Message from the Chairman of the ISSF Market Development Committee

One of the ultimate objectives for ISSF is to grow the market profitably. Since its creation in 1996, the Market Development Committee (MDC) has identified and driven various market development projects. The MDC also facilitates the exchange of good stainless steel marketing ideas between various markets around the world.

In 2006, the first ISSF Book of New Applications was published. Its purpose was to inspire and help stainless steel marketers to grow the market by learning from each other. Thanks to valuable support from ISSF members and Stainless Steel Development Associations (SSDAs) around the world, the book was produced in a very short time. It was published at the ISSF-10 Annual Conference in Louisville, USA.

Considering the success of this first publication, it has been decided to produce a new edition and to publish it at ISSF-11 in Kyoto, Japan. The overall objective is again to promote the usage of stainless steel in new applications, with the aim to have a balance regarding geography, sectors, grades, surfaces, and products. It has also been decided that ‘new’ means ‘new to the local market’. Therefore, not all of the applications are brand new to all readers.

The task of preparing the second Book of New Applications was given to an ISSF Stainless Steel Fellow from China, Ivy Zhang (Yizhong Zhang) from the Research Institute of Baoshan Iron & Steel Co., Ltd in Shanghai. Ivy has spent six months in Brussels working hard to develop this second ISSF Book of New Applications, which you now hold.

As you will see, there are applications from most sectors of the market. Most geographical parts of the world are also represented, making the book of New Applications truly balanced and global. I would like to thank Ivy and all of the ISSF members who contributed to this Book of New Applications. I sincerely hope that this will help you, and us, to grow the market profitably.

JEAN-YVES GILET
EXECUTIVE VICE PRESIDENT ARCELOR MITTAL
CEO ARCELOR MITTAL STAINLESS
Stainless steel long products (SSLP) are used in many applications around the world. There are a large number of SSLP grades which make it possible to utilise stainless steel wherever a long product is required. At the end of their life, all SSLP can be completely recycled. It is also very easy to manufacture SSLP. Improvements in the processing properties of stainless steel have made SSLP easier to use than ever before. SSLP can be formed through melting, cold drawing, cold hardening, forming, forging and machining. Austenitic, ferritic, martensitic, and duplex grades of SSLP are available. SSLP are used extensively in the building and construction industry. Their resistance to corrosion, fire and seismic activity make them an ideal material for this market. SSLP have a high aesthetic value and are nice to touch, making them ideal for building fittings. The following images show some typical applications for SSLP in the building and construction industry.
The four types of stainless steel

**AUSTENITIC**
Austenitic stainless steels contain a significant amount of chromium, and sufficient nickel or manganese to ‘stabilise’ the ‘austenite’ microstructure that gives these steels good formability and ductility (and makes them non-magnetic). A typical composition is 18% chromium and 8% nickel, as found in the popular ‘304’ grade - to use the American Iron and Steel Institute (AISI) designation. Austenitic grades can be highly durable and corrosion resistant and have high ductility, low yield stress, relatively high tensile strength and good weldability. They have a very wide range of uses.

**FERRITIC**
Ferritic stainless steels have properties similar to those of mild steel but show better corrosion resistance. Most common are 11% and 16% chromium-containing grades – the former used mostly in vehicle exhaust systems and the latter mostly in cooking utensils, washing machines and indoor architecture.

**AUSTENITIC-FERRITIC (DUPLEX)**
These stainless steels, which contain high chromium and some nickel, have a roughly 50% ferritic, 50% austenitic microstructure. They are mostly used in the process industry and in seawater applications.

**MARTENSITIC**
Like ferritic grades, martensitic grades contain 12% -16% chromium. However, they have higher carbon content and are subjected to specific heat treatments during production, making them very hard and strong. They are used in applications such as turbine blades, cutlery and razor blades.
Surface finishing treatments applied to stainless steels can take many forms. The main surface finishes are described below.

<table>
<thead>
<tr>
<th>Description</th>
<th>ASTM</th>
<th>EN 10088-2</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot rolled</td>
<td>1</td>
<td>1E/1D</td>
<td>A comparatively rough, dull surface produced by hot rolling to the specified thickness, followed by annealing and descaling.</td>
</tr>
<tr>
<td>Cold rolled</td>
<td>2D</td>
<td>2D</td>
<td>A dull, cold rolled finish produced by cold rolling to the specified thickness, followed by annealing and descaling. May also be achieved by a final light pass on dull rolls.</td>
</tr>
<tr>
<td>Cold rolled</td>
<td>2B</td>
<td>2B</td>
<td>A bright, cold rolled finish commonly produced in the same way as the 2D finish, except that the annealed and descaled sheet receives a final cold roll pass on polished rolls. This is a general-purpose cold rolled finish and is more readily polished than 1 or 2D.</td>
</tr>
<tr>
<td>Bright Annealed</td>
<td>BA</td>
<td>2R</td>
<td>BA finish produced by performing bright annealing in inert atmosphere after cold-rolling and light cold rolling. Smoother and brighter than 2B.</td>
</tr>
<tr>
<td>Brushed or dull polished</td>
<td>No. 4</td>
<td>1J/2J</td>
<td>A general-purpose bright polished finish obtained by finishing with a 120-150 mesh abrasive, following initial grinding with coarser abrasives.</td>
</tr>
<tr>
<td>Satin polished (matt)</td>
<td>No. 6</td>
<td>1K/2K</td>
<td>A soft satin finish having lower reflectivity than brushed (or dull polished) finish. It is produced by Tampico brushed (or dull polished) finish, using a medium abrasive.</td>
</tr>
<tr>
<td>Bright polished (mirror)</td>
<td>No. 8</td>
<td>1P/2P</td>
<td>The most reflective finish commonly produced. It is obtained by polishing with successively finer abrasives then buffing with a very fine buffing compound. The surface is essentially free of grit lines caused by preliminary grinding operations.</td>
</tr>
<tr>
<td>Electropolished surfaces</td>
<td>-</td>
<td>-</td>
<td>This surface produced by electrolysis in electrolytic solution. This electrochemical process improves the surface finish by removing the peaks of irregular surface.</td>
</tr>
</tbody>
</table>

(NB: the above table is not official and should be used only as a guide)
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- Stainless steel pillar 12
A R T

Mural

This coloured mural depicts the great importance of biotechnology in human life today. The mural is installed in the offices of Biocon India in Hebbagodi. Approximately one tonne of stainless steel was used.

LOCATION/ENVIRONMENT  BANGALORE, INDIA/INDOOR  
PRODUCT  COLD ROLLED STAINLESS STEEL SHEET  
FABRICATION PROCESS  POLISHING AND PAINTING  
GRADE  304  
SURFACE  POLISHED AND PAINTED  
COMPETING MATERIAL  
DATE OF COMPLETION  2005  
MANUFACTURING COMPANY  
ARTIST  YUSUF ARAKKAL  
MATERIAL SUPPLIER  SALEM STEEL PLANT  
SOURCE OF INFORMATION  ISSDA  
REMARKS  THE MURAL MEASURES 5.1 × 9.1 M.
ART

Sculpture

This six-metre tall sculpture depicts the great importance of biotechnology in human life today. The sculpture is located outside the offices of Biocon India in Hebbagodi. Approximately 1.8 tonnes of stainless steel was used.

LOCATION/ENVIRONMENT  BANGALORE, INDIA/OUTDOOR
PRODUCT  HOT ROLLED STAINLESS STEEL PLATE
FABRICATION PROCESS  SCULPTING AND WELDING
GRADE  304
SURFACE  HAMMERED AND WELDED
COMPETING MATERIAL  CARBON STEEL
DATE OF COMPLETION  2005
MANUFACTURING COMPANY
ARTIST  YUSUF ARAKKAL
MATERIAL SUPPLIER  SALEM STEEL PLANT
SOURCE OF INFORMATION  ISSDA
REMARKS
ART

Saint Joseph statue

This statue of Saint Joseph is made of stainless steel scrap and is 10 meters high.

LOCATION/ENVIRONMENT  Ribeirão Pires, Brazil/Outdoor
PRODUCT  Stainless Sheets and Tubes
FABRICATION PROCESS  Cutting, Bending and Welding
GRADE 300 Series
SURFACE Several
COMPETING MATERIAL
DATE OF COMPLETION  2006
MANUFACTURING COMPANY
SCULPTOR  Lúcio Bittencourt
MATERIAL SUPPLIER  Inox Tubos
SOURCE OF INFORMATION  Núcleo Inox
REMARKS  Saint Joseph is the patron saint of Ribeirão Pires, Brazil.
Artwork (Narita Airport)

Stainless steel art is widely used as decoration at Narita International Airport in Japan.

LOCATION/ENVIRONMENT: Japan/Indoor
PRODUCT: Cold Rolled Stainless Steel Sheet
FABRICATION PROCESS: Colour, Etching and Perforation
GRADE: 304 CSP
SURFACE: BA and Spattering (Inside), BA Half Etching and Spattering (Outside)
COMPETING MATERIAL: Nickel
DATE OF COMPLETION: 2006
MANUFACTURING COMPANY: Sanwa Tajima
MATERIAL SUPPLIER: Nisshin Steel/Tsukiboshi Art
SOURCE OF INFORMATION: Nisshin Steel
REMARKS
DESIGNER: Naoya Sakagami
Stainless steel pillar

This is one of the seven stainless steel pillars for the Geeta Mandir Hindu temple in Washington. Grade 316 was used to make these artistic pillars. Each pillar is 2.1 m high and 30 cm in diameter. Approximately 108 kg of stainless steel was used for each pillar.
AUTOMOTIVE

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- Exhaust system 17
AUTOMOTIVE

Conti Support Ring

The Conti Support Ring ensures safety and mobility in the event of a flat tyre. The ring is mounted on a normal wheel rim, together with a conventional tyre. Under normal driving conditions, comfort is not affected.

If there is a loss of tyre pressure (for example, a puncture) the car can still be controlled and can be driven for up to 200 km at a maximum speed of 80 km/hour. The support ring is suitable for use in winter conditions where de-icing salts have been used. Four support rings weigh less than one spare tyre.

The proprietary stainless steel grade used for this application has excellent plasticity and formability.
AUTOMOTIVE

Exhaust system

TISCO has designed an exhaust system made of grade 409L. The exhaust system is being used on the Jetta automobile which is made in China.
BUILDING AND CONSTRUCTION

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Copper-coated stainless steel roofing sheet

In some regions of the world there is a strong tradition of using copper in roofing and roof drainage. With current raw material prices, stainless steel is often a more budget-friendly solution than copper. Copper-coated stainless steel provides the aesthetics of copper with the technical and cost benefits of stainless steel.
Building and Construction

Marion Island research centre

The site is on a remote volcanic island, 1,200 km south-east of Cape Town. It is accessible only by barge or helicopter. The surface area available for construction is covered by muddy mire with a depth of between 1 and 25 m.

Specially-designed mini-piling rigs were used to install over 2.5 km of 102 mm diameter 3Cr12 piles. Grade 3Cr12 stainless steel was selected for the pilings as it could perform adequately in the prevailing conditions.

Grades 304 and 316 stainless steel were used for the balustrades and external fittings. This will ensure the long-term performance of the structure on the remote and rainy island.

Location/Environment: Marion Island, South Africa/Outdoor
Product: Stainless Steel Tube and Plate
Fabrication Process: Fabricated Beams
Grade: 3Cr12, 304 and 316
Surface: 2B and ASTM 1
Competing Material: Galvanised Carbon Steel
Date of Completion: Grade 3Cr12 piling completed in November 2005. Remaining structure still under construction.
Manufacturing Company: Petrel Engineering
Material Supplier: Columbus Stainless, Barloworld Robor Tube, Trident Midrand Steel
Source of Information: SASSDA
Remarks: The current research base on Marion Island has evolved reactively over 54 years, as demand dictated. The long time span has resulted in the use of various building technologies in the construction of the foundations, base structures, walls, roofs and internal finishes.
Pyongyang Ryukyung Jungjuyoung Gymnasium

Pyongyang Gymnasium uses a dome-type roof construction. Fan-shaped sheets of stainless steel, 50 m long, are used from the ridge of the roof to the eaves.
The external walls of the Samsung Museum of Art (Leeum) are finished with stainless steel, giving the museum a modern image. Panels of 5 mm stainless steel and 25 mm stainless steel curtain-walls are used.

**LOCATION/ENVIRONMENT** Seoul, South Korea/Outdoor

**PRODUCT** Stainless steel plate (5 mm and 25 mm)

**FABRICATION PROCESS** Welding

**GRADE** 304

**SURFACE** Oxidised black finish

**COMPETING MATERIAL** Carbon steel

**DATE OF COMPLETION** 2004

**MANUFACTURING COMPANY** Hanlim E&C

**MATERIAL SUPPLIER** POSCO

**SOURCE OF INFORMATION** KOSA

**REMARKS** The panels are connected with butt joints. The curtain wall panels are welded together. The building was designed by Ateliers Jean Nouvel. Construction began in 2003.
Stainless steel panels

Stainless steel was chosen for the exterior of VIVO’s new Rio de Janeiro branch office. Stainless was chosen to reflect the colours and landscape around the building and to give it a high-tech appearance.

The building has three floors with a total area of more than 42,000 square metres. It is located three kilometres from the coast and near busy roads.
**Rainsky E**

The RainSky E shower combines an overhead shower, body shower, rain curtain and fog jets. An integrated light illuminates the water. Different shower settings can be selected through a minimalist control panel. For example, a rain-like release of water can be combined with programmed temperature variations, mist and perfume. The shower is designed to be a key feature in the interior design.

**LOCATION/ENVIROMENT** GERMANY/INDOOR  
**PRODUCT** COLD ROLLED STAINLESS STEEL SHEET  
**FABRICATION PROCESS**  
**GRADE** 304  
**SURFACE** MANUALLY POLISHED OR BRUSHED  
**COMPETING MATERIAL** NO SIMILAR PRODUCTS IN OTHER MATERIALS  
**DATE OF COMPLETION** 2006  
**MANUFACTURING COMPANY** DORNBRACHT  
**MATERIAL SUPPLIER**  
**SOURCE OF INFORMATION** EURO INOX, STAHL-INFORMATIONEN-ZENTRUM  
**REMARKS** THE RAINSKY E WON FIRST PRIZE IN THE STEEL DESIGN CATEGORY OF THE 2006 GERMAN STEEL INNOVATIONS AWARD. THE SHOWER WAS DESIGNED BY SIEGER DESIGN OF SASSENBERG, GERMANY.
Mediamesh® is a woven metal screen with integrated light emitting diodes (LEDs) that turns external stainless steel finishes into a media system. Depending on the density of the mesh, various image resolutions can be achieved, even up to video quality. Each pixel consists of three LEDs (one red, one green and one blue).

The system is best viewed at a distance of 100 to 300 m. However, large facades can be used as a video screen and viewed at distances of up to 5 km.
In buildings such as hospitals or food processing plants, high quality decorative or functional wall surfaces need to be protected from accidental damage. Stainless steel was selected for a new series of protective rails because of its mechanical strength and ease of cleaning in environments where hygiene is important.
Public waste bins must be decorative, cost-effective, corrosion resistant, mechanically resistant, fire resistant and easy to clean. There is a new type of waste bin made from stainless steel stretch-metal. The stretching process makes the austenitic stainless steel work-harden and ensures outstanding mechanical resistance despite its low weight.
Organically coated solar panels

These self-supporting stainless steel solar panels are a sandwich of two stainless steel sheets. The centre of the sandwich contains thermal insulation and the primary path for the circulation of water. The system makes a conventional supporting roof redundant. This makes the generation of solar thermal energy particularly cost-effective.

In contrast to other products, the selective layer is provided by a high absorption organic coating. The coating maximises use of diffuse light and works well even if the orientation of the roof is not optimal.
BUILDING AND CONSTRUCTION

Underpass handrails

The mall on Kievskaya Square in Moscow uses stainless steel for most of its external fittings including handrails. The mall is the largest in Europe. Stainless steel is the most practical material because of its aesthetics and corrosion resistance.
Metro barriers

A renovation programme at Moscow’s famous metro stations is replacing aluminium fixtures with longer-lasting stainless steel. Stainless steel is the ideal material for public spaces because of its strength and its ability to look good under continuous use in public spaces.

LOCATION/ENVIRONMENT MOSCOW, RUSSIA/OUTDOOR
PRODUCT STAINLESS STEEL SHEET
FABRICATION PROCESS BENDING
GRADE AISI 304
SURFACE POLISHING
COMPETING MATERIAL CARBON STEEL AND ALUMINIUM
DATE OF COMPLETION FEBRUARY 2007
MANUFACTURING COMPANY THYSSENGRUUP
MATERIAL SUPPLIER THYSSENGRUUP
SOURCE OF INFORMATION USSA
REMARKS
Building and Construction

Escalator

Stainless steel is indispensable for busy public places. It reflects the light and makes the location look clean and inviting. A new generation of stainless steel escalators is being installed in malls and supermarkets around Russia.
New Milan Fair Complex

The New Milan Fair Complex (Nuovo Sistema Fiera Milano) is an exhibition centre built on a 200-hectare site. Stainless steel was used in a multitude of different locations throughout the complex, including the platforms of the underground station that connects the complex with Milan.

The most impressive aspect of the project is the spectacular mirror effect of the stainless steel. It reflects the most striking architectural parts of the building.

LOCATION/ENVIRONMENT MILAN, ITALY/OUTDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEETS AND STRIP
FABRICATION PROCESS PREASSEMBLED
GRADE EN 1.4401 (AISI 316)
SURFACE BA FINISH, SATIN FINISHED WITH 220 GRAINS
COMPETING MATERIAL PAINTED STEEL
DATE OF COMPLETION SEPTEMBER 2005
MANUFACTURING COMPANY STAINLESS STEEL CLAD PANELS: PERMASTEELISA
MATERIAL SUPPLIER TERNINOX
SOURCE OF INFORMATION EURO INOX, CENTRO INOX
REMARKS THE NEW MILAN FAIR WAS DESIGNED BY WELL-KNOWN ARCHITECT MASSIMILIANO FUKSAS. THE CONSTRUCTION PROJECT WAS UNDERTAKEN BY STUDIO ALTIERI. STRUCTURAL ENGINEERING WAS PROVIDED BY STUDIO MARZULLO.
BUILDING AND CONSTRUCTION

LitterShark Protectus

The LitterShark Protectus is an explosion-resistant waste bin. The bin is welded from 5 mm stainless steel and reinforced with stainless steel ropes. If a bomb is set off in the bin, the detonation force is directed upwards instead of sideways. This makes it much less likely that there will be serious injury to bystanders or damage to nearby property. The bin is ideal for use in cities where security is a concern.
Stratobel® EVA Creation Inoxia is a laminated pane consisting of 0.5 mm perforated stainless steel sealed between two layers of tempered glass. This material combination is possible because the ferritic stainless steel and the glass have identical thermal expansion coefficients. This ‘sandwich’ has an exceptional rigidity and requires little maintenance. It can be used for external and internal solar shading, parapet fillings and street furniture. The maximum panel size is 1,250 x 6,000 mm.

LOCATION/ENVIRONMENT FRANCE/OUTDOOR OR INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS PERFORATION, LAMINATION WITH GLASS
GRADE 430
SURFACE 2R MECHANICALLY MIRROR POLISHED
COMPETING MATERIAL SCREEN-PRINTED GLASS, TEXTILE FABRICS
DATE OF COMPLETION 2006
MANUFACTURING COMPANY GLAVERBEL
MATERIAL SUPPLIER UGINE & ALZ
SOURCE OF INFORMATION EURO INOX, GLAVERBEL
REMARKS THE IMAGES SHOW THE PANEL IN USE ON THE ECOLE NORMALE SUPERIEURE, IN PARIS, FRANCE.
THE BUILDING IS OWNED BY THE REGION ILE DE FRANCE. THE ARCHITECT WAS PHILIPPE GAZEAU.
THE PHOTOS WERE SUPPLIED BY THE ARCHITECT.
Terne-coated roofing sheet for facades

The Frenchgate Interchange project demonstrates innovative use of stainless steel roofing material in facades. The panels are just 0.5 mm thick. To avoid glare and to mimic the appearance of lead, terne-coated Uginox AME was used. The surface weathers over time, developing a decorative patina. This patina does not affect the intrinsic corrosion-resistance of the stainless steel.
Building and Construction

Entrance gate to the Japanese National Museum of Art

The gateway to the National Museum of Art is designed to express the vitality of bamboo and the progress and growth of modern art. The structural material is stainless steel, which is equivalent or superior to carbon steel in load-bearing. Stainless steel is also highly durable and can be welded on-site. A photo-catalytic coating has been applied to highlight the clean appearance of stainless steel. The gate serves not only as the symbol of the museum but also as the entrance gate to the local community.

LOCATION/ENVIRONMENT Osaka, Japan/Outdoor
PRODUCT Stainless Steel Pipe
FABRICATION PROCESS Bending, Welding
GRADE 304
SURFACE 2B
COMPETING MATERIAL
DATE OF COMPLETION 2004
MANUFACTURING COMPANY JST
MATERIAL SUPPLIER Nisshin Steel
SOURCE OF INFORMATION JSSA
REMARKS
DESIGNER Cesar Pelli and Associates, Japan
Building and Construction

Kitchen tiles

Cladding materials must be durable and easy to clean and maintain. Mozaik tiles, with their metallic finish, fit perfectly with contemporary architecture. The tiles can be used on walls, floors, leisure areas, and in mosaics.

Location/Environment: Brazil/Indoor
Product: Cold Rolled Stainless Steel Sheet
Fabrication Process: Drawing
Grade: AISI 304
Surface: N7 (Buffing Bright), N5 (Similar to ASTM No. 4 Followed by a Skinpass with Bright Rolls), 2B, Micro-texture and Electro-Coloured
Competing Material: Cladding Materials such as Ceramic Tiles, Glass, Aluminium, and Natural Stone
Date of Completion: January 2006
Manufacturing Company: Mozaik
Material Supplier: Acesita
Source of Information: Núcleo Inox
Remarks: The tiles can be laid with standard tile mortar.
## COOKWARE

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- Stainless steel boiler 43
- Cutlery 44
- Ferritic stainless steel pots and pans 45
The stainless steel lunch box is used to store food and then re-heat it in a steamer. Traditionally lunch boxes are made of aluminium. However, aluminium is more fragile than stainless steel and more difficult to clean. Using stainless steel avoids these problems.
COOKWARE
Stainless steel boiler

Many manufacturers are urgently looking for a grade of steel to replace the nickel-containing 304 grade. Grade 436L is a good solution. It contains some titanium and molybdenum, has excellent corrosion-resistance, highly effective thermal-conductivity and magnetic conductivity. Grade 436L contains some nickel.

LOCATION/ENVIRONMENT  CHINA/INDOOR
PRODUCT  COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS  PRESSING, STRETCHING AND POLISHING
GRADE  436L (17CR-MO)
SURFACE  2B
COMPETING MATERIAL  304
DATE OF COMPLETION  JANUARY 2006
MANUFACTURING COMPANY
MATERIAL SUPPLIER  TAIYUAN IRON AND STEEL (GROUP) CO. (TISCO)
SOURCE OF INFORMATION  TISCO
REMARKS  THIS PRODUCT IS STILL IN THE TESTING PHASE OF DEVELOPMENT
COOKWARE

Cutlery

Stainless steel grade 2Cr13 is made by TISCO and used in the cookware sector. The grade is used extensively for cutlery which is used locally in China and exported overseas.
Ferritic stainless steel pots and pans

The ferritic grade of stainless steel used in these pots has a low cost. It is a basic but highly efficient material.
## ELECTRICAL MACHINERY OR EQUIPMENT

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- Microwave oven exterior 49
- Washing machine drum 50
- Mobile telephone 51
- Tube-type optical fibre unit 52
Electrical room and control cabin

Electrical rooms and control cabins have traditionally been made of carbon steel. This type of structure is often used in dusty, humid and harsh environments. In these conditions, carbon steel often suffers from severe external corrosion. Because of its well-known corrosion resistance, stainless steel offers a solution for this type of structure. The cabins are used to control two pieces of equipment that transport iron ore at CVRD’s facility at Tubarão Harbour.

LOCATION/ENVIRONMENT VITÓRIA BRAZIL/OUTDOOR
PRODUCT STAINLESS STEEL TUBE
FABRICATION PROCESS CONFORMATION AND BOLTED ASSEMBLING
GRADE AISI 304 (1 TO 3 MM WALL THICKNESS)
SURFACE BRUSHED
COMPETING MATERIAL GALVANISED STRUCTURAL CARBON STEEL
DATE OF COMPLETION NOVEMBER 2006
MANUFACTURING COMPANY THYSSENKRUPP AND COMISA
MATERIAL SUPPLIER ACESITA
SOURCE OF INFORMATION NÚCLEO INOX
REMARKS STRUCTURAL COLUMNS AND BEAMS MADE OF 80 MM SQUARE TUBES (AISI 304, WALL THICKNESS OF 3 MM). TOTAL CONSUMPTION OF STAINLESS STEEL WAS 17 TONNES.
Microwave oven exterior

The outer panel of this microwave uses grade 430D stainless steel. The grade is ideal for use in the pressing phase of production.

LOCATION/ENVIRONMENT CHINA/INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS PRESSING, WELDING AND FASTENING
GRADE 430D
SURFACE 2B\2BB
COMPETING MATERIAL 430
DATE OF COMPLETION JANUARY 2006
MANUFACTURING COMPANY GLANZ GROUP COMPANY
MATERIAL SUPPLIER TAIYUAN IRON AND STEEL (GROUP) CO. (TISCO)
SOURCE OF INFORMATION TISCO
REMARKS
ELECTRICAL MACHINERY OR EQUIPMENT

Washing machine drum

This washing machine drum is made from grade 430D stainless steel. The grade has the durability required from this application and is ideal for use in the pressing process used to create the drum.
Mobile telephone

Stainless steel adds a sophisticated appearance and beautiful surfaces to an everyday object such as a mobile telephone. The stainless steel also has superior mechanical resistance and never peels because no coating is applied.

LOCATION ENVIRONMENT SOUTH KOREA/OUTDOOR AND INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS BENDING
GRADE ST304
SURFACE ASTM NO. 4
COMPETING MATERIAL PLASTIC
DATE OF COMPLETION OCTOBER 2006
MANUFACTURING COMPANY LG ELECTRONICS
MATERIAL SUPPLIER
SOURCE OF INFORMATION KOSA
REMARKS
In conventional optic overhead ground wire units, aluminium tubes were used to house optical fibres. Switching the tube material to stainless steel has enhanced the reliability of the unit. Because stainless steel tubes have higher crush resistance than their aluminium counterparts, the wall thickness can be lower. This allows the density of optical fibres to be increased. The diameter of the stainless steel unit remains the same as its aluminium counterpart.
FOOD AND BEVERAGE

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- Mobile vending/cooking demonstration unit 61
FOOD AND BEVERAGE

Food service trolley

This food service trolley has been designed for use in hospitals. Manufactured from No. 4 brushed stainless steel, the trolley has a double-panelled construction. Polyurethane insulation is sandwiched between the panels to ensure the food stays warm while it is delivered.

The trolley has two sections. One section is heated and the other remains a neutral temperature. The heated section is fitted with nine pairs of runners. Each runner is fitted with a removable stainless steel plate holder. Each plate holder has four cut-outs to accommodate dinner plates.

The runners are pressed stainless steel, ensuring a surface that is easily cleaned. This is an important consideration in hospital applications.

LOCATION/ENVIRONMENT  SOUTH AFRICA/INDOOR
PRODUCT  HOT ROLLED STAINLESS STEEL SHEET (1.2 MM)
FABRICATION PROCESS  SHEET METAL, CUTTING, BENDING, WELDING
GRADE  430
SURFACE  2B AND ASTM NO.4 BRUSHED
COMPETING MATERIAL  GALVANISED CARBON STEEL
DATE OF COMPLETION  ONGOING
MANUFACTURING COMPANY  STAINLESS STEEL DESIGNS CC
MATERIAL SUPPLIER  COLUMBUS STAINLESS
SOURCE OF INFORMATION  SASSDA
REMARKS
FOOD AND BEVERAGE

Kiosk

This elegant, minimalist and modern kiosk was designed to attract customers while being easy to clean. Due to the high mechanical strength of stainless steel, the thin walls also have load-bearing functions. The kiosk is suitable for both indoor and outdoor use.

LOCATION/ENVIRONMENT SPAIN/OUTDOOR OR INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS BREAK PRESSING, WELDING
GRADE 316L OR 304
SURFACE SHOT BLASTED FINISH
COMPETING MATERIAL GALVANISED CARBON STEEL, ALUMINIUM, GLASS, WOOD
DATE OF COMPLETION 2005
MANUFACTURING COMPANY SANTA & COLE (WWW.SANTACOLE.COM)
MATERIAL SUPPLIER GRUPOINOX
SOURCE OF INFORMATION EURO INOX, CEDINOX
REMARKS
FOOD AND BEVERAGE

Train restaurant

A new range of stainless steel restaurant equipment has been designed for high-speed and express trains in Spain. Stainless steel was selected for its ease of cleaning, mechanical resistance and attractiveness.
Cooking stand

Traditional cooking stands are made of wood or carbon steel. As wood burns and carbon steel rusts outdoors, more and more proprietors are choosing stainless steel cooking stands. Stainless steel is also easier to clean compared to wood and carbon steel. Proprietors can choose stands made from different grades of stainless, depending on their needs and budget.

LOCATION/ENVIRONMENT TAIWAN, CHINA /OUTDOOR AND INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS FORMING, WELDING
GRADE SUS 304 AND SUS 430
SURFACE 2B
COMPETING MATERIAL CARBON STEEL AND WOOD
DATE OF COMPLETION 2006
MANUFACTURING COMPANY TUNG LI MACHENICAL
MATERIAL SUPPLIER HSIN KUANG STEEL/YUSCO
SOURCE OF INFORMATION YUSCO
REMARKS THE BLUE PLASTIC MEMBRANE IS APPLIED TO AVOID SCRATCHES.
FOOD AND BEVERAGE

New kitchen concept

An ambitious project to build a pre-fabricated two-zone kitchen was been completed in Maré, New Caledonia, an island in the Pacific Ocean. The kitchen is used to prepare 1,000 meals a day for the children of Maré.

The construction was tested twice in France in 2003. The Maré kitchen was then pre-fabricated in France and shipped 22,000 km in eight, 12 m containers. Altogether it took three months to build the world's most advanced kitchen. The kitchen combines excellent ergonomics for kitchen staff with the hygienic properties of stainless steel.
FOOD AND BEVERAGE

Mobile vending/cooking demonstration unit

This mobile cooking unit can be used as a catering station or for cooking demonstrations. The unit is on rollers which make it easy to move about. The unit is a good example of the high quality, innovative and cost-effective properties of stainless steel.
HOME AND OFFICE APPLIANCES

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HOME AND OFFICE APPLIANCES

Umbrella packing box

This stainless steel umbrella box holds plastic sleeves for wet umbrellas. The cover holds the excess water from the umbrella so that it does not drip on the floor or carpet. This is especially important on smooth floors where pedestrians may easily slip on wet floors. Stainless steel was chosen for its excellent visual effect and cleanliness, even on the rainiest days.
Mono Concave oil lamp

Inspired by butter oil lamps used in Tibetan monasteries, Mono Concave is a modern interpretation of the open oil lamp. The flame appears to hover over the matt polished surface.
HOME AND OFFICE APPLIANCES

Classified trash container

The stainless steel trash container is designed so that it is easy to separate different types of trash. Stainless steel was chosen because it is sturdier and easier to clean than plastic or aluminium.

LOCATION/ENVIRONMENT TAIWAN, CHINA/OUTDOOR OR INTERIOR

PRODUCT COLD ROLLED STAINLESS STEEL SHEET

FABRICATION PROCESS FORMING AND WELDING

GRADE SUS 304

SURFACE HAIR LINE (OUTDOOR APPLICATIONS) AND 2B (INDOOR APPLICATIONS)

COMPETING MATERIAL ALUMINIUM, PLASTIC, CARBON STEEL, WOOD

DATE OF COMPLETION JANUARY 2004

MANUFACTURING COMPANY BEI-KIN CO., LTD.

MATERIAL SUPPLIER YUSCO

SOURCE OF INFORMATION YUSCO

REMARKS MATERIAL SELECTION CAN BE MODIFIED DEPENDING ON THE CUSTOMER'S PREFERENCE OR PURPOSE.
HOME AND OFFICE APPLIANCES

Medical clinic furniture

Medical clinic furniture, while being easy to clean and disinfect, must also be visually pleasant to staff and patients. By using stainless steel, the designers succeeded in bringing together durability, hygienic properties and interior design.

LOCATION/ENVIRONMENT  SPAIN/INDOOR

PRODUCT  COLD ROLLED STAINLESS STEEL SHEET

FABRICATION PROCESS  CUTTING, BENDING AND WELDING

GRADE  304

SURFACE  BA

COMPETING MATERIAL  PAINTED CARBON STEEL

DATE OF COMPLETION  2006

MANUFACTURING COMPANY  EURO MOBILIARIO CLINICO (WWW.CLINEQUIP.COM)

MATERIAL SUPPLIER  GRUPINOX

SOURCE OF INFORMATION  EURO INOX, CEDINOX

REMARKS
HOME AND OFFICE APPLIANCES

Kitchen hoods

This new line of kitchen hoods are made from grade 430 stainless steel. This grade enables the company to considerably reduce production costs.

LOCATION/ENVIRONMENT BRAZIL/INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET, THICKNESS OF 0.6 MM
FABRICATION PROCESS CUTTING, BENDING AND WELDING
GRADE AISI 430
SURFACE SATIN FINISHING
COMPETING MATERIAL OTHER GRADES OF STAINLESS STEEL AND PAINTED CARBON STEEL
DATE OF COMPLETION JUNE 2005
MANUFACTURING COMPANY FALMEC
MATERIAL SUPPLIER ACESITA
SOURCE OF INFORMATION NÚCLEO INOX
REMARKS THE REDUCTION IN PRODUCTION COST HAS MADE IT POSSIBLE FOR FALMEC TO INCREASE DEMAND FOR THIS LINE OF KITCHEN HOODS.
HOME AND OFFICE APPLIANCES

Refrigerator

Until recently, the use of stainless steel sheets for the outer panels of refrigerators was mostly limited to commercial equipment. The main reason was that the polished finish of stainless steel sheets looked cold to consumers. This did not fit well in domestic kitchens. It was difficult to accommodate different preferences as the finishes could only be supplied in monochrome.

New coated stainless steel refrigerator panels have been developed to provide different finishes. Clear, transparent coatings can be applied to moderate the sharp, cold appearance of stainless steel. Elegant touches of the polished surface can also be retained. Colour coatings or printed patterns can be applied to the stainless steel surface, giving consumers a wide variety of finishes to choose from. Antimicrobial agents can also be added to the paint, thereby enhancing the consumer’s impression that the refrigerator is hygienic and appropriate for the domestic environment.

LOCATION/ENVIRONMENT JAPAN/INDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS CUTTING AND BENDING
GRADE SUS 430
SURFACE ASTM NO. 4 AND COLOUR CLEAR COAT
COMPETING MATERIAL COLOUR CARBON STEEL SHEET
DATE OF COMPLETION 2001
MANUFACTURING COMPANY SANYO ELECTRIC
MATERIAL SUPPLIER NISSHIN STEEL
SOURCE OF INFORMATION JSSA
REMARKS
Extendible shelving/bookcase

Stainless steel offers practical and elegant functionality in this extendable shelving system. The shelves are also easy to assemble.
INDUSTRIAL MACHINERY

- Quick-connect coupler 74
- NATO submarine rescue system 75
- Evaporators for multi-effect distillation 76
- Storage tank for medicine 77
- Ferritic stainless steel water tank 78
- LMD-filter hood 79
- Motor shaft 80
Quick-connect coupler

Conventional couplers are typically machined and welded to the tube. This new quick-connect coupler is produced directly from the tube ends. By exploiting the formability of austenitic stainless steel, this technology achieves material savings of up to 30%. Fabrication time is decreased by one third, while energy input is reduced by up to 80%.

A circular bead on an inner tube accommodates the O-ring. Corresponding beads on the outer and the tube take-up a special stainless-steel spiral, which acts as a fastener. The coupler produces a joint. The joint has proved its water-tightness at pressure up to 100 bar. This well exceeds the nominal pressure of 40 bar.

The maximum deflection of the tube axes is 0.5 degrees. The useful inner diameter of the tube is constricted within the coupler.

The coupler is designed for use both underground and in water.
A new submarine rescue system has been developed for use by NATO. The system is built from 5 mm grade SAF2205 stainless steel which was selected because of its strength. Weight was an important consideration in material selection as the system is normally flown to the rescue site. Due to the high strength of SAF2205, thinner gauges could be used, making the end product lighter. The 100 m³ hyperbaric complex consists of five connected chambers. Each chamber can be isolated from the others independently. Up to 72 people can be accommodated in the system. The system has been developed to the relevant industry standards. Hydro tests were run on the system and all were completed successfully.

LOCATION/ENVIRONMENT SOUTH AFRICA/OUTDOOR
PRODUCT HOT ROLLED STAINLESS STEEL PLATE, 5 MM
FABRICATION PROCESS WELDING
GRADE SAF 2205 DUPLEX STAINLESS STEEL
SURFACE ASTM 1
COMPETING MATERIAL
DATE OF COMPLETION APRIL 2006
MANUFACTURING COMPANY H G MOLenaar
MATERIAL SUPPLIER IMPORTED FROM SWEDEN
SOURCE OF INFORMATION SASSDA
REMARKS
Evaporators for multi-effect distillation

The dual-duplex concept combines the excellent properties of different duplex stainless steel grades into an optimal construction. In this example, the more corrosion resistant grade 2205 is exposed to the hostile conditions. Grade 2304 is used where the environment is less corrosive.

The benefits of using duplex include improved corrosion resistance and higher strength, compared to conventional austenitic stainless steels. Duplex chambers can be built with thinner plates, resulting in less material, less bevelling and welding, easier handling and lower environmental impact. By using the dual-duplex concept, considerable cost savings are possible.
Stainless steel is extensively used to meet the cleanliness requirements of the pharmaceutical industry. Stainless steel protects the drugs from the effects of corrosion that may be found in other materials.

LOCATION/ENVIRONMENT USA/INDOOR
PRODUCT HOT ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS WELDING
GRADE SUS 304L [18Cr-10Ni-LC]
SURFACE ASTM 1
COMPETING MATERIAL CARBON STEEL
DATE OF COMPLETION MAY 2006
MANUFACTURING COMPANY NINGBO LEHUI FOOD MACHINERY CO., LTD
MATERIAL SUPPLIER BAOSHAN IRON AND STEEL
SOURCE OF INFORMATION BAOSHAN IRON AND STEEL
REMARKS THE IMAGE ABOVE IS OF ONE OF THE MEDICAL TANKS USED BY GENENCOR INTERNATIONAL (USA).
Ferritic stainless steel has been used to build this water tank in China. Stainless steel was chosen as the tank needed to be located near the sea. It provides an aesthetic finish and long-term durability.

**LOCATION/ENVIRONMENT** CHINA/OUTDOOR  
**PRODUCT** COLD ROLLED STAINLESS STEEL SHEET  
**FABRICATION PROCESS** PUNCHING AND WELDING  
**GRADE** 444 (18CR-2MO)  
**SURFACE** 2B  
**COMPETING MATERIAL** CARBON STEEL OR CONCRETE  
**DATE OF COMPLETION** DECEMBER 2006  
**MANUFACTURING COMPANY** SHANGHAI TONGHUA STAINLESS STEEL PRESSURE VESSEL FACTORY  
**MATERIAL SUPPLIER** BAOSHAN IRON AND STEEL  
**SOURCE OF INFORMATION** BAOSHAN IRON AND STEEL  
**REMARKS** THIS IS ONE OF THE LARGEST COMBINATION WATER TANKS IN CHINA.
The goal of this project was to develop a lighter, leak-proof and maintenance-friendly hood for an LMD filter. The result is a modular, sandwich-structured hood. Laser welding and traditional sheet metal work is used to manufacture the hood.

LOCATION/ENVIRONMENT  FINLAND/INDOOR
PRODUCT  COLD ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS  LASER WELDING, TRADITIONAL SHEET METAL WORK
GRADE  EN1.4301
SURFACE  2B 2J
COMPETING MATERIAL
DATE OF COMPLETION  2003
MANUFACTURING COMPANY  HIGH METAL PRODUCTION
MATERIAL SUPPLIER  OUTOKUMPU STAINLESS AND RUUKKI
SOURCE OF INFORMATION  EURO INOX, OUTOKUMPU TORNIO WORKS
REMARKS  THIS PRODUCT WON THE PLOOTU FENNICA AWARD IN 2006. THE PHOTOGRAPH WAS TAKEN BY ANDRITZ.
Motor shaft

Stainless steel is extensively used for these motor shafts. The motor shafts are designed to work at high temperatures. Stainless steel was selected instead of carbon steel because of its anti-corrosion properties and durability.
TRANSPORT

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TRANSPORT

Railway station seats

About 30 sets of stainless steel seats have been installed in the Bangalore City railway station. Each set contains four seats. The seats have a honeycomb finish. Perforations in the seats facilitate air circulation. Each set of seats uses about 35 kg of stainless steel.
TRANSPORT

Timber truck and trailer

These timber truck structures are made from temper-rolled stainless steel. They are easy to maintain, strong and provide optimal performance. The banks are made of stainless steel material in strength class +C850 (Rm > 850 MPa). The polished, corrugated safety wall is in the strength class +C1000 (Rm > 1000 MPa).

LOCATION/ENVIRONMENT FINLAND/OUTDOOR
PRODUCT COLD ROLLED STAINLESS STEEL SHEET (HIGH STRENGTH)
FABRICATION PROCESS LASER CUTTING AND ARC WELDING
GRADE EN 1.4318 2H +C850 AND +C1000
SURFACE COLD ROLLED 2H
COMPETING MATERIAL ULTRA HIGH STRENGTH STEEL, ALUMINIUM ALLOYS
DATE OF COMPLETION 2006
MANUFACTURING COMPANY ALUKARIKKA
MATERIAL SUPPLIER OUTOKUMPU TORNIO WORKS
SOURCE OF INFORMATION EURO INOX
REMARKS
TRANSPORT

Transwerk 10m5 (Gomod) train

The exterior bodywork of this train is made from corrosion-resistant 3Cr12. This grade can easily be painted in the client’s choice of colour. Approximately six tonnes of 3Cr12 is used to build the body shell of each vehicle. The grade was selected because it is a corrosion-resistant material that is easily painted. The product fully justifies its 30-year guarantee.

LOCATION/ENVIRONMENT  SOUTH AFRICA/OUTDOOR
PRODUCT  STAINLESS STEEL TUBE AND SHEET
FABRICATION PROCESS  WELDING
GRADE  3CR12
SURFACE  2B
COMPETING MATERIAL  CARBON STEEL
DATE OF COMPLETION  OCTOBER 2005
MANUFACTURING COMPANY  TRANSWERK
MATERIAL SUPPLIER  COLUMBUS STAINLESS
SOURCE OF INFORMATION  SASSDA
REMARKS  STAINLESS STEEL PANELS WERE USED IN THE PAST. ALTHOUGH THE STAINLESS STEEL WAS CORROSION RESISTANT, IT SHOWED DENTS EASILY AND WAS DIFFICULT TO KEEP SHINY AND BLEMISH-FREE.
Many carbon steel rail-wagons in China are deteriorating and corroding after more than 20 years of service. Stainless steel is now being used to build rail wagons with a capacity of more than 80 tonnes of freight. The new wagons are designed to have a service life much longer than 20 years.
TRANSPORT

Subway cars

New subway cars were required for Beijing’s No 5 subway line. Stainless steel was chosen for the new cars because carbon steel was too heavy. Aluminium was also considered. However, its fire resistance properties were inadequate for this application. Stainless steel provided an ideal solution because of its light weight and fire resistance. Stainless steel is also easy to keep clean and looks modern and inviting.

LOCATION/ENVIRONMENT BEIJING, CHINA/OUTDOOR
PRODUCT HOT ROLLED STAINLESS STEEL SHEET
FABRICATION PROCESS WELDING
GRADE SUS 301L (17Cr-7Ni-LC)
SURFACE 2B
COMPETING MATERIAL CARBON STEEL OR ALUMINIUM ALLOY
DATE OF COMPLETION AUGUST 2006
MANUFACTURING COMPANY CHANGCHUN RAILWAY VEHICLE
MATERIAL SUPPLIER BAOSHAN IRON AND STEEL
SOURCE OF INFORMATION BAOSHAN IRON AND STEEL
REMARKS
Refrigerated containers are used for goods that need to be transported at a constant temperature, either above or below freezing point. Stainless refrigerated containers have the advantages of high hardness, ease of cleaning and excellent corrosion resistance. During the life of the container, frequent maintenance is unnecessary.
**TRANSPORT**

**Stainless steel boxcar**

To meet the requirements of China’s railroad industry, TISCO has developed a new kind of ferritic stainless steel named TCS. The material is being used to build rail boxcars to transport freight. TCS is an environmentally-friendly and economical material. The material meets the customer’s requirements for high strength, low cost, light deadweight, corrosion resistance and long life.

<table>
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<tr>
<td>FABRICATION PROCESS</td>
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<td>GRADE</td>
<td>TCS (12Cr-Ni)</td>
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<td>DATE OF COMPLETION</td>
<td>DECEMBER 2005</td>
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<td>QIDIAN HAER VEHICLE FACTORY</td>
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<td>MATERIAL SUPPLIER</td>
<td>TAIYUAN IRON AND STEEL (GROUP) CO. (TISCO)</td>
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<td>SOURCE OF INFORMATION</td>
<td>TISCO</td>
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<td>REMARKS</td>
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</tbody>
</table>
Fishing boat

The choice of stainless steel for the plating and the structural strengthening elements was driven by the need for greater resistance and durability. Stainless steel also offered easier maintenance and, above all, a lighter product. Inside the boat the galley area and wash-basin are made of stainless steel. This boat is safe, comfortable and practical.

LOCATION/ENVIRONMENT ITALY/OUTDOOR

PRODUCT COLD ROLLED STAINLESS STEEL SHEET, TUBES, FULL RODS AND SCREWS IN AUSTENITIC MOLYBDENUM EN 1.4401 (AISI 316) STAINLESS STEEL

FABRICATION PROCESS CUTTING, WELDING

GRADE AISI 304 (EN 1.4301)

SURFACE THE SURFACES WERE SAND-BLASTED TO ASSIST THE APPLICATION OF THE EPOXY PAINTS

COMPETING MATERIAL CARBON STEEL, WOOD

DATE OF COMPLETION JANUARY 2006

MANUFACTURING COMPANY CARPENTINOX (WWW.CARPENTINOX.IT)

MATERIAL SUPPLIER

SOURCE OF INFORMATION EURO INOX, CENTRO INOX

REMARKS
The Husqvarna STR 650 CRC prototype motorcycle was unveiled at the 2006 Milan International Motorcycle Exhibition (EICMA 2006). The motorcycle frame is made of stainless steel and aluminium.
Train carriage fittings

Mumbai’s MRVC suburban trains will be tastefully furnished with stainless steel interiors. The Integral Coach Factory (ICF), a production unit of Indian Railways, has rolled out a prototype of the carriage. Approximately two tonnes of stainless steel is used in each carriage. Stainless steel has been used for the pipes and double ferrule-type fittings for the brakes. It has also been used for roof panelling, seat frames, handholds, luggage racks, fans, partitions, doorway grab poles, protective wire window screens and rainwater gutters.

LOCATION/ENVIRONMENT   MUMBAI, INDIA/OUTDOOR AND INDOOR
PRODUCT   WELDED TUBES, COLD ROLLED STAINLESS STEEL SHEETS, WIRE
FABRICATION PROCESS   PIPES WITH DOUBLE FERRULE FITTINGS
GRADE   SS 304
SURFACE   BUFFED
COMPETING MATERIAL   CARBON STEEL
DATE OF COMPLETION   2006
MANUFACTURING COMPANY   INTEGRAL COACH FACTORY (ICF)
MATERIAL SUPPLIER   RATNAMANI METALS AND TUBES
SOURCE OF INFORMATION   ISSDA
REMARKS   PHOTOGRAPH COURTESY OF ICF
Stainless steel has been used for part of the hydraulic braking system in long-distance passenger carriages. Grade 304 was used. Indian Railways plans to fit all suburban and main-line carriages with this stainless steel braking system.

**TRANSPORT**

**Hydraulic braking system**

**LOCATION/ENVIRONMENT** India/outdoor

**PRODUCT** Stainless steel welded tube

**FABRICATION PROCESS** Pipes with double ferrule fittings

**GRADE** SS 304

**SURFACE** 2B

**COMPETING MATERIAL** Carbon steel

**DATE OF COMPLETION** 2006

**MANUFACTURING COMPANY** Integral Coach Factory (ICF)

**MATERIAL SUPPLIER** Ratnamani Metals and Tubes

**SOURCE OF INFORMATION** ISSDA

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OTHERS

Eyeglass frames

Nelson Martins de Almeida Netto has designed eyeglasses with a frame made of stainless steel wire. The stainless steel wire offers superior resistance to tension, torsion and bending than its main competing material, titanium. The stainless steel frame is also lighter and cheaper to produce than similar titanium frames.
Training equipment

Stainless steel is the best material for outdoor training equipment because of its corrosion resistance and aesthetic qualities. This stainless steel exercise equipment was developed by the KOSA Stainless Steel Club.
Temper-rolled stainless steel grade 201 (EN1.4372) is being used to manufacture penetration-resistant metallic inserts for the safety footwear industry. Grade 201 is being used as alternative to grade 301 (EN1.4310).

The use of the high molybdenum grade 201 provides comparable mechanical, penetration and corrosion-resistance compared to the higher-nickel grade 301 alternative. Grade 201, with approximately 3% lower nickel, provides a cost advantage compared to the standard 301 grade which has traditionally been used by European manufacturers.
## More Information

<table>
<thead>
<tr>
<th>Country</th>
<th>Organization</th>
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