

Stainless Steel in Architectural Applications





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Introduction

The tiny town of New Plymouth, on the southern-most tip of the south island of New Zealand has attracted unusual world-wide attention in the fields of architecture, and, of course, stainless steel, following the completion of the Len Lye Museum, which is arguably one of the most beautiful modern buildings in the world. With a highly polished and artistically curved façade made from 316 stainless steel, the building stands as a shining beacon for all that is attractive about the use of stainless steel in the Architecture, Building and Construction (ABC) sector.



JOHN ROWE
Secretary-General

But if one turns the pages of history back to 1930, it is a fair bet that onlookers would have been similarly attracted by the stunning beauty of the roof panels of the Chrysler Building in New York, which was among the first to use stainless steel for decorative panelling on a major building. And the remarkable thing is that the roof of the Chrysler Building has been inspected and cleaned only thrice in the intervening 86 years - in 1961, 1996 and 2001 - and on these occasions normal household cleaning material was used and the roof was found to be in excellent condition.

These two examples amply illustrate the attraction of stainless steel, both from an aesthetic and a long life perspective. But there are countless other examples all around us of the

usefulness of this product for the ABC sector. This publication offers a number of examples taken from around the world and is offered in the hope that it will inspire yet more creativity to brighten our environment.

There are many different grades of stainless steel, which offer solutions to a wide range of design problems, from corrosion resistance in even the most aggressive environments, to high strength requirements; and from ease of formability to ease of welding. Similarly, stainless steels offer a wide range of surface finishes which can assist the architect in achieving the aesthetically pleasing appearance he is looking for. Surface finishes range from a plain matte through soft polishing through textured patterns and colours right up to highly polished mirror finishes. These provide the imaginative designer with a wide array of options. Care should be taken when using glossy surface finishes to ensure that they do not unwittingly create glare or heat reflectivity issues. Especially building fronts facing the sun and concave-shaped areas deserve special attention during the planning phase.

In our continuing search for ways to hasten the development of the use of stainless steel in this important area of the market, we have identified a need for more educational material for students of architecture and design, as well as a lack, in some markets, of information about technical aspects of handling and using stainless steel, and, in particular, a shortage of design codes. We have addressed these shortages by introducing our own highly respected Education Course, which is available on our website, and by contributing,

together with our Team Stainless colleagues (the International Chromium Development Association, the International Molybdenum Association and the Nickel Institute) and the Steel Construction Institute, to the preparation and publication of a new set of design codes for stainless steel structural materials. We have also created a website dedicated to providing references to publications about stainless steel reinforcing bars.

We hope that by identifying and filling these gaps in the knowledge profile of the ABC sector, and by providing photographic examples of the practicality, longevity and sheer beauty of stainless steel, we can encourage even greater use of this material in the buildings of the future.

Despite the very good work which we have done on extending the availability of good quality educational material for students of architecture a lot of work still needs to be done to inform architects, designers and construction companies of the critical importance of grade selection and the correct way to handle stainless steel to avoid surface damage. But, given correct grade selection for the prevailing conditions, and correct assembly and fastening, there is no reason why the use of stainless steel should not continue to provide lasting solutions in the Architecture, Building and Construction sector of the market. As the amazing examples which have been included in this Brochure illustrate, the limits for the use of stainless steel are only the limits of the imagination.

John Rowe
Secretary-General
International Stainless Steel Forum, Brussels



The Chrysler Building

The roof of the Chrysler Building in New York was fabricated out of Enduro KA 2 (AISI 302) austenitic stainless steel, patented by Krupp Nirosta in Germany and produced in the USA under licence by Crucible, Republic and Ludlum Steel Companies.

The roof was installed in 1930 and has only been cleaned three times – in 1961, 1995 and 2001. Inspections in 1995 and 2001 by Catherine Houska on behalf of the Nickel Institute revealed remarkably few signs of corrosion, despite the harsh environment.

Chrysler Building (1930), photo credit: Catherine Houska, Nickel Institute (2005)



The Kelpies in Scotland. Pictures courtesy of Ben Williams

The Kelpies

Location: Scotland

Artist: Andy Scott

Towering thirty meters above the Forth and Clyde canal in central Scotland, the Kelpies can claim to be among the world's most exciting pieces of public art. Scottish sculptor Andy Scott's massive pair of equine heads is inspired by the powerful heavy horses that worked the canal towpaths in times gone by.

Eight years on from Scott's initial sketches, the story is one of collaboration between the artist and some of the UK's finest engineers. They overcame with ingenuity the technical challenges of scaling up the original design tenfold, into two massive structures which combine painted carbon steel and hundreds of stainless steel cladding plates.

"I chose stainless steel both for its longevity and its visual effect," says Scott. The setting is 'big sky' country, with mountains in the distance and a special natural light. Stainless steel gave the effect I was looking for – a light, almost delicate quality against the natural backdrop.

Whilst remaining artwork, the sheer scale of this project meant it had to be approached in the same way as the building of a bridge.

"Andy's maquettes were digitally scanned to produce a 3D surface model. So whilst we built the Kelpies, the form is a perfect copy of Andy's

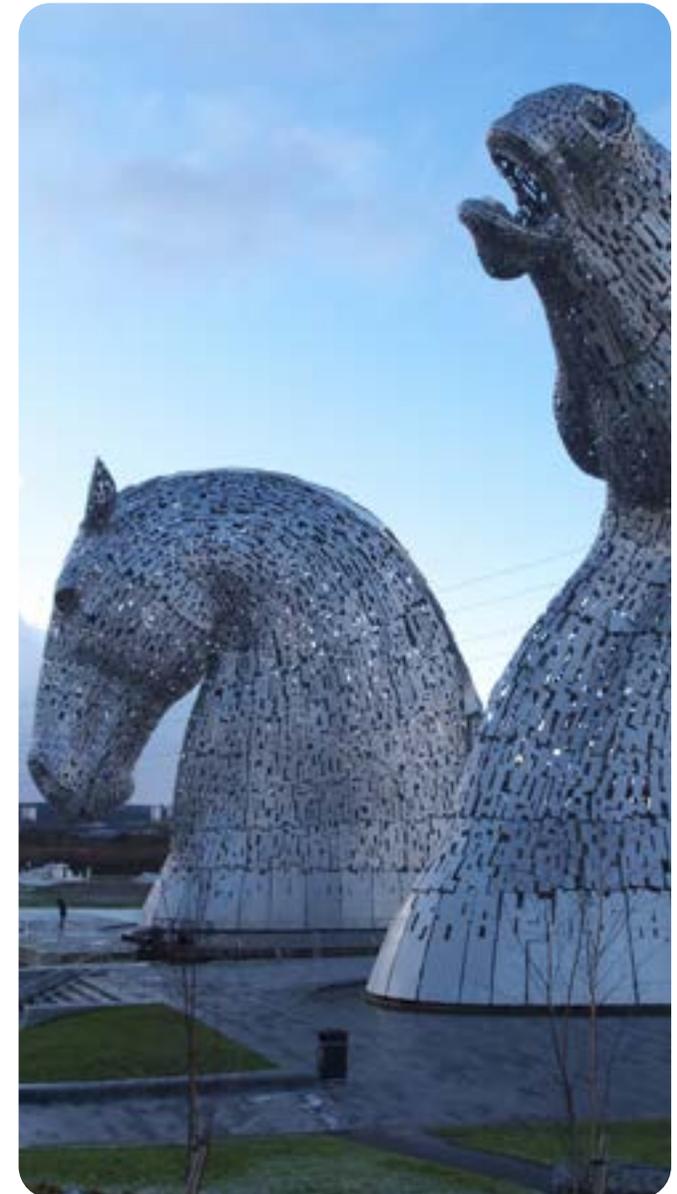
original work," explains Tim Burton of SH Structures, the project's principal contractor. To create an efficient and stiff primary structure, two triangular trusses interconnected by frames braced in-plane were constructed. A secondary frame followed the profile of the internal surface of the skin with brackets to take the stainless steel cladding that forms the outer layer of the two heads. The heads were covered with 150 tonnes of 6mm thick mill finish Type 316L (S31603) stainless steel plate, supplied and laser cut by Outokumpu. The finishing touch has been the installation of specially designed lighting, which dramatically transforms the Kelpies at night.

The Kelpies, which started out as an artist's vision has, through a collaborative process, the use of traditional fabrication skills and the application of excellent structural engineering, been transformed into a stunning piece of public art.

Source: nickelinstitute.org

Details

Environment:	rural
Grade:	316L (S31603)
Material thickness:	6 mm
Manufacturing company and material supplier:	outokumpu.com
More information:	outokumpu.com



Pictures courtesy of Ben Williams

Under the Sun

Location: Victoria, Australia

Architects: Robert Owen and Joanna Buckley

According to Ecclesiastes 1:9, "What has been is what will be, and what has been done is what will be done, and there is nothing new under the sun". Well, now, thanks to the imaginative design of Melbourne artists, Robert Owen and Joanna Buckley, there is a new sculpture entitled "Under the Sun" at the entrance to Stockland's Point Cook Centre, in Victoria, Australia. This mesmerising art form is a 1300 kg stainless steel sculpture with a diameter of 6.5 meters, suspended above the entrance as to resemble the moon floating over the earth. The piece was commissioned as part of a \$20 million revamp and was completed in 2014. Engineering work was carried out by Anthony Snyders of Adams Consulting Engineers and the fabrication by the artists themselves, in conjunction with Jeph Neale of Artery Cooperative and Luke Adams of Eco Electrics. The detail work was laser cut by Arrow Laser. The artists specified 316 stainless steel for the sculpture and the supporting mast and cables, for its excellent corrosion resistance, especially having regard to the harsh environment of coastal cities. The production was aided by 3D modelling in consultation with Ronstan Tensile Architecture

General Manager, Rowan Murray. The surfaces of the structure were polished done by MME Surface Finishing. The final result of this complex collaborative effort is a piece of unique art-work bringing together the elements for which stainless steel is justifiably famous – pleasing aesthetics, excellent corrosion resistance, durability and formability. For the architectural, building and construction sectors, the only limitation on the use of stainless steel is the scope of the imagination. (This story and the photographs have been supplied by ASSDA and we gratefully acknowledge the cooperation of Richard Matheson and Lissel Port).

Details

Environment:	urban
Fabrication process:	(Dish) No. 6 Finish - laser cut - pickling - passivating - electropolishing
Grade/surface:	316L
Main thickness or diameter:	(Dish) 6500 x 6500 x 465mm. (Cables) 4mm, 5mm, 7mm and 10mm
Date of completion:	2014
Manufacturing company and material supplier:	Ronstan Tensile Architecture, ACS2 Stainless Steel
More information:	assda.asn.au



Picture courtesy of John Gollings

Light Meander

Location: Nashville, USA

Artists: HADDAD | DRUGAN, LCC

The free form of Light Meander, a sculpture in Nashville's West Riverfront Park, is based on the meandering Cumberland River as it passes through Davidson County. The art channels the river's dynamic flow through a variety of effects created by the interplay of light and material. The river-facing side is finished with mirror polished stainless steel that creates playful distortions through its folding reflections. On the city-facing side, color-changing LEDs illuminate horizontally inset acrylic rods creating rippling and flowing colors inspired by the changing seasonal qualities of the river. The sculpture forms a curvilinear seat of wood at the base that cantilevers and transcends to a series of mirror polished stainless steel tubes that catch ambient reflections like scintillating light on the water. A mesh of hundreds of hanging reflective stainless steel guitar picks cap the sculpture and dangle from the underside of the bench creating touch and wind-activated sounds and shimmers. The sides are clad in stainless steel with a glass bead finish that glows in the sunlight.

Details

Environment:	urban
Grade/surface:	glass bead finish
More information:	haddad-drugan.com

Light Meander is by Artists Laura Haddad and Tom Drugan (Copyright © Haddad Drugan, LLC), and is a Project Of The Metropolitan Nashville Arts Commission Percent For Art Program.

Picture courtesy of Laura Haddad





Reflective Lullaby-Frankie

Location: Melbourne, Australia

Artist: Gregor Kregar

The Gnome, also known as “Reflective Lullaby-Frankie” is a stainless steel sculpture, standing 9 metres high, which was made from mirror polished 316 material. The structure was fabricated with stainless steel pipes and sheets ranging from 2.5-3mm.

This sculpture was commissioned by the McClelland Sculpture Park and the Peninsula Link Freeway. It will remain in its present location, next the Freeway for 4 years, after which it will be relocated to the McClelland Sculpture Park. The cute garden gnome is often over looked as purely decorative, yet the word gnome originates from the Greek word gnosis, for knowledge. The gnome plays with the notion of heroic monumental sculpture; he is not the hero of one event but rather the funny philosopher of everyday life. He peers out over the landscape and the freeway, and looks reflective (in both senses). The artist sees him as a comic-heroic ornament for the surrounding environment.

Details

Environment:	urban industrial
Grade/surface:	316
Main thickness or diameter:	2.5 to 3 mm
Date of completion:	2015
More information:	gregorkregar.com



Memorial

Location: Utøya, Norway

Architects: 3RW arkitekter

The Utøya Island in Norway was the scene of one of the most awful crimes in the country's history. Sixty nine people, most of whom were children, were murdered here by a single gunman on 22 July 2011.

Those affected by this tragic event decided to use the natural beauty of the island as a backdrop for a memorial to those who lost their lives.

The architects 3RW arkitekter were commissioned to design this particular moving memorial, featuring a ring made from stainless steel. The ring is fixed to the surrounding trees by cables and is able to move in harmony with the trees but only very slowly due to its weight. The stainless steel has a sandblasted surface and will therefore not act as a mirror, but will nevertheless reflect the colours and surrounding light, thus absorbing the unique character of the site throughout the day and also through the seasons of the year.

Details

Environment:	marine
Grade/surface:	sandblasted
Date of completion:	2015
More information:	3rw.no



Symbiosis

Location: Turku, Finland

Artist: Stefan Lindfors

Because the coastal area environment is very aggressive the artist Stefan Lindfors selected Outokumpu Supra 316/4401 for the stainless steel material for his artwork "Symbiosis", located by the River Aura in Turku, Finland.

Symbiosis was designed to reflect the unique elements of the Archipelago Sea - a fish, a bird and sea in symbiosis. The sculpture was revealed on 03 June 2014.

The sculpture was built out of stainless steel sheets produced by Outokumpu and which will eventually be paid for by public donations. It symbolizes the need to protect the archipelago. Funds collected from this work will be directed to water protection projects via the Protection Fund for the Archipelago Sea. So far more than 1000 people have bought steel sheets and total donations have reached Euro 100,000.

Details

Environment:	marine
Grade/surface:	Outokumpu Supra 316
Date of completion:	2014
Manufacturing company and material supplier:	outokumpu.com
More information:	outokumpu.com





Reflect (9/11 Memorial)

Location: Rosemead, USA

Artist: Heath Satow

This moving sculpture, designed by Heath Satow denotes a pair of hands holding up an I-beam which was salvaged from the World Trade Center after it had collapsed on 11 September 2001. The sculpture is composed of 2,976 individual pieces formed into stylized bird silhouettes, each of which represents a life which was lost in the terrorist attack. For added corrosion resistance in the coastal city environment of New York, the designer specified 316 stainless steel.

Details

Environment:	urban
Grade/surface:	316/polished
Date of completion:	2011
More information:	publicsculpture.com



Photo courtesy of Heath Satow



“Venus Rising”

Location: Brisbane, Australia

Artist: Ross Wolfgang Buttress

This sculpture is entitled Venus Rising and was designed by the public space artist Wolfgang Buttress, who took his inspiration from the Fibonacci Spiral as well as the intersecting spines of a Nautilus Shell. The structure stands 23 metres high and is located in the Stainless Steel Sculpture Park at Kangaroo Point Park, overlooking the river in Brisbane.

Venus Rising features 10,790 individual welds and more than 7 km of grade 316 and 2205 duplex stainless steel tube, pipe and round bar supplied by the ASSDA Sponsor, Sandvik.

Having worked with stainless steel for over 25 years, the artist said that the material provides strength, and combines an ability to look good over time with minimal maintenance, and has the flexibility of finishes which works well both practically and aesthetically. The variety of finishes which can be achieved with stainless steel through polishing, glass blasting and heat treatment is great. The material needs to be strong, resilient and look as good in 50 years as it does on installation.

Details

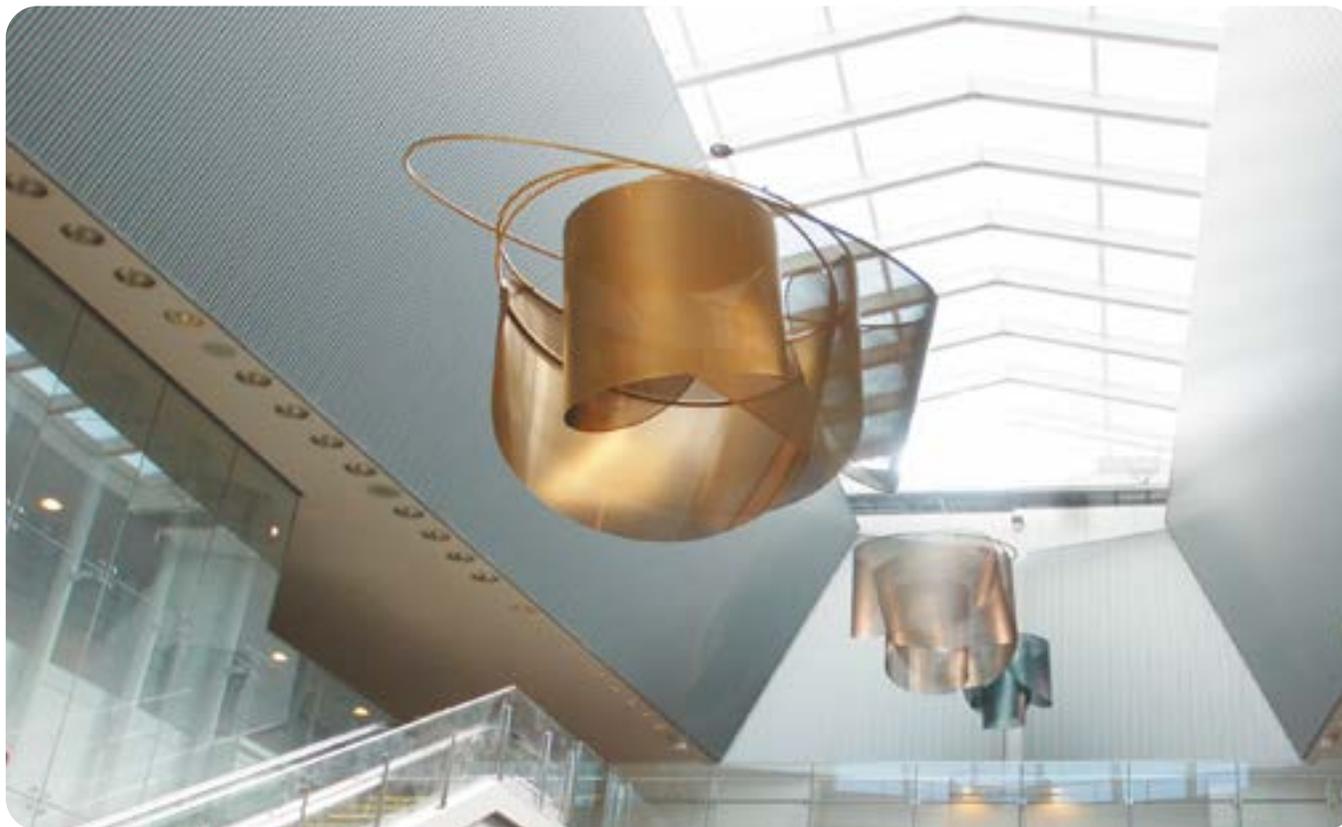
Environment:	marine
Grade/surface:	316 and 2205 duplex stainless steel tube, pipe and round bar
Date of completion:	2012
Manufacturing company and material supplier:	Sandvik
More information:	assda.asn.au



The Seasonal Flowers

Location: Tokyo, Japan
Artists: Naoya Sakagami and Art Associates Yat

The Seasonal Flowers (Toki-no-hana) are sculptures made from 400-micron 304 stainless steel sheets and are displayed in the South Wing of Terminal 1 of Tokyo International Airport to represent Japanese beauty. The work consists of three flowers signifying “crescent moon” “half moon” and “full moon” respectively as well as dancing flower petals imbedded in the glass siding. The unique Japanese beauty that attaches high values to such natural elements as flowers, birds, wind and moon is expressed with etched and colored sheets of stainless steel, a material commonly used in modern urban space and everyday life. This work is a result of a collaboration between artists and a number of steel engineers who have made full use of their technical capabilities. Their efforts have not only succeeded in bringing out the high quality of stainless steel, but also broadened the horizon of its designability. As the work is displayed in Tokyo International Airport for good exposure to a wide spectrum of people, it serves to elevate the image of stainless steel both at home and abroad.



Details

Environment:	indoor	Date of completion:	2006
Grade:	SUS304	Manufacturing company:	Sanwa Tajima
Surface:	BA and spattering (inside), BA half etching	Material supplier:	nisshin-steel.co.jp
		More information:	nisshin-steel.co.jp

and spattering (outside)



Vases des Jardin des Tuileries

Location: Paris, France
Architects: Juan Garaizábal

Born in Madrid in 1971, Juan Garaizábal is a conceptual artist best known internationally for his monumental public sculptures. His "Urban Memories" recuperate lost architectural elements by means of sculpture and light.

One of the most recent works is "Vases des Jardin des Tuileries", his interpretation of the vases that once stood in the garden of Tuileries Palace in Paris, made of stainless steel and wood or brick. This project consists on the temporary recreation of the Palais des Tuileries, a royal palace in Paris which stood on the right bank of the River Seine until 1871, when it was destroyed by fire in the upheaval during the suppression of the Paris Commune. It closed off the western end of the Louvre courtyard, which has remained open since the destruction of the palace.

Source: cedinox.es

Picture courtesy of juangaraizabal.es

Details

Environment:	urban
Manufacturing company and material supplier:	acerinox.com
More information:	cedinox.es

Len Lye Museum

Location: New Plymouth, New Zealand

Architects: Patterson Architects

A strikingly different use of stainless steel in architectural applications can be found in the city of New Plymouth, New Zealand, where the award winning Len Lye Center is to be found at the Govett-Brewster Art Gallery. This inspirational building has a mirror-like façade manufactured from approximately 32 metric tons of austenitic 316L stainless steel sheets, beautifully polished to a No. 8 finish, which have been hung in vertical inter-locking panels which exhibit an apparently seamless appearance while reflecting the images of the immediate surrounds. The effect is stunningly beautiful and has already made the building an attraction for visitors to the city. The building was designed by Patterson Architects, who used stainless steel because it had been a medium for a number of Len Lye's sculptures over many years. The highly alloyed grade 316L, containing nickel, chrome and molybdenum is particularly well suited for external façades of buildings in coastal environments because of its robust resistance to corrosion.

Details

Environment:	Marine
Grade/surface:	316L/No. 8 Finish
Date of completion:	2013
Manufacturing company and material supplier:	Steel&Tube Stainless
More information:	nzssda.org.nz



Pictures courtesy of Patterson Architects



Musée des Confluences

Location: Lyon, France

Architects: Ross Wolfgang Buttress

The Musée des Confluences is a Science Centre and Anthropology Museum which was opened in Lyon in 2014. It is a stunning example of the beauty and agility of a combination of stainless steel and glass in architecture. This iconic building was designed by the Austrian architects, Coop Himmelb(l)au. The structure used 600 tons of 316L stainless steel which was supplied by SMAC and Aperam and micro-bead blasted by The Design Factory in Germany creating a uniform satin effect that offers a particularly contemporary look. Over 17,000 stainless steel tiles in 37 different forms cover the 20,000 m² area, including the underside of the building and the interior of the lobby and corridors. Beauty and agility at work, this combination of cladding, along with the stark shape of the building gives Musée des Confluences its unique appearance that is accentuated under the light, creating the impression of a solid behemoth or a soft cloud.

Details

Environment:	Urban
Fabrication process:	Slitting
Grade/surface:	EN1.4404 (316L)/2B
Main thickness or diameter:	3mm
Date of completion:	2012
Manufacturing company and material supplier:	Design Factory (Germany) - SMAC (France) - Aperam Stainless Europe
More information:	aperam.com





Saint Maria Maggiore Cathedral

Location: Tokyo, Japan

Architect: Kenzo Tange

The Tokyo Cathedral was designed in 1964 by Kenzo Tange, the famous architect. For the latest renovation project, ferritic stainless steel with a very high corrosion resistance was selected for the exterior walls. The material was supplied by Nippon Metal Industry.

The design with stainless steel will not fade over the years and the structure will remain attractive, contributing to the society and its culture.

The use of the ferritic grade in this historically important building will help elevate the image of stainless steel and raise the possibility of demand expansion for ferritic grades in large structures.

Details

Environment:	urban
Grade:	SUS445J1
Manufacturing company and material supplier:	Nippon Metal Industry
More information:	jssa.gr.jp





De Beers Ginza Building

Location: Tokyo, Japan

Architects: Jun Mitsui & Associates Architects

Located in the fashionable Ginza area of Tokyo, this building, designed by the architects Jun Mitsui and Associates was inspired by the twisting form of light in motion, which is reflected by the interesting use of five rows of 1000 mm wide 316L stainless steel panels with a very special polished finish.

Details

Environment:	marine urban
Grade/surface:	SUS316
Manufacturing company and material supplier:	nisshin-steel.co.jp
More information:	nisshin-steel.co.jp



α MATRIX Building

Location: Tokyo, Japan

Architects: A.A.E./Taketo Shimohigochi

This building is located in the Ginza district of Tokyo. It has a wall featuring a number of circular holes punched into thick sheets of mirror-finished stainless steel, giving the building a very distinctive appearance. Images reflected on the stainless steel sheets show the interaction of the people moving in the area and between nearby buildings and streets. This project has contributed to improving the image of stainless steel for its aesthetic features.

Details

Environment:	marine urban
Grade:	SUS304
Surface:	mirror finish
Date of completion:	2008
More information:	jssa.gr.jp



A Walk to Remember

Location: Newcastle, Australia

Architects: EJE Architecture

Combining the breath-taking natural beauty of Australia's eastern coastline with the timeless beauty of stainless steel, a new walkway has been constructed around the cliffs of Newcastle, linking Strzelecki Lookout and Bar Beach. Named the Newcastle Memorial Walk to commemorate the Anzac Centenary, the walkway was opened on 24 April 2015. With a total length of 450 meters, and built at a cost of \$4.5 million, the project was designed by EJE Architecture and built by Waeger Construction, with engineering by Northrop Engineers. As the design life was required to be not less than 70 years, austenitic grade 316L was selected for its proven strength, corrosion resistance and durability. The construction required 64 metric tons of stainless steel in the forms of hollow sections, bridge section frames, round bars and tubes for handrails. The pre-construction fabrication work of the bridge was done by SGM Construction and Fabrication and it was delivered in 8 single span sections 20 meters in length. Seven Y shaped precast concrete pylon, up to 8.8 meters high and 3.4 meters wide, support the bridge sections. The handrails and vertical balustrades were electro-polished by Australian Pickling and Passivation Service. Newcastle's beaches receive more than

2 million visitors every year and the Newcastle Memorial Walk has already positioned itself as a major tourist attraction. But one should never forget that it also stands as a fitting monument to all Australian and New Zealand service men and women who served and died in all wars, conflicts, and peacekeeping operations and to the contribution and suffering of all those who have served. (Story provided by Richard Matheson and Lissel Port of ASSDA)

Details

Environment:	marine
Grade/surface:	316L
Main thickness or diameter:	2 mm
Date of completion:	2015
Manufacturing company and material supplier:	Waeger Construction, Atlas Steels
More information:	assda.asn.au



Picture courtesy of Thomas Bryce



Daycare with 3D Facade

Location: Essen, Germany
Architects: JSWD Architekten and Chaix&Morel et Associés

The headquarters of ThyssenKrupp AG in Essen, Germany, include a kindergarten building. The architects were a consortium of JSWD Architekten, Cologne, and Chaix & Morel et Associés, Paris. They designed a stainless steel façade using 316L material, perforated and polished to 240 gritwidth which gives a soft matte appearance.

The design involved a hydro-mechanical forming process that had not previously been used in building and construction, with a three-dimensional surface pattern, computer-generated to the architects' specifications, transferred to the stainless steel sheets using oil pressure within a closed system. This alternative to deep-drawing uses a single faced tool and is more cost-efficient even in a smaller project. The panels are 650 mm by 1,300 mm. The façade has four areas arranged so that the overlapping parts fit snugly, resulting in a homogeneously undulating surface. The stiffening effect of the pattern made it possible to use very thin sheets, thus reducing weight and cost. Stainless steel is particularly suitable for this process because it eliminates deep-drawing marks on the visible face. The technique, which

can be used for sheets of up to 4,000 mm x 2,000 mm, won the first prize in the 2015 Steel Innovation Award by the German Steel Federation.

Details

Environment:	urban
Fabrication process:	proprietary hydro-mechanical forming technique
Grade/Surface:	316L, perforated, polished grit 240
Main thickness or diameter:	1 mm
Date of completion:	2014
Manufacturing company and material supplier:	Fielitz GmbH Leichtbauelemente, ThyssenKrupp Materials Services
More information:	stahl-online.de



Dalarna Media Library

Location: Falun, Sweden

Architects: Adept aps and Sou Fujimoto Architects

Advisors: TOPOTEK1, Ramboli A/S and Bosch and Fjord

The new library at Dalarna University is now open to the public. The building was designed by the architectural firm ADEPT and re-interprets the library in a multi-functional design and is laid out as a 3000 square metre 'spiral of knowledge' that naturally integrates into the surrounding landscape at the Campus in Falun, Sweden. The characteristic double facade with reflecting horizontal lamellae (very thin, plate-like structures) fronting a wooden cladding was developed in collaboration with the Danish artist Jeppe Hein. Instead of creating an isolated piece of art work the artist and ADEPT have developed the façade into a detailed and refined expression that mirrors its surroundings and the people in it with interrupted reflections. The lamellae were made from highly polished stainless steel and their wooden bac is a Siberian larch.

Details

Environment:	urban
Date of completion:	2014
Grade:	EN 1.4301 (AISI 304)
Surface:	superbright polished
Material supplier:	outokumpu.com
More information:	outokumpu.com





Datacube

Location: Münchenstein,
Switzerland

Architects: ffbk Architects

The data stronghold is situated in the vicinity of an industrial area near the Swiss town of Basel. By today's standards the Quickline datacenter is the most advanced data storage center in Switzerland. Offering redundant infrastructure as well as multi-level security systems the cube can also show off with its exemplary energy efficiency. The highest demands on data storage per sqm, environmental protection and security have been met throughout the construction while keeping up with architectural demands. Offering 10 kilowatt per square meter the project has been awarded a development scheme by the federal office for energy.

The concept of reflection as the metaphor of data reflecting our society's cultural change has led to a mirroring façade, preventing all intrusive views from the outside world.

Designed by ffbk architects, the monolith reflects the immediate surroundings and the sky on its stainless steel cladding. The statement of this compact building seems quite abstract in this rural neighbourhood.

The cladding of the server plant is made of trapezoidal stainless sheets. The rhythmic

sequence of perforated sheets altering with plain sheets breaks up the reflection; the resulting vertical stripes enliven the bold volume with its otherwise simple structures without giving away the building's function.

Details

Environment:	urban
Date of completion:	2014
More information:	ffbk.ch



Picture courtesy of © Johannes Marburg Photography Geneva, Switzerland

New Street Station

Location: Birmingham, UK

Architects: AZPML

Highly polished 316 stainless steel gives a new look for the New Street Station in Birmingham, England. More than 8 000 bright polished, laser-cut panels of stainless steel, totalling 20 000 square meters, will form the façade of the station. Outokumpu has supplied approximately 400 tons of stainless steel for this cladding, which demonstrates how effectively stainless steel can be used to decorate standard utility buildings.

Details

Environment:	urban
Grade/surface:	316/bright polished
Date of completion:	2015
Manufacturing company and material supplier:	outokumpu.com
More information:	outokumpu.com



Picture courtesy of Network Rail

Fuji Swimming Pools

Location: Shizuoka Prefecture,
Japan

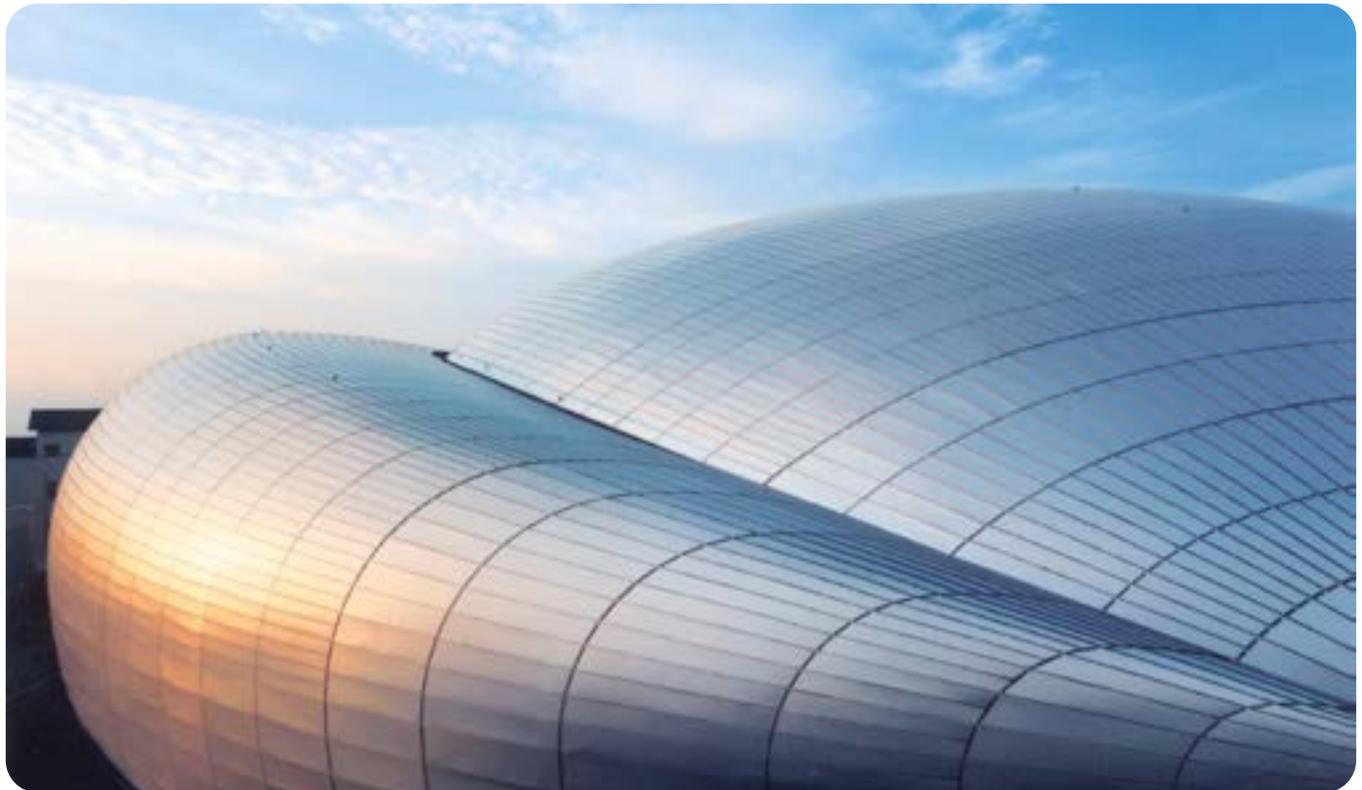
Architects: Showa Sekkei

The Shizuoka Prefectural Swimming Pool was planned as the main venue for the National Sports Festival in 2003. The enclosing structure was designed by the architects Show Sekkei and was clad in grade 220M stainless steel produced by NSSC. By applying a wooden deck outside and on the whole surface of one side of the pool, it became an open amenity space that is not seen in conventional facilities. The facilities are open to local residents as well as for use by sports teams. For the exterior dull finished stainless steel was used, giving the appearance of a drop of water from Fuji. The base part expressed the nature and strength of Fuji.

This facility becomes 'the poetry' that local people remember forever, we hope that this center can be used to develop young talents which will one day succeed in the world's events.

Details

Environment:	urban
Grade/surface:	NSSC220M
Date of completion:	2011
Manufacturing company and material supplier:	nssc.nssmc.com
More information:	nssc.nssmc.com



Monuments featuring soccer-ball-shaped water-receiving tanks

Location: Gifu University, Japan
Architect: Nobuo Matsuhisa

These Award winning tanks were fabricated from 304 and 316 stainless steel to hold and distribute water, while giving the outward appearance of giant football sculptures.

They were built on the premises of a national university as an example of artistic and practical applications, in harmony with the surrounding environment.

Details

Environment:	urban
Grade/surface:	SUS304, SUS 316
Fabricator:	morimatsu.jp
More information:	jssa.gr.jp





Roof of the Ritz-Carlton Hotel

Location: Kyoto, Japan

The Ritz-Carlton Hotel in Kyoto is located near the Nijo-Ohashi Bridge and creates an extremely refined atmosphere where modernity and tradition fuse.

Kyoto, with 17 World Heritage sites, has strict landscape ordinances regulating the height and design of buildings. Against this background, the roof of the hotel is patterned according to Japan's traditional building technique of Sukiya-construction and the ferritic SUS445J2 sand-blasted stainless steel provides a "matt-looking finish". The rectilinear roof and eaves with horizontally-laid panels blend nicely in the landscape facing thirty mountains of Higashiyama, harmonizing with the townscape of Kyoto and are well appreciated by hotel guests and strollers.

The parties concerned worked and succeeded in sandblasting the ferritic roofing stainless steel of 0.4 mm in thickness, which had been previously deemed difficult, meeting the requirements of various parties including the owner, designer and builder. The parties have contributed in providing the Hotel with flavors of genuine Japanese architecture to match the city of Kyoto.

Details

Environment:	urban
Grade/surface:	SUS445J2
Manufacturing company and material supplier:	nisshin-steel.co.jp
More information:	nisshin-steel.co.jp



Dream Downtown Hotel

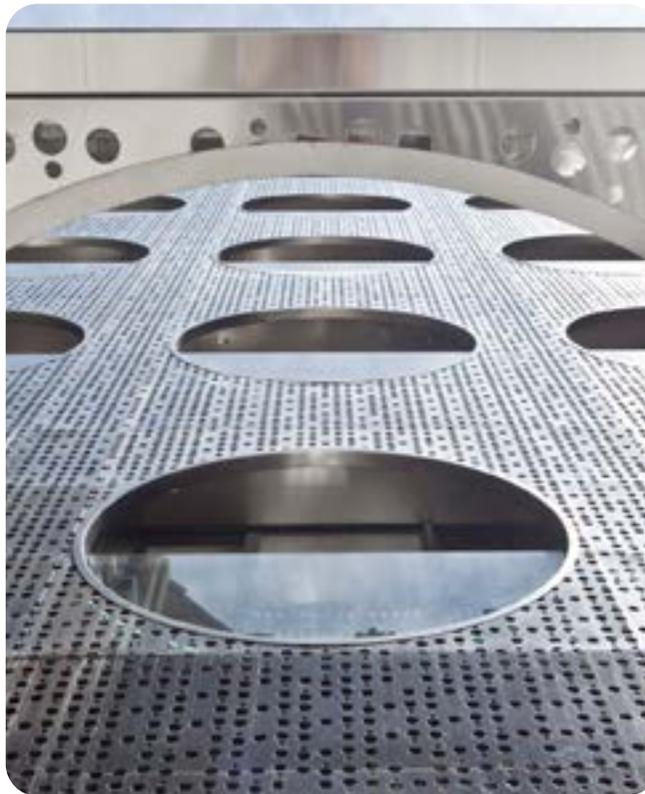
Location: New York, USA
Architects: Frank Fusaro, AIA,
 Partner, Handel Architects

Dream Downtown Hotel is a 184,000 SF boutique hotel in the Chelsea neighbourhood of New York City. The 12-story building includes 316 guestrooms, two restaurants, rooftop and VIP lounges, outdoor pool and pool bar, a gym, event space, and ground floor retail.

The "otherness" of Ledner's 1966 design for the National Maritime Annex was critical to preserve. Along the 17th Street exposure, the sloped façade was clad in stainless steel tiles, which were placed in a running bond pattern like the original mosaic tiles of Ledner's Union building. New porthole windows were added, one of the same dimension as the original and one half the size, loosening the rigid grid of the previous design, while creating a new façade of controlled chaos and verve. The tiles reflect the sky, sun, and moon, and when the light hits the façade perfectly, the stainless steel disintegrates and the circular windows appear to float like bubbles. The orthogonal panels fold at the corners, continuing the slope and generating a contrasting effect to the window pattern of the north façade.

The 16th Street side of the building, previously a blank façade when the building served as an

annex, was given new life. The skin is constructed of two perforated stainless steel layers, its top sheet of holes a replication of the 17th Street punched-window design and the inner sheet a regular perforation pattern. The outer rain screen is punctured with porthole-shaped Juliet balconies for the guestrooms and peels up at the ground level to form the hotel canopy and reveal the hotel entrance.



Details

Environment:	urban
Date of completion:	2011
Manufacturer:	azahner.com
More information:	handelarchitects.com

The Tiger Enclosure

Location: London, UK

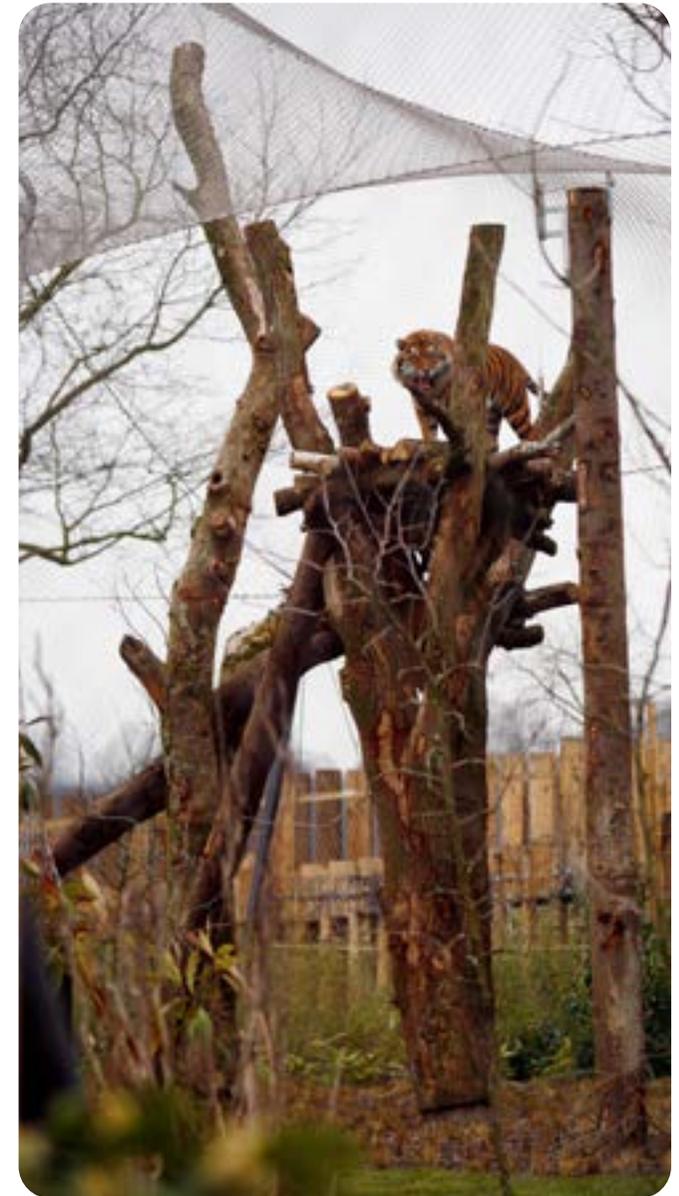
Structural Engineers: David Dexter Associates

The new compound of the Sumatran Tigers of the London Zoo was designed with the help of conservationists and experts to ensure that it meets the needs of these magnificent creatures. One of the most important requirements was for the roof of the 2500 square metre enclosure to be transparent, so that the tigers may be viewed from all aspects. Tigers in the wild like to observe their terrain from a high vantage point. Working with engineers and specialist subcontractors, the design team has been able to realise a concept incorporating a ground-breaking, transparent roof made from woven 316 stainless steel mesh, which combines high strength with lightweight. The roof reaches 17 meters in places in order to accommodate the tall trees and feeding poles and is set at a height to encourage natural climbing behaviour.

Sourced from the [MolyReview](#)

Details

Environment:	urban
Year of completion:	2013
Grade:	Type 316
Material thickness:	3 mm
More information:	imoa.info



Rundle Mall Redevelopment

Location: Adelaide, Australia

Architects: Hassel Architects

A modern and innovative design using coloured and textured stainless steel has left an impressive statement on an Adelaide streetscape.

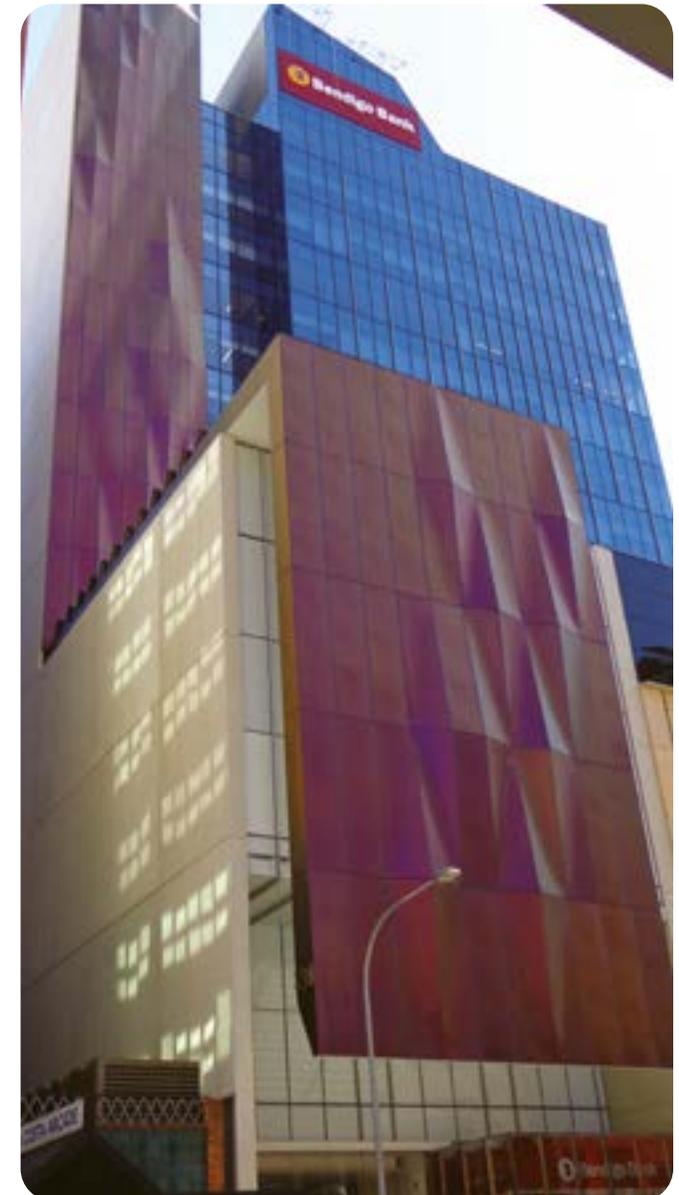
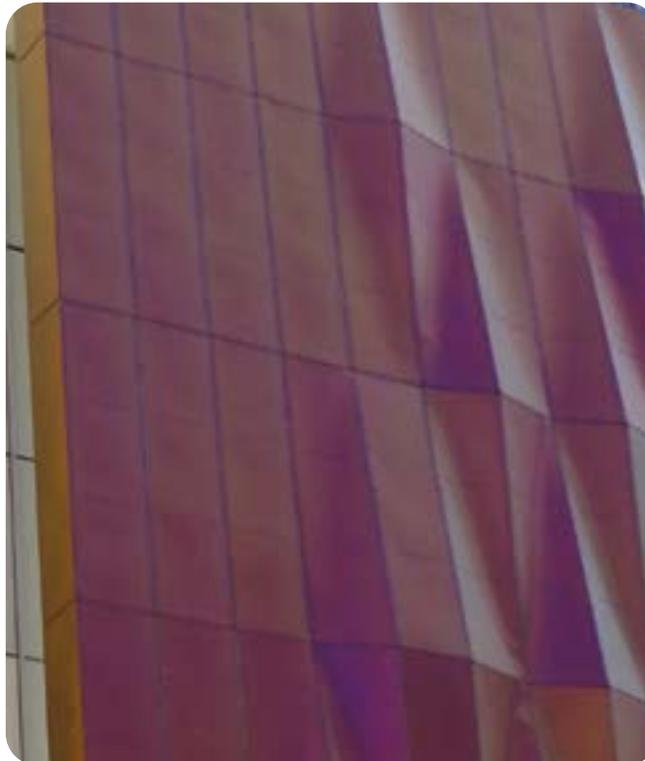
South Australia's premier shopping district Rundle Mall underwent a full makeover from 2012-2014 as part of the Adelaide City Council's initiative to revitalise the precinct.

Stainless steel was specified for this design as its inherent properties allowed for the level of manipulation required to construct the architect's creative expression, as well as provide a high quality and aesthetically pleasing finish.

The visually striking building façade integrates impressively into the Rundle Place precinct, and the outcome has resulted in a virtually maintenance-free and colour enduring structure.

Details

Environment:	urban
Grade/surface:	304 coloured stainless steel
Date of completion:	2014
Manufacturing company and material supplier:	steelcolor.com.au
More information:	assda.asn.au



Open Sky Shopping Center

Location: Metz, France

Architects: Gianni Ranaulo Design

To enhance the effect of this re-designed row of shop windows, the architect, Gianni Ranaulo Design used mirror-finished stainless steel (Uginox Bright) to completely cover the structure. The stainless steel finish covers the entire building extending from the two internal and external façades through to the broad canopy that covers the route followed by visitors. The design was created in the form of a vast, radiant and flowing wave forming a boundary that stretches for the entire length. To attach the variable wave cawling, a special cladding system was developed using large honeycomb panels covered with bright annealed stainless steel. Spliced together without visible joints, these panels are each around 6 metres long and 1.5 metres wide, creating a continuous and flowing reflective surface. The façade was fabricated by Compagnie de Phalsbourg, using stainless steel produced by Aperam.

Details

Environment:	urban
Grade/surface:	AISI 304 (EN 1.4301)/ Uginox Bright
Date of completion:	2014
Manufacturing company and material supplier:	Campagne de Phalsbourg, Aperam
More information:	uginox.com





Wrap House

Location: Surrey, UK

Architects: Edgley Design

This project involved the renovation of a 1960s house which had fallen into disrepair. The interior was re-designed, the house was extended and re-insulated, and parts of its exterior were clad with reflective polished 316L stainless steel, contrasted with dark zinc fascias. The resultant design creates a strong connection with the beautiful countryside.

The material selection forms a colourful, shimmering envelope, constantly changes and reflecting the seasonal and daily changing colours and tones of the environment to create a dynamic façade. The material was also selected for its durability and recyclability, with a potential recovery rate of 100%, emphasising the sustainable ethos of the project.. Large expanses of glass and a promenading corridor were inserted to the garden elevation to internally improve the connection to the landscape.

The stainless steel clad forms were designed to make optimal use of a standard stainless steel coil width. The vertical strips were intentionally installed with an 'oil-canning' effect to prevent mirror-like reflections and to abstract the colours of the landscape. This design feature also considered the long-term maintenance of the building ensuring that accidental damage would not have an adverse impact on the aesthetic of the building.



Details

Environment:	rural
Grade/surface:	316L (EN 1.4404)/ Uginox Mat
Main thickness or diameter:	0.5 mm
Date of completion:	2014
Manufacturing company and material supplier:	Boss Metals Limited, Aperam
More information:	aperam.com





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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). The association has 56 members from all over the world and currently represents approximately 90% of the total production of 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.

Contact us

issf@issf.org

+32 2 702 89 00

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