

Indian stainless steel industry and its end use transformation

Looking at the rapid developments that are taking place in India, which are leading to stainless steels becoming the material of choice in a vast variety of applications and market areas.

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Today, India is the second largest stainless-steel producer in the world after China. India overtook Japan as the second biggest producer in FY 2106 as the country's output rose to 3.32 million tons showing an impressive growth of more than 9%. Both flat products and long products have shown growth in the domestic market. The apparent consumption of stainless steel mill products in the country has grown at a CAGR of over 9% per annum over the last eight years. This makes India the fastest growing market for stainless steel and as the apex industry association, we are looking at growth segments very carefully to meet the market requirement.

end use of stainless steel in the country. In the beginning it was primarily getting used for pots and pans in kitchens, and as an exception rather

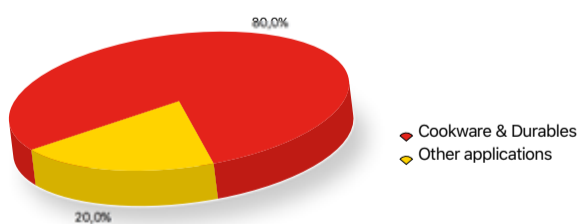
such as rail coaches, tankers for carrying liquids, pipelines for carrying oil, gas, liquids including potable water, various products for architecture,

possible, which is quite visible today. The figures above shows a dramatic change in the end use profile of stainless steel consumption in the country within a short period of time.

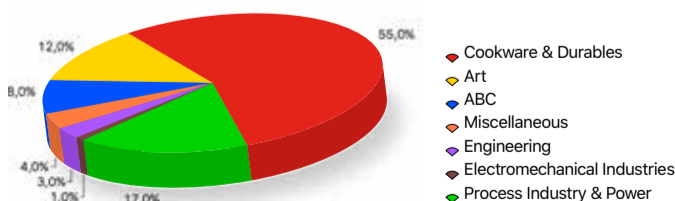
of urban airport land under its territory for building multiplexes, shopping centers, and convention centers. Application such as stainless steel roofing, facades, and plumbing are likely to emerge in addition to other products for the ABC sector.

activities, both at a private and governmental level, and this is likely to speed up the stainless steel demand in this sector. Additionally, from the traditional use of building hardware there has been a noticeable shift in the use of stainless steel as a preferred choice of material for gates and handrails. Today, even in a moderately-sized residential flat in a high-rise apartment or in an individual houses, big or small, the preference will be to give it a designer stainless steel front

Consumption Pattern 1997-1998



Consumption Pattern 2016-2017



Today's uses of stainless steel

Today we see stainless steel usage has increased exponentially in the Architecture, Building and Construction (ABC) sectors and in the Automotive Railways and Transport (ART) sectors. Stainless steels have become the preferred choice of material for coaches, wagons and other utilities in Indian Railways and we are likely to see good growth considering the expansion plans of Indian Railway in the coming years. Apart from this, Indian Railways' decision to redevelop and modernize four hundred stations in a phased manner will generate good demand for stainless steels in the coming future. There are fifty new airports planned and likely to come up in the next ten years. Not only this, the Airport Authority of India Limited is also planning to open up portions of 50,000 acres

Uses of stainless steel in Indian cities

Indian cities are going through a phase of rapid urbanization and construction

Brief history

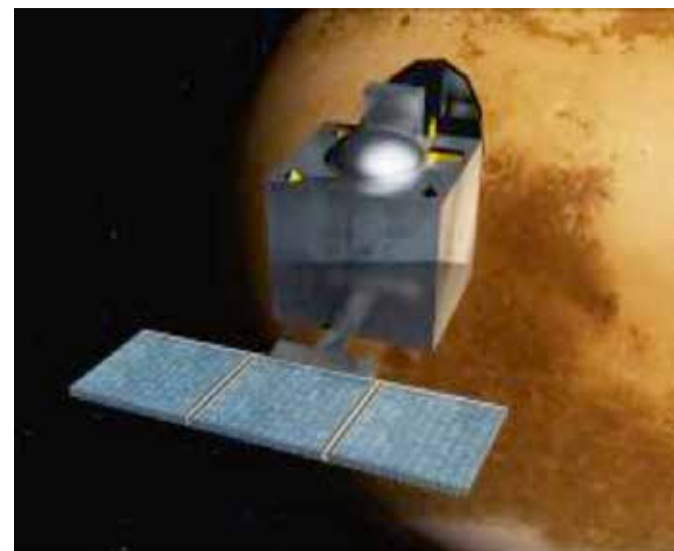
We all know that stainless steel is a relatively young material compared to other metals but in just over a hundred years of its discovery, it has proved to be a wonder material and is being used in wide variety of products in everyday life to various engineering applications. In the last three decades we have seen a complete transformation in the

er than the rule, it was also being used for engineering purposes. Over the next two decade this trend continued whereas Western and other developing countries started using it more in applications

and building and construction. But with the persistent efforts of the Indian Stainless Steel Development Association (ISSDA) and the stainless industry in India, a change in end use pattern was made



▲ A stainless steel bio-digester tank flitted.



^ A representation of 'Mangalyan'.

gate. The increase in demand of such gates can be gauged from the fact that several pipes and tubes mills has started up in the recent past in the country.

Stainless steel in urban infrastructures

In urban infrastructure the development of stainless steel is to find its rightful presence in many areas. National Capital Delhi has been leading and charting the way for all metros and other cities in the country in terms of urban renewal with a generous use of stainless steel. In Delhi all bus queue shelters has been converted into stainless steel and this has resulted into a domino effect and now all over country, even in remote places, one can see stainless steel bus queue shelters. Also foot over bridges with escalators is swiftly adopting stainless steels for an aesthetic and maintenance-free life. Recently the Ministry of Steel of the Government of India has created a task force to increase steel/stainless steel demand in the country and in order to fulfill this dream one of the prime focuses of

this task force has been to explain the importance of lifecycle cost analysis in the selection of material to various other Ministries in the Government for their projects such as in the Ministry of Urban Development, the Ministry of Road Transport and Highways, the Ministry of Railways, and others. Such initiatives are likely to help stainless steel become a material of choice in many urban development initiatives taken by the Prime Minister such as the creation of one hundred smart cities, access to clean drinking water, and clean India campaigns.

Stainless steel in the process industries

The process industry, which historically has been a consistent consumer of stainless steels in a wide range of process industries including: refineries, petrochemicals, chemicals, dairy, power, textiles, sugar, food processing, distilleries, fertilizers, cement, medicines, paper & pulp and others, has adopted stainless steel for many of its applications where maintenance on account of failure of materi-

als has been the big concern. Here also many new grades of stainless steels, with improved mechanical and corrosion properties, have replaced conventional materials.

Changes in perception

The tremendous changes in the perception about stainless steels within the country have also opened up many new areas of applications in various sectors where earlier India was dependent on imports. A lot of credit also goes to the technological upgradation of stainless steel mills, which have enabled us to produce some innovative new grades as well as high-quality grades for niche applications. In the early 90's, on the arrival of the argon oxygen decarburization refining process, Indian producers started producing more chrome manganese grades popularly known as the 200 series grades, and gradually became the world's largest producer of 200 series grades until China copied our success. These grades are equally suitable in many applications including utensils. Newer duplex grades

of high strength and higher corrosion resistance were also developed. Today, Indian producers have upgraded their technology in the field of melting with intelligent refining systems, high-quality continuous casting and rolling machines, and are capable of producing almost every grade of stainless steel matching world quality standards.

Revolutionary new uses

Nowadays, we see stainless steels being used in space research and Indian companies are supplying different grades of stainless steels in many prestigious pro-

jects demanding the highest quality. Very recently the Steel Authority of India (SSI) contributed to the historical achievement of the Mars Orbiter Mission by providing stainless steel for fabricating the fuel and oxidizer tanks of the PSLV-XL, which carried 'Mangalyan' to the red planet.

In another development Jindal Stainless Limited, India's largest stainless steel producer, supplied high-quality stainless steel to the International Thermonuclear Experimental Reactor's cryostat project in France, which is a large-scale scientific experiment that strives to produce commercial energy from fusion.

New innovation uses

There are many areas where new innovations have created a unique demand in the country for stainless steel usage. For example, the innovation of bio-digester toilets, researched and developed by the Defense Research and Development Establishment (DRDE) for Indian Railways. Stainless steel materials were chosen and used for their construction, which has created a good market for stainless steels, particularly since it was decided to fit all of their 60,000 railway coaches with it. Some other innovations linked with the ongoing initiatives of the Government of India to improve sanitation and waste management facilities and to build smart cities are likely to create new end usage for the stainless steel market. Today we can see some innovative uses of stainless steels for designing portable, stand-alone public toilet facilities.

Towards a sustainable and environmental future

At present, the world is moving toward the use of more sustainable and environmental friendly materials and there cannot be a better material than stainless steels. It is highly durable and is also fully recyclable. It definitely is a true green material. We firmly believe that the awareness among designers, specification writers and end users about the benefits of stainless steel is increasing and we will definitely see even more diversification in the end use of stainless steels in the country in the future.



^ A stand-alone public toilet.



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Mr. Shri K.K. Pahuja has around forty 40 years of experience in the steel industry in the areas of operations and the supply chain. He is a Mechanical Engineer from BITS Pilani and has a MBA from FMS, Delhi University. He has worked at the Steel Authority of India Ltd. where he was part of key strategic groups used to drive the growth plans of the company in product development and operational efficiencies. He is also a Senior Assessor for CII-EXIM Bank Business Excellence Award and has been advising many companies on their journey towards excellence and change management.

