| Present Affiliation       | President  
Indian Stainless Steel Development Association (ISSDA) |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Academic Qualification</td>
<td>B. Tech (Hons.), Birla Institute of Technology and Science (BITS), Pilani</td>
</tr>
<tr>
<td>Area of Specialization</td>
<td>Worked in India with leading Industrial Houses for over 46 years and has been associated with Stainless Steel Industry for last 36 years in various capacities</td>
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<td>Achievements / Awards</td>
<td>“Stainless Steel UDYOG RATNA AWARD” in September, 2009</td>
</tr>
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</table>
| Paper                    | Present Status of Stainless Steel Industry in India & it’s Future Prospects  
* N. C. Mathur, Rohit Kumar* |
Present Status of Stainless Steel Industry in India and it’s Future Prospects

Presented by:
N.C. Mathur
President: Indian Stainless Steel Development Association (ISSDA)
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<th>Centenary of Stainless Steel</th>
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<td>Global Stainless Steel Scenario</td>
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<td>Indian Stainless Steel Scenario</td>
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<td>Stainless Steel Growth Drivers in India</td>
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<td>Watch For</td>
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<td>Summing Up</td>
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Centenary of Stainless Steel
International Stainless Steel Forum (ISSF) launches 100 Years of Stainless Steel website to celebrate a “Century of Innovation”

The Global Stainless Steel Industry community has completed a Century since Stainless Steels were first created, patented and launched.

To celebrate the anniversaries, International Stainless Steel Forum (ISSF) has launched a new Website: www.stainlesssteelcentenary.info

This website is dedicated to the history of Stainless Steel and its Innovative applications.
Evolution of Stainless Steel

- Nickel: 1751
- Molybdenum: 1778
- Chrome: 1797
- Stainless Steel: 1912
100 Years of Stainless Steel

After four years of development work in Krupp’s laboratories, the physicist Professor Benno Strauss and his co-worker Dr. Eduard Maurer found the formula for non-rusting steels which are insensitive to water and humidity.

1912

1913

1915

1919

1924

1929

1930

During World War-I, Stainless Steel is used to manufacture valves for aircraft engines.

1919-1923, Sheffield cutlers start regular production of Stainless Steel cutlery, surgical scalpels and tools.

The first Stainless Steel roof makes an appearance in America.

The first Stainless Steel Tanker is used for transporting 3,000 gallons of milk.

1928-1930, the top seven arches of Chrysler Building are clad in Stainless Steel. This New York City landmark is one of the world’s most recognized skyscrapers. This iconic building inspired new age architects to explore the potential of Stainless Steel in Architecture, Building and Construction worldwide.

English metallurgist Harry Brearley invents Stainless Steel in his search for an alloy to protect cannon bores from erosion.
100 Years of Stainless Steel

In the year 1990, Jindal Stainless became the pioneer in developing and commercialize 200 Series (Chrome-Manganese) Stainless Steel in India.

1931
- Duplex Grade Stainless Steel is first produced in Sweden.

1933
- Stainless Steel Kitchen Sinks and furniture are introduced.

1950
- Stainless Steel is used with increasing frequency in the automobile industry.

1963
- The first Stainless Steel Razor Blades are produced.

1969
- The first men on the moon (Apollo 11) are taken there by a Stainless Steel Saturn V Rocket.

2000...
- Stainless Steel is used in the façade of the world’s tallest building, the Burj Khalifa in Dubai, which was opened in 2010.

The first Stainless Steel railway carriage appears in the US. Also, Rolls Royce produces the first Stainless Steel radiator grill and emblem.

In the year 1990, Jindal Stainless became the pioneer in developing and commercialize 200 Series (Chrome-Manganese) Stainless Steel in India.
Global Stainless Steel Scenario
Stainless Steel .... a Growth Material

Compound Annual Growth Rate of major metals (%/year): 1980 - 2012

- Lead: 2.29%
- Copper: 2.56%
- Zinc: 2.48%
- Aluminium: 3.52%
- Carbon steel: 2.61%
- Stainless steel: 5.57%

Average: 2.69%

Source: ISSF
Stainless Steel Crude Production

1,000 tonnes

-1.0% +7.8% +10.4% +7.6% -0.1% +16.9 -2.0% -6.8% -5.0% +24.9 n/a +5.2

China  Asia w/o China  W. Europe/Africa  Americas  Central + East Europe

* Major correction of Chinese figure for 2011, therefore not comparable with previous years
Stainless Crude Steel Production
(By Categories)

Note: Due to major corrections of Chinese figures since 2011 not fully comparable with 2010, for CrMn steels in particular.

Source: ISSF
‘Top 20’ Stainless Steel Producers (2012 e)

12 of Top 20 are Asian!

Source: SMR
Global Stainless Steel Market Drivers by End Use Segments

- Growing wealth and stringent Emission and Safety Regulations
- Architectural, Building & Construction 17%
- Chemical / Petrochemical 12%
- Offshoring to emerging countries drives demand for process equipment Downstream from Shalegas in USA
- Transportation 12%
- Other Applications 3%
- Catering / Appliances 37%
- Process / Resources 19%
- India and South America drives Food Processing, Re-building Russia

Growing Wealth: Stainless Steel is increasingly the prestige & value option in Appliances and Lifestyle Products

Global long term outlook remains bright

Source: SMR
Indian Stainless Steel Scenario
Crude Stainless Steel Production
World Vs. Share of India

<table>
<thead>
<tr>
<th>Period</th>
<th>India</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012 (est)</td>
<td>2.94</td>
<td>34</td>
</tr>
<tr>
<td>2011</td>
<td>2.7</td>
<td>33.6</td>
</tr>
<tr>
<td>2010</td>
<td>2.5</td>
<td>31.1</td>
</tr>
<tr>
<td>2009</td>
<td>2.4</td>
<td>24.9</td>
</tr>
<tr>
<td>2008</td>
<td>2</td>
<td>26.2</td>
</tr>
<tr>
<td>2007</td>
<td>2</td>
<td>28.2</td>
</tr>
<tr>
<td>2006</td>
<td>1.92</td>
<td>28.7</td>
</tr>
<tr>
<td>2005</td>
<td>1.81</td>
<td>24.5</td>
</tr>
</tbody>
</table>
Stainless Steel Melt Production: India

<table>
<thead>
<tr>
<th>Year</th>
<th>Total (000 tons)</th>
<th>Long Products (000 tons)</th>
<th>Flat Products (000 tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1817</td>
<td>421</td>
<td>1396</td>
</tr>
<tr>
<td>2006</td>
<td>1921</td>
<td>463</td>
<td>1458</td>
</tr>
<tr>
<td>2007</td>
<td>2033</td>
<td>509</td>
<td>1524</td>
</tr>
<tr>
<td>2008</td>
<td>2010</td>
<td>560</td>
<td>1450</td>
</tr>
<tr>
<td>2009</td>
<td>2415</td>
<td>727</td>
<td>1688</td>
</tr>
<tr>
<td>2010</td>
<td>2540</td>
<td>790</td>
<td>1750</td>
</tr>
<tr>
<td>2011</td>
<td>2670</td>
<td>775</td>
<td>1895</td>
</tr>
<tr>
<td>2012</td>
<td>2950</td>
<td>862</td>
<td>2088</td>
</tr>
</tbody>
</table>
Stainless Steel Mill Products
Production Trends: India

CAGR 7.2%
CAGR 5.9%
CAGR 10.8%

Source: SMR
Stainless Steel Consumption by End Use

India

Flat Products: Year 2012

- Cookware and durables: 57.0%
- ART: 10.6%
- Process industry and Power: 16.9%
- Miscellaneous: 15.8%
- Engineering: 2.2%
- ABC: 6.7%

Long Products: Year 2012

- Process Industry and Power: 24.1%
- Engineering: 36.2%
- Cookware and durables: 27.8%
- ABC: 4.4%
- ART: 1.2%
- Electro Mechanical industries: 1.5%
- Miscellaneous: 4.7%
Projected Apparent Consumption of Stainless Steel in India

Market Share
- Flats: 80%
- Longs: 20%

Year | Long Products | Flat Products | Total
--- | --- | --- | ---
2012 | 2419 | 2006 | 4425
2013 | 2615 | 2160 | 4775
2014 | 2838 | 2334 | 5172
2015 | 3085 | 2527 | 5612
2016 | 3354 | 2737 | 6091
2017 | 3650 | 2967 | 6617
2018 | 3973 | 3217 | 7190
2019 | 4329 | 3491 | 7820
2020 | 4722 | 3794 | 8516
2021 | 5150 | 4122 | 9272
2022 | 5618 | 4480 | 10108

('000 tons)
Projected Regional Stainless Steel Consumption in India

North: 30% (2012), 27% (2022)
West: 48% (2012), 46% (2022)
East: 5% (2012), 8% (2022)
South: 17% (2012), 19% (2022)
Opportunities in Indian Infrastructure Structure

- India plans to spend US$1 Trillion on infrastructure in next five years.
- Indian airports require investments worth US$13 billion in next five years; private sector to contribute US$10 billion.
- Highways sector will attract investments worth US$123 billion in next 5 years.
- US$300 billion planned to be spent on upgrading rail infrastructure (including new rail lines, double/multiple lines, high-speed rail) by 2020.
- Around $55 billion worth investments planned in major and non-major ports by 2020.
SS Growth Drivers in India
SS Growth Drivers in India

**ABC**
- SS roofing sheets
- Decorative and color coated SS
- Street furniture
- Escalators, elevators
- Claddings
- Railings
- Airports
- Railway station upgradation

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

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

**Consumer Durables**
- India as hub for white goods manufacturing
- SS used as components
Railways

- New Stainless Steel Wagons & Coaches
- Refurbishing Railway Stations with world class facilities
- Development of Metro Rail projects and street infrastructure

Delhi Metro
Stainless Steel in Railways

Railway Stations: Cladding, Roofing, Structures, Decoration, Selling Carts, Display Boards, Ticketing Area, Seating Space, Floor Tiles...
ABC

- Urban Renewal in the form of Street furniture e.g. Bus Shelters
- Shopping Malls, organized retail is growing at rapid pace.
- Modular kitchens
- Airports

Delhi Bus Shelter
SS Modular Kitchen

New age applications in Household

- Kitchen Applications
- Bathroom Accessories
- White Goods
- Lifestyle Products
- Interior Decoration
Airports

Wall Cladding, Roofing, Check in Area, Seating Spaces, Immigration Area, Railings, Display Boards, Lounge, Booths, Duty Free Area, Signage, Decorative, Elevators, Escalators, Travelators, Food Courts....
Industrial Applications

- Power
- Process Industry
Automotive and White goods

- India a leading automobile hub in S.Asia, specially for two wheelers and small cars
- Increase usage of Stainless Steel in exhaust, wheel rims etc.
- Large middle class driving White Goods market
India destined as a major Automotive hub in South Asia.

A large manufacturing base for Two wheelers / Small cars / Steel and Stainless Steel components for automobiles.
What Next???
Applications - Arriving shortly... (India)
Applications - Arriving shortly... (India)
Applications - Arriving shortly... (India)
Applications - Arriving shortly...
(India)
Applications - Arriving shortly... (India)
Applications - Arriving shortly...
( India )
Applications - Arriving shortly... (India)
Applications - Arriving shortly... (India)
But???
Challenges Ahead

- Inadequate Infrastructure – Energy, logistics, ports etc. not conducive to growth of manufacturing sector

- Infrastructure projects subject to delays and financial constraints

- Budget constraints Vs. Life Cycle benefits of Stainless Steel

- Dependence on imports for certain raw material – Nickel, SS Scrap, Moly.
Watch For....
Changes in the Market Place...

**Railway**
- Metro in major cities
- Railway Wagons
- Coach Up-gradation
- SS usage in Platforms

**Increasing ABC applications**
- Selective Rebar's
- Door & Windows
- Cladding
- Signage's
- Street Furniture
- Fasteners
- Life Style products

**India as export hub for**
- Auto Components
- Appliances
- Mill Products
- High Quality Value Added Engineering Products
Movements in environment

- RM Price Fluctuations (Ni, Cr, Scrap)
- Grade / Series Substitution in Industry
- Standardization (IKEA/ Whirlpool / Electrolux moving to 400 Series)
Nickel (key Raw Material for Stainless Steel) trades over a wider Price Range than other base Metals.

Source: Metalytics
Prospects

- High growth economy
- Increasing SS consumption

Growth Area

- ABC (Architecture, Building & Construction)
- Automobile
- Railways

Challenges

- Indian Infrastructure
- China Capacities
- RM Volatility
Summing up ++
SS Production will go up to 3.5 Million Tons by 2015

Overcapacity in the market .. export boost up

Scope for double digit growth in SS Consumption

(Growth in SS Consumption is about 1.2 Times GDP )

New applications will emerge very fast

Opportunities for business in downstream industries

SS will change the face of India