

STAINLESS INDIA

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**Indian Stainless Steel
Development Association**

L-22/4, Ground Floor, DLF Phase-II, Gurgaon 122 002



Tel : +91-124 4375 501, 502 & 503

Fax: +91-124 4375 509

E-mail: nissda@gmail.com, issdastainless@gmail.com

Web: www.stainlessindia.org

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Stainless Steel & Glass Spiral Staircase at Le Meridien with a One-Piece Look

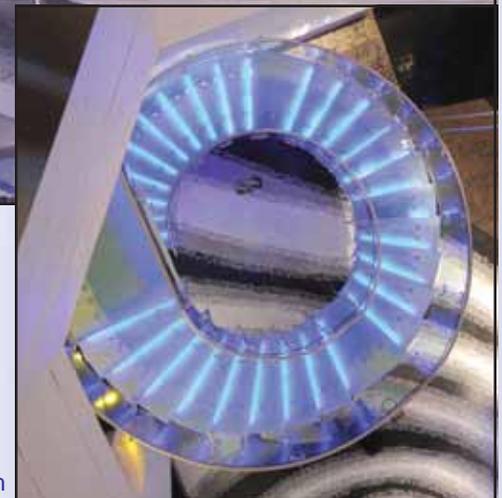
A beautiful spiral staircase of 360 degrees with one stringer clad with SS 304 sheet in No. 4 finish has been fabricated and installed at Hotel Le Meridien in Delhi's central district by M/s Sharp Engineers of Pune for M/s Bobby Mukherji Architects, Mumbai.

Three important features of this staircase are that (1) there is no central support and it is on bottom structural truss with a spool without loading the bottom slab. (2) The entire structure is assembled at site to give a one-piece look. (3) The design of this staircase was done by M/s Sharp Formwork & Consulting Engineers Pvt. Ltd., within the architect's stipulation that the staircase should be within an area of 4 X 4 square meters.

These features make this staircase very compact and elegant. The stainless steel cladding, handrails and the use of spider fittings in stainless steel type 316 add to the aesthetics of this structure.

A total of 2.5 tonnes of stainless steel was used in this structure which can take a load of 15 tonnes.

Steps are made out of safety structural glass. It is supported on the existing steel truss with the help of a spool bolted by four bolts and the slab is not loaded. The internal structural are of hot rolled plates of carbon steel.



Contact details :

Mr Shyam Agarwal
M/s SHARP ENGINEERS
Gate No. 301, Nanekarwadi, Chakan
Tal: Khed, PUNE - 410 501
Mobile No : + 91 - 93739 90220
Tel No :+ 91- 2135 - 320601/ 02 / 03
Fax No:+ 91- 2135 - 286260
Email:shyam_agarwal@sharpeng.com

BIS Approves Printing of New Standard for Low Nickel Stainless Steel for Utensils Inclusion of 430 Grade in IS:5522 Under Processing

“LOW-NICKEL AUSTENITIC STAINLESS STEEL SHEET & STRIP FOR UTENSILS AND KITCHEN APPLIANCES”

The Bureau of Indian Standards (BIS) gave approval for printing of a new Indian Standard titled “**Low-nickel austenitic stainless sheet & strip for utensils and kitchen appliances**” on December 27, 2010. This approval was given at a meeting of the ‘**Alloy Steel & Forging Sectional Committee, MTD 16 in Joint session with Low nickel Stainless steel for Utensils MTD 16:1**’ of the BIS. The meeting was chaired by Dr. Anil K Gupta, Director, Advanced Materials & Process Research Institute, Bhopal. This new standard will be given a number only after the translation into Hindi and at the time of printing sometime in 2011.



Samples for these tests were supplied by JSL and SSP.

In order to achieve this, extensive chemical and mechanical tests were conducted at TCR Engineering, Mumbai, on the various grades of stainless steels under consideration.

The all important tests in food media (leaching of metallic ions and corrosion) were conducted at Central Food Technologies Research Institute (CFTRI), Mysore. For this, hundreds of samples were supplied by Salem Steel Plant and

Jindal Steel Ltd and the samples were prepared under the supervision of Mr K R Ananathanarayanan, ISSDA's consultant based in Bangalore.

ISSDA wishes to place on record its sincere thanks to M/s TCR Engineering & CFTRI, Mysore, for conducting these tests and to Mr. Ananthanarayan for volunteering his services for meticulously analyzing each of the hundreds of tests and collating the results.

The above meeting also approved the inclusion of type 430 stainless steel as a grade suitable for manufacture of kitchen utensils under IS: 5522 (Stainless steel sheet & strip for utensils). The modified draft standard IS: 5522 which includes 430 grade has been submitted by ISSDA and will be sent for wide circulation by BIS and then adopted by the committee.

Chemical Composition

Grade Designation	Nominal Composition (in %)
N 1	C max 0.12; Cr 14.5 - 16.0; Ni 1-2; Cu 1.5-2.5; N 0.08-0.2
N 2	C max 0.10; Cr 15.5 - 17.0; Ni 1.5- 3.5; Cu 2- 4; N 0.10 - 0.25
N 3	C max 0.09; Cr 16.0 - 17.5; Ni 4-6; Cu 1.5 - 2.5; N 0.05 - 0.15

The publication of this standard would be very useful to exporters of kitchenware and appliances to convince overseas importers that they are supplying products made of stainless steel grades complying with Indian Standards.

Nickel Institute Announces New President Effective January 1, 2011



Dr Kevin Bradley

The Nickel Institute announces the appointment of Dr. Kevin Bradley as its new President effective January 1, 2011, to succeed Stephen Barnett whose term comes to a close on December 31, 2010.

Brussels for the Nickel Institute. “Kevin brings to this position a deep understanding of the functioning of European Institutions and the regulatory issues affecting the use of nickel and nickel compounds globally”, said the Chairman. “With his science background and experience in Government, Kevin knows the key role science plays in the development of public policy and the role of risk management in the use of nickel and nickel compounds”, the Chairman also noted. Under Kevin’s leadership the Nickel Institute will continue to promote nickel uses for the benefit of society. The Nickel Institute will continue to advocate globally for sound science as the basis for regulation and provide leadership on programs such as REACH in the European Union.

Dr. Bradley is currently Director, Regulatory Policy & Public Affairs and Head of Office-

Press Release, dated 7 December 2010, Nickel Institute, Toronto

Nickel Magazine

‘Nickel’ is a magazine devoted to nickel and its applications, published by the Nickel Institute. After 24 years of being published in print and sent free-of-charge to over 32,000 persons across the globe (including 3,500 in India), it has now gone online. Those wishing to receive this valuable magazine, please register at : www.nickelonline.org/subscribe to receive email notification of future issues.

Delhi Metro's Expansion – A Big Market for Stainless Steel

Delhi Metro is a rapid transit system serving Delhi, Gurgaon, Faridabad and Noida in the National Capital Region of India. The Delhi Metro Rail Corporation (DMRC) has already commissioned a 65 Kms route in Phase-I and is going ahead with another 128 Kms in Phase – II. Delhi Metro is planning to cover the whole of Delhi and NCR region by 2020. By then, Delhi metro will have covered a total of about 405.5 Kms in Delhi and the National Capital Region (NCR).

Delhi Metro, which has become world famous for its state-of-the-art transit system and efficiency, started on a very positive note by correctly specifying its metro coaches in stainless steel type 301L. 301L stainless steel was selected because of its high strength which results in lightweight coaches, aesthetics, durability (more than 30 year life), minimum maintenance, and most important of all, passenger safety in case of crash or fire.

The first section of the Delhi Metro opened on December 24, 2002 and became very popular and now has a ridership of 1.5 million commuters per day. Delhi Metro has become a boon for commuters who can escape steadily slowing traffic and congested buses and can quickly get to their destination in comfort and safety.

To cope with the huge rush the Delhi Metro are planning to start with six coach trains instead of 4 coach trains at present with one coach reserved for women. Usually, metro stations are spaced about 1 Km apart within the city. DMRC operates trains at a frequency of 2.5 minutes during peak hours.



For covering 405.5 route-kilometers, DMRC would also have hundreds of Metro Stations, which again generously use products using stainless steel like escalators, handrails, benches, advertising panels, turn-styles, ticketing counters etc. (See box item – 'Sustainable Stainless Steel Transit Station Design' by Catherine Houska, Nickel Institute).

By 2020, when the Delhi-NCR metro would cover about 405.5 Kms, Delhi Metro Rail Corporation would need a fleet of more than 2000-3000 coaches. Each coach would be using over 10 tonnes of 301L for the skin, structural members, under-frame and furnishing inside the coach. Type 301L stainless steel is by far the standard grade used the world over for metro coaches.

Other Indian cities like Mumbai, Kolkata, Chennai, Bangalore and Hyderabad are also providing metro stations for its population. Hence, the opportunities for providing stainless steel products or sub-assemblies for metro coaches and metro stations are immense.

CHENNAI TO HAVE ITS OWN METRO RAIL WITH STAINLESS STEEL COACHES

Chennai's metro rail project was initiated in 2007. Phase 1 consists of two interconnected lines, linking North Chennai to the Airport in the South and Chennai Central to St. Thomas Mount. It will include 32 stations -19 equipped with full size platform screen doors - over 45 km (24 km underground and 21 km elevated). These lines have been planned with a capacity to carry more than 500,000 people daily and a frequency between two trains as short as 3 minutes.

The Chennai Metro Rail Ltd (CMRL) has placed orders for the supply of 42 sets of 4-car configuration (168 coaches), including supply of spares and maintenance kits with the M/s Alstom Transport SA (ATSA) and Alstom Projects India (APIL) Consortium.

Stainless Steel Coaches of State-of-the-art design.

The cars will be of state-of-the-art design with **light weight shell made of Austenitic stainless steel** with 3 phase AC drive and regenerative braking system. The car body structure will be manufactured in Austenitic Stainless Steel AISI Types such as **201L, 301L, 304** etc., with the exception of end under-frames, which will be built in low alloy high tensile carbon steel. In order to obtain lighter structures, the material of each structure will have the most appropriate cold drawn grade of austenitic stainless steel for the load it carries.

The cars will have automatic train protection (ATP) and automatic train operation (ATO) systems. All cars are

provided with electrically operated bi-parting automatic sliding doors to ensure safety of passengers. Besides, these coaches will be air conditioned and have electronic route map, public address system, passenger emergency intercoms, video surveillance and CCTV. The initial lot of 36 coaches will be manufactured at Lapa, Brazil. The remaining coaches are planned for manufacture in India.

The first delivery of cars is planned for the end of 2012. Chennai Metro plans to commence services partly by the end of 2013. The entire project is scheduled to be completed by 2015.

(Authored by Mr. R. Sriraman, formerly of the Indian Railways, now based in Chennai)

Sturdy 316 Stainless Steel Handrails at Rajkot Crystal Mall



M/s Kich Architectural Products Pvt Ltd is one of the reputed and biggest stainless steel architectural hardware manufacturers and exporters of India since 1992. They are specialist in manufacturing anti corrosive high grade AISI 316 stainless steel architectural products. Their product portfolio includes Mortice Handles, Lock Bodies & Pin Cylinder, Pull Handles, Main Door Handles, Door Hinges, Grab rails, Sign Plates, Door stops, Bathroom Accessories, Handrail & Baluster System (Knock down system) as well as Tailor Made products as per your required specifications. Now Kich has expanded its services by providing to the construction industry stainless steel handrail and other on site installations.

Milling crowds (in the picture above) watching an event at the Rajkot city's 'Crystal Mall' speak volumes about the sturdy design of the 316 grade stainless steel handrails. In service since 2007, event after event, these handrails have given sterling service, without needing any servicing or repair. 316 grade of stainless steel nominally contains Cr-16-18 %, Ni-10-14 % and Molybdenum – 2-3%. The addition of Molybdenum enhances the corrosion resistance of stainless steel, adds to durability and minimizes maintenance.

M/s Kich Architectural Products Pvt. Ltd of Rajkot, Gujarat (formerly known as Kich Marketing Pvt. Ltd.), designed, manufactured and installed the above system. This system is modular in construction without any involvement of welding or fabrication at site. The joints of

this knock-down system are internally enhanced with bushing made of stainless steel or brass for extra strength and to withstand forceful or intense use or misuse of the railings. The handrails are made of tube of 1.5mm thick 316. Close attention is paid to detailing for aesthetic finish with 1.5 mm end-cover caps and at the base of the balusters.

High strength and extra-long anchors and fasteners are used for grouting the balusters. Balusters can be mounted on the steps or side of staircases.

M/s Kich Architectural Products manufacture all items in house in their factory which is certified to ISO 9001:2008 quality standards. This includes their state of the art finishing facility. A range of designs are readily available and designs can be customized to the user's requirements. This includes the option of toughened glass or horizontal pipe members.

Their customer list includes prestigious names such as ... Zydus Cadila, TORRENT, WOCKHARDT, Sun Pharma, Cipla, Cape Gemini, Scientific Convention Center, Bombay Hospital, RBI, SBI, Standard Chartered Bank, ICICI, HSBC, HDFC, UTI, Hyatt, Holiday Inn, Taj Group, Inter Continental, Reliance, TATA, L&T, Wipro, Infosys, IFFCO, Finolex, The Times Group, SAB TV, Fun Republic, COCA COLA, Jet Air Ways and many more.

Contact details :

Mr Niraj Joshi
(Admin Head - Marketing)
Kich Architectural Products Pvt Ltd
Yogeshwar Main Road, Atika,
Dhebar Road (South),
RAJKOT-360 002. Gujarat (India)
Ph.: +91-281-3290316/17, 2368121,
2367768, Fax: +91-281-2361602

E-Mail : misc@kichindia.com

Website: www.kichindia.com

More about Kich.....

M/s Kich Architectural Products Pvt Ltd is the only company in India who won the **National Award for the Best Quality Products** in hardware category. Their door hardware products are successfully tested for conformity to all the requirements of **BS EN 1935** (Mechanical Testing) by world's largest **BODYCOTE** testing group and **BS EN 1634-1** (Fire Resistance Testing) by world's leading independent fire testing organization **WARRINGTON FIRE**.

M/s Kich Architectural Products Pvt Ltd is the first member of **Indian Green**



Building Council (IGBC) in Architectural Hardware Products, promoting the Green Building Movement. All the Kich Products which are made of AISI 316 grade stainless steel are made from the raw material that is

Contd...on page 13

SALEM STEEL joins the elite group of integrated stainless steel mills

The aspirations and dreams of a dedicated team, cherished and pursued with perseverance through three decades came to fruition when the first cast of liquid stainless steel was taken through the new steel melting facilities at Salem Steel Plant in September 2010. With major facilities in the steel melting shop complex having been put in position and after progressive steps of trials and testing, stainless steel slabs have now started rolling out – thereby docking Salem Steel Plant in the next higher orbit - amongst world class integrated stainless steel producers of the world.

The Rs. 1900 crore expansion programme at Salem inter-alia envisages setting up of Steel Melting Shop with the following major facilities:

- 55 MT EAF
- 60 MT AOD Converter
- 60 MT Ladle Furnace
- Single Strand Slab Caster
- Slab Grinder

Along side, the CRM is also being strengthened with additional facilities like a third Annealing and Pickling Line, third Sendzimir Mill, second Slitting Line, Tension Leveling line, Second Skin Pass Mill, roll grinders and other auxiliary facilities.

With this major step in its backward integration journey, Salem Steel Plant will now be fully equipped to launch itself in the mission of developing high-end grades of stainless steel in-house for automobile, railway and other critical industrial applications. With this major expansion, the capacity of saleable stainless steel production will go up from the present level of 175,000 MT to 340,000 MT. This will comprise of 146,000 MT of cold rolled stainless steel products and 194,000 MT of HR products.

Conceived in the early seventies as a special steels complex to produce 220,000 MT of stainless, electrical and special steels, the Salem Steel Plant has had a long and continuous tryst with its destiny. In March 1977, the formal go ahead was given by Late Smt Indira Gandhi for implementing this project through a process of "Reverse Integration" by setting up a 32000 tpa capacity Cold Rolling Mill Complex with all associated facilities. The first stainless steel coil rolled out exactly after 54 months in September 1981, setting new standards in timely project implementation. Salem has never looked back since then.

Stage after stage, brick by brick, this team has demonstrated resilience and commitment - completing every stage of expansion dot on time with no cost / time over runs and by 1991, a second Sendzimir Mill was added to increase the CRM capacity to 70,000 MT. Reacting quickly to the emerging market potential for stainless steel coin blanks in the country,



Tapping of Liquid Steel at the EAF



Charging Liquid Steel into AOD Converter



Casting of Slab

Salem added a 3000 tpa capacity Coin Blanking Line in 1993.

The next step in the backward integration was the addition of Hot Rolling Mill complex with the state-of-the-art Steckel Mill in 1995. And, latest and the final step in this odyssey has been the completion of the steel melting facilities.

With a penchant for quality assurance and new application developments, Salem Steel Plant had pioneered usage of stainless steel in India - for coinage, railway coach components, architectural applications, appliances, roofing, bulk solid handling and wagon building applications, to name a few.

The seeds of product development initiated by Salem Steel decades ago in the form of developing 409M grade for corrosion and wet abrasion prone applications has today germinated and blossomed into huge market segment in

the form of usage of stainless steel in railway wagon building and material handling applications – revolutionizing the rolling stock of Indian Railways. This indeed has been a classic illustration of Life Cycle Cost (LCC) based value engineering adopted by Indian Railways that has substantially improved rolling

stock availability with considerably less maintenance outlay.

Salem Steel Plant produces and supplies stainless steel sheets, coils and strips in 200, 300 and 400 series and products are marketed through branch network spread across the country at Delhi, Kolkata, Mumbai, Chennai, Ahmedabad, Pune, Hyderabad, Bangalore and Coimbatore. In addition to core products, Salem has also forayed into value added stainless steel products ranging from kitchenware, roofing sheets, pipes, tubes to other fabricated products. Salem has recently engaged a Service Center at Mumbai to provide customized products to discerning customers.

Contact details :

Mr R Viswanathan
G M, Marketing
Salem Steel Plant (SAIL)
Tel: 0427-2382803, viswa@sailssp.in

Seawater Desalination – A big opportunity for stainless steel

Of all the water on this planet, 97% is saline and two per cent is in the form of glaciers. Only one per cent of water on earth is drinkable. Out of this 1%, only one third is accessible to human populations.

Global Situation: According to environmental scientists, the global population of over six billion people which is increasing at a rate of around 80 million people per year can only be supplied with clean water if we find a sustainable method of converting saline water into clean water.

India: Figures from the ministry of rural water supply show that the country had enough drinking water for its people in 1951 at 5,177 cubic meters per person per year. But by 2000 India had become a water-deficient country. In 2003, the country had a 25% deficit, at a rate of 1,500 cubic meters per person per year. The deficit is projected to rise to 33 per cent by 2025, unless measures are taken to resolve it.

India has a long coast line and this huge resource offers the only solution to our urban centers which are already densely populated beyond their limits. Additional 200 million people from the countryside are expected to join urban areas in the next two decades. This is the immensity of our urban infrastructure, providing water for the population is just one of them.

Positive Action by the Indian Government to address Water problem: Surging demand for assured water supplies is forcing municipal corporations and industrial entities to look beyond the conventional methods in trying to increase supply. Various options such as rainwater harvesting, waste water recycling and desalination are being explored. Chennai, the metropolitan capital of Tamil Nadu has pioneered the use of large scale seawater desalination for producing potable water.

The Minjur Desalination plant, built on a 60-acre site in Kattupalli, about 35km north of the state capital city, Chennai, will be the largest desalination plant in India. The second largest plant is in Jamnagar, Gujarat, with a capacity of 96,000m³/day.

The Minjur Reverse Osmosis Seawater desalination plant has a capacity of 100 MLD (million litres per day). It commenced trial operations in June 2010. It is also India's first large scale seawater desalination plant dedicated to supply of drinking water for public consumption. Water from Minjur is pumped through 23.5



kms of pipelines to reach Madhavaram pumping station in the city of Chennai. The cost of potable water production from seawater at Minjur is less than 5 paise per litre.

Tamil Nadu has become a haven for desalination projects as it has a coastline of over 900 km and has over 70+ ongoing and commissioned desalination projects of varying scales, using different technologies. There are already several desalination plants in Tamil Nadu treating brackish ground water.

At Mundra in Gujarat, an even larger 25.2 MLD Seawater Reverse Osmosis plant is near completion for an upcoming 4000 MW Ultra Mega Power plant.

The Gujarat government has envisaged self-sufficient townships on the coastal areas, complete with desalination and solar power plants, solid waste management, waste water treatment and rain water harvesting systems. Gujarat already has several 30-40 MLD desalination plants in operation.

By the year 2026, Mumbai will be the largest consumer of water among coastal cities. The city alone would account for 55% of the total water demand of Maharashtra. Given the unbridled construction activity and growing population the monsoons may not be enough to meet its water needs. Mumbai's demand is 4,250 MLD but the supply from its six water sources is only 3,400 MLD.

In anticipation of such a scenario, the Mumbai Metropolitan Region Development

Authority (MMRDA) has decided to set up two desalination plants of 100 MLD each. One of the desalination plants will be for South Mumbai and the other for the suburbs and areas outside Mumbai such as Mira-Bhayander. It comes nearly a year after the Brihanmumbai Municipal Corporation (BMC) decided on a similar move. In the long term, MMRDA is looking at 1,500 MLD desalination capacity to supply water for Mumbai.

The above picture is an indicator of the potential of stainless steel in desalination projects. This segment offers tremendous opportunities for the stainless steel industry as India has a coastline of 7,517 km and seas are perennial water bodies.

Rajasthan: Two desalination plants at Sheelgaon village in Barmer District and Satlana village in Jodhpur, Rajasthan have a capacity of 30,000 liters/day capacity with the support of BARC in cooperation with Defence Laboratory for providing water from bore well / brackish water sources.

For a Reverse Osmosis (RO) Plant the cost of desalination of sea water would be around 5 paise per litre and for brackish water desalination the cost works out to around 2 to 5 paise per litre. India has so far installed 175 plants, starting with one at Andaman in 1946. Desalination plants have proved to be an elixir for places like Lakshadweep, Andaman and some places in Gujarat, Tamil Nadu and Andhra Pradesh and Rajasthan.

Note on Grade Selection for Desalination Plants on page ...9

Skid-free Stainless Steel Flooring Now Available in India

Highly Durable, Safe and Cost Effective Option

Rigidized (embossed) stainless sheets are produced by rolling a pattern into the sheet with mating rolls which carry the male and female impressions. This produces a sheet which has raised patterns on one side of the sheet and the back side carries corresponding dimples. (See images of mating rolls given on this page).

Rigidized stainless steel sheets with anti-slip patterns are slip-free, enable large number of people to move in a limited area without losing their balance, assure safety of workmen and people, and are long lasting. These patterns are attractive and offer designers a unique material to work with for providing safety to people where there are heavy footfalls and in different industrial environments.

Stainless steel has a naturally high resistance to wear, scratching, denting, tearing and corrosion, and is aesthetically pleasing and easy to maintain. Specifically, austenitic stainless steels like 304 are strongly recommended because of their ability to work-harden on cold forming the patterns. The raised patterns have a much higher hardness than the base material, and therefore, higher wear resistance. This, combined with the high corrosion resistance of the austenitic stainless steels, make these grades eminently suited for this application.

The life cycle cost of stainless steel anti-skid sheets is minimal compared to other materials like carbon steel (where corrosion gradually eats away the



Mating rolls for Rigidized sheet

protrusions) and aluminium which is soft and patterns tend to get erased over a period of time. With both these materials, they lose their functionality for which skid-free patterns were provided in the first place, and will have to be replaced every few years to be functional.

Applications of skid-free stainless steel sheets are innumerable: The major

application area is slip-free floorings in the transportation sector for railway coaches, metro coaches, buses etc., and industrial workplace, ladders and elevator floorings etc., to ensure safety of people. It can also be used for architectural applications in public places like foot over bridges and staircases. These skid-free sheets are also used in the landing areas of escalators to help people retain their



Non-skid steps of stainless steel at a modern abattoir at Ghazipur, New Delhi

balance when abruptly getting off from a moving escalator.

In addition, the nature of stainless steel makes the material ideal for use in hygienic

applications like pharmaceutical, dairy & food processing plants. Plus, the high corrosion resistance and easy cleanability means a floor that will not have stains which can affect the surrounding clean production area.

Finally, in the automotive sector where corrosive chemicals are used in the painting process, this corrosion resistant slip-free stainless steel flooring shows its mettle by its durability and ensuring workers' safety. Other flooring materials corrode very quickly in automotive paint shop environments.

These patterned sheets are up to 75% stronger than ordinary carbon steel sheet metal. This results in a down-gauging which allows for less raw material use — saving money and precious environmental resources. This feature is ideal for applications where weight and cost savings is an important consideration (See table).

Contact Details:

M/s Jindal Architecture Limited
Plot No.64, 2nd Floor
Udyog Vihar, Phase-IV
Gurgaon-122 016
Tel: + 91 124 4127700
Fax: +91 124 4127777
Website: www.jindalarc.in

Technical Comparison Chart

Parameter	Aluminium	Stainless Steel 200/300/400 Series
Visual		
Yield Strength	Low-200 Mpa	High-515 Mpa
Hardness	Low - Vickers 100	High-Vickers 275 Wear Resistance High (2.5 times)
Wear & Tear Abrasion Resistance	Very high because of low hardness and high ductility	Very low due to high rigidity, hardness and high abrasion resistance
Fixing Method	Assembly with Screws or rivets. Gets loosened by vibrations	Assembly with Screws, rivets and welding
Weldability	Low	Very High
Equivalent thickness of SS Compared to Al. (Wt.in Kgs/Sq.mtr)	2mm (5.4kg/mm ²) 3mm (8.1Kg/mm ²) 4mm (10.8Kg/mm ²)	0.8mm (6.2 Kg/mm ²) 1mm (7.8Kg/mm ²) 1.25mm(9.75Kg/mm ²)
Cleanability	Difficult due to sharp edges	Easy
Expected Life	1 Unit	3 Units
Relief	Low - single side	High-double side
Corrosion Resistance	Low	Very High

Ultra-modern facility established in Umbergaon

Chandan Steel becomes a Major New Seamless Tube Producer

Chandan Steel Ltd, based in Umbergaon, Gujarat province, India, has set up a new, ultra-modern, state-of-the-art facility for the production of stainless steel seamless pipes and tubes. With this latest investment, Chandan Steel will be one of the few companies to offer such a wide range of long products including both solid as well as tubular products, all under one roof.

Chandan Steel seamless tubes division (STD) can offer a high degree of flexibility, both with respect to grades supplied and delivery, drawing substantial benefits from its own in house raw material supply. The melt shop, continuous caster, and rolling mills, which already feed the company's long products division, as well as its forging division, will now also cater to its new seamless division supplying bars for the production of mother hollows.

Chandan Steel provides customized products to its customers in a wide range of austenitic, ferritic, duplex and super duplex grades. In line with its long-held reputation as a highly innovative company, Chandan Steel has installed a conical piercer to produce superior quality mother hollows and pipes with some indigenous process changes to the technology. It has also installed specially engineered, fully automatic, high speed Pilger mills for rolling tubes. This gives higher cross sectional reduction to the mother hollows, which in turn gives better metallurgical properties after solution annealing. The higher elongation introduced in the manufacturing process for cold rolled seamless tubes ensures better dimensional control and surface finish, and imparts better anti-corrosion properties in the tubes. It also allows longer tube lengths. Chandan Steel can produce 52 meter long tubes, which are the longest available from Indian manufacturers in order to produce high quality bright annealed tubes required for such niche applications as nuclear and oil exploration.

The new production facility at STD boasts equipment of the highest standard, and the process technology used also is one of the best employed specially for production of cold rolled and bright annealed tubes and are much superior to the other plants employing conventional equipments and technology. These has been done with a view to cater to recent market developments which require higher quality products for critical and niche applications such as the nuclear and power sectors, offshore exploration, process equipment, etc.



Bright Annealing Furnace



Pilger Mills for Rolling Tubes

Chandan has installed a state-of-the-art solution bright annealing process and the latest equipment (110 meters in length) which ensures uniform temperature, soaking and quenching. This imparts higher stability in the metallurgical properties of the product.

For all these operations to take place without interruption, the company requires a guaranteed continuous power supply. This is provided by its own 8 MW power plant. Here, it has also shown its concern for the environment by installing four wind turbines which account for 45% of the power used by the company. And Chandan is on its way to becoming a 100% green energy user by installing additional wind turbine generation capacity in 2011/12. Chandan Steel plans to produce approximately 6,000 tonnes per annum of seamless stainless steel pipes and tubes, initially offering sizes ranging from 3mm to 133mm. The company's area of expertise also includes bright annealed umbilical

and instrumentation tubes from 3mm to 32mm, in coils, up to 500 meters in length.

Chandan Steel has a wide range of stainless steel long products and seamless tubes complying with appropriate EN & ASTM standards.

They have approvals from several reputed third party Inspection agencies as well as oil & gas sectors and have an impressive list of clients.

Contact Details:

Mr Chirag Chandan (Director)

Seamless Tubes Division

Mr Ramesh N Sanathara

(Manager – Exports Div)

M/s Chandan Steel Ltd

Tel: +91 (260) 308 9999, 308 9879

Fax: +91 (260) 308 9872

E-mail: exports@chandansteel.net,

exports.smls@chandansteel.net

Website: www.chandansteel.net

The liberty to choose any unique pattern of one's desire is the ultimate freedom and this is now possible in stainless steel for architectural applications.

Architects, interior designers and fabricators would be delighted to know that etched stainless steel sheets are now indigenously available at reasonable prices. An infinite variety of exciting and dynamic graphic designs can be created on stainless steel surfaces by many methods. One of them is chemical etching where an architect can choose a design of his choice and this can be translated on to the surface of the stainless steel sheet. Etched patterns of your choice can be now sourced from M/s Fabrinnox, Architectural Division of Dharam Industries, based in Delhi. You also have the choice of selecting the background in No. 4 (hairline), No. 8 (mirror) or Vibratory finishes.

In this process, a protective coating is applied selectively to the surface. Unprotected areas are chemically etched to create the design. Etched areas are dull silver colour and contrast well with the finish on the unetched surface. The depth of etching is only of the order of a few microns, but it gives a stunning new look to the stainless steel product's surface.

Applications:

1. Wall Cladding.
2. Column Cladding.
3. Elevators
4. Signage
5. Interiors
6. Furniture
7. Lifestyle Products



Advantages:

1. Aesthetics
2. (Increased resistance to scratches) Scratches tend to get masked in the background of the pattern
3. Personalized designs possible for architects
4. Etched patterns are permanent

Contact details :

Mr Jaspreet Singh Sarna / Mr Ardaman
M/s FABRINOX
Architecture Division of
DHARAM INDUSTRIES
H.O :- A-70, Wazirpur Indl. Area
New Delhi - 110 052
Mob :+ 91-98108 21213/98102 08882
Fax :+ 91-11-27374983
email : jaspreet@fabrinnox.net,
info@fabrinnox.net, www.fabrinnox.net

Stainless steel selection for Seawater RO Plants

Successful desalination requires a material that can resist the aggressive corrosion caused by seawater and brine. Utilizing stainless steel to create fresh water further increases the sustainability profile of the desalination industry. The durability and minimal maintenance requirements of stainless steel make it a good choice economically. The high-level of recycled content and 100% recyclability at the end of its life are the cornerstones of stainless steel's environmental profile. High performance stainless steels, including duplex grades, are the perfect choice for desalination.

Global production of desalinated water has increased exponentially since then. Yet worldwide, only 1% of drinking water is produced by desalination plants, despite the fact that there are more than 12,500 plants in over 120 countries. Just under half (47%) of the commissioned global desalination capacity is located in the Middle East. Considering that almost one quarter of the world's population lives less than 25 km from the coast, seawater has the potential to become one of our main sources of fresh water.

Experience from 27 seawater reverse osmosis (SWRO) plants already in service

confirm that there is a risk of corrosion if the wrong stainless grade is used in the **high-pressure piping**.

Neither grade 316L/1.4404 nor 317L/1.4438 possess sufficient corrosion resistance properties. Not even highly alloyed grades (such as 2205/1.4462 and 904L/1.4539) show reliable service performance in this application. However, no corrosion has been reported for new super-austenitic stainless grades (such as S31254/1.4547) which have been used in more than 30 full-strength SWRO plants and several plants using brackish water with high salinity.

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Website: www.suhner.com

Design engineers frequently specify stainless steel in industrial piping systems and tanks for its excellent corrosion resistance. While stainless steel's unique characteristics make it a standout leader in the durability stakes of alloys, it is not completely immune to corrosion.

Premature failures of the stainless steel can occur due to Microbiologically Influenced Corrosion (MIC). This corrosion phenomenon usually occurs when raw water used for hydrostatic pressure tests is not fully removed from the pipework and there is an extended period before commissioning of the equipment. The result is localised pitting corrosion attack from microbacterial deposits that, in severe cases, can cause failure within a few weeks. MIC is easily prevented using proper hydrostatic testing techniques.

MIC failures occur by pitting corrosion, often at welds, where colonies of bacteria may form. A number of different bacterial species are known to cause the problem, but the detailed mechanism is not known.

Iron utilising bacteria appear to be the dominating microbial species involved with MIC occurring in stainless steel. Anaerobic sulphate-reducing bacteria pose a greater risk of instigating or accelerating corrosion often under a layer of aerobic slime or microbial deposits. However others, such as manganese utilising bacteria (generally from underground waters), have also been discovered.

MIC is extremely aggressive and difficult to eliminate once established, so it is surprising and disappointing that there is limited knowledge of MIC within the engineering community. Fortunately, MIC is easily avoided by using good practices during the initial hydrostatic testing. Education and promotion of proven hydrostatic testing practices which prevent MIC are vital to minimising its potential impact on the stainless steel industry.

Hydrostatic testing practices to eliminate MIC

In order to eliminate MIC, it is recommended that the following practices are used.

1. Fabrication practices

Crevice should be eliminated or at least minimised during the fabrication process,



as they are the preferred sites for attachment and growth of microbial colonies. They also provide traps for chemicals which could concentrate and cause pits.

The likelihood of MIC will also be reduced by:

- > using full penetration welds; and
- > purge welding to prevent the formation of heat tint; or
- > removing heat tint by grinding or pickling.

Arc strikes and weld splatter should also be ground off and pickled.

2. Use clean water

The cleanest water available should be used in a hydrostatic test, such as demineralized, steam condensate or treated potable water. Untreated or raw water from dams or bores should be avoided when conducting a hydrostatic test but, where this is not possible, the water should be sterilized (eg. by chlorination) before use. If sterilization is not practical, the requirements for short residence time and subsequent drying of the system are extremely important. The cleaner the water, the less 'food' there is for MIC bacteria to live off and multiply.

It is important to ensure that there is no trace of sediment in the stainless steel system during testing to avoid silting, as the water is normally not circulated during a

hydrostatic test. This may require the test water to be filtered to ensure it is free of all undissolved solids. Sediments can provide the conditions for crevice attack.

3. Draining and drying

Thoroughly draining and drying the stainless steel system immediately following a hydrostatic test (preferably within 24 hours, certainly within 5 days) will almost certainly prevent the occurrence of MIC.

Horizontal pipelines should be installed in a sloping direction to make them self-draining.

Drying can be achieved by pigging (cleaning with foam or rubber scrapers), followed by blowing dry air through the system. Beware of blowing higher temperature moist air through cold pipework unless the air is dried before being introduced to the system. If warm air is used, it should not be from a gas burner as condensation may occur.

Draining and drying of systems following a hydrostatic test should only be disregarded when the system is placed into service immediately following the test. Partial draining is potentially very serious as subsequent slow evaporation of even clean residual water can produce very concentrated and aggressive solutions.



MIC deposits on surface



Corrosion under deposit



Corrosion pits

Contd...next page

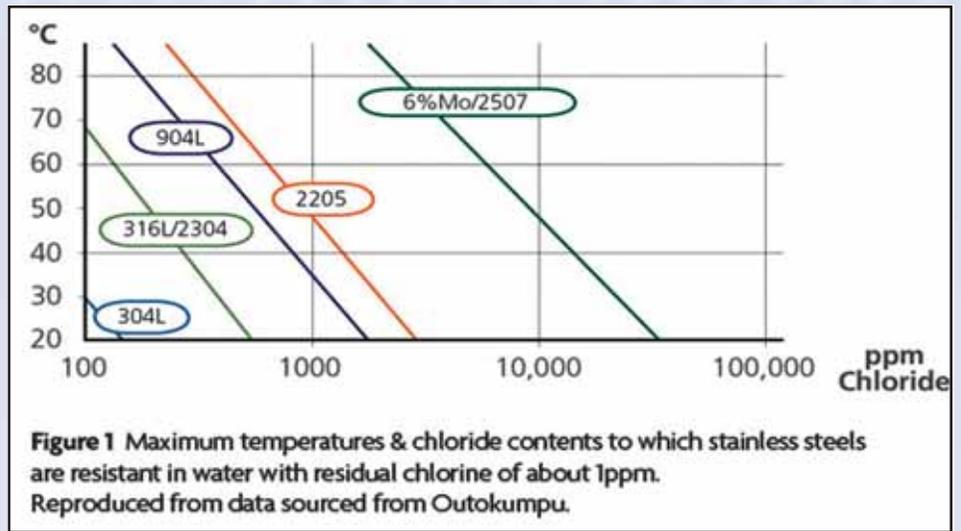
Continued from.. page2

Hydrostatic testing of stainless steels

4. Chloride content and temperature

During hydrostatic testing of stainless steel equipment, the chloride content of the test water must be within the range to which the stainless steel grade is resistant. Figure 1 shows the maximum temperatures and chloride contents to which stainless steels are resistant in water with residual chlorine of about 1 ppm.

The limits shown in Figure 1 may be exceeded provided the contact time of the water is brief, ie 24-48 hours. If the chloride content of the test water is uncertain, the water should be analyzed.



5. Standards

NACE and API standards for a number of products and installations provide guidelines for hydrostatic testing, including limits for water quality and contact times. These standards should be consulted for specific details for the fabrication in hand.

Conclusion

The benefits of stainless steel's corrosion resistance are well proven in many industrial applications involving piping systems, but failures can occur during hydrostatic testing if care is not taken. Attention to a few simple details will prevent

surprises a few months down the track, allowing the long service life available from stainless steel to be fully realised.

Source : Australian Stainless Steel Development Association (ASSDA), www.assda.asn.au

Welcoming New Members . . .

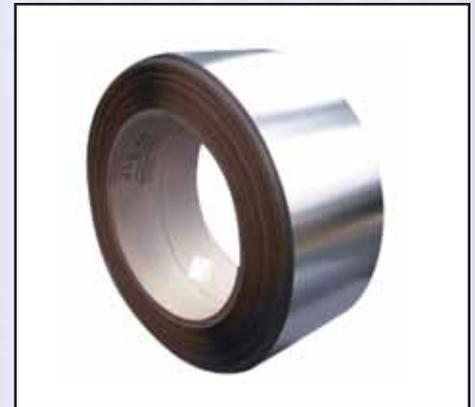
VSP International Pvt. Ltd., a Kharkia Group Company, manufactures a wide range of Stainless Steel Strips & Coils for Indian and International marketplace. The stainless steel strips manufactured and distributed by the company are manufactured from the best quality of raw steel so they are very durable and have considerably long functional life.



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We offer a very comprehensive **stainless steel strip & stainless steel coil** mix. Most of the **stainless steel strips and stainless steel coils** are tailor made to cater the need of various Industrial/Commercial segments. Our product range is as follows:



Stainless Steel Strips



Grade	: AISI 200, 300 & 400 series.
Thickness	: 0.15 mm to 3.50 mm.
Width	: 250 mm to 750 mm (Mill Edge). 5.0 mm to 750 mm (Slit Edge).
Finish	: 2D Cold rolled stainless steel strips annealed & pickled. 2B Cold rolled stainless steel strips annealed & skin passed. 2R work hardened for specific hardness.
Hardness	: Annealed-pickled (soft), 1/4 hard, 1/2 hard, 3/4 hard & full hard (as rolled).
Weight	: 50 kg to 4 M.T.
Coil ID	: 150 mm to 510 mm depending on thickness & width of coil.
Length	: In Coil Form.
Tolerance in Weight	: Max 6.5 kg per mm width of strips depending on required thickness & width of the coil.

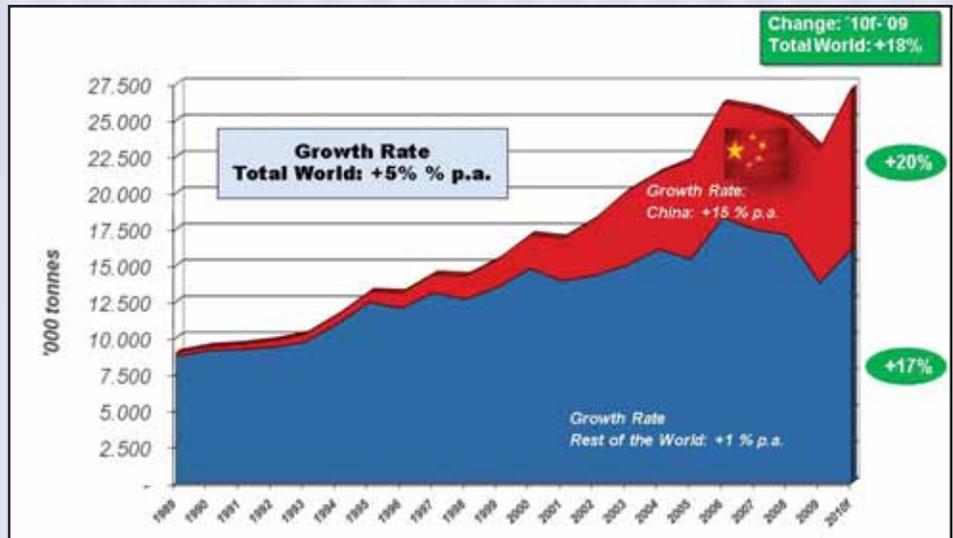
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The real impact of the strong growth rate of stainless steel in China on world figures is given in the graph, courtesy, SMR of Austria.

While a 5% growth rate for world stainless steel is a generally accepted figure for the last two decades, a closer scrutiny shows that the exclusion of robust growth of stainless steel in China from world figures would have brought down the world growth rate figure to a paltry 1%!!! China has single-handedly lifted the figure to a respectable 5%!!! Its own growth rate in the last 20 years has been a robust 15%.

The growth rate figures indicated outside the field of the graph on the right side indicate that between 2009 and 2010, when the economies recovered around the world, the growth rates in the rest of the world rebounded to 17%, China to 20% and the whole world to 18%.

Stainless Steel Demand Impact of the 'Chinese miracle'



Website : www.smr.at

Reprint available from ISSDA

Sustainable Stainless Steel Transit Station Design

by Catherine Houska

Abstract:



Attractive, sustainable transit buildings are an important part of an efficient modern infrastructure. In addition to being attractive, properly specified stainless steels are durable, require minimal maintenance and provide long-term safety, security and traffic control. These factors and its inherent sustainability have made stainless steel an important design material for new transit buildings around the world. This review of stainless steel applications, benefits and specification will provide designers with the confidence to use it into designs capable of providing 50 or more years of service.

The Indian economy is growing at about 8%+ and there is a lot of emphasis on improving infrastructure at a fast pace. A few large airports have come up, many more have been revamped. Work on 12 new airports is to start soon (many more are lined-up); a large number of railway stations being renovated and a half-dozen cities are on the way to getting their own metro transit systems. Many modern bus stations and thousands of bus shelters in stainless steel are also coming up.

Given these circumstances, this excellent publication would be a very useful tool for urban planners, designers, architects and site engineers and builders construct attractive, long-lasting, cost-effective and environmentally friendly designs using stainless steel for transit buildings.

Apart from handrails, column cladding and counter tops, there are many new applications like roofing, curtain walls etc., which will add many decades of life to these structures.

For obtaining a copy of this publication, please write to ISSDA
nissda@gmail.com;
issdastainless@gmail.com

More about Kich....from page 4

recycled and recyclable. Kich Products can help you in contributing towards 4 LEED POINTS for your Green Building Project.

In addition to the above credits M/s Kich Architectural Products Pvt. Ltd. has been chosen as Star Brand 2010 -11 of India. This Citation is awarded to Kich after an extensive pan-India research conducted by Indian Council for Market Research (ICMR). Star Brand is a research oriented summation of India's Most impactful Brands. A pristine initiative, Star-Brand gives recognition to the most impact creating brands across industries and sub-industries chosen by Indian Consumers.

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New stainless steel products range from complete systems of knocked-down, maintenance-free modular kitchen units (including tops, shutters and carcasses) that can be assembled on site, thus saving transport costs. Other products include wall and roof cladding systems for elite and elegant looks, false ceilings and atriums; modular handrails for clean and light appearance; maintenance-free door and window sections for high-rise and public buildings; urban and outdoor furniture including benches, bus shelters and ad panels.

New stainless steel finishes that impart a distinct look to any product or surface include PVD and PVDF finishes in many colours and textures; etched finishes to depict images and illustrations; embossed finishes of different textures and surfaces; new anti-fingerprint process; Sctoch-Brite & Hairline finishes; coil finishing for stainless steel for mirror finish and No 4 oil processing; and electro polishing lines for coils. These matt, satin and mirror finishes in almost unlimited colours, textures and effects provide an eye-catching appeal to your products. These finishes are effectively used in building facades, interior decoration, elevators, white goods (refrigerators, washing machines etc.), furniture, lifestyle accessories, kitchen units, doors, electronic gadgets, among other applications.

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A one-stop solution provider, Contemporary Creations Pvt Ltd can provide all these inputs as it brings ten



Urban and Outdoor Stainless Steel Furniture at the display centre

years of experience in this area. New product lines are constantly created and designed by leading designers in Italy and Europe and accessed by Contemporary Creations Pvt Ltd. This company can also provide with a number of proven and successful products ready with prototypes for starting new business lines. After their success abroad, these products can be equally successful in the fast developing Indian market.



Innovative finishes in Stainless Steel



Modular Stainless Steel Kitchen (including tops, shutters and carcasses).

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Contemporary Creations Pvt Ltd draws upon a path breaking experience of five years' experience of establishing many successful ventures in India. The CEO of this company, Jasbir Bindra, has been associated with one of the India's largest stainless steel companies with forward integrated applications of stainless steel. He has been instrumental in creating, developing and successfully launching new companies for them for new products for building and construction segment,



Jasbir Bindra with a Stainless Steel door section

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M/s Carl F International Pvt. Ltd. is a fully owned subsidiary of Carl F, Denmark which is part of Sanistaal, Denmark, an INRS 6,000 crore Group of Companies. We started business operations in India since February 2000. We have offices all over India which is led by a dynamic team of professionals, including sales and technical personnel in India to offer you best of services. Our Channel Partners & Business Partners are spread throughout Punjab, Rajasthan, Andhra Pradesh, Tamil Nadu, Karnataka, Kerala, Maharashtra, Goa and West Bengal.

Our products are and have been associated with the elite architects, landmark buildings, airports, hospitals, educational institutions, blue chip corporate and residential customers for the past 129 years globally. We are proud to say that our products are being supplied and installed at Delhi International Airport and many more Airports like Pune Airport, Srinagar Airport, Madurai Airport, Coimbatore Airport, Ahmedabad Airport, Nagpur Airport, Trichy Airport, Pune Airport, Mangalore Airport, etc and that we have successfully supplied and installed our products at major Corporates & high end residences like Shah Rukh Khan's residence, Chiranjeevi's residence, hotels like Le-Meridien, Radisson, ITC Group of Hotels and Corporates like TCS & Reliance all over India.

PRODUCT CHARACTERISTIC

The characteristic of our products is that all items are bent to a radius which equals the diameter of the tube. This gives the range a aesthetic appeal. Solid inserts of brass and aluminum as well as concealed fittings are used to ensure optimal strength, durability and to prevent vandalism.

DESIGN CRITERIA

The following founds the basis of the range in stainless steel:

- Clean design
- Few geometric principles
- Minimum maintenance
- Functional, inter-related design
- Uniform design
- Form Strength & Function

We endeavor to offer architects a total solution and the product portfolio includes beautifully detailed building hardware, many varied accessories that are practical for the designer without any compromise on aesthetics.

MATERIAL

Stainless steel, ensuring:

- Durability
- Minimum maintenance
- Hygiene
- Anti-allergenic Ecologically friendly



BRANDS

d line
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PRODUCT RANGE:

- Door Hardware
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- Washroom or Sanitary Panels

Contact Details:

Ms. Renu Kathuria
Managing Director
M/s Carl F International Pvt Ltd
Oberoi Garden Estate
'B'Wing , 3rd Floor 3073/3074
Chandivali Farms Road
Andheri (East)
Mumbai – 400072
Tel: 022-4097 8800
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BRG Group is setting up a state-of-the-art, fully integrated stainless steel manufacturing facility with a capacity of 0.8 million Mtpa spread over 300 acres in Dist. Dhenkanal (Orissa), located near the eastern coast of India.

The group's vision of "Integrating the longest value chain in stainless steel" for the ultimate benefit of end users and society at large, is the driving force for creating the manufacturing facilities that are being set up in phases.

In the 1st phase, BRG Group has already commenced production of Stainless Steel Hot Rolled Annealed & Pickled (HRAP) Plates with a thickness range of 8mm & above, in all the major SS grades like 304/304L, 316/316L, 321, 310/310S, 409M/410, BRG-4 (nominally 1% nickel), BRG-1 (nominally 4% nickel), in accordance with international specifications & standards. The slabs are sourced from its in-house stainless steel raw materials (Ferro-Chrome, Ferro-Silicon and Sponge Iron) manufacturing and melting facility.

The company boasts of a distinct competitive advantage in manufacture of high quality HRAP Plates up to 2050mm width, for the very first time in India. These products have been well received by the end user industries in India and abroad.

In the 2nd phase starting Feb-March 2011, the company will commission its facilities for manufacturing Stainless steel HRAP Sheets/Plates & Coils in a thickness range of 2.40mm & above and Cold Rolled Annealed & Pickled Coils (CRAP) in thickness of 0.2mm & above.

The HRAP & CRAP coils will be produced in widths up to 1600mm, again for the very first time in India. This will help end users in their total cost reduction through yield maximization and weld joint reduction.

Surface Finishes for HRAP will be No.1 and CRAP-2D, 2B, No.4, Scotch Brite, No.8, BA, besides customer specific special finishes.

The 3rd phase will witness an intricate state-of-the-art manufacturing complex



BRG Plate Mill in operation for plate thickness 8mm & above, Widths 1250 – 2050mm



Stainless steel plates at the cooling bed after rolling, annealing, quenching and hot levelling

for value added stainless steel products at Kharagpur (West Bengal) by September, 2011. This will be spread over 100 acres and will cater to the requirements of consumers across a wide variety of industries – Utensils & Kitchenware, Architecture Building & Construction, Pipes and a host of niche products hitherto unavailable in India.

Presently, the company can serve the requirements in Stainless Steel HRAP plates for a thickness range of 8mm & above, Width range of 1250, 1500 to 2000mm and a length up to 10,000mm.

For more information please visit

BRG group's website: www.brggroup.in

Product enquiries can be forwarded to:

Marketing Department
(Stainless Steel), Godrej Waterside,
Suite No. 402/ 403/ 404, Plot No.5,
Block-DF, Sector V, Salt Lake City,
Kolkata-700097, India.

Email : marketing@brggroup.in

Business enquiries :

Domestic : (+91) 91633 66004,

91633 66005, 99030 33007

Exports : (+91) 90070 14905

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