adaptability and innovation. For example, the industry can look for the ways to make its manufacturing operations environmentally sustainable, thus reducing the risk of the material substitution owing to sustainability issues.

5.2 Global trade analysis

In 2023, the trade volume of stainless-steel tubes and pipes across countries amounted to approximately 1.19 million tonnes. During the year, most of the stainless-steel tubes and pipes were exported from China and Italy, which together accounted for ~60% of total exports globally. They were followed by Germany (5%), India (5%), and USA (3%) in the total volume exported in the year.

On the import side, USA, Germany, Poland, India, Canada, and France cumulatively accounted for approximately one-third of the global imports in 2023.

Stainless steel tubes and pipes region wise trade split (million tonnes, % share) – CY 2023



Source: : United Nations Comtrade, CRISIL MI&A, Industry

Note:

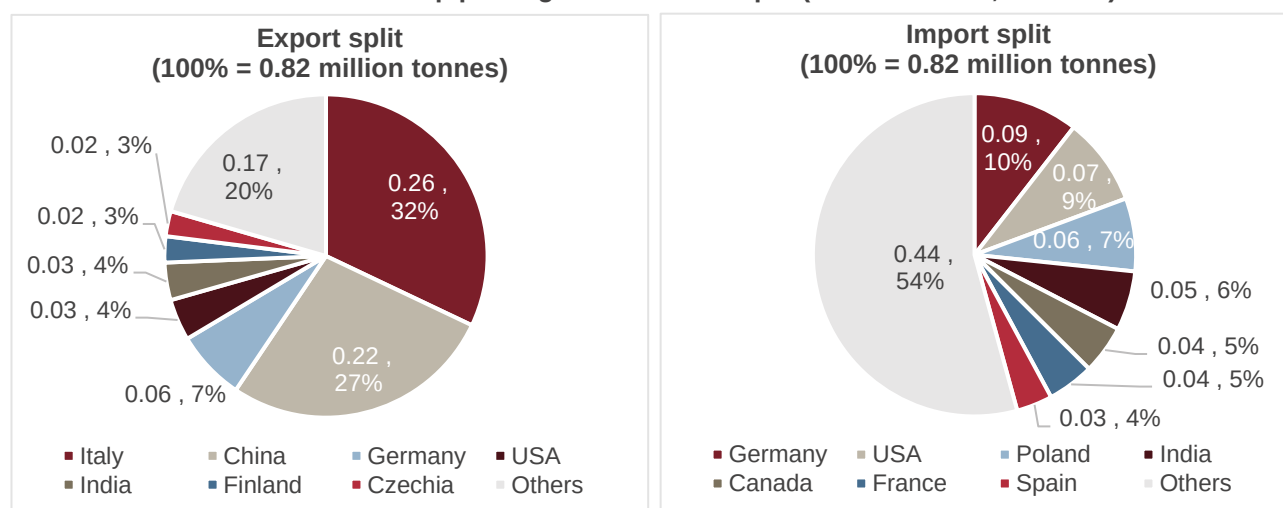
1. For stainless steel tubes and pipes, products of HS codes 730441, 730611, 730621 & 730640 were considered

2. Some key importers other than the ones represented in the "Import split" pie chart are Netherlands, Mexico, Brazil, United Kingdom, and Turkiye, each of which accounted for 2-3% share in the global import volumes of stainless steel tubes and pipes

Stainless steel welded tubes and pipes

Overall traded volume of stainless-steel welded tubes and pipes amounted to approximately 0.82 million tonnes in 2023. During the year, Italy was the top exporter accounting for a 32% share in the total global exported volume stainless-steel welded tubes and pipes. China was the second largest exporter in the segment, accounting for 27% share. On the import side, Germany and USA together accounted for around one-fifth of the imports of stainless-steel welded tubes and pipes (share of 10% and 9%, respectively). These were followed by Poland, India and Canada which imported 7%, 6% and 5% of the total globally traded volume of stainless-steel welded tubes and pipes, respectively.

Stainless steel welded tubes and pipes region wise trade split (million tonnes, % share) – CY 2023



Source: United Nations Comtrade, CRISIL MI&A, Industry

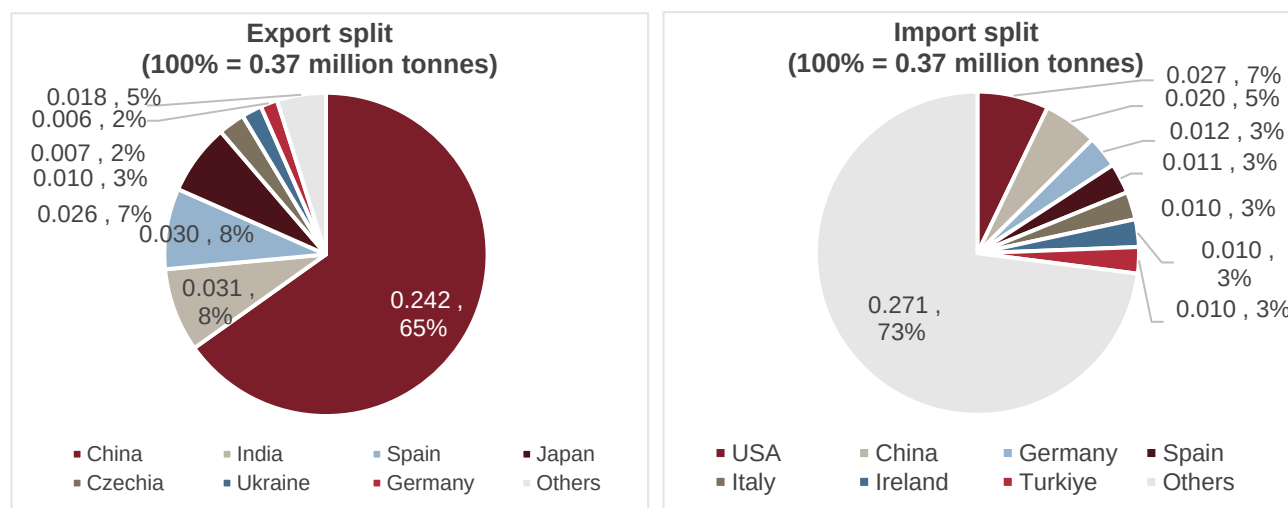
Note: For stainless steel welded tubes and pipes, products of HS codes 730611, 730621 & 730640 were considered

Stainless steel seamless tubes and pipes

In the stainless seamless tubes and pipes segment, China was the top exporter accounting for 65% of the total traded volume in 2023. China was followed by India (8%) and Spain (8%).

On the imports side, USA, China, Germany, Spain and Italy, together accounted for around 20-21% of the overall global imports of the stainless seamless tubes and pipes in 2023.

Stainless steel seamless tubes and pipes region wise trade split (million tonnes, % share) (CY 2023)



Source: United Nations Comtrade, CRISIL MI&A Consulting, Industry

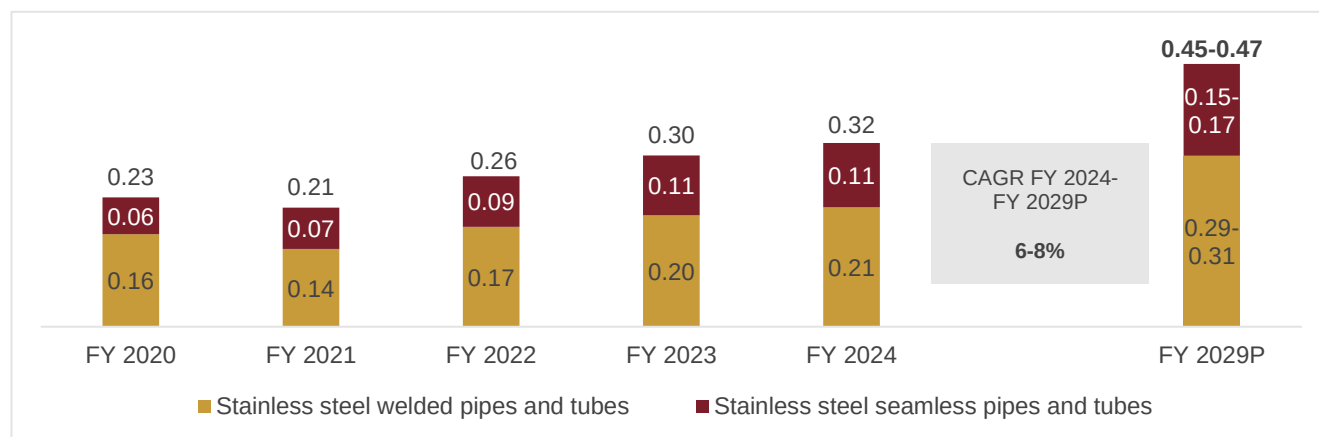
Note: For stainless steel seamless tubes and pipes, products under HS code 730441 were considered

6. Indian stainless-steel tubes and pipes industry

6.1 Demand

Domestic demand for stainless steel tubes and pipes increased from 0.23 million tonnes in fiscal 2020 to 0.32 million tonnes in fiscal 2024, clocking a CAGR of approximately 9% during the period. The share of stainless-steel welded tubes and pipes in the overall domestic demand has largely remained at around 65% with the stainless-steel seamless tubes and pipes accounting for the rest 35% share throughout the period.

Stainless steel tubes and pipes - domestic demand in million tonnes

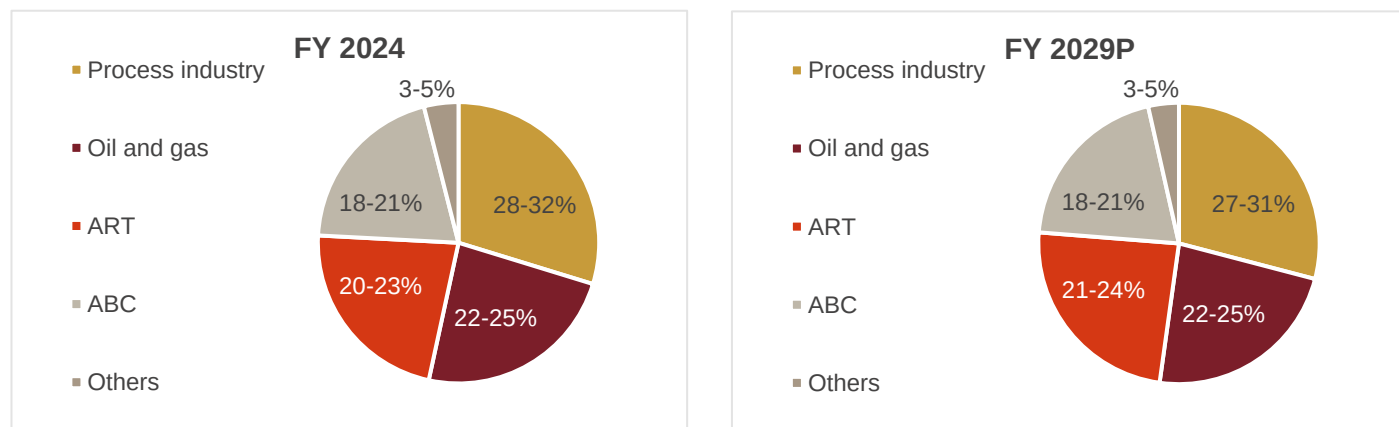


P: Projected

Source: CRISIL MI&A, industry

Between fiscals 2024 and 2029, the domestic demand for stainless steel tubes and pipes is expected to increase at a CAGR of 6-8% to 0.45-0.47 million tonnes in fiscal 2029. This healthy growth in the demand will primarily be led by strong growths in major end use industries of stainless-steel tubes and pipes such as building and construction, automobile, oil and gas, chemical manufacturing, food and beverage, etc.

Stainless steel tubes and pipes - domestic demand split



P: Projected

Source: CRISIL MI&A, industry

ABC: Architecture, building and construction, ART: Automobile, railways, and transportation

End use sector growth outlook and application mapping with respect to type of stainless-steel pipes

End use industry	Expected growth CAGR (FY 2024-2029)	Type of stainless-steel pipe used
Process industry	6-8%	Electric resistance welded tubes and pipes for chemical and fluid transportation (Seamless tubes and pipes are also used but in rare cases)
Oil and gas	6-8%	Seamless for oil exploration, etc Submerged arc welded for oil and gas transport
ART	8-10%	Seamless for suspension arms, steering rods, etc Electric resistance welded for exhaust systems, cooling systems, etc.
ABC	6-8%	Seamless for structural support Electric resistance welded for water, sanitation, and gas systems

Source: CRISIL MI&A, industry

Domestic demand drivers

Process industries

Process industry, which primarily constitutes chemical and food and beverage industries, accounts for around 28-32% of domestic demand of stainless-steel tubes and pipes.

Chemical sub-sector: This end-use sector is a key one primarily owing to ability of stainless-steel material to withstand harsh environments of the chemical processing and manufacturing plants. Stainless steel tubes and pipes extensively are used to manufacture the overall piping structure within the plant to transport chemicals, gases, and fluids and also to manufacture parts of storage tanks and heat exchangers.

Food and beverage sub-sector: The usage of stainless-steel tubes and pipes in food and beverage industry is significant on the account of high durability, hygienic aspects, and high corrosion, bacteria, and temperature resistance of the material. Particularly, these pipes are used in making piping systems to transport liquids and ingredients without the risk of contamination or flavour transfer and also parts of storage tanks and vessels.

The process industry is expected to grow at a CAGR of 6-8% between fiscals 2024 and 2029 on the account of increasing demand of wide range of consumer products, including personal care and home care products, increasing demand of new chemicals from various end use industries for process, product and operations related improvements in the chemical manufacturing plants. Further, other factors such as growing disposable income levels, urbanization, quick commerce businesses and increasing demand for packaged foods in the country will also support the growth in the industry.

Oil and gas

This sector is another major end-user of stainless-steel tubes and pipes, accounting for 22-25% of its domestic demand. Due to their high resistance to corrosion, the stainless-steel tubes and pipes are extensively used in the sector at the locations with harsh environments such as in offshore oil rigs, marine applications, and refineries. The sector is expected to grow at a CAGR of 6-8% over the next five fiscals on the back of anticipated healthy domestic economic growth, increasing urbanization, and industrialization. Further, this sector also offers growth opportunities

in the oil exploration segment, for instance: potential gas hydrate discoveries in the Krishna-Godavari basin, which will provide boost to the demand for seamless form of stainless-steel tubes and pipes.

ART

Automobile, railways, and transportation sectors which primarily use stainless steel tubes and pipes in making different components of exhaust system, suspension system, door structures, fuel and hydraulic lines, fasteners, etc., accounts for 20-23% of its total domestic demand. The sector is expected to grow at a CAGR of around 8-10% over the next five fiscals on the account of improving demand for personal vehicles, easy availability of financing options, improving disposable income levels, and a continuous push towards expansion of transportation network throughout the country. Since stainless steel is gaining popularity as a material with high strength-to-weight ratio and high resistance to corrosion, the demand for stainless steel tubes and pipes will further get a boost through this sector on the account of automobile makers' increasing focus on making fuel efficient and environmentally sustainable variants.

ABC

The combined sector of building, construction, and infrastructure accounts for 18-21% of the domestic stainless steel tubes and pipes demand. The stainless-steel tubes and pipes are extensively used in the heating, cooling, and exhaust systems of the residential and commercial buildings in light of stainless steel's ability to withstand extreme temperatures, while providing high strength-to-weight ratio. Further, in the buildings segment, stainless steel tubes and pipes are used in interior designing and decoration works, internal water piping and sanitation systems, and in making components of windows, doors, and roof structures. In the infrastructure segment, the stainless-steel tubes and pipes are used in making handrails of bridges, structural frameworks and support columns.

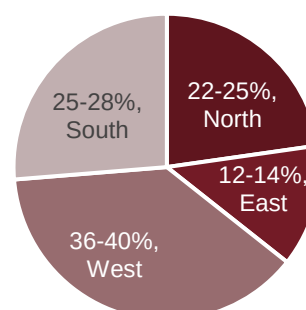
This end-use sector is expected to grow at a CAGR of 6-8% between fiscals 2024 and 2029 on the back of government's strong focus on infrastructure development through schemes like National Infrastructure Pipeline (NIP) and continued focus on affordable housing schemes. The growth will also be led by increasing private investments in the residential real estate sector on the account of urbanization and in the commercial real estate sector on the back of government's supportive policies towards domestic production.

Stainless steel tubes and pipes - domestic demand split by regions

Region	Key end use sectors
North	Food and beverage, automobile, chemical industries
West	Oil and gas, construction and infrastructure, automobile industries
South	Construction and infrastructure, automobile, oil and gas industries

Source: CRISIL MI&A, industry

Region wise domestic demand split for stainless steel tubes and pipes



West region of India, having states like Gujarat and Maharashtra with high share of expenditures towards infrastructure development and high concentration of oil and gas industry, is the major consumption hub for stainless steel tubes and pipes in India. In particular, the region accounts for around 36-40% of the overall domestic stainless-steel tubes and pipes demand on the account of high consumption from key end-use sectors like oil, gas, chemical, automobile, and construction in western states. Southern states like Tamil Nadu and Andhra Pradesh are home to

many oil refineries and oil exploration sites, chemical industries, rapidly urbanizing cities of Chennai, Mysore, Hyderabad, and Amravati, automobile plants, and thus account for 25-28% of overall domestic demand of stainless-steel tubes and pipes in India. North region, which has multiple food, beverage, chemical and automobile manufacturing plants, accounts for 22-25% of the domestic demand for stainless steel tubes and pipes. Eastern zone of India accounts for the rest 12-14% of the domestic demand.

Domestic demand growth inhibitors

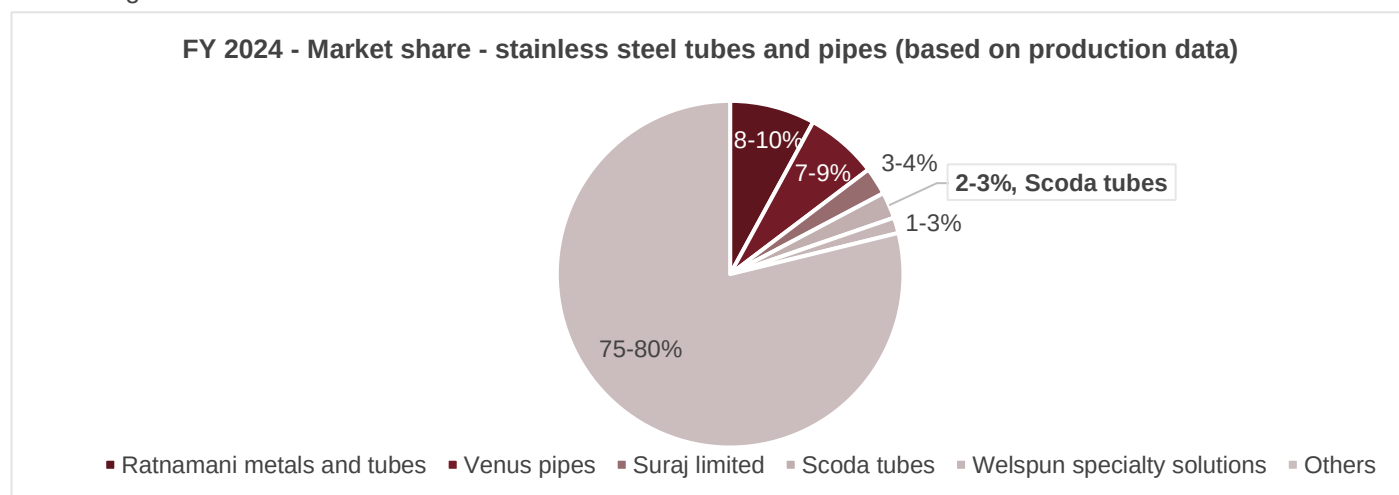
Fluctuating raw material prices: Stainless steel (in flat or long form), which is the primary raw material in the manufacturing of stainless-steel tubes and pipes, consumes metals like nickel and chromium for its production. The prices of these metals are derived from international commodity exchanges, and hence are volatile. This directly affects the production and inventory related cost of stainless steel and indirectly affects the cost of manufacturing stainless steel tubes and pipes. As a result, there is a risk that small-scale stainless-steel pipe producers temporarily or permanently shut down their stainless-steel pipe production operations. Consequently, this could create a demand supply balance and force the end use industries to opt for substitute materials.

Substitution by alternative material pipes: Due to technological advancements, it is likely that stainless steel tubes and pipes could get replaced by tube and pipes made of other new materials or alloys. Further, end use industries, based on suitability with respect to the application area and viability with respect to costs and sustainability, could start substituting stainless steel tubes and pipes with tubes and pipes of different materials like carbon steel, copper, plastic, etc.

Policies: The production process of stainless-steel tubes and pipes is energy and resource intensive and going forward, could invite restrictions so as to adhere to potentially stringent environmental norms, policies and regulations. Further, the custom duties, tax rates, tariffs, and potential trade agreements on the pipes and the major raw materials would also impact the domestic demand-supply balance.

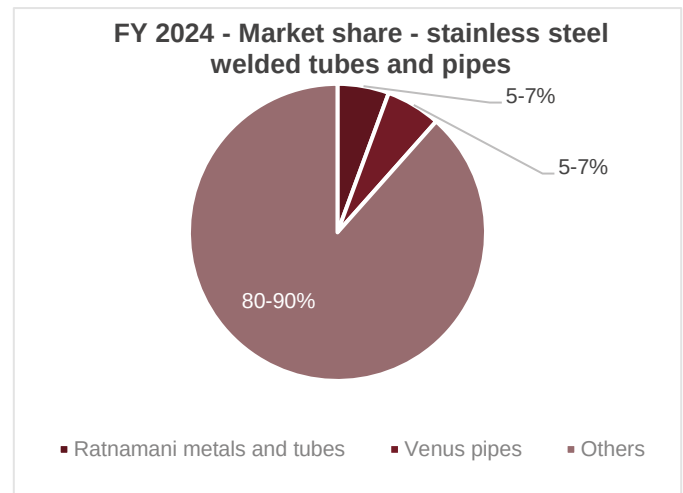
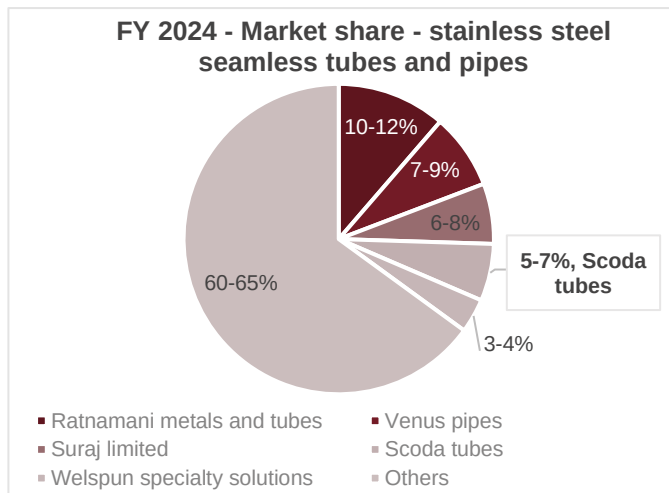
Stainless steel tubes and pipes – player wise market share

Stainless steel tubes and pipes manufacturing industry is largely fragmented with key leading players such Venus Pipes and Tubes, Ratnamani metals and tubes, Suraj limited, Scoda tubes, and Welspun specialty solutions accounting for around 20-22% of domestic market.



Source: CRISIL MI&A, Industry

For the peers considered above, the market shares for stainless steel seamless tubes and pipes and stainless steel welded tubes and pipes are represented below:



Source: CRISIL MI&A, Industry

Note: The market shares are determined based on the production data of the companies considered in the peer set

In the stainless-steel seamless tubes and pipes industry, Ratnamani metals and tubes is the leader with 10-12% market share in India. It is followed by Venus pipes and tubes, Suraj limited and Welspun specialty solutions, which have market shares of 7-9%, 6-8, and 3-4%, respectively in the industry in India. Scoda tubes accounted for 5-7% share in the market in the segment.

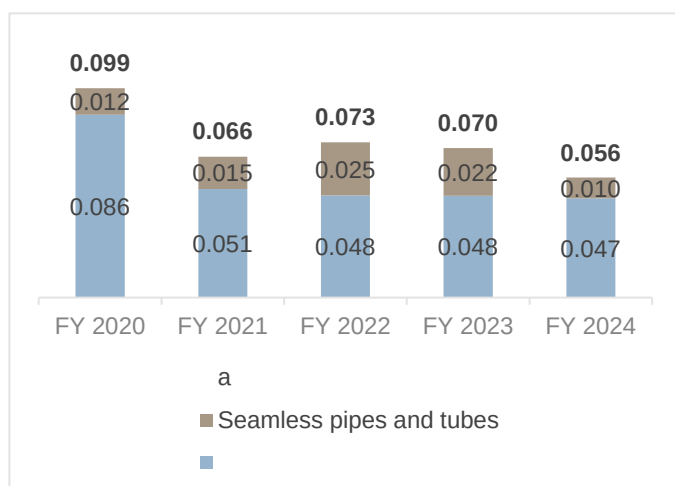
In the stainless-steel welded tubes and pipes segment, Ratnamani metals and tubes and Venus pipes and tubes account for 5-7%, each in the industry. The other peers considered for the study, namely, Suraj limited and Welspun specialty solutions don't have presence in the welded tubes and pipes segment.

6.2 Trade analysis - India

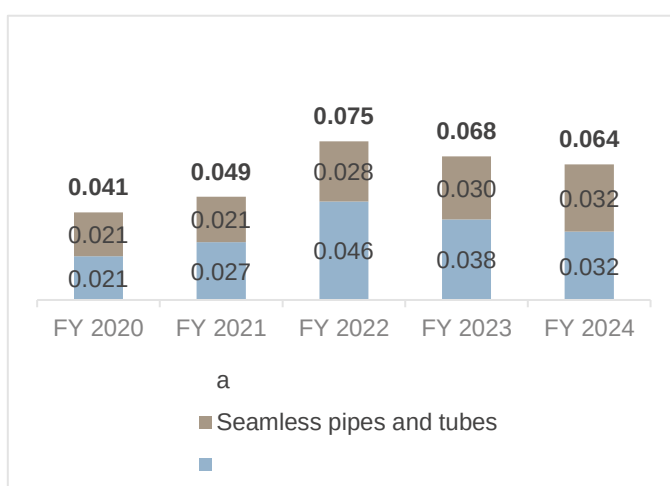
Stainless tubes and pipes

The import volume of stainless-steel tubes and pipes by India declined on-year by 33% to 0.066 million tonnes in fiscal 2021, owing to reduced demand from key end-use sectors in the wake of pandemic-induced lockdowns in the fiscal. Between fiscals 2021 and 2024, the imported volume of stainless-steel tubes and pipes decreased at a CAGR of (-5%) to 0.056 million tonnes, primarily because of an anti-dumping duty imposed by India on stainless steel seamless tubes and pipes from China to guard the interests of local producers. As a result, the imported volume of stainless-steel seamless tubes and pipes, particularly, declined at a much higher negative CAGR of (-14%), during fiscal 2021-2024 period. This has led to a significant reduction in import-export gap over the years, eventually making India a net exporter of stainless-steel tubes and pipes in fiscals 2022 and 2024.

Imports to India (million tonnes)



Exports from India (million tonnes)



Source: Ministry of commerce and industry, CRISIL MI&A, Industry

Note: For stainless-steel welded tubes and pipes, products of HS codes 730611, 730621 & 730640 were considered, and for stainless-steel seamless tubes and pipes, products of HS codes 730441 were considered

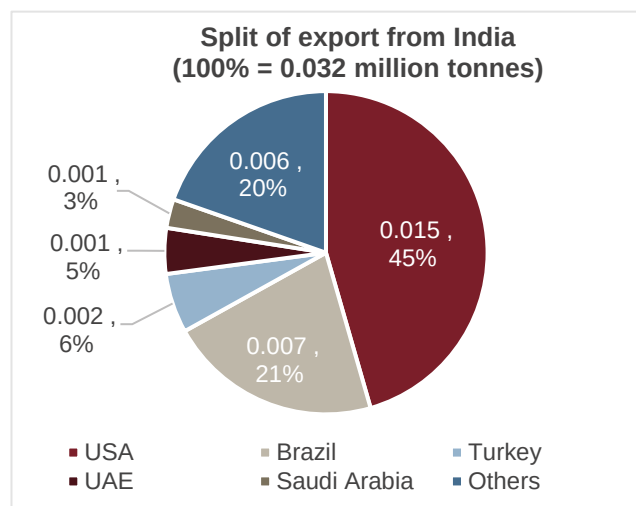
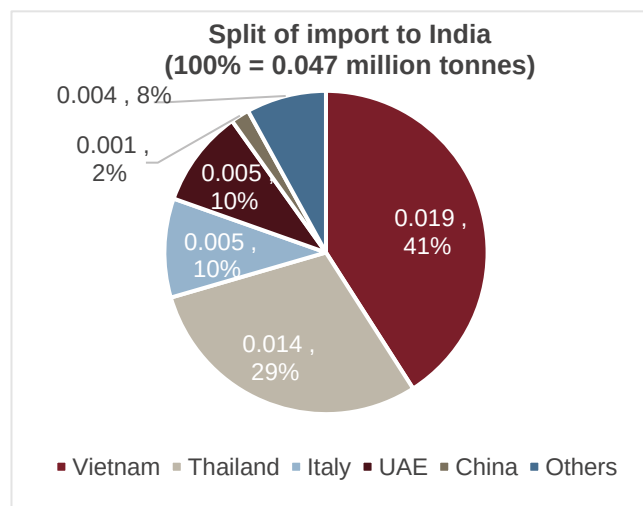
On the other hand, the exports from India increased at a CAGR of around 35% between fiscals 2020-2022 to 0.075 million tonnes in fiscal 2022, on the back of recovery of economy and pent-up demand in key export destinations from the pandemic induced slowdown in the previous fiscal. However, the exports of stainless-steel tubes and pipes further declined at a CAGR of (-8%) between fiscals 2022 and 2024 to 0.064 million tonnes in fiscal 2024 primarily because of inflationary environment of key export markets and geopolitical conflicts in fiscals 2023 and 2024. Further, Indian steel produced faced high competition in the export market from the cheaper products made in other countries, resulting in decline in demand for India-made stainless-steel tubes and pipes in the export market.

Welded tubes and pipes

In fiscal 2024, India imported majority of stainless-steel welded tubes and pipes from Vietnam (share in total imports was ~41%), followed by Thailand (~30%) and Italy (~10%). The high import volume from Vietnam was on the account of its low cost and India's free trade agreement with the country.

On the exports front, USA accounted for ~45% of total stainless-steel welded tubes and pipes export volume from India in fiscal 2024. It was followed by Brazil, which accounted for around 22% share in the overall exports from India in the fiscal. The high share of exports to USA and Brazil can be attributed to the rising demand for stainless steel tubes and pipes in various sectors such as construction, automotive, and oil & gas in both the US and Brazil.

Stainless steel welded tubes and pipes country wise split of trade with India – FY 2024



UAE: United Arab Emirates, USA: United States of America

Source: Ministry of commerce and industry, CRISIL MI&A Consulting, Industry

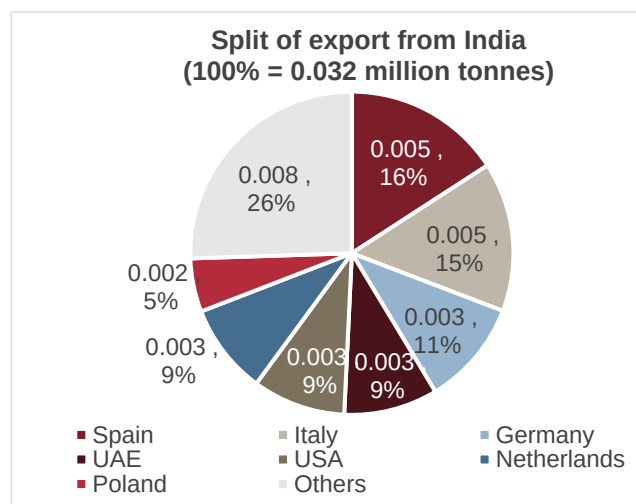
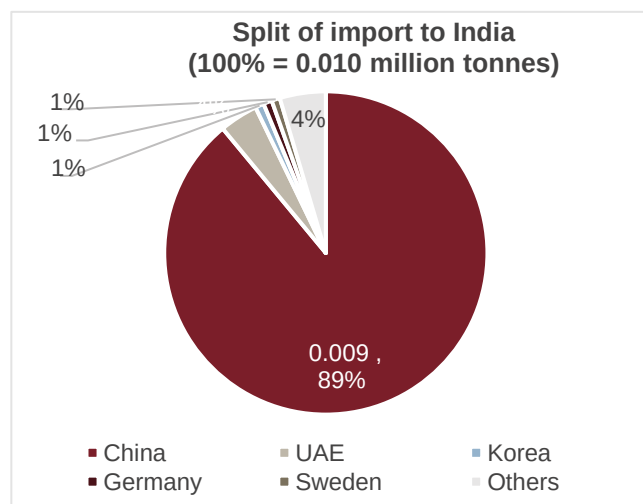
Note: For welded tubes and pipes, products of HS codes 730611, 730621 & 730640 were considered; values in the pie correspond to volume in million tonnes (wherever provided) and share in overall pie

Seamless tubes and pipes

China accounted for approximately 89% share in overall imported volume of stainless-steel seamless tubes and pipes to India in fiscal 2024, amounting to 8,692 metric tonnes. The high share of China made stainless-steel tubes and pipes in India's overall imports is on the account of preference of end-consumers in India towards low-cost Chinese steel products.

As far as exports are concerned, Italy, Canada, and Saudi Arabia cumulatively accounted for around one-third of India's total exported volume of stainless-steel tubes and pipes in fiscal 2024.

Stainless steel seamless tubes and pipes country wise split of trade with India (% share) – FY 2024



UAE: United Arab Emirates, USA: United States of America

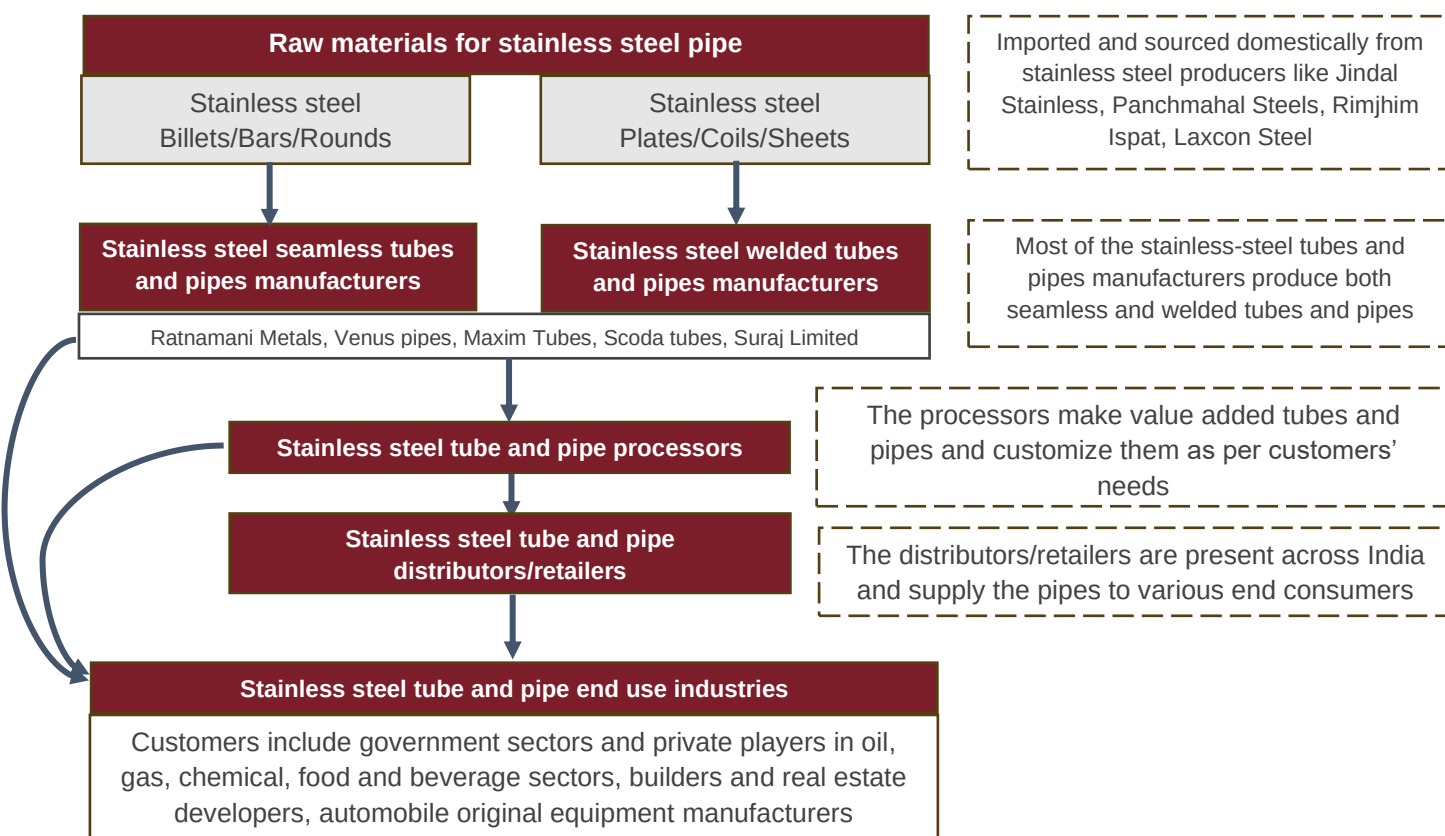
Source: Ministry of commerce and industry, CRISIL MI&A Consulting, Industry

Note: For seamless tubes and pipes, products of HS codes 730441 were considered; values in the pie correspond to volume in million tonnes (wherever provided) and share in overall pie

Key European union countries such as Spain (imported 5,025 metric tonnes of stainless steel seamless tubes and pipes from India), Italy (4,744 metric tonnes), Germany (3,346 metric tonnes), Netherlands (2,874 metric tonnes), and Poland (1,699 metric tonnes), were the top importers of stainless-steel seamless tubes and pipes from India in

fiscal 2024 and together accounted for around 56% of total exported volume from India in the fiscal. USA is another key export market for India, which imported approximately 2,952 metric tonnes of stainless-steel seamless tubes and pipes from India in the fiscal.

6.3 Value chain analysis



Source: CRISIL MI&A, Industry

6.4 Raw material scenario

Stainless steel seamless tubes and pipes

Primary raw material for manufacturing stainless steel seamless tubes and pipes is long stainless steel in the form of billets or rounds. Seamless pipe manufacturers source this raw material mostly domestically from manufacturers like Viraj Group, Ambica Steels, Mukand Limited, Rajputana Stainless Limited, etc.

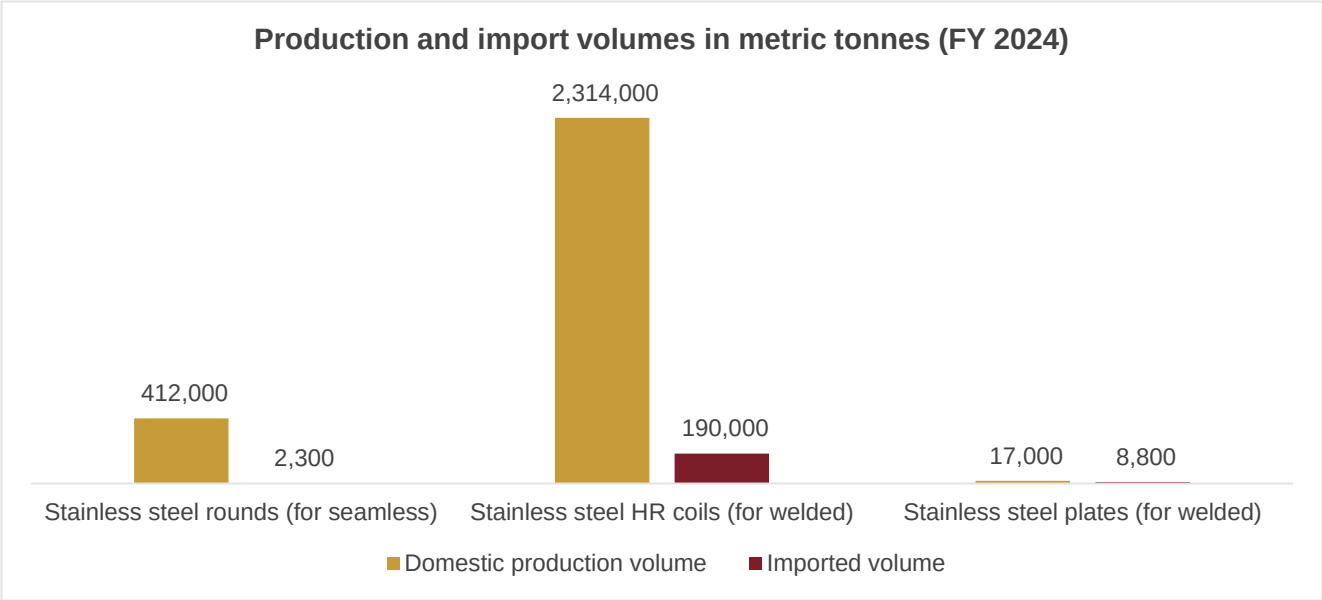
Stainless steel welded tubes and pipes

Primary raw material for manufacturing stainless steel welded tubes and pipes (electric resistance welded and submerged arc welded tubes and pipes) is flat stainless steel, primarily in the form of hot rolled (HR) coils/sheets/strips or plates. Welded pipe manufacturers source flat steel in these forms from Jindal Stainless and Shah Alloys Steel, etc.

While top integrated steel producers hold a significant share in the domestic production volume in carbon steel or alloy steel industry, the industry of the long and flat forms of stainless steel is relatively fragmented. Stainless steel

used in the pipes segment is imported as well, particularly to meet certain grade related requirements of niche end use segments. However, the major chunk of raw material for manufacturing both seamless and welded tubes and pipes in the stainless-steel segment is procured domestically.

Raw material availability and procurement scenario for stainless steel pipe manufacturing (Fiscal 2024)



Source: JPC, CRISIL MI&A, industry

Units are kept in metric tonnes, and not in million tonnes in the above chart for better visibility of smaller figures

In fiscal 2024, India produced ~2.3 million tonnes of stainless-steel hot rolled coils, a key raw material used in the manufacturing of stainless welded tubes and pipes. Out of the total production of HR coils, the share of ISPs was very low with only SAIL producing HR coils to the tune of 0.13 million tonnes in the fiscal. Further, only 0.19 million tonnes (just 8% of domestic production volume in the fiscal) of stainless-steel HR coils were imported during the fiscal.

Approximately 412,000 metric tonnes of stainless-steel plain rounds and approximately 17,000 metric tonnes of stainless-steel plates were produced in fiscal 2024. The imported volumes in India amounted to ~2,300 and ~8,800 metric tonnes for stainless steel rounds and plates, respectively.

7. Competition benchmarking

7.1 Operational benchmarking

Stainless steel tubes and pipes manufacturing facilities in fiscal 2024

	Welded			Seamless			Total		
	Capacity	Production / Sales	Utilization rate (%)	Capacity	Production / Sales	Utilization rate (%)	Capacity	Production / Sales	Utilization rate (%)
Ratnamani Metals and Tubes Limited	20,000	12,500-13,500	60-70%	28,000	17,500-18,800	60-70%	48,000	30,000-32,000	60-70%
Suraj Limited	-	-	-	N/A	8,448	N/A	N/A	8,448	N/A
Venus Pipes and Tubes Limited	24,000.0	11,557*	45-50%	14,400	10,555*	70-75%	38,400	22,112*	55-60%
Welspun Specialty Solutions	-	-	-	18,000	4,785*	25-30%	18,000	4,785*	25-30%
Scoda Tubes Limited	1,020	39	3.82%	10,068	7,165	71.17%	11,088	7,204	64.97%

(All figures are in tonnes, unless mentioned otherwise, and are for fiscal 2024)

Note:

1. Production volumes for Ratnamani Metals and Tubes Limited is estimated based on a utilization level of 60-70% prevailing for the company.
2. Utilization rate defines production volume as a percentage of production capacity
3. *correspond to sales/dispatch numbers, numbers without the asterisk sign are production numbers
4. N/A implies that numbers are not available, “-” represents that the company does not operate in the corresponding category
5. Total capacity and production correspond to sum total of capacities and production volumes of seamless and welded tubes and pipes for each of the companies

Source: Company reports, CRISIL MI&A

Industry verticals being catered to, by the peer-set

	Industries
Ratnamani Metals and Tubes Limited	Oil and gas, dairy, chemicals and fertilizers, thermal, solar and nuclear power, desalination, defence, aerospace, chillers & cooling systems, pulp & paper Industry, automobile
Suraj Limited	Pharmaceuticals, dyes & pigments, oil, gas, refinery
Venus Pipes and Tubes Limited	Chemical, petrochemical, engineering, fertilisers, pharmaceutical, power, food processing, paper, oil & gas, and aerospace
Welspun Specialty Solutions	Automotive, energy, defence, nuclear power, and aerospace
Scoda Tubes Limited	Fertilizers, chemicals, power, nuclear, mining, railways, aerospace, oil and gas

Source: Company financials, CRISIL MI&A Consulting

Product mix

	Products
Ratnamani Metals and Tubes Limited	Nickel Alloy Stainless Steel Seamless Tubes & Pipes (with coating as well) Stainless Steel Welded Tubes & Pipes (with coating as well) Titanium Welded Tubes
Venus Pipes and Tubes Limited	Stainless Steel High Precision and Heat Exchanger Tubes Stainless Steel Hydraulic and Instrumentation Tubes Stainless steel seamless pipes Stainless steel welded pipes
Welspun Specialty Solutions	Stainless extruded seamless schedule pipes Stainless seamless cold finished tubes and pipes Stainless seamless hollow bars Stainless seamless heat exchanger tubes Stainless seamless hydraulic and instrumentation tubing Stainless seamless U-bent tubes
Suraj Limited	Seamless heat exchanger tubes and 'U' tubes Seamless instrumentation tubes Welded and seamless mechanical polished tubes Welded and seamless electropolished tubes
Scoda Tubes Limited	Seamless pipes (including high precision tubes and 'U' tubes) Seamless hydraulic / instrumentation tubing Welded tubes Hot pierced Mother Hollow

Source: Company websites, reports, CRISIL MI&A

Capacity expansion plans

Company	Plans
Ratnamani Metals and Tubes Limited	- Expected commissioning of expansion project of circulars of pipes for higher diameter and 18 meters in fiscal 2025 - Expected operationalization of a new stainless steel seamless tubes and pipes manufacturing capacity of 1,200 to 1,500 tonnes per annum in fiscal 2025
Suraj Limited	N/A
Venus Pipes and Tubes Limited	The company has announced a capital expenditure of Rs 175 crores for multiple expansion projects. This capex will also be utilized to set up a titanium welded tubes manufacturing capacity by March 2025 and a seamless/welded pipe manufacturing capacity by December 2025

Scoda Tubes
Limited

- The company is planning to raise Rs 270 crores, out of which Rs 100 crores would be used in capital expenditure for expansion
- Capital expenditure amounting to Rs 100 crores would be utilized by the company to increase the capacity of stainless steel seamless tubes and pipes to 20,068 metric tonnes per annum from the current 10,068 metric tonnes per annum and that of stainless steel welded tubes and pipes to 13,150 metric tonnes per annum from the current 1,020 metric tonnes per annum

Source: Company financials, CRISIL MI&A

Share of exports and export markets (FY24)

Company	% share of exports in revenues	Export market
Ratnamani Metals and Tubes Limited	40%	USA, UK, France, Germany, Italy, Netherlands, Japan, South Korea, Middle East
Suraj Limited	-	Middle East
Venus Pipes and Tubes Limited	12%	Europe, USA, Middle East
Welspun Specialty Solutions	-	Europe and North America
Scoda Tubes Limited	21%	Europe, USA, Middle East

Source: Company reports, CRISIL MI&A Consulting

7.2 Financial benchmarking

To benchmark the performance of Scoda Tubes Limited with its competitors, a comparison is drawn across the profitability, liquidity, and leverage parameters.

Peer comparison for FY 2024 (Rs million)

Particulars	Units	Ratnamani Metals and Tubes Limited	Suraj Limited	Venus Pipes and Tubes Limited	Welspun Specialty Solutions Limited	Scoda Tubes Limited
Revenue from operations	Rs million	50,590.90	3,306.65	8,021.98	6,966.70	3,998.61
EBITDA	Rs million	8,971.17	394.74	1,463.16	558.30	587.91
EBITDA margin	%	17.73%	11.94%	18.24%	8.01%	14.70%
PAT	Rs million	6,250.97	215.26	859.79	624.70	183.00
PAT margin	%	12.36%	6.51%	10.72%	8.97%	4.58%
Return on capital employed	%	24.36%	19.27%	24.22%	11.44%	15.92%
Return on equity	%	19.90%	17.57%	21.17%	67.11%	28.77%
Fixed asset turnover	Ratio	3.80	3.89	2.73	3.43	4.90
Working capital days	Number	176.75	54.54	113.66	75.57	162.38
On-year revenue growth in fiscal 2024	%	13.07%	-9.81%	45.22%	66.74%	31.05%

Realization	Rs per tonne	N/A	391,458.86	362,834.66	N/A	442,156.35
EBITDA per tonne	Rs per tonne	N/A	N/A	66,170.41	N/A	65,009.63

Source: Company financials, CRISIL MI&A Consulting

Consolidated financials of Ratnamani Metals and Tubes Limited and Suraj Limited; and standalone financials for Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited and Scoda Tubes Limited have been considered throughout the financial benchmarking & analysis

Definitions of the financial parameters mentioned in the above table:

1. EBITDA is calculated as profit (PAT) for the period plus finance costs, depreciation and amortization and total tax expense
2. EBITDA Margin is calculated as EBITDA divided by total revenues
3. PAT Margin is calculated as profit for the period divided by total revenues
4. Return on Capital Employed is calculated as EBIT divided by capital employed. EBIT is calculated as EBITDA minus depreciation. Capital Employed is calculated as Total shareholders' equity + Short-term borrowings + Long-term borrowings.
5. Return on Equity is calculated as profit for the year (PAT) divided by Total shareholders' equity.
6. Fixed Asset Turnover Ratio is calculated as total revenues divided by fixed assets
7. Working capital days is computed as Inventory days plus Trade receivable days minus Trade payable days. Inventory days is calculated as Inventory divided by cost of goods sold multiplied by 365 days. Trade receivables days is calculated as Trade receivables divided by total revenues multiplied by 365 days. Trade payable days is calculated as Trade payable divided by cost of goods sold multiplied by 365 days.
8. Realization per tonne and EBITDA per tonne are determined basis the revenues, EBITDA, and the total volume of pipe sold/produced

Operating margins

Year	FY22	FY23	FY24
Peer set	13.34%	15.42%	16.53%
Scoda Tubes Limited	5.15%	11.40%	14.70%

Source: Company financials, CRISIL MI&A Consulting, Industry

Notes: The peer set includes the following four companies: Ratnamani Metals and Tubes Limited, Suraj Limited, Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited

Operating margins of the peers have remained above that of Scoda tubes limited. However, Scoda tubes limited has shown a strong improvement in fiscals 2023 and 2024, wherein it was able to increase its operating margin from 5.15% in fiscal 2022 to 11.40% in fiscal 2023 and then to 14.70% in fiscal 2024. This strong improvement in the operating margins of the company for the two consecutive fiscals is on the account of company's better control of operating costs in light of economies of scale and effective backward integration.

Net margins

Year	FY22	FY23	FY24
Peer set	8.10%	9.69%	11.54%
Scoda Tubes Limited	0.84%	3.39%	4.58%

Source: Company financials, CRISIL MI&A Consulting, Industry

Notes: The peer set includes the following four companies: Ratnamani Metals and Tubes Limited, Suraj Limited, Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited

Net margins of the peers have remained above that of Scoda tubes limited. However, Scoda tubes limited has shown a strong improvement in fiscals 2023 and 2024 by being able to increase its net margins from lesser than 1% in fiscal 2022 to 3.39% in fiscal 2023 and further to 4.58% in fiscal 2024.

Return on capital employed (ROCE)

Year	FY22	FY23	FY24
Peer set	14.45%	21.72%	23.11%
Scoda Tubes Limited	5.84%	12.62%	15.92%

Source: Company financials, CRISIL MI&A Consulting, Industry

Notes: The peer set includes the following four companies: Ratnamani Metals and Tubes Limited, Suraj Limited, Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited

Average ROCE of the peers has remained more than that of Scoda tubes limited. However, Scoda tubes limited has shown a strong improvement in fiscals 2023 and 2024 by increasing its ROCE from 5.84% in fiscal 2022 to 12.62% in fiscal 2023 and further to 15.92% in fiscal 2024.

Return on equity (ROE)

Year	FY22	FY23	FY24
Peer set	13.19%	18.40%	21.13%
Scoda Tubes Limited	4.68%	22.81%	28.77%

Source: Company financials, CRISIL MI&A Consulting, Industry

Notes: The peer set includes the following four companies: Ratnamani Metals and Tubes Limited, Suraj Limited, Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited

ROE for Scoda tubes, after remaining lower than peer's average ROE till fiscal 2022, increased to 22.81% in fiscal 2023, beating the peers' average ROE of 18.40% in the fiscal. In fiscal 2024, the company further strengthened its ROE by increasing it to 28.81%, which was significantly higher than the peer set's average ROE of 21.13% in fiscal 2024.

Working capital days

Year	FY22	FY23	FY24
Peer set	188.90	165.77	152.72
Scoda Tubes Limited	188.54	151.00	162.38

Source: Company financials, CRISIL MI&A Consulting, Industry

Notes: The peer set includes the following four companies: Ratnamani Metals and Tubes Limited, Suraj Limited, Venus Pipes and Tubes Limited, Welspun Specialty Solutions Limited

Working capital days for Scoda tubes limited has historically remained close to average working capital days for its peer set companies. While the average working capital days for its peer set decreased on-year from ~166 days in fiscal 2023 to ~153 days in fiscal 2024, the working capital days for Scoda tubes increased from ~151 days in fiscal 2023 to ~162 days in fiscal 2024.

8. Company profiling

Business profile

Incorporated in 2008, Scoda Tubes Limited commenced commercial production of stainless-steel tubes and pipes in 2010. The company's plant is currently located at Survey Number - 2437, 2442, 2443, 2444, 2445, 2446; Ahmedabad-Mehsana Highway, Village – Rajpur, Taluka – Kadi, District - Mahesana, Gujarat. Currently, the company's product portfolio includes stainless steel seamless tubes and pipes (including seamless high precision tubes and 'U' tubes and seamless hydraulic/instrumentation tubes) and stainless-steel welded tubes and pipes.

The company's manufacturing facility in Gujarat has separate seamless and welded tubes and pipes divisions which are equipped with latest product-specific machineries such as hot piercing mills, pilger mills, expanding machines, cold drawing lines, bright annealing furnace, TIG/MIG welded tube mill, etc. Further, the plant also has different testing mechanisms facilitated by machines such as eddy-current testing machine, spectro-testing machine, tensile testing machine, etc.

Scoda Tubes Limited is currently managed by Jagrutkumar Patel, Ravi Patel, Samarth Patel, Saurabh Patel, and Vipulkumar Patel, who act as the promoters of the company. The below table provides the roles and responsibilities/designations of key managerial personnel of the company.

Promoters	
Key managerial personnel	Designation
Jagrutkumar Patel	Promoter, Managing Director
Ravi Patel	Chief Financial Officer
Samarth Patel	Promoter, Chairman and Executive Director
Saurabh Patel	Promoter, Non-Executive Director
Vipulkumar Patel	Promoter
Directors	
Key managerial personnel	Designation
Samarth Patel	Chairman, Executive Director (Whole-time Director)
Jagrutkumar Patel	Managing Director
Saurabh Patel	Non-Executive Director
Piyush Shah	Independent Director
Other key managerial personnel	
Key managerial personnel	Designation
Ravi Patel	Chief Financial Officer
Nishita Sanghvi	Company Secretary, Compliance officer
Senior Management Personnel	
Key managerial personnel	Designation
Vipulkumar Patel	President
Dhavalkumar Mistry	Domestic Marketing Manager
Chiragkumar Patel	Marketing Manager (Exports)
Dharmendra Patel	Quality Manager
Hardik Sanghvi	Assistant Manager (Export Marketing)
Vinodkumar Patel	Plant Manager

Source: Company

Started as a small-scale stainless-steel tubes and pipes manufacturer, the company now has a global presence. The company consistently focuses on adopting latest technology, skilful manpower, and modern infrastructure. Along with having approvals from various esteemed organisations such as ISRO, BHEL, etc., the company is recognized with the certifications such as ISO 9001:2015, ISO 14001:2018, ISO 45001:2018 along with PED 2014/68/EU and AD 2000 Merkblatt WO. They also focus on sustainable development by prioritizing principles of prevention of pollution and environment, prevention of injuries and ill health, and occupational health and safety of employee.

ISRO: Indian Space Research Organization; BHEL: Bharat Heavy Electricals Limited; ISO: International Organization for Standardization; PED: Pressure Equipment Directive; TIG: tungsten inert gas; MIG: metal inert gas

Corporate history

Calendar year	Key highlights for the calendar year
2008	Incorporation of the Company
2010	Entered exports market
2012	Received approval from Bharat Heavy Electricals Limited (BHEL) H.E.E.P Haridwar for supply of products
2013	- Received approvals from key-state owned fertilizer companies i.e. Gujarat Narmada Valley Fertilizers and Chemicals Limited (GNFC), Indian Farmers Fertilizers Cooperative Limited (IFFCO) Kandla and Kalol Unit and Krishak Bharati Cooperative Limited (KRIBHCO) for supply of products - Entered in Petroleum sector after receiving approval from Hindustan Petroleum Corporation Limited (HPCL) for supply of products
2014	Received approval from Engineers India Limited (EIL) for supply of products
2016	Change in management
2017	- Supplied product to Department of Atomic Energy, Government of India - Received approval from Bharat Heavy Electricals Limited (BHEL), Hyderabad for supply of products
2018	- Entered power sector after supplying products to Triveni Turbine - Entered Mining & Engineering sector after receiving approval from Bharat Earth Movers Limited (BEML) for supply of products - Received approval from Bharat Heavy Electricals Limited (BHEL) Bhopal and Jhansi for supply of products
2019	Received trademark certificate for 'Scoda Tubes Limited' thereby creating a brand
2022	- Entered in chemical & pharmaceutical sector after supplying products to Laxmi Organics - Supplied products to government railway companies such as Banaras Locomotive Work, Rail Coach Factory, Western Railway and Central Railway
2023	- Supplied Products to National Thermal Power Corporation (NTPC), Bilaspur - Supplied products to government railway companies such as Modern Coach Factory and Chittaranjan Locomotive Work - Received certificate for implementing Quality Management System in accordance with ISO 9001:2015 - Received certificate for implementing Environmental Management System in accordance with ISO 14001:2015

	Received certificate for implementing Occupational Health and Safety Management System in accordance with ISO 45001:2018
2024	- Supplied products to government railway companies such as Eastern and Northeastern Railway - Achieved production capacity of 11,088 metric tonnes per year

H.E.E.P: Heavy Electricals Equipment Plant

Source: Company

Scoda Tubes Limited's production facility is in Mehsana, Gujarat. The manufacturing capability of the company has increased over the years in terms of number of production lines, land area, and production capacity per annum as detailed below:

Fiscal	Number of production lines			Land area owned by company (square meter)	Manufacturing plant area (square meter)	Production capacity (metric tonnes per annum)		
	Seamless pipes	Welded pipes	Mother hollow			Seamless pipes	Welded pipes	Mother hollow
2018	3	2	-	9,429	9,429	1,140	1,020	-
2019	4	2	-	9,429	9,429	1,740	1,020	-
2020	6	2	-	9,429	9,429	2,340	1,020	-
2021	8	2	-	15,034	15,034	2,340	1,020	-
2022	10	2	-	21,199	21,199	4,410	1,020	-
2023	15	2	1	21,199	21,199	6,540	1,020	20,000
2024	18	2	1	69,411	21,199	10,068	1,020	20,000

Source: Company, Chartered Engineer Certificate

Note: The company has a free land area, where it would build additional plant capacity in case it is needed. Further, from fiscal 2023 onwards, a 20,000 metric tonne per tonne capacity dedicated for mother hollow pipe manufacturing is operational, which will act as backward integration for seamless tube and pipe manufacturing

Product mix over the past years

Scoda Tubes Limited primarily manufactures stainless seamless welded tubes, pipes and U-tubes. Stainless steel is resistant to corrosion, oxidation, and high temperature and has a very high tensile strength. Thus, their products can be used in mining and minerals, oils and gas, desalination, etc. Various products manufactured by Scoda Tubes Limited are summarised as follows:

Product	Outer diameter	Thickness	Length	Standards	Usage
Stainless steel seamless pipes	1/8" NB to 6" NB	Sch10s to Sch80s	Single Random Length and Double Random Length	ASTM, ASME, EN, ISO, Norsok, IBR	Used by industries for transportation of fluids / liquids
Stainless steel seamless tubes	6.00 mm to 101.6 mm	0.70 mm to 6.00 mm	Up to 22 meters	ASTM, ASME, EN, ISO, Norsok, IBR	Used in heat exchangers, air-fin coolers, condensers. LP/HP heaters and boilers
Stainless steel seamless 'U' tubes	6.00 mm to 50.80 mm	0.70 mm to 4.00 mm	Up to 22 meters	ASTM, ASME, EN, ISO, Norsok, IBR	Used in heat exchangers, air-fin coolers, condensers. LP/HP heaters and boilers
Stainless steel seamless hydraulic/instrumentation tubes	6.00 mm to 50.80 mm	0.80 mm to 6.00 mm	Up to 18.000 meters	ASTM, ASME, EN, ISO, Norsok, IBR	Used by industries for high pressure applications

Stainless steel welded tubes / “U” tubes	6.00 mm to 60.30 mm	0.80 mm to 4.00 mm	Up to 11.800 meters	ASTM, ASME, EN, ISO, Norsok, IBR	Used by industries for low pressure applications
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NB: nominal bore; mm: millimeter; ASTM: American Society for Testing and Materials; ASME: American Society for Testing and Materials; EN: European norm; ISO: International Organization for Standardization; IBR: Indian Boiler Regulation; LP / HP heaters: low pressure / high pressure heaters

Source: Company data, CRISIL MI&A, Industry

Further, the product-mix of the company comprises of several grades, which are key to applications in specific end-use industries, as detailed below:

Product	Grades	End-use application areas
Stainless steel seamless pipes	300 series grades: 304/L/H, 316/L/H/Ti, 317/L, 321/H, 347/H, 310/S. 309/S 400 series grades: 405, 410 Other grades: S31803, S32205, S32750, 1.4301, 1.4307, 1.4401, 1.4404, 1.4432, 1.4541, 1.4571	Onshore and Offshore Oil and Gas Production, Exploration and Transport, Chemical and Petrochemical, Energy and Power Generation, Mechanical and Plant Engineering, Marine Equipment's, Pulp & Paper, Pharmaceutical Industry, etc.
Stainless steel seamless tubes	300 series grades: 304/L/H, 316/L/H/Ti, 317/L, 321/H, 347/H, 310/S. 309/S 400 series grades: 405, 410 Other grades: S31803, S32205, S32750, 1.4301, 1.4307, 1.4401, 1.4404, 1.4432, 1.4541, 1.4571	Onshore and Offshore Oil and Gas Production, Exploration and Transport, Chemical and Petrochemical, Energy and Power Generation, Mechanical and Plant Engineering, Marine Equipment's, Pulp & Paper, Pharmaceutical Industry, etc.
Stainless steel seamless 'U' tubes	300 series grades: 304/L/H, 316/L/H/Ti, 317/L, 321/H, 347/H, 310/S. 309/S 400 series grades: 405, 410 Other grades: S31803, S32205, S32750, 1.4301, 1.4307, 1.4401, 1.4404, 1.4432, 1.4541, 1.4571, TEMA 'R', 'C', 'B'	Onshore and Offshore Oil and Gas Production, Exploration and Transport, Chemical and Petrochemical, Energy and Power Generation, Mechanical and Plant Engineering, Marine Equipment's, Pulp & Paper, Pharmaceutical Industry, etc.
Stainless steel seamless hydraulic/instrumentation tubes	300 series grades: 304/L/H, 316/L/H/Ti, 317/L, 321/H, 347/H, 310/S. 309/S 400 series grades: 405, 410 Other grades: S31803, S32205, S32750, 1.4301, 1.4307, 1.4401, 1.4404, 1.4432, 1.4541, 1.4571	Nuclear & Thermal Power generation, Oil and Gas, Process Industries, Chemical and Fertilizer, Nuclear Power, Food & Beverage Processing, Automotive, Aerospace, Medical Pharmaceutical etc.
Stainless steel welded tubes / “U” tubes	300 series grades: 304/L/H, 316/L/H/Ti, 317/L, 321/H, 347/H, 310/S. 309/S 400 series grades: 405, 410 Other grades: S31803, S32205, S32750, 1.4301, 1.4307, 1.4401, 1.4404, 1.4432, 1.4541, 1.4571	Chemical & Petrochemical, Gas Industry, Power Generation, Mechanical and Plant Engineering, Marine Equipment's, Pulp & Paper, Pharmaceutical Industry, etc.

L: low carbon steel grade; H: high carbon steel grade

Source: Company data, CRISIL MI&A, Industry

Product manufacturing process at the company

The company manufactures stainless steel seamless pipes, stainless steel seamless tubes, stainless steel seamless 'U' tubes, stainless steel seamless hydraulic/instrumentation tubes, stainless steel welded tubes / “U” tubes.

The manufacturing processes of each of the products are summarized as follows:

For manufacturing stainless steel seamless pipes and stainless-steel seamless tubes, the following method is deployed by the company:

Consulting

Step#	Reference	Description
1	Round Bar inspection	On receipt of the raw material, a sample testing typically called the “Round Bar inspection” is carried out as per ordered specifications. In case the raw material passes the test, the same is segregated basis its quality and standards and thereafter utilized for manufacturing the final product as per customer specification.
2	Peeling	The peeling process of round bars is a machining operation that is used to remove surface imperfections and achieve a smooth, uniform surface finish. This process is essential for producing high-quality round bars with precise dimensions and improved surface quality.
3	Cutting	The Round Bars are cut in desired lengths using a band-saw cutting machine.
4	Hot piercing	Hot piercing process is used to produce seamless hollow pipes from round bars. It involves piercing or punching a hot metal billet with a mandrel or piercing punch to create a hollow cavity, which is then elongated and shaped into a pipe, commonly known as Mother Hollow Pipe.
5	Hot Finish Pipe Annealing	Hot finish pipe annealing is a heat treatment process that is used to soften and refine the microstructure of hot-finished steel pipes, improving their mechanical properties and dimensional stability. It involves heating the pipes to a specific temperature and holding them at that temperature for a certain period before slowly cooling them down.
6	Straightening	Tubes and pipes are further passed through a straightening machine to straighten any unwanted bent areas, including deformations occurring during the heat treatment process.
7	Coating or Pickling	Coating: An oxalate coating operation is carried out by dipping the hollow pipe in oxalate at a prescribed temperature/time (as per applicable product standards) This operation is carried out for formation of a lubrication film on the hollow pipe for the purposes of easing the cold drawing process. This is necessary for cold drawing process. Pickling: A series of surface treatment processes, known as pickling, are carried out on the inner and outer surface of the pipes using a combination of acids with a small addition of a corrosion inhibitor or active agent, for the purposes of removing oxides scales and grease from the surface of the pipe by chemical action in order to obtain a clean and shiny metal surface. This is necessary for pilgering process.
8	Cold Drawing or Pilgering	Cold Drawing: Cold drawing process is carried out for the purposes of reducing the cross-sectional diameter and thickness of the tubes/pipes (as required) and increasing the tensile strength of the product by drawing through successively smaller dies. The tube/pipe is pulled through a die, which reduces its cross-sectional area by up to 40% in a single pass. Pilgering: Pilgering is a cold working process that is used to reduce the diameter and wall thickness of metal tubes/pipes with high precision and excellent surface finish. The cold pilger process achieves cross-section reductions of more than 70 percent in a single working cycle of stainless-steel tubes and pipes.
9	Solution Annealing	Solution annealing, a common heat-treatment process for different families of metals (including stainless steel) is carried out for the purposes of dissolving any precipitates present in the material and transforming the material into a single-phase structure. This process is commonly used for the purposes of removing internal stress, restoring ductility, softening the metal for cold working, and enhancing electrical conductivity, which can improve machinability and properties of stainless steel.
10	Cutting and Straightening	Pipes are cut in desired specifications using a band-saw cutting machine and are then, straightened using a straightening machine/hydraulic press for the purposes of applying pressure points.
11	Deburring	A secondary process of deburring is undertaken for the purposes of enhancing the final product quality by removing raised edges and unwanted pieces of material, known as burrs, left by the initial machining processes including shearing, bending, cutting, piercing, and compressing materials. The process polishes the edges and the surface of the work piece for achieving a completely smooth finish.
12	Pickling and Passivation	Pickling: A series of surface treatment processes, known as pickling, are carried out on the inner and outer surface of the pipes using a combination of acids with a small addition of a corrosion

		inhibitor or active agent, for the purposes of removing oxides scales and grease from the surface of the pipe by chemical action in order to obtain a clean and shiny metal surface. Passivation: A non-electrolytic finishing process known as passivation is carried out for the purposes of improving the corrosion and rust resistance properties of stainless-steel manufacturing subsequent to manufacturing. Corrosion resistance is critical for metal used in a variety of applications where contamination may have a destructive impact during production or during a product's end use. Though raw stainless steel begins with a high level of corrosion resistance, surface contamination from grease and oil, debris, and chemicals are usually present on parts and components after machining. The Passivation process clears away these contaminants and enhances the corrosion resistance of stainless steel.
13	Straightening	Tubes/pipes are further passed through straightening machine to straighten any unwanted bent areas, including deformations occurring during the heat treatment process.
14	Hydrotesting	A pressure test known as the Hydrostatic (HYDRO) test is carried out for testing the products for their strength and leaks. The procedure involves filling the test product with a liquid (water) and pressurising it to a specified pressure (as per applicable product standards), subsequent to which the pressure is held for a specific amount of time to visually inspect the system for any leaks.
15	Non-destructive testing (NDT Testing)	A testing/analysis technique, namely Non-destructive testing (NDT) is applied for the purposes of evaluating the properties of the materials, components, structures or systems for identification of characteristic differences/welding defects/discontinuities.
16	Inspection and Marking	A physical inspection of the products is carried out and subsequently product markings are applied on each tube/pipe by way of stencilling/inkjet. Further, additional markings are applied as per the customer purchase orders and specifications. Subsequent to the markings, a tag is applied to the lot of tubes/pipes and the materials inspected are hard stamped/electro-etched, as applicable on tubes/pipes or on tag of the bundle.
17	Packing	On receipt of the final product from the quality department, the packaging department verifies the tag and matches the same with the size and quantity of the product to be packed. Thereafter, the product is packed in a wooden box/hessian cloth/plastic wrapping based on packaging instructions and a copy of the packing list is kept inside the packaging.
18	Dispatch	The details of the products are then entered in the dispatch register as per the applicable delivery schedule and thereafter the products are loaded into transportation for delivery.

Source: Company, CRISIL MI&A, industry

For manufacturing stainless steel seamless “U” tubes, the following method is deployed by the company:

Step#	Reference	Description
1-5	Round Bar Inspection, Peeling, Cutting, Hot piercing, and Hot Finish Pipe Annealing	Same as those described for manufacturing process of stainless-steel tubes and pipes above (steps 1-5).
6	Coating or Pickling	Same as that described for coating or pickling step under manufacturing process of stainless steel tubes and pipes (step 7)
7	Solution Annealing or Bright Annealing	Solution Annealing: This is a common heat-treatment process for different families of metals (including stainless steel) which is carried out for the purposes of removing internal stress, restoring ductility, softening the metal for cold working, and enhancing electrical conductivity, which can improve machinability and properties of stainless steel. Bright Annealing: This is a heat treatment process applied to metals, particularly stainless steel, to improve their mechanical properties, corrosion resistance, and surface finish. The process is performed in a controlled atmosphere to prevent oxidation and discoloration, resulting in a bright, reflective surface.
8	Straightening	Same as that described for straightening step under manufacturing process of stainless-steel tubes and pipes (step 6)

9	Cold Drawing or Pilgering	Same as that described for Cold Drawing or Pilgering step under manufacturing process of stainless-steel tubes and pipes (step 8)
10	Straightening	Pipes are straightened using a straightening machine/hydraulic press for the purposes of applying pressure points and straightening any unwanted bent areas, including deformations occurring during the heat treatment process.
11	"U" bending by Cold press	The straight stainless-steel tubes are fed into a tube bending machine equipped with mandrels and dies designed to create the desired U-bend shape. The tube bending machine uses hydraulic or mechanical forces to bend the tubes around the mandrel to form the U-shape.
12	"U" bending after straight tube inspection	After the U-bending process, additional testing such as Hydrostatic, Eddy Current (ECT), and Visual Inspection (VDI) are conducted as per client's specifications and industry standards.
13	Stress Relieving at bend portion	Stress relieving at the bend process is a heat treatment method used to alleviate residual stresses that may develop in metal components after bending. This is done to improve integrity and strength of the bent portion.
14	Cutting and Straightening	Same as that described for Cutting and Straightening step under manufacturing process of stainless-steel tubes and pipes (step 10)
15	Deburring	Same as that described under Deburring step under manufacturing process of stainless-steel tubes and pipes (step 11)
16	Pickling and Passivation	Same as that described under Pickling and Passivation step under manufacturing process of stainless-steel tubes and pipes (step 12)
17-21	Hydrotesting, NDT testing, Inspection and Marking, Packing, Dispatch	Same as those described for manufacturing process of stainless-steel tubes and pipes above (steps 14-18).

Source: Company, CRISIL MI&A, industry

For manufacturing stainless steel seamless hydraulic / instrumentation tubes, the following method is deployed by the company:

Step#	Reference	Description
1-8	Round Bar Inspection, Peeling, Cutting, Hot piercing, and Hot Finish Pipe Annealing, straightening, coating or pickling, cold drawing or pilgering	Same as those described for manufacturing process of stainless steel tubes and pipes (steps 1-8).
9	Bright Annealing	Bright annealing is a heat treatment process applied to metals, particularly stainless steel, to improve their mechanical properties, corrosion resistance, and surface finish. The process is performed in a controlled atmosphere to prevent oxidation and discoloration, resulting in a bright, reflective surface.
10	Cutting and straightening	Same as that described for Cutting and straightening step under manufacturing process of stainless-steel tubes and pipes (step 10)
11	Deburring	Same as that described for Deburring step under manufacturing process of stainless-steel tubes and pipes (step 11)
12-16	Hydrotesting, NDT testing, Inspection and Marking, Packing, Dispatch	Same as those described for manufacturing process of stainless-steel tubes and pipes above (steps 14-18).

Source: Company, CRISIL MI&A, industry

For manufacturing stainless steel welded tubes / "U" tubes, the following method is deployed by the company:

Step#	Reference	Description
1	Coil/Strip Inspection	On receipt of the raw material, a sample testing typically called the coil/strip inspection is carried out as per ordered specifications. In case the raw material passes the test the same is segregated basis its quality and standards and thereafter utilized for manufacturing the final product as per customer specification.
2	Roll Forming and tungsten inert gas (TIG) Welding	Subsequent to the coil/strip inspection, the following two process are carried on the coil/strip: Roll Forming: In this process, incremental bending to a continuous fed strip of metal is carried out by using a set of precisely placed rollers (which are mounted in sets on a consecutive stand). The process begins with a large coil of sheet metal that can be from 50 mm to 700 mm wide with a thickness of 1mm to 8 mm. TIG Welding: The Tungsten Inert Gas ("TIG") is an inert gas welding process used to join metals by creating a weld in a roll formed shape by way of heat being generated by an electric arc between the metals to be joined and an infusible tungsten-based electrode, located in the welding torch. The arc area is shrouded in an inert or reducing gas shield to protect the weld pool and the tungsten electrode. The filler metal as a rod (if required) is applied automatically by the welder into the weld pool and as the rolled form exits the rollers, and before it is cut, it is automatically welded.
3	Solution/Bright Annealing	Solution/ Bright annealing, a common heat-treatment process for different families of metals (including stainless steel) is carried out for the purposes of dissolving any precipitates present in the material and transforming the material into a single-phase structure. This process is commonly used for the purposes of removing internal stress, restoring ductility, softening the metal for cold working and enhancing electrical conductivity, which can improve machinability and properties of stainless steel.
4	Straightening (applicable only to "U" tubes)	Pipes are cut in desired specifications using a straightening machine/hydraulic press for the purposes of applying pressure points and straightening any unwanted bent areas, including deformations occurring during the heat treatment process.
5	"U" bending (applicable only to "U" tubes)	The straight stainless-steel tubes are fed into a tube bending machine equipped with mandrels and dies designed to create the desired U-bend shape. The tube bending machine uses hydraulic or mechanical forces to bend the tubes around the mandrel to form the U-shape
6	"U" bending after straight tube inspection (applicable only to "U" tubes)	After the U-bending process, additional tests such as Hydrostatic, Eddy Current (ECT), and Visual Inspection (VDI) are conducted as per client's specifications and industry standards
7	Stress Relieving at Bend Portion (applicable only to "U" tubes)	Stress relieving at the bend process is a heat treatment method used to alleviate residual stresses that may develop in metal components after bending. This is done to improve integrity and strength of the bent portion.
8	Cutting and straightening	Pipes are cut in desired specifications using a straightening machine/hydraulic press for the purposes of applying pressure points.
9	Deburring	Same as that described for Deburring step under manufacturing process of stainless-steel tubes and pipes (step 11)
10	Pickling and Passivation	Same as that described for Pickling and Passivation step under manufacturing process of stainless-steel tubes and pipes (step 12)
11-15	Hydrotesting, NDT testing, Inspection and Marking, Packing, Dispatch	Same as those described for manufacturing process of stainless steel tubes and pipes above (steps 14-18).

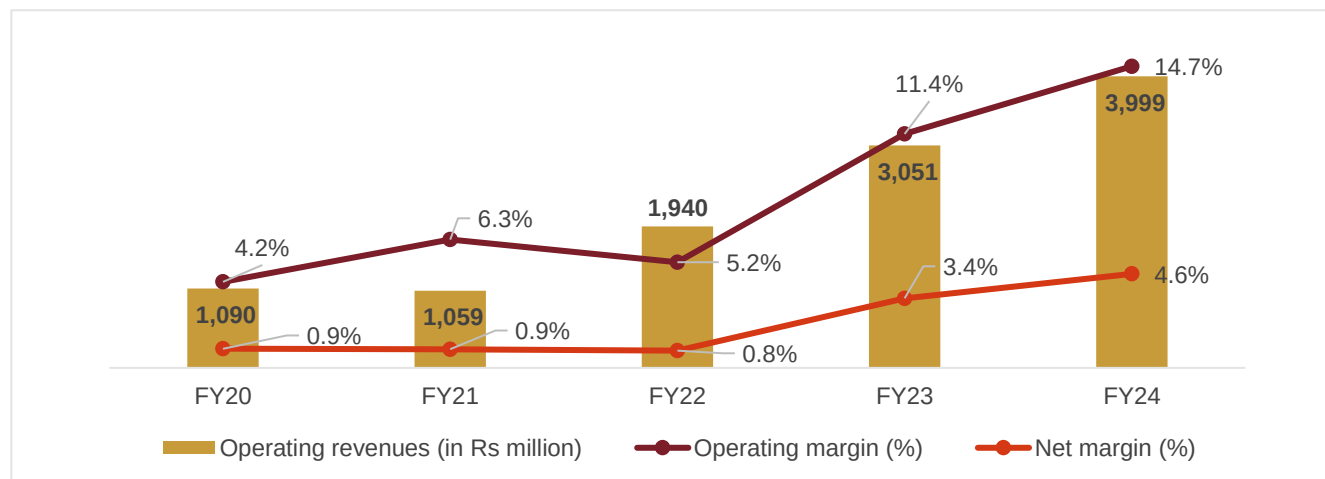
Source: Company, CRISIL MI&A, industry

Past performance of the company

Financial performance

Consulting

The operating revenues of the company increased at a strong CAGR of approximately 38% between fiscals 2020-2024 primarily on the back of expansion of the company's operational capabilities. The sharpest on-year growths in operating revenues of the company came in fiscals 2022, 2023, and 2024, wherein the operating revenues increased on-year by 83%, 57%, and 31%, respectively. This sharp growth in operating revenues happened primarily on the account of expansion of seamless tubes and pipes manufacturing capacity from 2,340 metric tonnes per annum in fiscal 2021 to 10,068 metric tonnes per annum in fiscal 2024. The added capacity helped the company capitalize on the growing demand for the tubes and pipes, thus contributing to a robust increase in operating revenues.

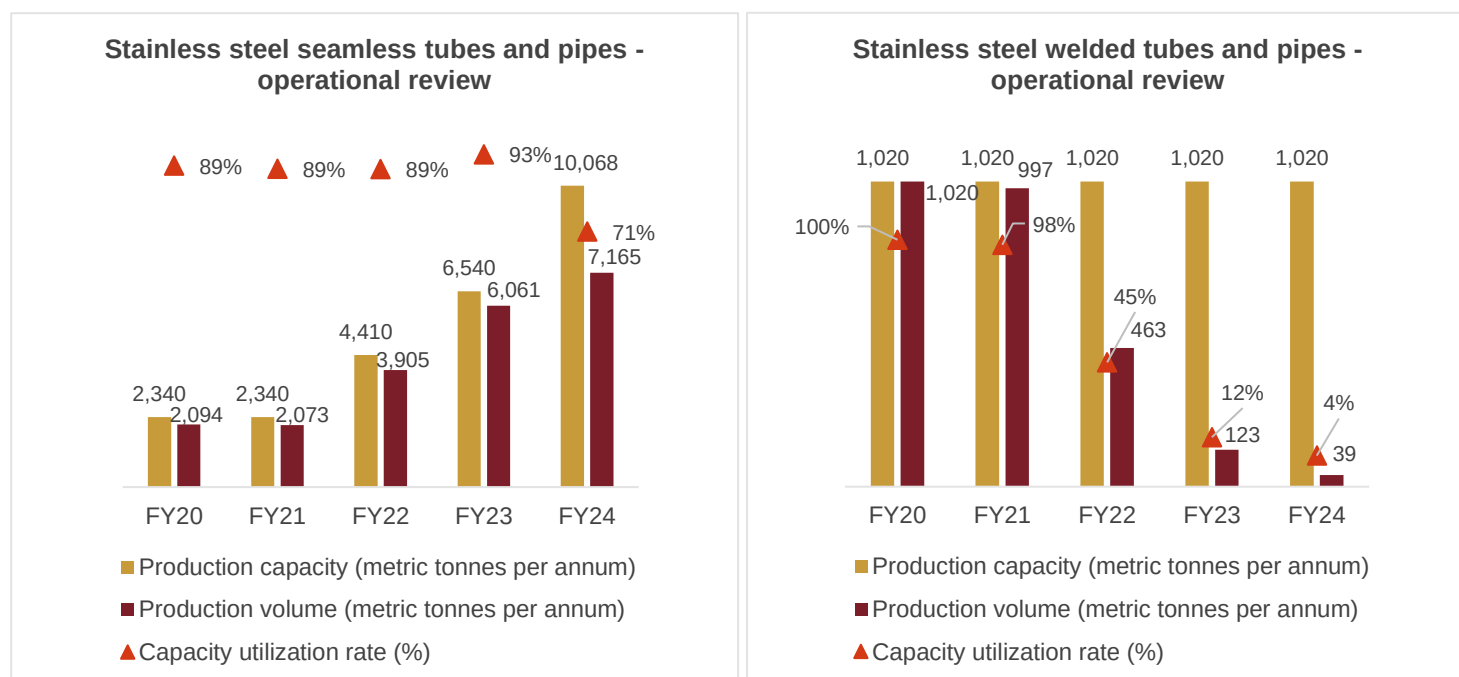


Source: Company, CRISIL MI&A, industry

The operating and net margins remained rangebound for 3 fiscals leading to fiscal 2022 and clocked 5.2% and 0.8%, respectively in fiscal 2022. However, in fiscal 2023, the company, along with an expansion of seamless tubes and pipes capacity, developed backward integration capability by setting up a 20,000 metric tonnes per annum mother hollow pipes capacity. The cost-related benefits from the economies of scale and the backward integration capability helped the company increase its operating and net margins to 11.4% and 3.4%, respectively in fiscal 2023 and further increase them to 14.7% and 4.6%, respectively, in fiscal 2024

Operational performance

Scoda tubes limited has facilities to produce stainless seamless and welded tubes and pipes, along with mother hollow pipes. The company has remained more focussed on stainless steel seamless tubes and pipes segment, where the capacity has grown from 1,140 metric tonnes per annum in fiscal 2018 to 10,068 metric tonnes per annum in fiscal 2024. On the other hand, the capacity of stainless-steel welded tubes and pipes has remained steady at 1,020 metric tonnes per annum throughout said period. The company also operationalized a mother hollow pipe manufacturing facility of 20,000 metric tonnes per annum capacity for backward integration purpose in fiscal 2023. The company manufactured 6,500 metric tonnes and 9,900 metric tonnes of mother hollow pipes in fiscals 2023 and 2024, respectively.



Source: Company data, Chartered Engineer certificate

The stainless-steel seamless tubes and pipes manufacturing facility operated at capacity utilization level of above 85-90% between fiscals 2020 and 2023. However, in fiscal 2024, as the stainless-steel seamless tubes and pipes capacity increased by 3,528 metric tonnes per annum to 10,068 metric tonnes per annum, amounting to an on-year capacity increase of ~54%, its capacity utilization rate dropped to approximately 71% owing to the gradual operationalization of the increased capacity. On the other hand, with the strategic shift of the focus of the company on the seamless tubes and pipes segment owing to capacity expansions¹ in the segment in fiscals 2022-2024, capacity utilization rate at the facility of stainless-steel welded tubes and pipes dipped from 100% in fiscal 2020 to 45% in fiscal 2022 and to 4% in fiscal 2024.

¹The capacity of stainless-steel seamless tubes and pipes expanded:

1. from 2,340 metric tonnes per annum to 4,410 metric tonnes per annum in fiscal 2022 (over 88% on-year increase in the capacity in the fiscal),
2. from 4,410 metric tonnes per annum to 6,540 metric tonnes per annum in fiscal 2023 (approximately 48% on-year increase in the capacity), and
3. from 6,540 metric tonnes per annum to 10,068 metric tonnes per annum in fiscal 2024 (approximately 54% on-year increase in the capacity in the fiscal)

Footprint across Indian and overseas stainless steel tubes and pipes market

The company has obtained product related approvals from multiple end-use customers in India as well as abroad over the years. This has helped the company spread its distribution network through-out India. The company has also been exporting its products to international clients in key geographies of the world.

Some of the key current and prospective **domestic** clients of the company are listed below (based on the product approvals received by the company historically):

Client	Industry	Location
Gujarat Narmada Valley Fertilizers & Chemicals (GNFC)	Fertilizer	Gujarat
Krishak Bharati Cooperative Limited (KRIBHCO)	Fertilizer	Gujarat, Uttar Pradesh
Hindustan Petroleum Corporation Limited (HPCL)	Petroleum	Maharashtra, Andhra Pradesh
Triveni Turbine Limited	Power	Karnataka
Laxmi Organic Industries Limited	Specialty chemicals	Maharashtra
Bharat Heavy Electricals Limited (BHEL)	Power	Karnataka, Andhra Pradesh, Tamil Nadu, Uttarakhand, Uttar Pradesh, Madhya Pradesh
Bharat Earth Movers Limited (BEML)	Mining	Karnataka
Modern Coach Factory	Railways	Uttar Pradesh
Western, Central, Eastern and Northeastern Railway	Railways	PAN India
Rail Coach Factory (RCF)	Railways	Punjab
Department of Atomic Energy	Nuclear energy	Maharashtra

EPC: Engineering, procurement, and construction

Source: Company

A few major current and potential **international** clients of the company are mentioned below:

Client	Industry	Location
Voss Edelstahlhandel GmbH & Co. KG	Trading	Germany
Rff Rohr Flansch Fitting	Trading	Germany
Cunado S.A.U.	Trading	Spain
Dacapo Stainless AS	Trading	Denmark
Nords AS	Mechanical processing	Estonia

Source: Company

Quality control management

Scoda Tubes Limited pays high attention towards maintaining high quality of its finished products. For this, the company has a dedicated quality control team which takes care of quality standards during all the manufacturing stages including raw material processing, cold rolling, pipe manufacturing and dispatching, etc. Further, the company houses the following inspection and testing facilities to ensure that the manufactured products meet the desired specifications and quality standards:

Category of tests	Outside diameter
Mandatory tests	Positive material identification (PMI) test, Hydrostatic test, Chemical test, Tensile test, Mechanical tests, Micro test, Hardness test

Supplementary tests

Eddy current test, Ultrasonic test, Intergranular Corrosion (IGC), practice “A” “C” and “E” tests, Air under water test, Dye penetrant test, Impact test, Boroscopic examination

Source: Company reports, CRISIL MI&A, Industry

Future expansion plans and tie-ups for sales

The company has been working on expanding its production lines by purchasing and developing more land, as well as investing in new equipment and machinery.

Since 2016, the Company has grown consistently in terms of acquisition of land:

- In 2016, the production facility was situated on a land of area 9,429 square meters only. In 2024, the company's land area has increased over 7 times to approximately 69,411 square meters. However, the company's manufacturing facility is situated on 21,199 square meters of land, which is around 32% of total land area available with the company. This leaves around two-third of the available land area for the company to build additional manufacturing facility for pursuing its capacity expansion plans.
- Out of the 21,199 square meters of land area with the manufacturing facility, 15,034 square meters of land is owned by the company, while the rest is taken on lease by the company.
- The company has also purchased additional vacant land parcel of approximately 10,669 square meters of area adjacent to its current manufacturing facility.
 - The company has reserved this additional land area for future expansion of its manufacturing capacity for seamless tubes and pipes. The company plans to use 7,746 square meters of land of this land parcel for installing said capacity.
- Further, the company has also purchased vacant land parcel with an area of approximately 30,064 square meters.
 - The company has reserved 5,250 square meters of said vacant land parcel for building its manufacturing facility for welded tubes and pipes.

The company's consistent focus on acquisition of land has remained and will continue to remain a key factor to its growth due to the nature of finished products and their intricate requirements for space for its production, handling, storage and logistics.

The Company has also grown consistently in terms of production capacity:

- In 2018, the company had a stainless-steel seamless tube and pipe manufacturing facility with a capacity of 1,140 metric tonnes per annum. This capacity increased by over 8 times between 2018 and 2024 to 10,068 metric tonnes per annum in 2024. Further, the company has a manufacturing facility to produce 1,020 metric tonnes of welded tubes and pipes and another manufacturing facility to produce 20,000 metric tonnes of mother hollow pipes in 2024.
- As of 2024, the company has 18 production lines for seamless tubes and pipes, 2 production lines for welded tubes and pipes, and 1 production line for hot piercing at its manufacturing facility.
- The company plans to set up 9 additional production lines for seamless tubes and pipes and 5 additional production lines for welded tubes and pipes.
- These production lines will help the company nearly double its stainless steel seamless tubes and pipes manufacturing capacity to 20,068 metric tonnes per annum in the medium to long term

- Further, the additional production lines will increase the production capacity of stainless-steel welded tubes and pipes by ~12,130 metric tonnes per annum to 13,150 metric tonnes per annum in the medium to long term

The summary of the expansion plans of the company is as follows:

Infrastructure / facility	Units of measurement	Current size of the facility (FY 2024)	Future size of the facility after planned expansion	Increase in size through expansion
Land with manufacturing facility	Square meters	21,199	69,411	216%
Number of production lines for seamless tubes and pipes	Number	18	27	50%
Number of production lines for welded tubes and pipes	Number	2	7	250%
Seamless tubes and pipes manufacturing capacity	Metric tonnes per annum	10,068	20,068	~100%
Welded tubes and pipes manufacturing capacity	Metric tonnes per annum	1,020	13,150	~13 times

Source: Company, CRISIL MI&A, Industry

SWOT Analysis

Strengths

Specialised production of Stainless-Steel tubes and pipes

- The company specializes in the manufacturing of seamless and welded tubes and pipes in a single metal category, i.e., stainless steel. This high emphasis on a single metal category for catering to the pipe requirements of both domestic and international customers has, over time, improved the expertise of the company in terms of manufacturing process, inventory management and sales of products
- With the vast experience in the designated product segment, the company has achieved an ability to accurately assess and respond to customer preferences in this segment. This has helped the company to be able to offer various specialized stainless-steel tubes and pipes products in terms of length, bending, thickness and grades as required or preferred by our customers.

Thus, the specialized focus of the company on the stainless-steel segment of tubes and pipes has well positioned it in attracting and retaining customers to cater to their requirements of customized, specialized and high-quality stainless-steel tubes and pipes across the world.

Plant's strategic location and integrated operations

- The company's current manufacturing facility is strategically located in the state of Gujarat to enable easy and seamless access to key ports and junctions for efficient flow of products.
 - For instance, the plant is in close proximity, approximately 200 kilometres, from the Mundra port, a key port for exports, and 23 kilometres from an Inland Container Depot, that ensures sound access and connectivity to the company.

The strategic location of the manufacturing plant, hence, helps the company in reducing its logistics costs and improving its margins.

- Currently, the company possesses 21 production lines for its products (18 production lines of seamless tubes and pipes, 2 production lines of welded tubes and pipes, and 1 production line for hot piercing). As of fiscal 2024, the company owns land area of 69,411 square meter, out of which the plant facility is built upon 21,199 square meter area. The extra land gives the company an opportunity to expand its manufacturing capacity in the near or long term.
- The company's plant is fully integrated with sizeable production facilities. For example, the company has stainless steel seamless tubes and pipes manufacturing capacity of 10,068 metric tonnes per annum. The company also possesses a 1,020 metric tonnes per annum manufacturing capacity of stainless steel welded tubes and pipes. As a result of the high capacity, the company garners benefits such as the economies of scale and produces its final products at competitive prices. The company is fully committed to continue to invest in its production facilities to increase the quantum of edge over its competitors in the long term.
- In fiscal 2023, the company completed the set-up of a brand-new piercing mill for the production of mother hollow (annual capacity of 20,000 metric tonnes per annum), which is the principal raw material for its products. This new facility of the company makes its overall pipes manufacturing operations a highly backward integrated one. Apart from getting benefits such as lower raw material related costs and reduced supply side risks owing to low reliance on the raw materials suppliers, the company also gets the flexibility to easily accommodate changes in its product portfolio as per the market dynamics to cater to requirements of its wide spectrum of customers.

Customer and geography diversification

- The company sells its products to diversified end-user markets, both domestically and internationally. In the domestic market, it sells products to end-users, fabricators, EPC contractors as well as stockists.
- In the United States market, the company supplies its products through one exclusive distributor, while in the Italy, Germany, Austria and Eastern Europe markets, it supplies its products through its hired sales/marketing representatives to end-users, fabricators and EPC contractors.
- The company, thus, has a solid end-user base in a wide range of industrial sectors, such as oil & gas, petroleum, fertilisers, chemicals, defence & aerospace, pharmaceutical, power, automobile industry, etc. Some of the key customers of the company are described below:
 - The company has received approvals from various esteemed organizations such as Laxmi Organic Industries Limited, Gujarat Narmada Valley Fertilizers & Chemicals Limited (GNFC), Krishak Bharati Cooperative Limited (KRIBHCO), Triveni Turbine, Hindustan Petroleum Corporation Ltd. (HPCL), Bharat Heavy Electricals Limited (BHEL), etc.
 - Further, the company has supplied its products to major domestic public sector clients such as Western, Central, Eastern and Northeastern Railway, Modern Coach Factory (MCF), Rail Coach Factory (RCF), Department of Atomic Energy, etc.
- The company exported its products to over 16 countries in fiscal 2024, The share of exports in the company's overall revenues have remained over 20% for the last three fiscals

This diversification with respect to industries and the market regions helps the company garner revenue diversification and sustainable operations in the medium and long term. This also helps the company to hedge its business operations from concentration risks and other sector- or geography- specific risks.

Valuable experience, qualifications, and industry relations of the promoters

- The promoters of the company, namely, Jagrutkumar Patel, Ravi Patel, Samarth Patel, Saurabh Patel, Vipulkumar Patel have experience of over 8 years in the pipe industry, which gives the company a strong and healthy relationship with suppliers and customers.
- The promoters have high expertise in marketing, procurement, finance, accounting and customer relationship management.
- The company's senior management team comprises of professionally qualified members with experience and knowledge in the pipe industry and regulatory environment. Their experience and their understanding of the

industry has enabled and will continue to enable the company to take advantage of both current and future opportunities. Since a large number of senior management personnel have worked with the company for a significant period of time, it will result in effective operational coordination and continuity of business strategies.

- This extensive experience and understanding of the business has played a huge in customer satisfaction, which brings repeat-business and new-client referrals for the company.

Extensive and Effective Quality Control

- All the products manufactured by the company adhere to national and international standards and go through extensive quality control procedures by trained and experienced personnel.
- The company has a dedicated quality control team which takes care of quality standards during all the manufacturing stages including raw material processing, cold rolling, pipe manufacturing and dispatching, etc. Some of the quality testing and inspection facilities in the company include Positive material identification (PMI) test, Hydrostatic test, Chemical test, Tensile test, Mechanical test, Micro test, Hardness test, Eddy current test, Ultrasonic test, Intergranular Corrosion (IGC), practice “A” “C” and “E” tests, air under water test, dye penetrant test, impact test, and Boroscopic examination.
- The company’s quality team is responsible for different aspects of the manufacturing process, such as monitoring the parameters of equipment, checking the strength of materials, reporting any irregularities in the manufacturing process and making adjustments accordingly.
- The company has a low production rejection rate. On an average annual basis, approximately 3% and 2% of the company’s products are rejected by its quality control systems and its customers, respectively.

The high focus of the company towards maintaining quality standards helps it cater to large sections of the end-use industry, both domestically and internationally, while keeping its brand image intact.

International Accreditations and product approvals

- The company follows international standard manufacturing practices, and its manufacturing facility benefits from the quality benchmarking certifications, including ISO 9001:2015, 14001:2015 and 45001:2018. Further, the company is certified with TUV SUD South Asia Private Limited and Pressure equipment directive (PED), Norsok M650, and DNV

[ISO: International Organization for Standardization; DNV: Det Norske Veritas]

- The products sold to the European market are certified under PED 2014/68/EU and ADW/AD 2000 – Merkblatt – W0 from TUV Nord.
- The company also holds accreditation from the Indian Boiler Regulation for manufacturing and supply of stainless steel seamless and welded pipes, tubes and U-tubes, DNV-CP-0252 certification for steel pipes and steel pipe fitting and DNV marine certificate for application in ship building and marine industry.
- The company’s products also comply with relevant standards stipulated by Engineers India Limited and Bureau of Indian Standard in the domestic scenario. In the international context, the company’s products comply as per DNV(Germany), Norsok (Norway), ASTM (US) & ASME (US), EN (Europe), Lloyds Marine (UK), Bureau Veritas Marine (France), Rina Marine (Italy) standards.

The domestic and international accreditations has enabled the company to supply its products to approximately 940 companies in the past across sectors, including oil & gas, petroleum, fertilisers, chemicals, defence & aerospace, pharmaceutical, power & atomic, automobile industry, etc. Thus, these certifications along with the industrial

expertise, that the company possesses, favourably positions it in servicing client requirements across all segments of the stainless-steel seamless and welded tubes and pipes market.

Financial position of the company

The company's financials have been showing consistent improvement for the last 3 fiscals. For example, its operating revenues increased on-year by 83%, 57%, and 31% in fiscals 2022, 2023, and 2024, respectively, indicating a strong sales performance of the company. Further, its operating margins and net margins grew from 5.1% and 0.8%, respectively, in fiscal 2022 to 11.4% and 3.4%, respectively in fiscal 2023 and further to 14.7% and 4.6%, respectively, in fiscal 2024. These sharp growths in the margins happened on the account of company's cost related benefits from the economies of scale and the backward integration developed between fiscals 2022-2024. As a result, the return on equity and the return on capital employed increased from 4.7% and 5.8%, respectively, in fiscal 2022 to 28.8% and 15.9%, respectively in fiscal 2024

Opportunities

1. Government's supportive policies

The government's policies to boost local production and increase the competitiveness of Indian industries through "Make in India" and "AatmaNirbhar Bharat" initiatives would pave a way of opportunity for the stainless-steel pipe manufacturing sector. Further, government's policies, announcements, high budgetary allocations towards railways, roads, civil aviation, gas pipelines for affordable housing are expected to drive demand for steel products including stainless steel tubes and pipes. Additionally, the policies such as Production Linked Incentive (PLI), Jal Jeevan Mission, PM Jivan Yojana targeting development in various sectors like infrastructure and housing development pose a unique opportunity for stainless steel tubes and pipes sector.

Further, in light of India's decision in 2022 to impose anti-dumping duty on stainless steel seamless tubes and pipes imports from China for five years would also present an opportunity to domestic stainless-steel tubes and pipes manufacturing industry. This policy has historically resulted in increase in the capacity utilization rates of domestic stainless-steel tubes and pipes manufacturers, is expected to continue to provide benefits to the domestic players in terms of operational efficiencies and margins.

Additionally, in September 2024, the government extended the anti-subsidy duty, initially imposed in 2019, on the imports of welded steel tubes and pipes from China and Vietnam to India. These government actions are expected to keep a check on the steel tubes and pipes that are imported at predatory prices and hence, will support the growth in domestic steel tubes and pipes industry.

2. Infrastructure development

Private and public sectors are increasingly focussing on infrastructure development in the areas of transportation, water supply, energy, chemical and manufacturing industries, and the residential and commercial real estate.

Additionally, big infrastructure development projects like the Baltic Pipe Project and the discovery of new natural gas sources are expanding the global market for natural gas, and in turn will increase demand for pipeline network growth.

3. Growth in oil and gas industry

Increasing offshore exploration and production and digital transformation of the oil and gas industry are expected to boost the oil and gas sector, supporting the demand growth for stainless steel welded and seamless tubes and pipes.

Further, on the global front, the demand for natural gas is rising owing to its eco-friendly nature, its consumption in a variety of sectors like transportation and power generation, and its growing need for energy security in places like the Middle East, Africa, and Asia-Pacific. As a result, the infrastructure for gas pipelines is set to grow. Additionally, the demand for the natural gas pipeline network is anticipated to rise on the back of an anticipated growth in the worldwide liquified natural gas (LNG) trade.

The incorporation of cutting-edge security technologies in the pipeline distribution network to make the global operations secure, cost-effective, and productive would also support the oil and gas infrastructure industry. Government's push towards increasing the usage of compressed natural gas (CNG) and LNG as substitute fuels for petrol and diesel to minimise carbon footprints and greenhouse gas emissions, will also support the natural gas infrastructure industry.

Threats & Weaknesses

- In fiscal 2024, the debtor days increased from 62 in fiscal 2023 to 82 in fiscal 2024. As a result, the working capital days also increased from 151 days in fiscal 2023 to 162 days in fiscal 2024. The company would want to keep a check on its working capital variables to be able to quickly gain revenues from its production.
- The current ratio of the company dipped from 1.22 in fiscal 2022 to 1.09 in fiscal 2024, indicating a slight decrease in the company's ability to meet its short-term obligations. The company would want to keep a check on its current liabilities and cash balance to keep the ratio in the desired range.
- Fluctuations in prices of raw materials such as stainless-steel round bars are likely to present a threat to company's margins. However, with the help of the vast experience of its promoters, the company can manage raw material inventory levels optimally and reduce the raw material volatility risk factor. For instance, the company has been booking the purchase of raw material on a back-to-back basis which reduces the chances of raw material inventory pile-up and significantly reduces the impact of raw material price fluctuations on company's profitability.
 - Further, company can take advantage of its backward integration facilities to reduce the impact of raw material price fluctuations.
- High cost of gas pipeline, and fluctuations in oil prices have a negative effect on government and consumer spending.
 - When the oil prices are high, there is an increase in inflation, current account deficit, and fiscal deficit in major oil importing nations like India and China. On the other hand, a decline in oil prices has a negative impact on government spending in nations like Saudi Arabia, Nigeria, and the UAE (United Arab Emirates), which are heavily dependent on revenues from crude oil export.
- In the international context, geopolitical conflicts, trade barriers, taxes, other trade restrictions, and reduced international investments and joint ventures can present a threat to business by limiting the company's ability to acquire raw materials, export completed goods, access new markets and find growth prospects.
- Less expensive imports of stainless-steel tubes and pipes may pose a challenge to the company's sales volume and margins. However, the company may also take steps to counter the effects of less expensive imports, including raising the quality of their goods, streamlining their supply chain, and growing their clientele.
- Volatility of raw material prices and changing government policies, custom duties, and regulations can pose threat to the stainless-steel tubes and pipes business.

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