

**Presentation on
An Overview of Stainless Steel Industry –
Challenges and Prospects**

Indian Institute of Metals, Delhi Chapter

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Outline

- **Stainless Steels and its classification**
- **Overview of Stainless Steels Market**
- **Overview of future growth prospects**
- **Challenges and Opportunities**

Stainless Steel

Stainless Steel is defined for a number of different steels primarily for their resistance to corrosion. Minimum percentage of Chromium of 10.5%, Nickel and Molybdenum are added to improve corrosion resistance. Stainless Steel is expensive compared to Mild Carbon Steel and represents a small but valuable niche market.

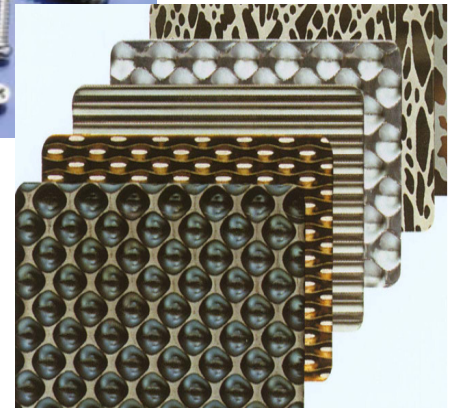
The Structural Stainless Steel is classified into :

- Ferritic (30% Chromium with no Nickel and little Molybdenum)
- Austenitic (17-18% Chromium and 8-11% Nickel)
- Martensitic (12-15% Chromium, Molybdenum 0.2 - 1%, no Nickel and Carbon 0.1 – 10.2%)
- Duplex (21 – 26% Chromium, 4 – 8% Nickel, 0.1 – 4.5% Molybdenum) - twice the strength compared to austenitic stainless steel and more resistance to corrosion

Stainless Steel

Attributes

- Excellent corrosion resistance – does not require coatings
- Excellent elongation / formability
- good looks with other materials –stone, wood, concrete, glass
- Available in a wide range of surface finishes
- Excellent fatigue resistance
- Easy to clean – hygienic
- 100% recyclable
- Good strength – the strength of steel
- High rigidity (Young's Modulus) – the rigidity of steel
- Low thermal conductivity
- Good high temperature resistance

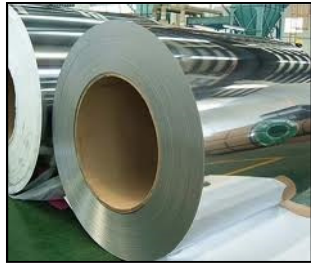


It is available in various forms

Flat products

Ex-mill

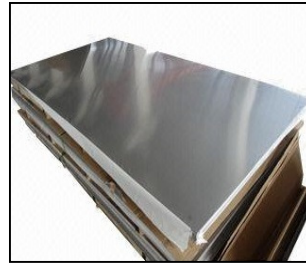
Cold-rolled coil



Cold-rolled strip



Cold-Rolled polished sheet

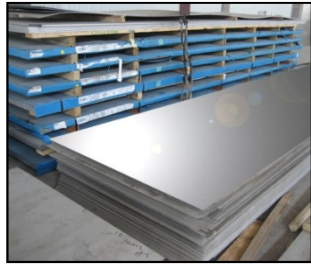


Custom

Laser cut shape



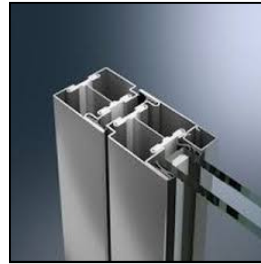
Plates



I-beam from plate



Door & Window profiles



Clamps



Standard tubes



Profiled tubes



Tube fittings



Railings



Long Products

Ex-mill

Bars



Reinforcing Bar



Wire Rod



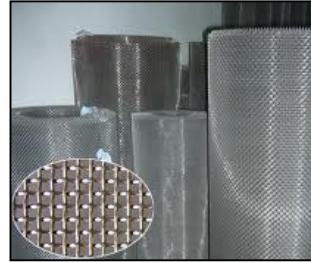
Tie-bars



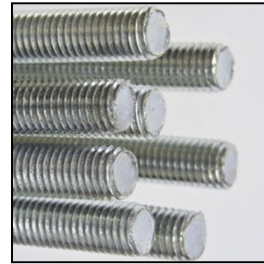
Cables



Mesh



Threaded bars



Concrete Anchors

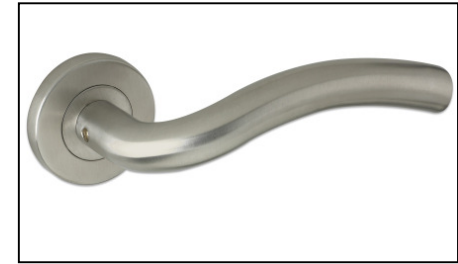


Fasteners

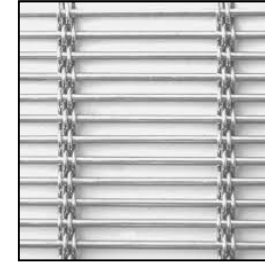


Custom

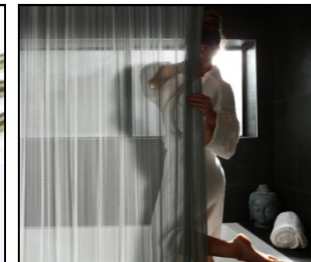
Handles



Sunbreaker

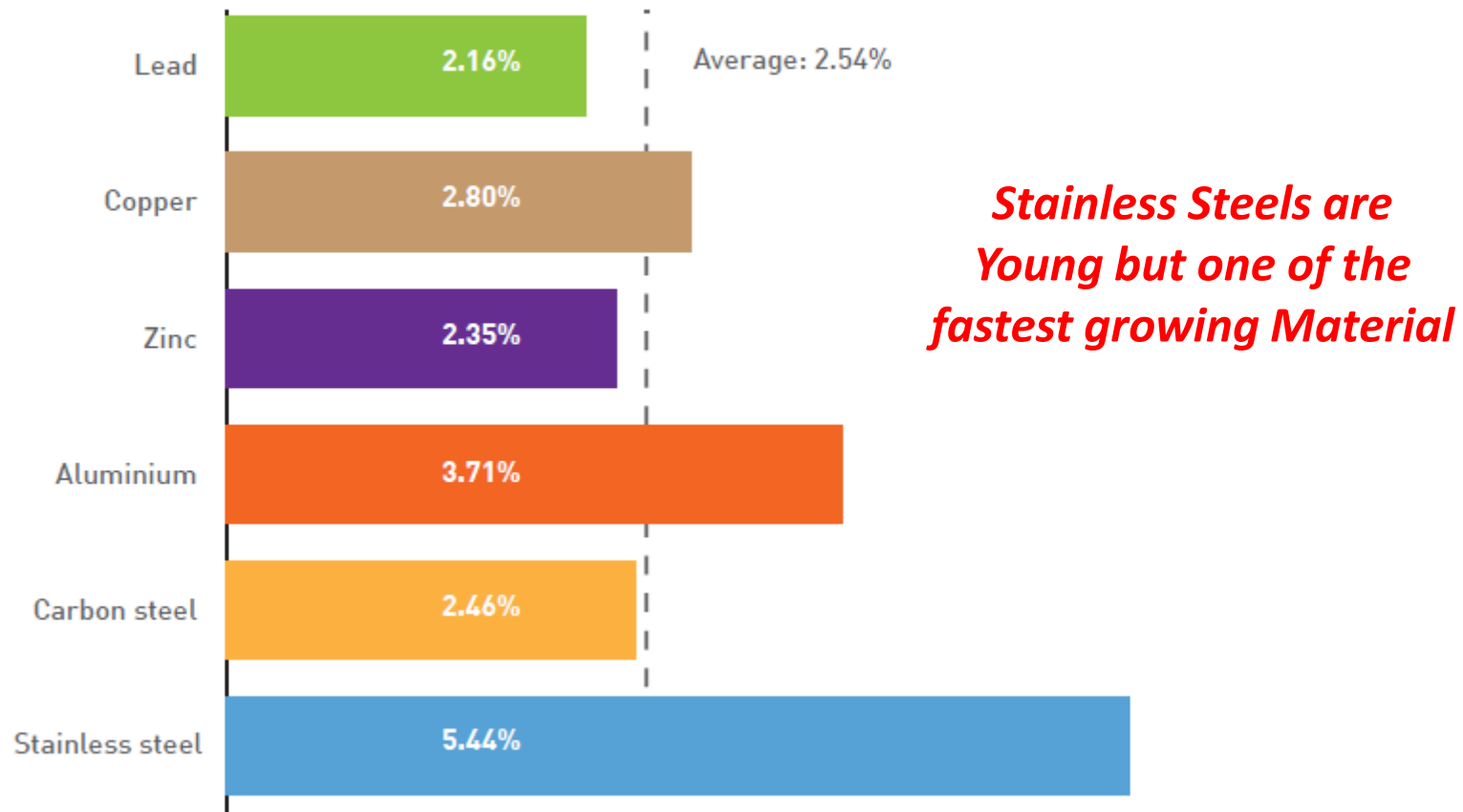


Mesh shower curtain



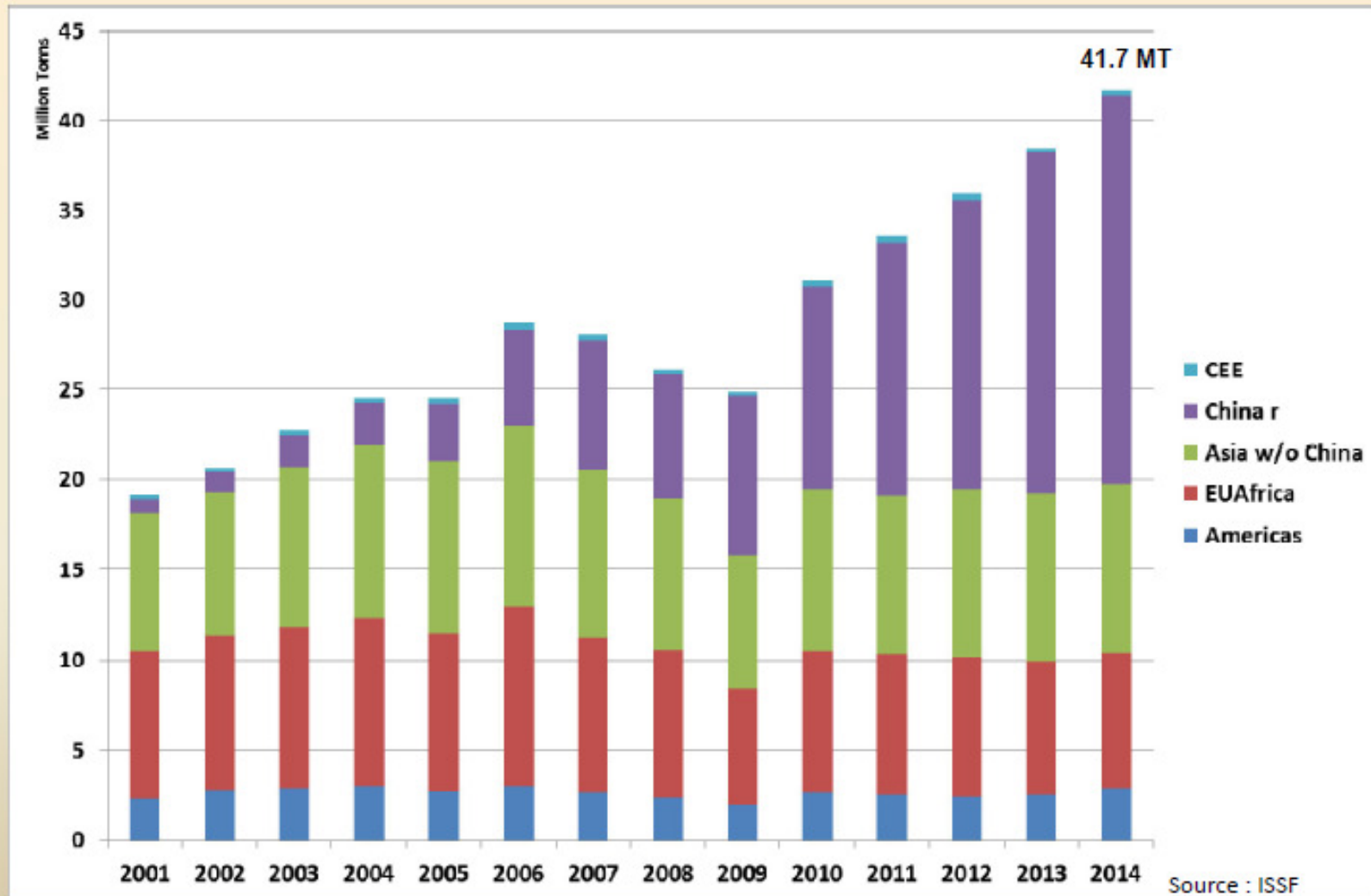
Metals – Annual Growth

Stainless steel production versus plastics production: 1980 – 2013. The production evolution of both is similar, though stainless steel is more volatile.



Compound annual growth rate of major metals (%/year): 1980 - 2014

World Stainless Steel Melt Production

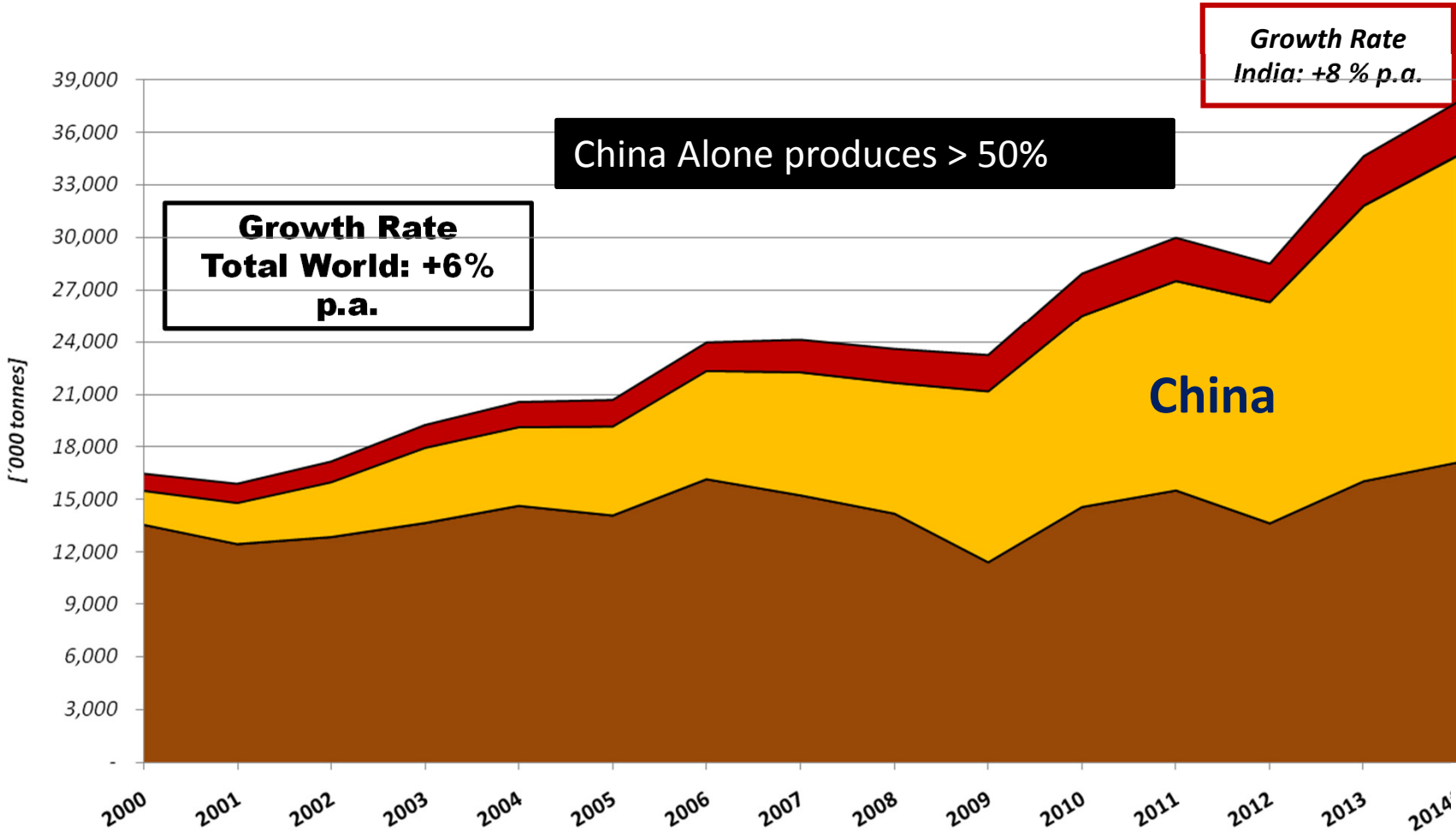


Source : Stainless Steel in Figures 2015 by ISSF

CAGR: 6.2%

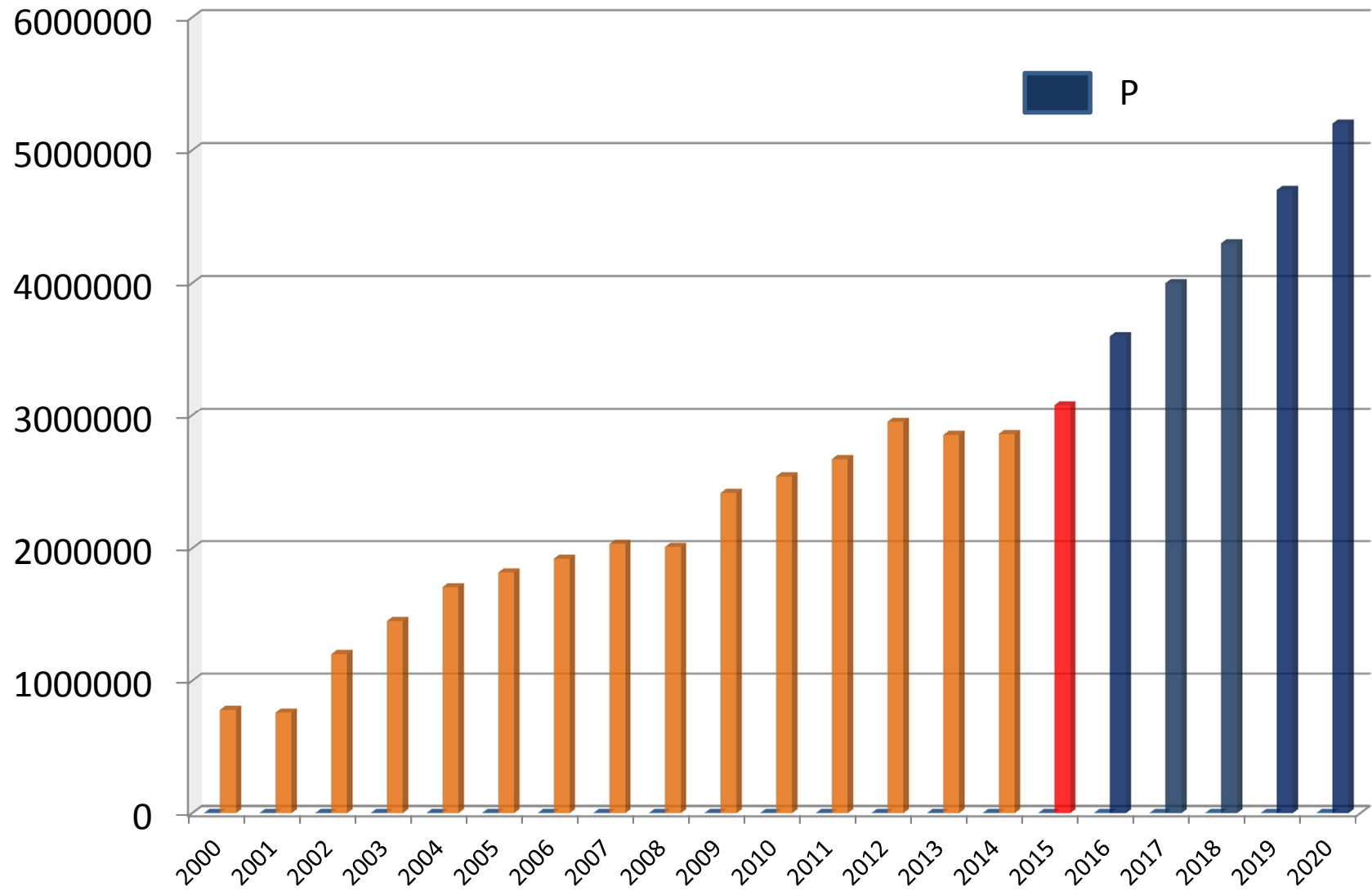
Estimated Production in 2015 – 43.3 MT

Stainless Steel Consumption Growth China & India vs. Rest of the World



Source : SMR

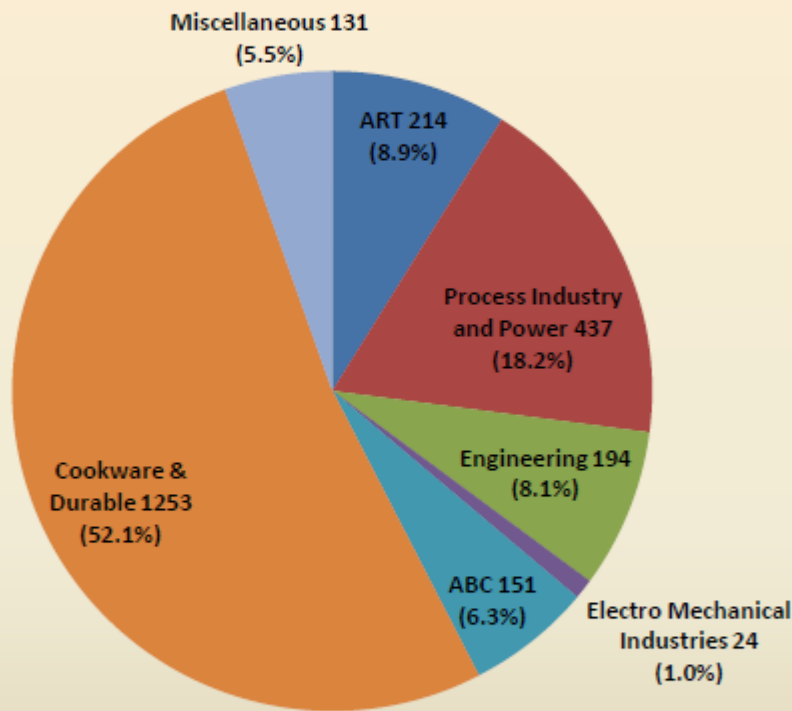
Indian SS Melt Production : Past, Present & Future



Source : JPC Market Survey Report, Ministry of Steel, GOI

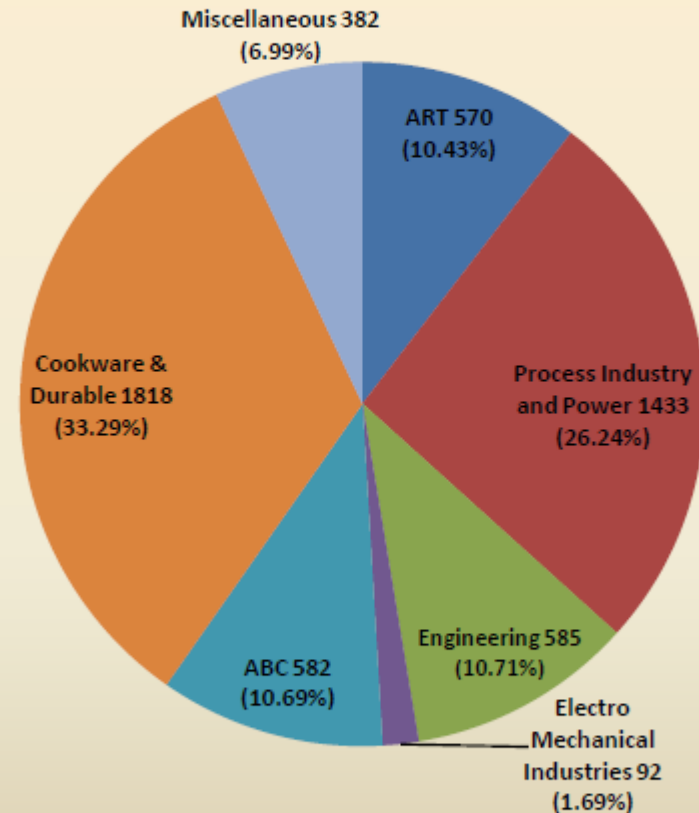
Apparent Consumption and Projected Consumption

('000 t)



Apparent Consumption in FY 2013

Total: 2404



Forecasted Apparent Consumption in FY 2023

Total: 5462

Note : CAGR : 8.5%

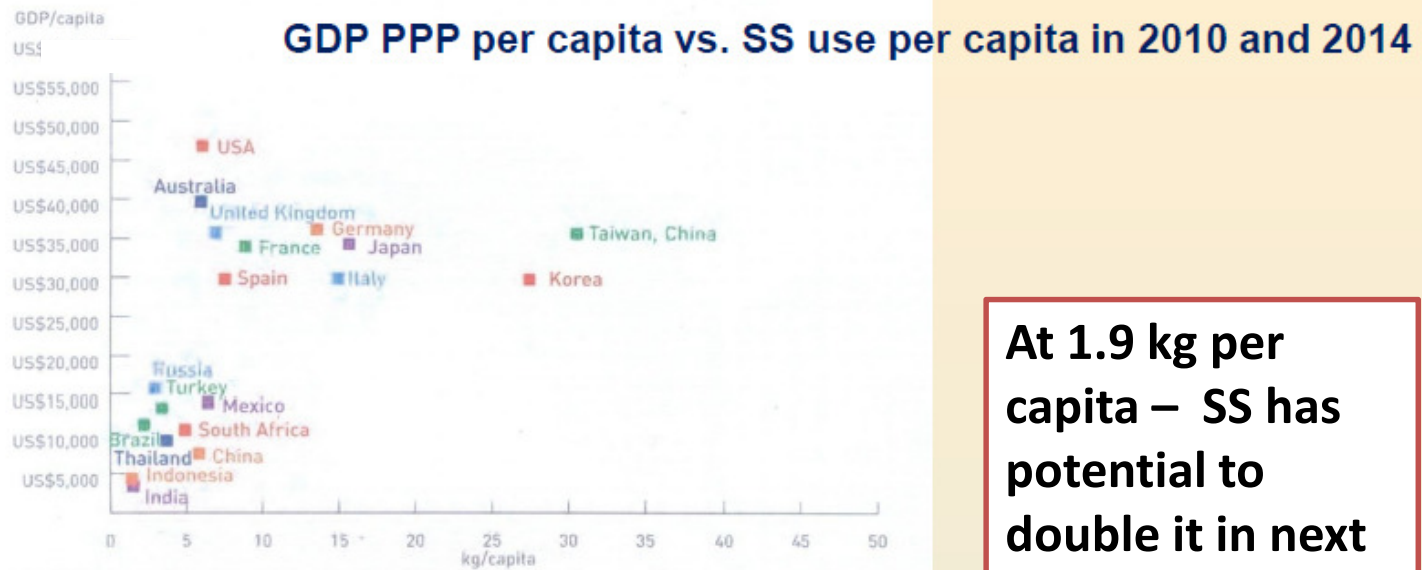
Source : JPC Market Survey

Grade-wise Pattern of Apparent Consumption

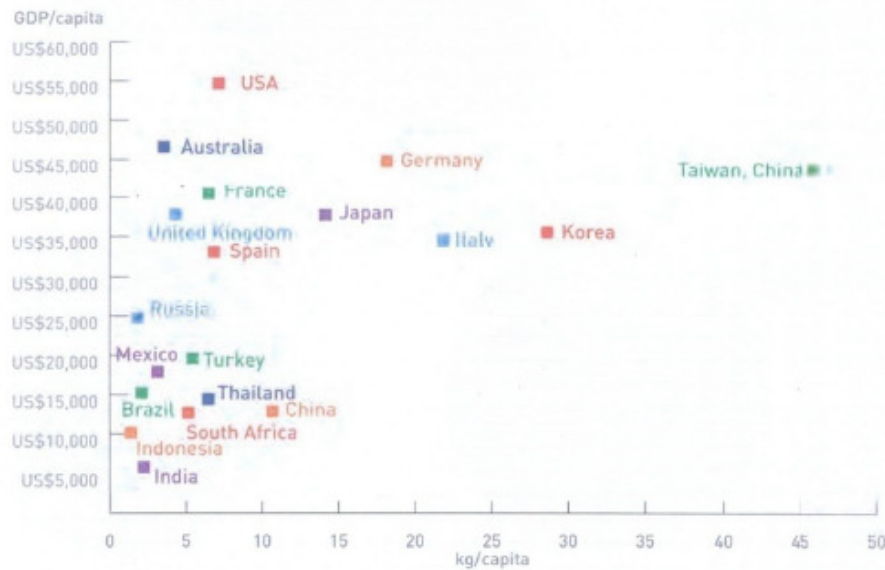
Grade	Share in FY '13	Projected Share in FY '23
400 series	16.0%	17.9%
300 series	28.6%	40.6%
200 series	54.3%	39.9%
Duplex	0.4%	0.6%
Other Special	0.7%	1.0%
	100.0%	100.0%

Source : JPC Market Survey Report, Ministry of Steel, GOI

The Stainless Steel End Use Sector in India



At 1.9 kg per capita – SS has potential to double it in next decade



Source : ISSF

GROWTH DRIVERS

Union Budget 2016:

Rs 2.21 lakh crore for
infrastructure sector

Ministry of Urban Development :

Urban infrastructure sector
offers Rs.73 lakh crore
investment opportunity for
private sector and PPP
investments over the next
15 years.

End –Use Growth Centers

Effluent and Water Treatment systems	Effluent treatment, Municipal waste & sewage treatment plants Water treatment (with Desalination plants)	Oil and gas	Refineries Petrochemicals Oil and Gas exploration LNG Re gasification CNG Application
Electronic and Electro Mechanical Industries	Washing Machines: Electrical Appliances: Optical Fiber Cables Micro wave ovens:	Process Industry	Fertilizers Chemicals Dairy Industry Brewery and Distillery Sugar Food Processing Drugs and Pharma Paper and Pulp
Engineering Industry:	Pumps Valves Welding wires and Electrodes: Fasteners: Solar Heaters: Watches Pipe fittings: Machine tools/machined parts	Power Sector	Thermal Power Plants Nuclear, Solar
		Metal Goods	Utensil and Kitchenware pressure cookers Cutlery/ Kitchen tools and gadgets Commercial kitchen equipment Gas stoves Life Style products Induction cookware Kitchen chimney
		Other areas	Surgical Instruments Hospital Furniture Household, Office and garden furniture Coinage

Some Important
Application Growth area

Architecture Building & Construction (ABC)

Mostly driven by growth in Indian real estate & Infrastructure sector



Residential real estate, commercial real estate, Retail space, hospitality projects and SEZs



Shopping malls, Multiplexes, Airports, Rail Metros Stations, IT parks, Commercial Complexes, Hotels, Fast food restaurants, High Quality Residential accommodations, Hi tech town ships and showrooms



Products :

Sinks
Elevators and escalators
Street furniture
Builder hardware:
Architectural Products
Railings, Barriers, Signage's,
Spiders, Claddings
Facades
Plumbing
Roofing
Reinforcement bars

Share of this application increased almost **3 times over the last 8 years** to reach 6.7% of the overall consumption of Stainless steel.

Creation of *100 smart cities*

DEMAND

Key Features of these cities will be

- 24x7 availability of high quality utility services like water and power
- Transport system that emphasizes on public transport
- Proper facilities for entertainment and the Safety and Security of the people
- State-of-the-art Health and Education facilities
- Recycling of waste materials, Water conservation

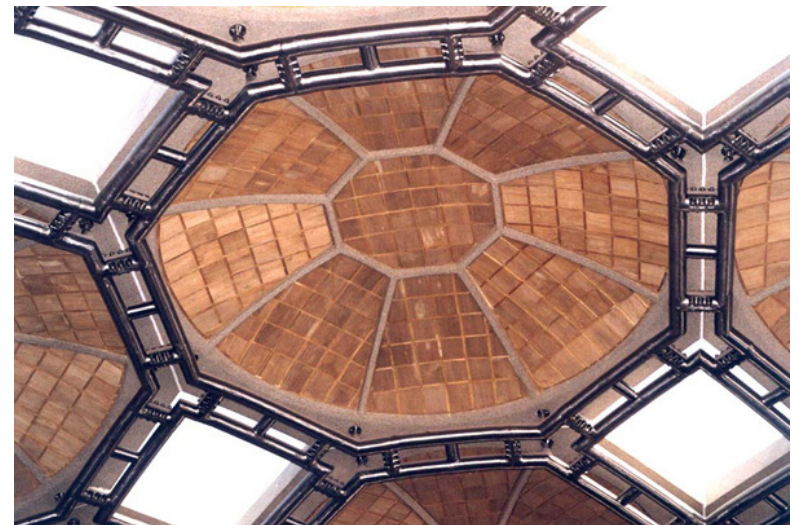
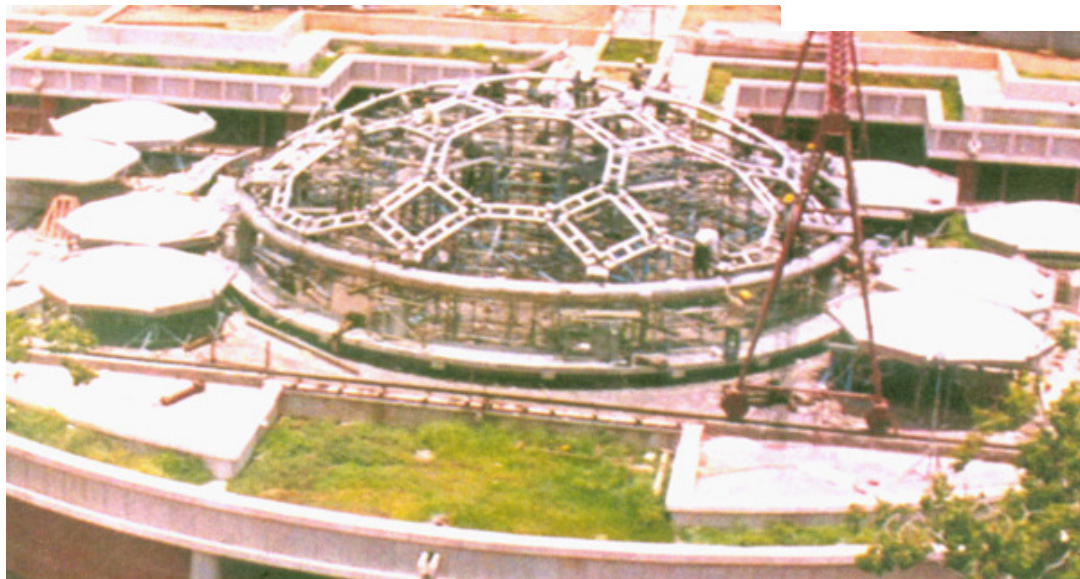
'Stainless Steel usage in many areas'



Structural Use of Stainless Steel is Increasing

Parliament Library

2003



Building entrances, canopies



Takes minimum space.

Easy to do maintenance



Structural Applications of Stainless Steel Rebar



Stainless steel rebar should be used in:

Marine structures, piers, off-shore-platforms.

Bridges, Tunnels, dams, sea and river wall defence systems

Rock-face/Reinforcements

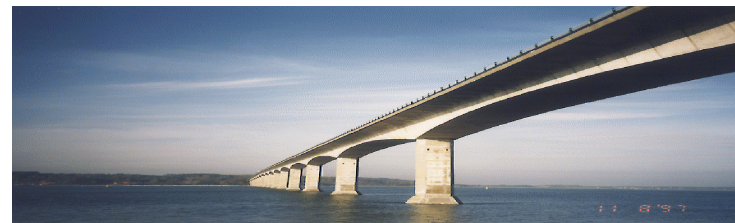
Aggressive environments

Sewage and chemical treatment plants

Structures with sensitive electronic equipment

Restoration of historic buildings

Quake resistant structures



Automotive Railways & Transport (ART)



The share of ART segment in last 8 years has grown by almost
5 times
from 2% to almost 10% in 2015.

ART will remain a growth driver



Rajdhani



Double Decker



Shatabdi



Duranto



EMU



Paintless Coaches - New



EMU

Metal Goods / Food & Hygiene

Mid Day Meal Scheme : Stainless Steel for Hygiene

Serving 120,000,000 children in over 1,265,000 schools

Largest such programme in the world



Image Courtesy :
Naik Foundation

Challenges

Challenges in Raw-material Sourcing

Key Raw-materials for Stainless Steel

- Ferro chrome, Ferro Nickel (Import), Pure Nickel (Import), Ferro Molybdenum (Import), Charge Chrome, Melting Scrap (Import)

Raw material	BCD in India	BCD in China
720260 Ferro Nickel	2.5%	1%
750210 Pure Nickel	2.5%	0
720270 Ferro Moly	5%	2%
720421 Stainless Steel Scrap	2.5%	0%
720449 Steel Scrap	2.5%	0%

Finished Goods	Brazil	China	India	Turkey
Stainless Steel Cold Rolled Flat Products	14%	10%	7.5%	8%
Stainless Steel Hot Rolled Flat products	14%	10%	7.5%	8%

Basic Customs Duty on all the key raw materials in India must be reduced to zero to ensure level playing field and Basic Customs Duties on Finished Goods should be aligned with rates applicable in China.

Recommendation :

Reduce Import duty on key raw materials like Ferro Nickel, Pure Nickel, Ferro Moly to NIL

Remove import duty on MS Scrap and SS scrap imported for use in stainless steel industry

Trade related issues

Free Trade Agreements : Current Scenario

FTA partner	MFN duty	Preferential duty
ASEAN	7.5%	NIL Duty
Japan	7.5%	0.8%
Korea	7.5%	1.88%

On stainless steel flat products covering HS Codes 7219 and 7220

Preferential duty of Japan and Korea will be NIL by 2016-17

Recommendations

India has not benefitted from these FTAs. The signing of the FTAs has only lowered protection levels on finished goods without giving any corresponding benefits in Raw Material or Investment. Therefore, urgent review of all existing FTAs must be taken.

NO tariff concessions to be granted to China on Stainless steel products under RCEP negotiations

Provisions of the Rules of Origin must be followed strictly to avoid mis-declaration and circumvention of duties.

Issues of Concern

- Non-availability of Nickel and high price
- Shrinking margin
- Rising imports of cheap Stainless Steel – China and FTA countries
- Unorganized sector – low quality cheap production – No refining facilities (AOD / VOD)
- Power shortage
- Poor logistics and port infrastructure
- Inadequate R&D
- Inverted Duty structure
- Poor fabrication quality

Opportunities to Explore

- Oil & Gas Sector requiring corrosive resistant steel, high pressure, high stresses and requirement of harsh environment
- High width HR > 1500 mm
- High demand for ferritic goods in consumer durable / process equipment, sugar, paper and chemicals, refineries
- Duplex grade in sophisticated use in oil & gas
- Major demand for 200 / 300 series CRC for non-critical application of 304 in Kitchen wear, Architecture, Refrigerator, Elevators
- High Speed fabrication facility for Architecture application
- LCA consideration of Stainless Steel

Indirect Imports Containing Stainless Steel

- Large Boilers
- Thermal Power equipment – Boiler, Pressure Vessels
- Process Pumps
- Industrial Machinery –
Sugar, Paper, Chemical, Brewery, Dairy, Food
- Refrigerator & Freezing equipment
- Heat Exchangers
- Dish Washing Machine
- Utensils
- Sinks
- Kitchen & Household articles
- Builders Hardware
- Auto Exhaust
- Surgical Instruments

65,000 t Stainless Steel indirect imports in 2011-12

62,000 t Stainless Steel indirect imports in 2012-13



Thank You