

# STAINLESS INDIA

100  
YEARS  
OF  
STAINLESS  
STEEL

A MAGAZINE PUBLISHED BY

**Indian Stainless Steel  
Development Association**  
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## A Stainless Steel Bio Mass Stove: Towards a Cleaner Future



Four out of every five rural and one out of every five urban households primarily depend on direct burning of solid biomass fuel like fuel wood, crop residue and cattle dung in traditional mud stove/ three stone fire for cooking. Such traditional cooking practice is characterized by low thermal efficiency (10%) and emits toxic smoke. Women (and accompanying children) cooking with a mud stove, particularly in poorly ventilated kitchens, have increased risk of pneumonia, respiratory diseases, etc. due to household air pollution caused by biomass burning. In India alone 10 lakh premature deaths are attributed to household air pollution. Smoke from incomplete combustion of biomass during cooking also emits climate change agents like black carbon.

Designed by The Energy and Resources Institute (TERI), an autonomous, not-for-profit research organization working globally with headquarters in New Delhi, this stainless steel stove uses traditional biomass such as fuel wood, agriculture residue and cattle dung cake as fuel. A fan at the bottom of the stove blows air into the combustion chamber in such a way that the biomass burns with an improved efficiency than normal open air cooking thereby resulting in less smoke emission.

The fan is powered by a Lithium Ion battery which in turn can be charged by either solar panels (in un-electrified households) or AC power to cater to households in un-electrified areas.

A mix of stainless steel grade in different thickness has been used for this stove. 304 grade of stainless steel has been chosen for inner core, where burning of bio mass takes place, for its ability to withstand higher temperature together with long life on account of its higher corrosion resistance. Outer structure, bottom & top plates, legs, all nuts & bolts are made of AISI 202 stainless steel grade. One stove consumes nearly 7 kg of stainless steel.

Stainless steel offers a maintenance free service life. The need to select a material like stainless steel was confirmed from the fact that this stove will be mostly used in remote rural places where maintenance can be a big

*Continued on page..3*

## ISSDA Interaction with Future Architects

Mr N C Mathur, President ISSDA, made a presentation at the Sushant School of Art & Architecture, Ansal University, Gurgaon on Friday, 8<sup>th</sup> November, 2013. The presentation was well received by the students and faculties. Mr Mathur also made the students aware of a free **Stainless Steel -Online Speciality Course**.

'Stainless India' magazine and brochure on the Stainless Steel-Online Speciality Course was distributed to the students and faculty.

Special issue of A+D magazine which showcased the new and innovative applications of use of stainless steel in the ABC sector were distributed to the students. They were also encouraged to visit ISSDA's website [www.stainlessindia.org](http://www.stainlessindia.org) and to contact ISSDA for any technical help required related to stainless steel and its applications.



*N C Mathur, President ISSDA*



*A Section of the audience*

## World Stainless Steel Production for First Half of 2013 : Mixed results

Preliminary figures released by the International Stainless Steel Forum (ISSF) show that stainless steel crude steel production has been further growing in the first half of 2013 with an increase of 4.6% compared to the same period of 2012. Total production for the first six months of 2013 was 18.6 million metric tons (mmt) – these are 0.8 mmt more than in the same period of last year and it is another all-time-high.

However the analysis by regions and even more by individual countries show very mixed results ranging from minus 15% to plus 15%.

In Asia with China excluded, stainless steel production decreased by 3.7% to 4.3 million tons. There was a mixed performance of the individual Asian countries in the period of review: While India showed increased production

volumes the stainless crude steel production decreased in Japan, Korea and Taiwan, China. China increased the stainless steel production in the period of review by 15.1% to 8.8mmt. Thus entire Asia now counts for approximately 70% of the world stainless crude steel production.

*Source: International Stainless Steel Forum (ISSF)*

Stainless and Heat Resisting Crude Steel Production (in '000 mt)						
Region	Quarter		+/-% Q-o-Q	1. Half year		+/-%Y-o-Y
	1/2013	2/2013		2012	2013	
Western Europe/ Africa	2,157	1,948	-9.7	4,276	4,105	-4.0
Eastern Europe	94	114	21.4	184	207	12.4
The Americas	600	597	-0.6	1,220	1,197	-1.9
China	4,404	4,414	0.2	7,660	8,818	15.1
Asia (w/o China)	2,146	2,149	0.2	4,462	4,295	-3.7
<b>Total World</b>	<b>9,401</b>	<b>9,221</b>	<b>-1.9</b>	<b>17,802</b>	<b>18,622</b>	<b>4.6</b>



Considering the fact that still large Indian rural households primarily depend on direct burning of solid biomass fuel it can translate into huge market potential for stainless steel.

There is lot of enthusiasm in rural communities where these stoves are being promoted with help of local NGOs and women self-help groups.

To know more about the stove and its application you can open the link below for a video presentation.

<http://www.youtube.com/watch?v=KMNm4zGnc>

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problem. Also it is easier to clean and wash the stove with just water or simple detergent.

Some typical advantages of this stove compared to tradition mud stove / three stone fires (subject to appropriate manufacturing and usage) are listed below

#### Less Fuel

- 50% less consumption of fuel
- Reduces drudgery of women collecting fuelwood
- Reduced deforestation due to less consumption of fuelwood

#### Less Cooking Time:

- Reduces the cooking time by approximately half

#### Less Smoke

- 70% reduction in smoke
- Less Indoor Air Pollution (IAP) and healthier environment
- Less blackening of cooking pots and kitchen walls

#### Local Fuel

- Chopped locally available solid biomass
- No addition fuel chain supply burden

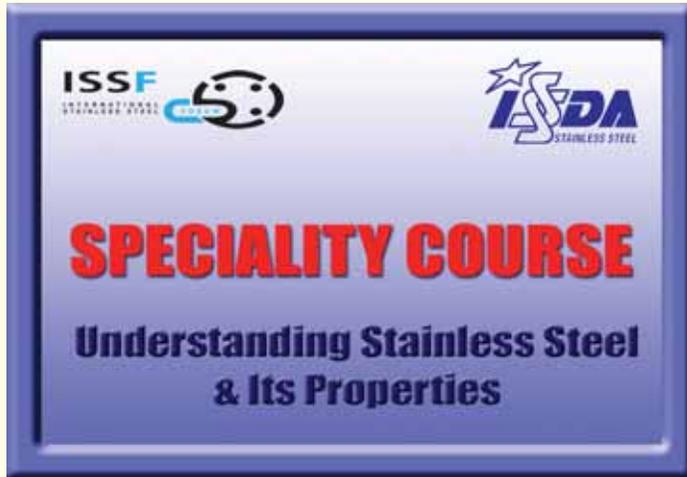
TERI is strongly committed to create innovative solutions for a sustainable future and stainless steel as a material well known for its sustainability goes hand in glove with it.

This stainless steel bio mass stove has already been tested and certified by Indian Institute of Technology Delhi. Ministry of Renewable Energy, Government of India has approved it and has made it technically eligible for all government funded projects. Several field trials has been done in part of rural areas of India and positive feed backs are supposed to boost its usage further.



*A Demo on Working of Stove in a Rural Area*

## Enhance Your Knowledge on Stainless Steel



This basic online course can improve your knowledge of stainless steel, its properties, performance and uses. The five interactive e-learning modules can be accessed online from anywhere in India free of cost. You just need to register and start the course which ends with a Q&A session to evaluate your understanding. Each module is uniquely designed to improve your knowledge on the subject. The course provides a standard level of knowledge and recognized level of achievement. On completion of the course you will be given a certificate of completion.

The course consists of 5 modules

- Module 1 : An introduction to Stainless Steels
- Module 2 : Stainless Steel and Corrosion
- Module 3 : The Mechanical properties of Stainless Steels
- Module 4 : Fabrication of Stainless Steels
- Module 5 : The Metallurgy of Stainless Steels

To register for this course go to the  
**URL: <http://www.issftraining.org/in/>.**

Write to us at [nissda@gmail.com](mailto:nissda@gmail.com), in case you face any difficulty or

**call us at 0124-437501 /502**

## The Tallest National Flag in India



Displaying a combination of Strength and longevity, this stainless steel flag post is the tallest in India. The monumental flagpole was installed by the Flag Foundation of India and is maintained by the Department of Tourism. The flagpole is installed on top of the small hillock between the two gates of the Kanakakkunnu Palace, one of the most recognized historic buildings in the southern Indian state of Kerala. Just a few kilometers away from sea, the stainless steel offers the corrosion resistance required together with structurally needed good strength to weight ratio.

Supporting a mammoth national flag, this flagpole is a whopping 65 metres tall and weighs more than 12.5 tonnes. This huge flagpost has a base diameter of 4.5 ft which ends with the top diameter of 1.5 ft. The flag itself is massive, measuring 22 meters long and 15 meters wide. To put that into a perspective, the structure is visible from almost all parts of the city.

The Flag Foundation of India has already installed many such flag post in different parts of the country in an attempt to rekindle the spirit of nationalism.

### 15th Asian Ferro-alloys Conference

01 April 2014 - 03 April 2014

Conrad Hotel, Hong Kong, Hong Kong

Metal Bulletin  
Events

15th Asian Ferro-alloys Conference

1-3 Apr 2014 | Conrad Hotel, Hong Kong

Metal Bulletin Events' 15th Asian Ferro-alloys Conference will still take place in Hong Kong. With over 600 delegates expected, the flagship Asian event is not only the most important forum to discuss the challenges and opportunities facing the regional and global markets, but an excellent platform to reconnect with trading partners, forge new business relationships and be updated on the latest industry information and trends.

The complete details of this event can be accessed by clicking on the following link.

**<http://www.metalbulletin.com/EventDetails/0/6854/15th-Asian-Ferro-alloys-Conference.html>**

## ISSDA's Annual Forward Looking Session & 24<sup>th</sup> AGM



The Indian Stainless Steel Development Association (ISSDA) held its Annual Forward Looking Session and 24<sup>th</sup> Annual General Meeting (AGM) on September 30, 2013 at Casurina Hall, India Habitat Centre, Lodhi Road, New Delhi 110 003.

More than 50 personnel from various industry associations and Government bodies such as Indian Railways and Ministry of Steel and representatives of ISSDA Member companies attended the Annual Forward Looking Session. They were very happy with the presentations and arrangements made. Mr Syedain Abbasi, Joint Secretary, Ministry of Steel & Chairman of JPC was the Chief Guest of this event. In his address he emphasized on the need of a sustainable development and how stainless steel as a material can help achieve that.

Mr Richard Matheseon, Nickel Institute, Mr J K Jain, CME, Rail Coach Factory, Rae Bareli, Mr N C Mathur, President ISSDA and Mr Rohit Kumar of ISSDA made presentations and shared future plans of Railways, in sector like architecture, building and construction (ABC) and in the field of renewable



energy in respect of the use of stainless steel.

Production of stainless steel coaches at new coach factory of Indian Railways at Rae Bareli has started and is expected to reach a 1000 coach production per year by 2015. ISSDA and its member companies would continue to support and share the knowledge on stainless steel in grade selection, design, forming and fabrication to the fullest with the Railway board.

Participants were informed by ISSDA President on the plans to celebrate silver jubilee of ISSDA completing 25 years in 2014. In view of this; ISSDA is planning

to host a 'Conference cum Exhibition' in November 2014 at New Delhi.

President also informed about the release of market research report '**Facts of Indian Stainless Steel Market**' by ISSDA. (This research was done by M/s Mindsight Consulting Pvt Ltd, who are pioneers in doing market research especially in stainless steel sector). Members were asked to take full advantage of this excellent report.

For viewing or downloading presentations made during the event, please visit ISSDA website [www.stainlessindia.org](http://www.stainlessindia.org)

## ISSDA's Participation at the BIG 5 CONSTRUCT INDIA 2013



*Mr. Rohit Kumar, Deputy Director, ISSDA*



*A section of the audience*

ISSDA participated in the BIG 5 CONSTRUCT INDIA 2013, the International Building and Construction Show held from 2-4 September, 2013 organized by Federation of Indian Chambers of Commerce and Industry (FICCI) in cooperation with DMG Events and co organized by Ministry of Urban Development, Govt. of India.

In a panel discussion, Mr. Rohit Kumar, Deputy Director, ISSDA highlighted the use of stainless steel towards sustainable and green future. The benefits of stainless steel over traditional material and role of stainless steel in building a lasting and world class infrastructure was explained to the audience.

The Big 5 Construct India is an international showcase of building and construction products where thousands of international construction products & innovations can be sourced.

### Wide Circulation Draft of Stainless Steel Milk Can

Dear Readers,

ISSDA is Happy to Inform you that the wide circulation draft of Stainless Steel Milk can is now available on bureau of Indian Standard (BIS) Website. The same can be accessed through following links.



<http://www.bis.org.in/sf/wcdraft.asp>

### New Director Commercial for Steel Authority of India Limited



Binod Kumar has taken over as Director, Commercial, of Steel Authority of India Ltd (SAIL). He was earlier SAIL's Executive Director, Marketing – Special Steels. Kumar, who holds a B.Tech in metallurgy from IIT-Kanpur, had joined SAIL in 1980.



*Mr. N C Mathur, President, ISSDA*

The 15th World Innovation Summit & Expo CONSTRUTECH INDIA 2013 was held at Bombay Exhibition Centre, Goregaon (E), Mumbai from 1-3 October 2013.

Construtech India 2013 main focus was on Smart and Sustainable Cities as progress of a country's infrastructure begins with the creation of smarter and sustainable cities.

Mr N C Mathur, President of ISSDA, made a presentation on "Innovative Usage of Stainless Steel in Urban Development for Smart Cities."

His presentation was well appreciated by the audience. Stainless steel plays a vital role as sustainable material for developing long lasting infrastructure in smarter cities. Audience were informed about a wide variety of applications and product such as stainless steel water tanks, Bus Queue Shelters, in Transit buildings, plumbing, furnitures, sculptures etc. in stainless steel for urban infrastructure development.

## Stainless Steel at Chennai Arignar Anna Zoological Park : For Animal Safety

Arignar Anna Zoological Park is one of the modern and scientifically managed zoos of the Country. It is also the first zoo in India, which was started during the year 1855.

Recently zoo authorities have taken the initiative to replace the existing steel enclosures with stainless steel for its carnivorous animals like Tiger, Leopard, Lions, Jackals etc.

Animals urinate and does it often to advertise its territory. A carnivore's urine is acidic in nature and can speed up the corrosion process of material prone to form rust. The living enclosure of

such animals made of steel has shown heavy rusting in past. Zoo authorities informed that replacing an enclosure and fitting new one is very stressfull not only to them but to the animals too. With time rusting not only weaken the enclosure but broken or sharp edges creates safety hazards for both animals and their keepers. Animals has a tendency to rub their body against the enclosures which can result into injury and if it is from a rusted steel then it can cause serious septic.

Were happy to select stainless steel which fulfilled their criteria of a material having high strength, good corrosion

resistance, long life and minimal maintenance. The long service life offered by stainless steel will prove to be cost saver.

First few enclosures have already used approximately 5 tonnes of Stainless Steel of grade 304. It was informed that they have planned to convert other enclosures in stainless steel in a phased manner.

Other than this Zoo authority also realized the aesthetic and long lasting values of stainless steel and has used it for the ticketing areas, railings and other guarding purposes.



## Joining Stainless Steel Made Easy

### Adhesive Bonding of Stainless Steel

Adhesive Bonding is the process of joining materials with the aid of an adhesive – a substance capable of holding materials together by surface attachments. Although adhesives are capable of producing structures which are more reliable than those fastened by conventional means, adhesive-bonded structures must be carefully designed and used under conditions which do not exceed the known operation limitation of the adhesive.

Adhesive bonding has been successfully used for stainless steel cladding for the facades.

To know more about the Selection of the correct joint design, the importance of Surface pre- treatment and methods to do it properly, Selection of kind of adhesive for different metal surfaces and type of joint, a recent publication of Euro Inox, an European market development association of stainless steel can be accessed from their website [http://www.euro-inox.org/pdf/map/Adhesive\\_bonding\\_EN.pdf](http://www.euro-inox.org/pdf/map/Adhesive_bonding_EN.pdf)



*Adhesive bonding is used for the assembly of door handles.*

*Photo Courtesy : Euro-Inox*



*Adhesive bonding is practical solution in building applications, when stainless steel has to be fastened to masonry or natural stone.*

### Exposion Cladding of Stainless Steels

Since Stainless steel owe their corrosion resistance to the passive film on their surface and it can be more economical in some applications to use only a layer of it on cheap substrate material. A very old technique of cladding stainless steel to other metal surface is explosion bonding process where an explosive detonation as the energy source is used to produce / weld a metallurgical bond between dissimilar metal components. With the advancement in technology, today this process manufacturers can produce larger clad plates, up to 30 sqm, and

can even do cladding of zirconium onto stainless steel.

This technology is readily accessible in India through a few dedicated Explosive cladding manufacturing units, most of who are based in and around Hyderabad. As the process involves use of commercial explosives, the manufacturing is done at licensed premises.

Stainless Steel cladding finds use in various applications in industries such as Upstream Oil and gas, Refineries, Power & Nuclear plants in applications ranging

from Pressure Vessels, Reactors, Columns, Separators, Heat Exchangers, Autoclaves etc.

A full article explaining the advantage and its application can be read from our website [www.stainlessindia.org](http://www.stainlessindia.org)

For obtaining more details of the technology, applications, manufacturing in India as well as any other techno-commercial clarifications, you may contact : TVS Sarma, Managing Director- Peri Nitrates Pvt Ltd, Pune [perinitrates@sify.com](mailto:perinitrates@sify.com).

## First Stainless Steel EMU Rake for Mumbai Suburban

The Indian Railways is the largest single railway system in the world under a single owner—the Government of India. It has a fleet of 60,000 coaches, 64,000 route kilometers and 2,20,000 wagons.

EMU (Electrical Multiple Unit) trains are popular on commuter and suburban rail networks around the world. Considered to be the life line of Mumbai, known as commercial capital of India, the Suburban Rail System is the most complex, densely loaded and intensely utilized rail system in the world. It is spread over 319 route kms on three corridors, i.e.; Western, Central and Harbour. Daily, a total of 2813 train services are operated by Western and Central railway on the three lines together. More than 22 lakh passengers travel on Mumbai suburban rail system.



In their plan to modernise the existing suburban rail networks, Mumbai Railway Vikas Corporation Ltd (MRVC), a Public Sector Undertaking of Govt. of India under Ministry of Railways, took the decision to procure first of its kind rakes made of stainless steel shell & internal fittings for Mumbai suburban rail system. The 12-car rake, developed for the second phase of the Mumbai Urban Transport

Project (MUTP) of the Mumbai Rail Vikas Corporation, will go on a three-month trial in Mumbai's suburban rail system before series production begins at ICF in May 2014. MRVC anticipates that production of all 72 sets (Total 864 coaches) will be completed by December 2015.

The rakes has been built at Integral Coach Factory (ICF), Chennai which claims that these prototype rakes has also been designed with better passenger comfort and safety features.

Indian Railways has already experienced the benefits from the use of stainless steel in their long distance coaches and wagons. Riding on the success of Metro rail in Delhi, other metro cities has also selected all stainless steel built coaches since it offers long and maintenance free service life apart from offering some crucial properties like improved crash worthiness, good strength to weight ratio, and aesthetics.

We have been informed that ICF looked to sustain stainless steel body EMU production beyond the MUTP as the design's twin benefits of energy efficiency and eco-friendliness were relevant for the start-stop nature of suburban operations.



## Stainless Steel Fences at Chennai Light House

Chennai boasts many stretches of beautiful beaches which together are considered to be one of the longest in the world.

The Chennai lighthouse, functioning since 1977, was closed for visitors, following security threats during the early 90s. It has now reopened to visitors after 22 years.

The triangular structure painted in red and white overlooking the Marina beach has been renovated with stainless steel grills on the 10<sup>th</sup> floor where visitors can enjoy a bird eye view of entire stretch of beach and the city landscape.

It has been informed that Chennai Shipping Ministry choose to use stainless steel on account of its excellent strength, durability, corrosion resistance and service life.

Highly frequented Marina beach is not new to stainless steel. The beach side of the wide pedestrian pathway along the long stretch of coastline was decorated with stainless steel hand rails which are still rust and maintenance free enthusing the confidence in material in this severe climatic condition.

Ministry has shortlisted 15 lighthouses, including Mamallapuram, Marakkanam, Kanyakumari and Rameswaram, in the country to be made tourist attractions.



## Learn New Technologies Available for Fabrication of Various Stainless Steel Products

As a conscious effort to educate the stainless steel fraternity and appraise them of new technologies available in manufacturing of various products, a website has been created by the

consulting company 'The Inox Solutions'.

Advanced and cost effective technologies for manufacturing architectural hardware (e.g. door hinges, cabinet hinges,

telescopic channels, door and lever handles), cutlery & kitchen tools, and utensils, latest welding solutions and surface finishing options are demonstrated in the website.



The link to the website is:  
[www.theinoxsolutions.com](http://www.theinoxsolutions.com)

For more details contact :  
Mr. Jasbir Bindra  
[jasbir.bindra@gmail.com](mailto:jasbir.bindra@gmail.com)

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## ALL- India ABC Workshops by Ms Catherine Houska, the world's leading expert on stainless steel.



*Ms. Catherine Houska*

We are pleased to announce that the Indian Stainless Steel Development Association (ISSDA) in association with the Nickel Institute (NI) organizing a series of three workshops on the Applications of Stainless Steel for Architecture, Building & Construction (ABC) sector.

The workshops will be held in Delhi, Mumbai & Bangalore during the week starting 13<sup>th</sup> – 17<sup>th</sup> February 2014. Details of the programme will be put on [www.stainlessindia.org](http://www.stainlessindia.org)

ISSDA will send invitation to architects, builders, interior designers, engineers, civil authorities, urban planners, infrastructure personnel from airports, highways, sea ports, railways and other facilities and stainless steel industry

personnel to attend the workshops. Participation will be only by invitation. There is no fee for attending the workshops. Anyone interested in these workshops, please contact us with your professional background.

These workshops will be conducted by Ms. Catherine Houska, a world renowned expert on the use of stainless steel in building and construction, based in Pittsburgh. She is a consultant to the Nickel Institute and world's leading general contractors, architectural and structural design firms.

She has addressed over ten thousand architects & designers around the world and published over 130 articles in leading architectural magazines and technical publications.

### Retirement

Mrs. A. P. Uma, Manager Administration, ISSDA (Second from right) who was on the payroll of the Nickel Institute for last 25 years took retirement on 31st December 2013.

Her expertise and commitment since the formation of ISSDA will be remembered. We wish her a prosperous health and life ahead.

### New Joining

ISSDA is pleased to announce the recent appointment of Mrs Jyotshna Singh (extreme right). She will be responsible for variety of tasks including office administration and accounts.

Prior to joining ISSDA, Mrs Singh was associated with Durable Façade Services Pvt Ltd and Arsh Exports Pvt Ltd in administration profile.

We hope that with her help, ISSDA would be able to execute its responsibilities.

### Attention Readers !

You can receive your personal copy of 'Stainless India' by sending your complete postal address and contact details to:

[nissda@gmail.com](mailto:nissda@gmail.com)



From L-R: Mr Bharat Raj, Mr Rajat Aggarwal, Mr Jausline George, Mr N C Mathur, Mr Rohit Kumar, Mrs A P Uma and Mrs Jyotshna Singh

### Disclaimer

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