



ISSF New Applications Awards Case studies

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Message from the Secretary-General



Dear Members,

It is well known that investments into new production facilities since the turn of the century have resulted in a level of capacity on a worldwide basis which exceeds the present level of demand for stainless steel. This has given rise to a new imperative to utilise the innovation, initiative and creativity of our industry to defend existing markets against

competing materials and to create new markets in order to boost the demand for stainless steel.

The Market Development Committee (MDC) has set as one of its primary goals the utilization of our common resources to create new markets around the world. This can be achieved by creating entirely new markets, or by sharing good ideas which may have worked well in one market to other markets. In this regard we are working very closely with the Stainless Steel Development Associations (SSDAs) in various parts of the world and they are now regular attendees at our Annual Conference.

To this end, the MDC has invited you to submit examples of creative new applications for stainless steel to us, and, from this year, an Award will be given to those submissions which have been judged to be the best in two categories – the Best New Application Award and the Best New Technology Award.

Noting the high quality of all of the submissions which we have received, and in order to spread the information as widely as possible, we have published all of the ideas in a new brochure which will be available on our Extranet and will also be distributed as booklet during our Annual Conference.

This Award Program will be repeated every two years in order to sustain the high level of quality of the individual entries. You are encouraged to continue to submit new ideas to us as soon as they become available and we will retain them on file for the next Awards Competition, in 2017.

We would like to remind you that we are planning to publish a distinctive “Coffee Table” type book which will contain the details of all new applications which have been submitted to us since the last New Applications Book was published in 2011. The new book will commemorate the 20th Anniversary of the ISSF and we hope that it will provide a stimulus for even more good ideas in future.

In the meanwhile, we encourage you all to read this brochure carefully, because there may just be one or two ideas which could work perfectly in your own market.

John Rowe
Secretary-General
International Stainless Steel Forum
Brussels
May 2015

Best New Development Award



1 “PELICAN”, Stainless Steel Boat to Clean Residues in Port Waters

Name of member	Acerinox Europa
Manufacturer	AISTER
Field	Automotive and vehicle
Location	Used for cleaning of different water ports in Spain
Environment	Outdoor
Grade/surface	T-316L, 2B Finish
Quantity	

This type of application creates new market for the use of stainless in special ship constructions.

Acerinox offers at present, alternatively for this type of maritime applications on boats/ships, the duplex grade ACX 900 - E.N. 1.4462 - ASTM2205 with a higher corrosion resistance in presence of chlorides.

It's nevertheless important to avoid a direct contact between the stainless steel structure and other parts, as screws or pieces produced with carbon steels or other metals of different galvanic potential in sea water, to avoid the risk of galvanic corrosion.



2 Fractal Stainless Steel Tiles

Name of member	IMINOX
Manufacturer	Outokumpu Mexinox
Field	Architecture, Building and Construction, Home and Office Appliances
Location	San Luis Potosi, Mexico
Environment	Indoor
Grade/surface	AISI 430/Polished
Quantity	4.9 kg per square meter

Fractal is a “do yourself” system of stainless steel 4 “x 4” tiles. Fractal system is an integral solution to provide the designer, builder or even general public a simple and efficient alternative of installation of stainless steel through its modular system. With Fractal can be covered smooth walls of any building such as home, office, hotels, hospitals, restaurants, sports centers, gardens, walls, kitchens, bathrooms, elevators, laboratories, spas, stands, schools, fireplaces, etc. achieving a very contemporary and sophisticated effect. Fractal allows decorate with own unique personal designs, playing with the direction of polishing (horizontal or vertical). Fractal is mounted on the surface with glue. Fractal system includes a tool to bend and cut the parts without complicated equipment by allowing the stainless make it a material accessible and easy to use by the general public.



3 Urban Bonfire

Name of member	IMINOX
Manufacturer	Carlos Glatt
Field	Home and Office Appliances
Location	San Luis Potosi, Mexico
Environment	Indoor
Grade/surface	AISI 304/Polished (tubing and pipe)
Quantity	1.49 kg per unit

Urban Bonfire is creative design for a new application of stainless in home. This product was the winner of IMINOX Impulse Contest. The First 100 Years of Stainless Steel, a special Mexican contest to celebrate the first centenary of stainless steel in 1912. Urban Bonfire is a playful and funny product that warms, illuminates, a bit like the lamps of the 60's where the balls went up and down very psychedelic. Today fire, stainless, more real materials are those that should be in our homes, and what better than a bonfire to sit around, good music, a glass of wine and watch the fire in a very simple way inside your house without burning, urban bonfire is domesticating it.



4 One-Body Construction of Fuel Inlet Pipes using Ferritic Stainless Steel

Name of member	Nippon Steel and Sumikin Stainless Steel Corporation
Manufacturer	FUTABA INDUSTRIAL CO.,LTD., BESTEX Kioey Co., Ltd., UNIPRES CORPORATION, FTS CO.,LTD.
Field	Automotive and Vehicle
Location	USA, Canada, Europe
Environment	Outdoor
Grade/surface	NSSC436S-T (SUS436L)/ Cathodic Electrodeposition Painting
Quantity	7000~8000 metric tons/year

The use of ferritic stainless steel welded pipes was limited due to its low expansion rate (\leq approximately 1.3D) in the past. However, it is now possible to expand them with a rate of more than 2.0D (200%) following the improvement in workability and mechanical properties, enabling fabrication of one-body construction of fuel inlet pipes. Moreover, one-body construction of ferritic stainless steel welded pipes adopting high efficient electric resistance welding was also realized. As ferritic stainless welded pipes with a high expansion rate of approximately 2.0D can now be used for one-body constructed fuel inlet pipes, it is possible to fabricate highly durable stainless fuel inlet pipes which satisfy the regulations by the State of California (LEV II: 15 years, 150,000 miles guaranteed), which went into effect in 2003. They are currently used in nearly all the cars being sold by Japanese car manufacturers in North America (approximately 6,000,000 cars per year).



5 Stainless Fuel Tank Using Metastable Austenitic Grade

Name of member	Outokumpu
Manufacturer	TechRoi FUELSYSTEM
Field	Automotive and Vehicle, Green Energy, Transport
Location	Sweden
Environment	
Grade/surface	1.4310/2B - HyTensX
Quantity	6.3 kg per unit

A stainless steel fuel tank is superior in terms of crashworthiness and does not need any surface treatment or maintenance. The steel grade used for the build, HyTensX®, allows for extremely thin walls and tailored strength, which contributes to its lighter weight. The fuel tank is made in half-shell design, which provides easy assembly for internal components. The steel can be fully recycled when the car reaches the end of its life cycle. The winning concept: a combination of good design, proper material selection, engineering expertise and access to the material with sufficient delivery reliability. “The competitive price and durability of stainless steel bring tangible benefits for car manufacturers.” Product manufacture has been able to cut, for example, engineering cost and time to market to half and investment cost about 50 to 70 percent. Outokumpu has a track record in supporting the automotive manufacturers to identify and engineer optimal fuel tank solutions, most recently in the United States market and Europa.



6 Using FDX Grade for Plate Heat Exchanger

Name of member	Outokumpu
Manufacturer	Vahterus Oy
Field	Automotive and vehicle, Green Energy, Industrial Machinery and Equipment, Home and Office Appliances, Transport
Location	Finland
Environment	Indoor
Grade/surface	1.4637/2E - FDX™
Quantity	0.98 kg per plate

Market requirements have created a need for a Formable Duplex grade and Outokumpu as the most experienced leading duplex developer has recently introduced such a product platform with the name FDX™. The FDX™ range of grades with different PRE (Pitting Corrosion Resistance) values is almost as formable as corresponding standard austenitic stainless steels and as durable as a high-strength steel grade. Moreover, the new product platform provides a solution to the limited formability of other duplex grades.

The demand to use high strength stainless steel as a base plate material for the manufacturing of Plate Heat Exchanger (PHE) is increasing. Commonly, standard austenitic grades with good formability are used for this kind of product, but one limitation is the relatively insufficient pressure capability of PHE made out of these grades. In order to enhance the serviceability of the product, in cooperation with Vahterus Oy, PSHE (Plate&Shell® Heat Exchanger) was produced by using the FDX 27™ grade. All corrugated FDX plates were produced by a mass volume manufacturing tool designed for the existing baseline material (4404). The study has identified a number of general advantages using the FDX™ grade

- No additional tool design adaptation/ adjustment was performed
- No tendency of wear or tool damage was observed
- The final strength of the assembled product was increased by 40%
- A satisfactory level of repeatability in properties and a stable forming process was achieved.

In conclusion, the FDX™ concept exhibits four unique attributes - high corrosion resistance, high strength, high ductility and price stable alloying.



7 Stainless Steel Used as Vineyard Supports

Name of member	SASSDA
Manufacturer	
Field	Food and Beverage
Location	South Africa
Environment	Outdoor
Grade/surface	AISI304/Polished
Quantity	150 to 170g per unit

Vineyards and wine is synonymous to the Western Cape region of South Africa. Wine farmers spend use parts of annual budgets on new vineyard preparation and any positive difference in cost can have a significant effect on the profitability and competitiveness of the winery in the market.

Traditionally vines are supported by a trellis structure with wooden poles for vertical supports and wire strands are fixed to the posts for horizontal support. Except for high labour cost planting the posts and wiring structure, the issues around sustainability and costs of procuring wooden posts in a country with a scarce water supply, started to become an issue.

Metal poles were soon seen as an answer, but hot rolled carbon steel profiles could not supply a solution with an adequate life span. The vineyards are irrigated with fertilizer and pesticides mixed into the water supply. Many of these substances are very corrosive. Carbon steel profiles are heavy and as such costly to transport and install.

A local entrepreneur identified stainless steel as the answer with its superior corrosion resistance and higher strength as key factors. A profile made from thin gauge stainless steel was designed to offer the required strength, life-cycle, ease of handling and installation. The rolled formed stake with a sharp edge is simply driven into the soil with a heavy hammer.

The design incorporates angled slots on the sides. This allows installation teams to simply hook the horizontal wires onto the profile before tightening the strands from the ends.

The product is complimented with a full set of connectors, end bracing and tightening mechanisms made from recycled material to offer the end-user with a modular and flexible fencing or orchard support solution.



8 Stainless Steel Curtain Wall

Name of member**Manufacturer** Shanghai Krupp Stainless Steel Co., Ltd.**Field** Architecture, Building and Construction**Location** Shanghai/Guangzhou**Environment** Outdoor**Grade/surface** 316L/Linen 25**Quantity** 900t

Baosteel is going to build their new headquarter to follow their new development in the future, the architect wants to use stainless steel to represent their design philosophy - metal feeling but not too much light reflection, SKS supply the finish - Linen25, which provides the uniform surface and defuse the light reflection and can meet the architect's requirement, after several rounds test, this material was chosen for the manufacture of the curtain wall. Because Baosteel new headquarter building will use a lot of stainless steel in single building, the good performance of stainless steel will also encourage other architects and developers to choose stainless steel as the material for curtain wall.



9 Pipe Connector with Stagnant Water Prevent Function

Name of member	KOSA (Korea Iron & Steel Association)
Manufacturer	HI-STEN
Field	Architecture, Building and Construction, Other
Location	Republic of Korea
Environment	Indoor
Grade/surface	STS304 or STS316
Quantity	about 620g

It can be easily installed at the pipeline for water supply.

Usually used for water supply, when emergency situation is happening it works for sprinkler system .

All buildings have pipelines for water supply.

- Application : For the sprinkler system to put out fires in the buildings
- Description : No need of pipelines for fire, No need of electricity, Don't make dead water



10 Solar Energy Water Heater

Name of member	Yusco
Manufacturer	Yu Feng Mold Manufacture Company
Field	Home and Office Appliances
Location	Taiwan
Environment	Outdoor
Grade/surface	Exterior: SUS304, Water tanks: SUS444
Quantity	70 kg

The product is designed with the heat collection plate to reduce heat energy loss due to circulation. Under the solar energy panel, it uses stainless steel SUS444 water tank to provide a special acid/alkali resistant and high chlorine resistant. It is also provided with an enclosure made of SUS304 stainless steel plate to resist rust, oxidization and corrosion for presenting a longer service life.



11 Stainless Steel Furnace

Name of member	YUSCO
Manufacturer	Kuo Chuan Stainless Steel
Field	Home and Office Appliances
Location	Changhua County, Taiwan
Environment	Outdoor
Grade/surface	304
Quantity	70kg

“Burning pray paper” has been a traditional religious practices in Taiwan and it is an important medium between god and human. Almost all temples are burning pray paper to express the highest respect to the gods. However, burning pray paper will produce harmful substances leading to effects on human health. Stainless steel furnace can achieve complete combustion to prevent air pollution from burning the paper.



12 Invisible Safety Net

Name of member	Yusco
Manufacturer	Tang Sheng Technology
Field	Home and Office Appliances
Location	Taiwan
Environment	Outdoor
Grade/surface	316
Quantity	5kg

Invisible safety net is not only effective in preventing falls incident for young children; because with the easy dismantling characteristics, it can also escape quickly in emergency situation. In addition, invisible safety net can connect with the intelligent alarm system to provide protection of residential burglary. Invisible safety net can also be described as home security protection.



13 Allianz Parque - Palmeiras Stadium

Name of member	Aperam
Manufacturer	Wtorre / Permetal / Hunter Douglas
Field	Architecture, Building and Construction
Location	Brazil
Environment	Outdoor
Grade/surface	444/2B
Quantity	210 ton

The Allianz Park Palmeiras is the stadium for Palmeiras which is popular soccer team in São Paulo. Stainless Steel is intensively used in its façade. Aperam supplied 210 tons of grade 444 2B to the project, the same grade that was used on Castelão stadium. The façade mixed flat sheets perforated by Permetal and tubes made by Aperam Inox Tubos Brasil.

This summary was quoted from the article from "[Team Stainless](#)" and "[Aperam](#)".

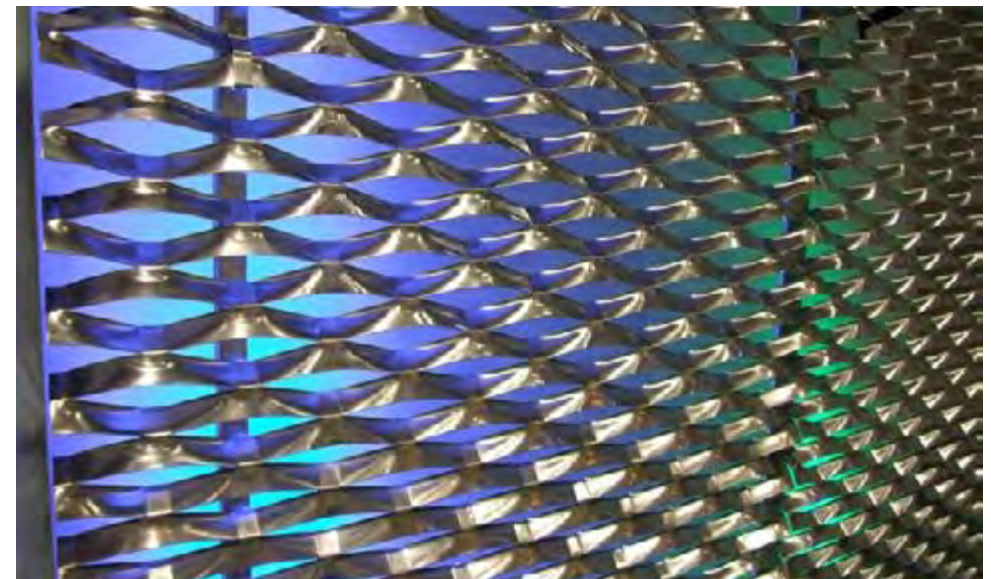


14 Governador Plácido Castelo Stadium - Castelão Arena

Name of member	Aperam
Manufacturer	Martifer / Permetal
Field	Architecture, Building and Construction
Location	Brazil
Environment	Outdoor
Grade/surface	444/2B
Quantity	80 ton

The stadium in Fortaleza city in the North East of the country, called Castelão, hosted 6 World Cup matches. This stadium for 64,000 persons went through two years of refurbishments. The project was led by a Brazilian architecture office, Vigliecca & Associados. The façade was entirely made using stainless steel expanded sheets. In addition to the external frame, stainless steel was used on railings, handrails at VIP areas, lavatories and locks of the stadium. "We have made an option for the durability stainless steel provides, which is essential to areas like the façade that required a corrosion-resistant material, and for its noble appearance, required in the hospitality sector", says architect Ronald Fiedler, responsible for the Project.

This summary was quoted from the article from "[Team Stainless](#)".



15 Sailboat KAT - Schurmann Family

Name of member	Aperam
Manufacturer	Caçapava Shipyard / Schurmann Family
Field	Automotive and Vehicle
Location	Brazil
Environment	Outdoor
Grade/surface	316L/2B
Quantity	25 ton

Easiness to clean, comfort and practicality are the main features sought in the materials used. Some of them were brought from abroad, but in the case of stainless steel, it is a domestic product. Supplied by Aperam, it was used on the deck, bathroom sink, furniture, floor and other structures. "Everything that can be made of stainless steel will be made of stainless steel. It provides flexibility of shapes, it is lightweight and enables working with different sizes. In addition, it helped us overcome one of the main challenges of the project: associating function, shape and aesthetic with balance", says Jeane Bianchi, architect responsible for the interior of the boat. Advantage for those who design and those who will have the sailboat as home in the next two years. "The other sailboats didn't have a stainless steel deck. As time passed, the material was susceptible to rusting and it constantly needed scraping and painting. Now, instead of scraping and painting, I will invest my time in taking pictures and enjoying the landscape", banter Vilfredo Schürmann.

This summary was quoted from the article from "[Aperam](#)".



16 Free-Formed Self-Supporting Facade Elements

Name of member	Outokumpu Nirosta GmbH
Manufacturer	Institut für Bildsame Formgebung und Lehrstuhl für Tragkonstruktionen, RWTH Aachen University
Field	Architecture, Building and Construction, Other
Location	Aachen, Germany
Environment	Outdoor
Grade/surface	Variable (in case of demonstrator 1.4404)
Quantity	16 kg/m ²

Architects are calling for greater and greater geometrical diversity. For “free form” buildings, expensive customized solutions are currently inevitable. A new method combines tessellation and folding to create facade elements, which are self-supporting and do not require a separate substructure. Stainless steel is a most suitable material for this technique, because austenitic grades are exceptionally malleable. Their marked work-hardening during the forming process can add to the structural properties of the fabrication. The possible reduction of wall thickness, weight and material cost, together

(*) accompanied by FOSTA and funded by the German Federal Ministry of Economics and Technology through Aif as part of the IGF project (no. 16603 N) for the promotion of industrial cooperation in accordance with a resolution of the German Parliament.



17 Stainless Steel Rebar for Magnetic Shielding

Name of member	Outokumpu
Manufacturer	Outokumpu
Field	Architecture, Building and Construction
Location	Cambridge and Cramlington (UK)
Environment	Indoor
Grade/surface	EN 1.4311 (304LN)
Quantity	51 and 5.6 t respectively

Low magnetic permeability stainless steel ($\mu < 1.005$) was used to reinforce the concrete structures of the new building of the Cambridge University Chemical Engineering and Biotechnology department. It forms an efficient Faraday cage which keeps away stray magnetic fields from sensitive electronic equipment used in research. A low carbon grade with an added nitrogen content of 0.12 to 0.22 %, EN 1.4311, was used. It is ideally suited for applications, in which, besides non-magnetic properties, an elevated level of mechanical strength is required. Further market potential lies in the application of such reinforcement in hospitals. The recently opened Specialist Emergency Care Hospital at Cramlington in the North of England is a case in point. The Magnetic Resonance Imaging (MRI) technique also requires the equipment to be protected from external electromagnetic fields.



Best New Technology Award



1 Bipolar plates for fuel cells

Name of member	IMINOX
Manufacturer	CIATEQ
Field	Green Energy
Location	San Luis Potosi, Mexico
Environment	Outdoor
Grade/surface	444 2B
Quantity	250gr per unit of 9.5 x 9.5 cm

For fuel cells become commercially successful require a significant reduction in their production cost.

The PEM (Proton Exchange Membrane) fuel cell stack hardware consists of the Membrane Electrode Assembly, the bipolar plate, seal, and end plate, etc. Among the components, the bipolar plate is considered to be one of the most costly and problematic of the fuel cell stack.

The bipolar plate is a multi-functional component within a PEM fuel cell stack. Its primary function is to supply reactant gases to the gas diffusion electrodes (GDE) via flow channels. The stainless 444 is an excellent material to be used for the bipolar plates, it's comparable to the austenitic 316 in corrosion resistant with the advantage of being an order of magnitude less costly than 316

Stainless bipolar plates are coated with protective coating layers to avoid corrosion. This coating also has good interfacial contact resistance.

A research was developed to test the functionality of stainless steel 316 and 444 among others. The research showed that both stainless work very well for the cell performance.



2 Application of Ferritic Stainless Steel Rebar for Bridge Construction

Name of member	Nippon Steel and Sumikin Stainless Steel Corporation
Manufacturer	Ministry of Land, Infrastructure, Transport and Tourism Kokuriku Regional Development Bureau/ Sumitomo Mitsui Construction Co., Ltd.
Field	Architecture, Building and Construction
Location	Japan
Environment	Outdoor
Grade/surface	SUS410-SD
Quantity	60 metric tons

Nou bridge, a precast concrete bridge on Japan National Route 8 that runs by the coast of the Japan Sea, had been significantly damaged by sea salt, and fundamental improvement on its durability was necessary.

After repeated studies on deterioration of the bridge and reasonable use of stainless steel rebar on the new bridge, ferritic stainless steel rebar (SUS410-SD) was used in the outer steel of one span of the precast beam which is most exposed to sea salt among the total of four spans of bridge beams, and also in the area between the beams where concrete is cast on-site. By using ferritic stainless steel rebar in the areas, which require the measures against sea salt damage, durability of the whole bridge was improved, and a great Life Cycle Cost (LCC) was realized. This is the first case where ferritic stainless steel rebar was used in the main structure of bridge beams. In Japan, there are many bridges damaged by sea salt and needing to be rebuilt, and this is a promising market that is highly expected to grow in contributing to installing the highly durable infrastructure.



3 Stainless Steel Lining Jacket

Name of member	Nippon Steel & Sumikin Stainless Steel Corporation/Nippon Yakin Kogyo Co., Ltd.
Manufacturer	Nippon Steel Engineering Co., Ltd and Joint Ventures
Field	Architecture, Building and Construction
Location	Tokyo, Japan
Environment	Outdoor
Grade/surface	NSSC270 (SUS312L, ASTM S31254)/ NAS185N (SUS312L, ASTM S31254), NAS354N (ASTM N08354)
Quantity	500 metric tons

D Runway of Tokyo International Airport, constructed as a part of the re-expansion work of the airport, was Japan's major social capital and required durability of 100 years and proper maintenance. Concerning the method to avoid corrosion for steel structure components of the pier, there were some considerations: organic anti-corrosive coating have a re-coating cost problem due to its insufficient durability, and titanium clad also have an initial excessive cost problem.

As a solution, the film lining construction method with seawater-proof stainless steel was adopted, as it was considered to be much more superior in terms of durability and LCC(Life Cycle Cost). This was the first large-scale application of the method to the airport facilities and the lining materials chosen for their high corrosion resistance against seawater were "NSSC 270 (SUS312L)", "NAS185N (SUS312L)", and "NAS354N (ASTM N08354)". This was a case that showed its potential in a new market.

SUS312L:20Cr-18Ni-6Mo-0.2N-LC = EN1.4547



4 Stainless Fuel Tank using Metastable Austenitic Grade

Name of member	Outokumpu
Manufacturer	TechRoi FUELSYSTEM
Field	Automotive and Vehicle, Green Energy, Transport
Location	Sweden
Environment	
Grade/surface	1.4310/2B - HyTensX
Quantity	6.3kg per unit

A stainless steel fuel tank is superior in terms of crashworthiness and does not need any surface treatment or maintenance. The steel grade used for the build, HyTensX®, allows for extremely thin walls and tailored strength, which contributes to its lighter weight. The fuel tank is made in half-shell design, which provides easy assembly for internal components. The steel can be fully recycled when the car reaches the end of its life cycle. The winning concept: a combination of good design, proper material selection, engineering expertise and access to the material with sufficient delivery reliability. "The competitive price and durability of stainless steel bring tangible benefits for car manufacturers." Product manufacture has been able to cut, for example, engineering cost and time to market to half and investment cost about 50 to 70 percent. Outokumpu has a track record in supporting the automotive manufacturers to identify and engineer optimal fuel tank solutions, most recently in the United States market and Europa.



5 Using FDX Grade for Plate Heat Exchanger

Name of member	Outokumpu
Manufacturer	Vahterus Oy
Field	Automotive and vehicle, Green Energy, Industrial Machinery and Equipment, Home and Office Appliances, Transport
Location	Finland
Environment	Indoor
Grade/surface	1.4637/2E - FDX™
Quantity	0.98 kg per plate

Market requirements have created a need for a Formable Duplex grade and Outokumpu as the most experienced leading duplex developer has recently introduced such a product platform with the name FDX™. The FDX™ range of grades with different PRE (Pitting Corrosion Resistance) values is almost as formable as corresponding standard austenitic stainless steels and as durable as a high-strength steel grade. Moreover, the new product platform provides a solution to the limited formability of other duplex grades.

The demand to use high strength stainless steel as a base plate material for the manufacturing of Plate Heat Exchanger (PHE) is increasing. Commonly, standard austenitic grades with good formability are used for this kind of product, but one limitation is the relatively insufficient pressure capability of PHE made out of these grades. In order to enhance the serviceability of the product, in cooperation with Vahterus Oy, PSHE (Plate&Shell® Heat Exchanger) was produced by using the FDX 27™ grade. All corrugated FDX plates were produced by a mass volume manufacturing tool designed for the existing baseline material (4404). The study has identified a number of general advantages using the FDX™ grade

- No additional tool design adaptation/ adjustment was performed
- No tendency of wear or tool damage was observed
- The final strength of the assembled product was increased by 40%
- A satisfactory level of repeatability in properties and a stable forming process was achieved.

In conclusion, the FDX™ concept exhibits four unique attributes - high corrosion resistance, high strength, high ductility and price stable alloying.



6 Stainless Hot-Water Distributor and Encircling Pipes

Name of member	KOSA
Manufacturer	DASUNGTECH Co. LTD
Field	Architecture, Building and Construction, Other
Location	Republic of Korea
Environment	Indoor
Grade/surface	STS304
Quantity	

Wide range of heating systems – from the individual to the district heating – utilize hot-water distributor and the encircling pipes coming out of the distributor have been built using mostly copper, brass or bronze. Applying our SP-Joint – exclusively built from steel pipe – would introduce more economical yet more corrosion-resistant and durable product.



7 SP-JOINT Fire Plug Granular Tee, Customized Fire Pipe Multi-Joint Tee

Name of member	KOSA
Manufacturer	DASUNGTECH Co. LTD
Field	Architecture, Building and Construction, Other
Location	Republic of Korea
Environment	Indoor
Grade/surface	STS304
Quantity	

Previously, copper or steel pipes had to be punched or fabricated a hole in order to connect with a branch pipe through welding. Dasung Tech's SP-JOINT Branch Tee is a customized, multi-joint Tee that is not only exclusive to fire piping but also removes the need of welding. Lower payroll costs yet more corrosion-resistant and safer.



8 Stainless Heat Exchanger

Name of member	KOSA
Manufacturer	KyungDong Everon
Field	Architecture, Building and Construction, Other
Location	Republic of Korea
Environment	Indoor
Grade/surface	STS430J1L, STS304CuWL, STS316L
Quantity	4kg/ea (latent heat exchanger) 1kg/ea (hot-water supply exchanger)

Applicable to the furnace and higher in efficiency than that of the current aluminum-based heat exchanger.



9 Solar Energy Water Heater

Name of member	Yusco
Manufacturer	Yu Feng Mold Manufacture Company
Field	Home and Office Appliances
Location	Taiwan
Environment	Outdoor
Grade/surface	Exterior: SUS304, Water tanks: SUS444
Quantity	70 kg

The product is designed with the heat collection plate to reduce heat energy loss due to circulation. Under the solar energy panel, it uses stainless steel SUS444 water tank to provide a special acid/alkali resistant and high chlorine resistant. It is also provided with an enclosure made of SUS304 stainless steel plate to resist rust, oxidization and corrosion for presenting a longer service life.



10 Stainless Steel Furnace

Name of member	YUSCO
Manufacturer	Kuo Chuan Stainless Steel
Field	Home and Office Appliances
Location	Changhua County, Taiwan
Environment	Outdoor
Grade/surface	304
Quantity	70kg

“Burning pray paper” has been a traditional religious practices in Taiwan and it is an important medium between god and human. Almost all temples are burning pray paper to express the highest respect to the gods. However, burning pray paper will produce harmful substances leading to effects on human health. Stainless steel furnace can achieve complete combustion to prevent air pollution from burning the paper.



11 Invisible Safety Net

Name of member	Yusco
Manufacturer	Tang Sheng Technology
Field	Home and Office Appliances
Location	Taiwan
Environment	Outdoor
Grade/surface	316
Quantity	5kg

Invisible safety net is not only effective in preventing falls incident for young children; because with the easy dismantling characteristics, it can also escape quickly in emergency situation. In addition, invisible safety net can connect with the intelligent alarm system to provide protection of residential burglary. Invisible safety net can also be described as home security protection.



12 Stainless Steel Curtain Wall

Name of member**Manufacturer** Shanghai Krupp Stainless Steel Co., Ltd.**Field** Architecture, Building and Construction**Location** Shanghai/Guangzhou**Environment** Outdoor**Grade/surface** 316L/Linen 25**Quantity** 900t

Baosteel is going to build their new headquarter to follow their new development in the future, the architect wants to use stainless steel to represent their design philosophy - metal feeling but not too much light reflection, SKS supply the finish - Linen25, which provides the uniform surface and defuse the light reflection and can meet the architect's requirement, after several rounds test, this material was choosed for the manufacture of the curtain wall. Because Baosteel new headquarter building will use a lot of stainless steel in single building, the good performance of stainless steel will also encourage other architects and developers to choose stainless steel as the material for curtain wall.



13 Allianz Parque - Palmeiras Stadium

Name of member	Aperam
Manufacturer	Wtorre / Permetal / Hunter Douglas
Field	Architecture, Building and Construction
Location	Brazil
Environment	Outdoor
Grade/surface	444/2B
Quantity	210 ton

The Allianz Park Palmeiras is the stadium for Palmeiras which is popular soccer team in São Paulo. Stainless Steel is intensively used in its façade. Aperam supplied 210 tons of grade 444 2B to the project, the same grade that was used on Castelão stadium. The façade mixed flat sheets perforated by Permetal and tubes made by Aperam Inox Tubos Brasil.

This summary was quoted from the article from "[Team Stainless](#)" and "[Aperam](#)".

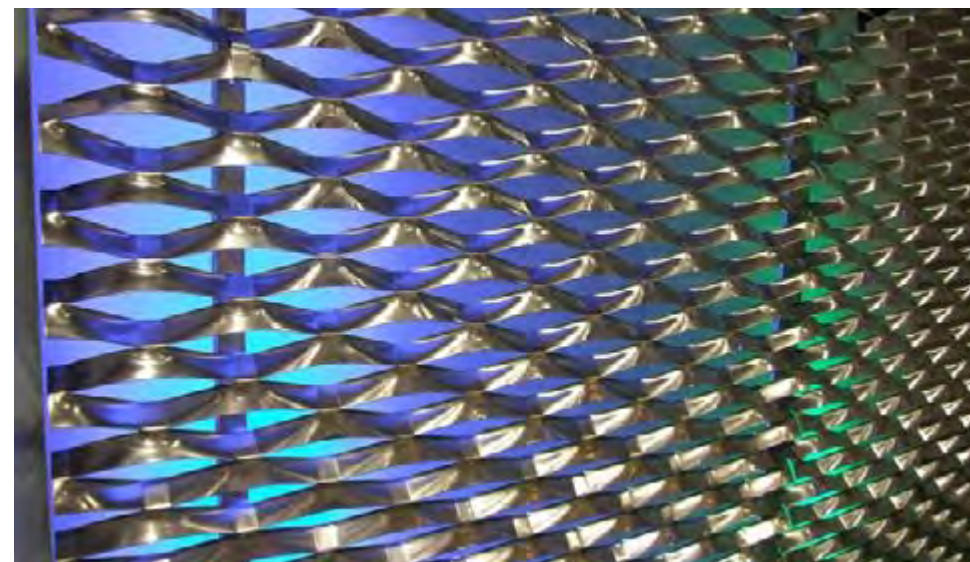


14 Governador Plácido Castelo Stadium - Castelão Arena

Name of member	Aperam
Manufacturer	Martifer / Permetal
Field	Architecture, Building and Construction
Location	Brazil
Environment	Outdoor
Grade/surface	444/2B
Quantity	80 ton

The stadium in Fortaleza city in the North East of the country, called Castelão, hosted 6 World Cup matches. This stadium for 64,000 persons went through two years of refurbishments. The project was led by a Brazilian architecture office, Vigliecca & Associados. The façade was entirely made using stainless steel expanded sheets. In addition to the external frame, stainless steel was used on railings, handrails at VIP areas, lavatories and locks of the stadium. "We have made an option for the durability stainless steel provides, which is essential to areas like the façade that required a corrosion-resistant material, and for its noble appearance, required in the hospitality sector", says architect Ronald Fiedler, responsible for the Project.

This summary was quoted from the article from "[Team Stainless](#)".



15 Sailboat KAT - Schurmann Family

Name of member	Aperam
Manufacturer	Caçapava Shipyard / Schurmann Family
Field	Automotive and Vehicle
Location	Brazil
Environment	Outdoor
Grade/surface	316L/2B
Quantity	25 ton

Easiness to clean, comfort and practicality are the main features sought in the materials used. Some of them were brought from abroad, but in the case of stainless steel, it is a domestic product. Supplied by Aperam, it was used on the deck, bathroom sink, furniture, floor and other structures. "Everything that can be made of stainless steel will be made of stainless steel. It provides flexibility of shapes, it is lightweight and enables working with different sizes. In addition, it helped us overcome one of the main challenges of the project: associating function, shape and aesthetic with balance", says Jeane Bianchi, architect responsible for the interior of the boat. Advantage for those who design and those who will have the sailboat as home in the next two years. "The other sailboats didn't have a stainless steel deck. As time passed, the material was susceptible to rusting and it constantly needed scraping and painting. Now, instead of scraping and painting, I will invest my time in taking pictures and enjoying the landscape", banter Vilfredo Schürmann.

This summary was quoted from the article from "[Aperam](#)".



16 High-chromium Austenitic 316plus

Name of member	Outokumpu
Manufacturer	Langh Group Cargo Solutions
Field	Automotive and Vehicle
Location	Finland
Environment	Outdoor
Grade/surface	Outokumpu 316plus (Outokumpu 4420)
Quantity	Unknown

Finnish Langh Group Cargo Solutions has chosen Outokumpu's new high-chromium austenitic steel grade Outokumpu 316plus™ (Outokumpu 4420) in cold worked condition for their special transportation containers. Container's floor and walls are made of Outokumpu stainless steel due to strict requirement for wear and corrosion resistance. 316plus enables transportation of aggressive and sharp bulk materials. The properties of 316plus allow thinner wall thickness resulting in lower overall weight of the container.

Outokumpu 316plus is a unique product developed by Outokumpu that provides a competitive alternative for 316(L). 316plus contains less nickel and molybdenum and the grade has higher strength than 316(L) even in annealed condition due to higher nitrogen alloying.

This summary was quoted from the article from "[Outokumpu](#)".



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The International Stainless Steel Forum (ISSF) is a non-profit research and development organisation which was founded in 1996 and which serves as the focal point for the international stainless steel industry.

Who are the members?

ISSF has two categories of membership: company members and affiliated members. Company members are producers of stainless steel (integrated mills and rerollers). Affiliated members are national or regional stainless steel industry associations. ISSF now has 65 members in 25 countries. Collectively they produce 80% of all stainless steel.

Vision

Stainless steel provides sustainable solutions for everyday life.

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For more information about stainless steel and sustainability, please consult the sustainablestainless.org website.

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