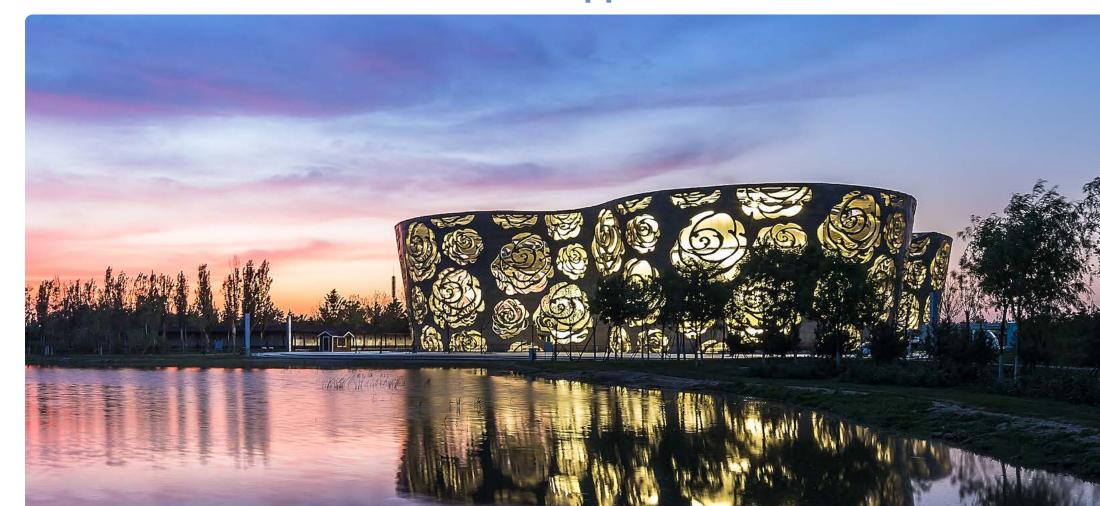


Stainless Steel in Architectural Applications





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Introduction



JOHN ROWE Secretary-General

A little over 100 years since stainless steel was first commercialised, and following the first 80 to 90 years of its development, in which the primary focus was on marketing its corrosion resistant and hygienic properties as well as its usefulness in industrial and chemical

plants and automotive applications, it is pleasingly appropriate to note the distinct emergence of a new specialist application for stainless steel, especially in the past 20 years. That new application is architecture.

Although stainless steel was used for the roof of the Chrysler Building in 1930, and to fully clad the Socony-Mobil Building (also in New York) in 1956, it is really only since the 1990s that it has positioned itself as a material of choice for landmark architectural designs and attracted the attention of the international superstars of architecture.

The International Stainless Steel Forum has seized this new development opportunity with pleasure. The broad spectrum of aesthetically pleasing designs that are made possible by the specification of suitable grades of stainless steel, coupled with the higher strength and corrosion resistance which the material gives to structural engineers, have resulted in an international poster board of wonderful new buildings that themselves advertise the potential of this most diverse material.

In addition to new buildings, there is a virtual cornucopia of stainless steel examples in street furniture, sculptures and statues.

This is the third in a series of "Stainless Steel in Architectural Applications" brochures which the ISSF has produced and which showcase examples from around the world. We hope it will provide further inspiration to an already fast growing market.

John Rowe Secretary-General International Stainless Steel Forum Brussels

Aeolus

Canary Wharf, London, United Kingdom

Aeolus was the ruler of the four winds in Greek mythology. The sculpture Aeolus is a giant stringed musical instrument, an acoustic and optical pavilion designed to make the silent shifting patterns of the wind audible and to visually amplify the ever changing sky. The sculpture is a giant aeolian harp. Vibrations in strings attached to some of the tubes are transferred through skins covering the tops, and projected down through the tubes towards the listener standing beneath the arch. Aeolus sonifies the three dimensional landscape

of wind, using a web of aeolian harp strings, almost like cats' whiskers sensitive to the

slightest touch. The strings register the shifting

by visitors. The aim is for the public to be able to

Those tubes without strings attached, are tuned to an aeolian scale and hum at a series of low frequencies even when there is no wind.

sound around them.

Environment: Outdoor

Material: Stainless steel Artist: Luke Jerram

Date of completion: 2016

Credit: the image Aeolus –

Acoustic Wind Pavilion by

Luke Jerram

More information: lukejerram.com







Beijing Boulder Art

World Art Sculpture Park, China

This amazing piece was created by the Beijing Sino Sculpture Group and features a stainless steel panel 25 metres long and six metres high, beautifully polished to a mirror finish. It looks for all the world as though a magic boulder has been split in half, apparently revealing a magnificent jewel within. This piece has been placed in the private garden of Corporate Structure – like something out of The Living Desert, the first of two movies made by Disney, featuring only flora and fauna, with no people or animations. It was the precursor of the great series subsequently created for the BBC by Sir David Attenborough, although, of course, Attenborough included people in his feature films.

Environment: Outdoor

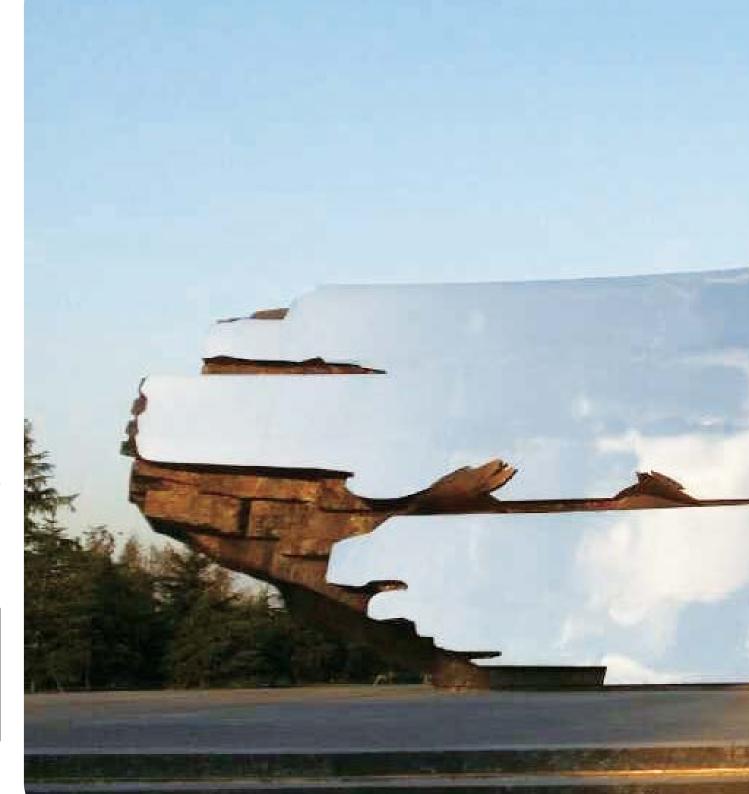
Material: 304 stainless steel

Artists: Beijing Sino Sculpture Group

Photographs: Beijing Sino Sculpture

Landscape Engineering

More information: sinosculpture.com





Dance of the Emerging Fountain

Paris, France

The fountain was created in 2000 by the French-Chinese artist Chen Zhen for the new neighbourhood that was being developed near the modern National Library. The snake-like dragon rises out of a wall and dives into the ground towards the Seine river.

The fountain has three parts. The first part depicts the dragon snaking out of the wall of the water-supply plant and tunneling underground. Constructed of stainless steel, glass and plastic, the dragon's transparent skin shows the water flowing within.

Environment: Urban

Materials: Stainless Steel, glass and

plastic

Artist: Chen Zhen
Photograph: Yacine Majidate

More information: espritdeparis.wordpress.com





Darwen Spitfire Memorial

Darwen, United Kingdom

Darwen was the smallest town in the UK to finance a spitfire during WWII, and the Spitfire memorial will be a lasting reminder of the Town's contribution to the War Effort. The sculpture has taken two years to complete; at a cost of £175k and was funded, manufactured and donated by the WEC Group to the people of Darwen. This donation is to recognise and remember the contribution the people of Darwen made when they managed to raise the cost to purchase a spitfire for use in the R.A.F.

The 3:1 ratio stainless steel sculpture, has a wing span of 3.8 metres, stands 6.9 metres high and was hand crafted by WEC Group's apprentices.

Environment: Urban

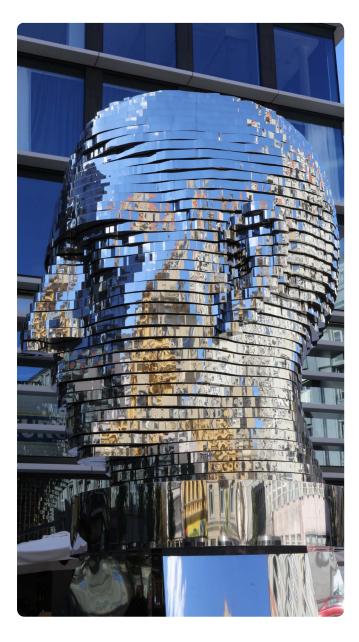
Grade: Stand: AISI 2205;

Sculpture: AISI 316

Finish: Dull polish 2
Photograph: m-tec.uk.com
More information: wec-group.com







Kafka

Prague, Czech Republic

Located in a busy shopping center in Prague, this twisting and reflective sculpture depicting the head of writer Franz Kafka is the latest kinetic artwork by controversial Czech artist David Černý. Installed in 2014, the enormous mirrored bust is comprised of 42 independently driven layers of stainless steel and weighs in at some 45 tons. The pieces move in complete synchrony to form and dissolve the author's face, creating an ever-influx 'metal-morphosis.' A closer look at the bust reveals Kafka's famous mid-parted hairstyle and sharp features.

The piece brilliantly reveals Kafka's tortured personality and unrelenting self doubt that plagued him his entire life.

Environment: Urban

Material: Stainless steel sheet

Finish: Mirror finish Artist: David Černý

Date of completion: 2014
Video: youtu.be
More information: quadrio.cz









Naoshima Pavilion

Kagawa, Japan

On the port side of Naoshima, renowned as an island of art and architecture, the artist designed a small public space where local residents and tourists can relax. It was anticipated that it would function as a community space and also a new landmark. The town of Naoshima which previously consisted of 27 islands, decided to create one more, the 28th island. The space is softly enveloped in a white metal mesh structure which resembles an irregular stone, floating like an island on the ground. Inside, the space also has an irregular topography, allowing people to find a place where they feel comfortable and sit down. The interior, cloaked in the translucent mesh, creates the sensation of a soft white spatial membrane, only allowing the wind, sounds, and smells of the port in. It is an inverted island and a new form of space that is different from rigid architectural spaces made with conventional floors, walls, and ceilings. While our sense of vision is diminished, our sense of hearing, touch and smell are enhanced, allowing us to experience the place with all of our senses. Though small, this is an ambitious work designed to provide a new architectural experience.

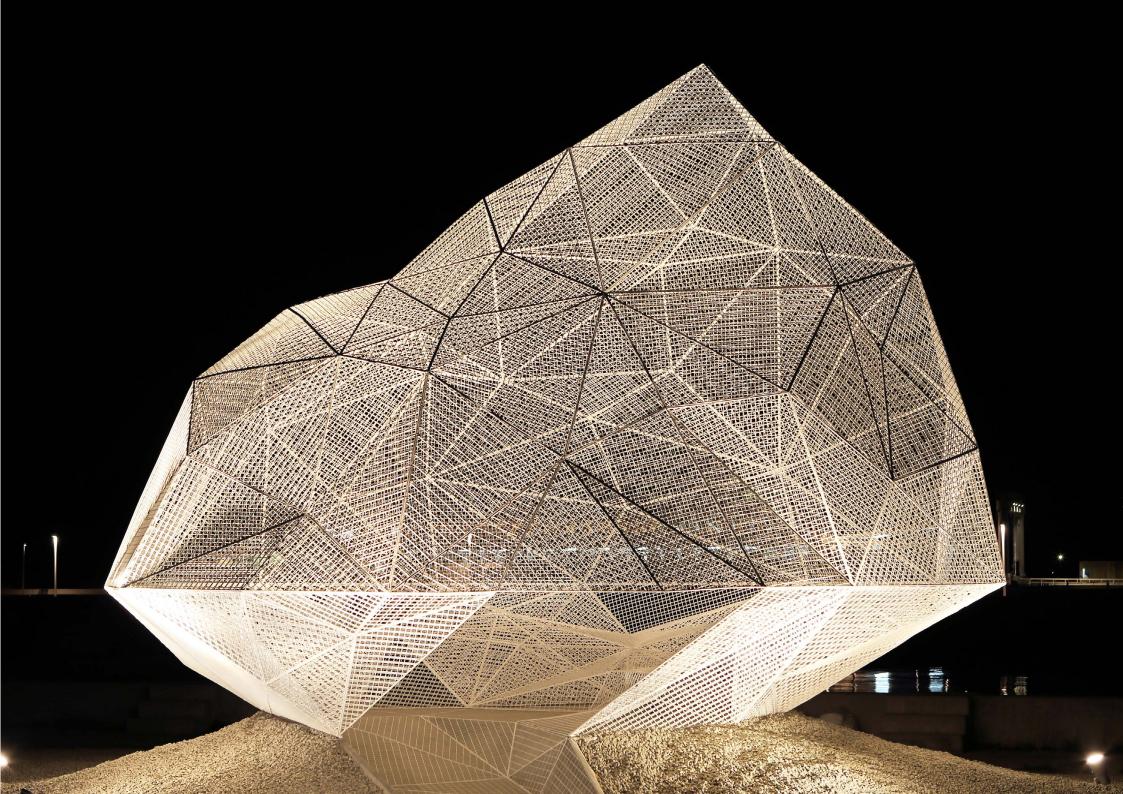
Environment: Marine

Marine

Material: White stainless steel mesh Architects: Sou Fujimoto Architects

Photograph: Jin Fokuda

More information: sou-fujimoto.net



The Seed Sculpture

Manchester, United Kingdom

The Seed Sculpture was a joint project between artist Colin Spofforth of Brimstone Artworks and m-tec. The 12.5 metre sculpture was fabricated from duplex stainless steel, laser cut, welded with a glass bead blast finish to the artists specification, to produce the sycamore leaf shaped sculpture. The sculpture provides a focal point in a new 450-acre urban business park, developed by Ask:Akeler Developments, located in East Manchester's Regeneration Zone. The the sculpture creates a bold and sophisticated centrepiece, which incorporates references to growth, development and regeneration. The overall feeling is one of organic creation, complemented by the use of contemporary man-made materials.

Environment: Urban

Material: Glass bead blasted duplex

stainless steel

Artist: Colin Spofforth
Photographs: m-tec.uk.com
More information: m-tec.uk.com





EDF Tower

Paris, France

Completed in April 2001, the EDF Tower is a 41-story, 24,414-square-foot office tower in La Défense, west of Paris. The architects Pei, Cobb, Freed & Partners designed the elliptical tower with a façade clad in alternating bands of stainless steel and lightly reflective glass panels. A special design feature is a conical shape carved into the building's base up to level 26.

Environment: Urban Grade: 316 Finish: Linen

Architects: Pei, Cobb, Freed & Partners

Manufacturing company and supplier:

outokumpu.com

More information: hines.com







Incheon Songdo Convention Center

Incheon, Korea

The Incheon Songdo District was built on landfill of offshore Songdo and will be developed as a state-of-the-art international city with selfsufficient city functions within the Incheon Free Economic Zone. A convention center in the international business complex in Incheon Songdo District is considered a major building, and is a landmark in the district. To fit the foregoing, the design of the convention center stands out too. The entire exterior, including the roof and walls, is made of stainless steel materials, so that it boasts a refined, splendid appearance. In cosideration of the characteristics of the coastal area, the exterior walls were designed with stainless steel materials, which are excellent in corrosion resistance. In addition, welded honeycomb panels were used to secure flatness.

Environment: Coastal
Material: STS 446M
Surface: Bead Blasted
Architects: Kohn Pedersen Fox

Associates PC

Photographs and text: posco.com More information: posco.com





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BUSINESS

Logistics Center

Tarragona, Spain

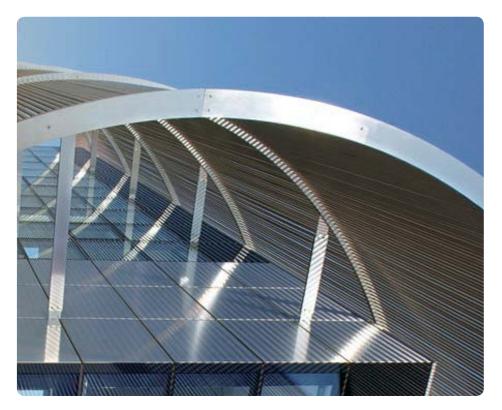
The required architecture for the logistics center had to express the importance of Acerinox in the sector and serve as a reference of the quality of the service and products. The function of the building goes beyond just a Logistics Center to be an element which reflects the philosophy of the company. This kind of industrial building is a special challenge because of the delicate balance between the storage needs and the willingness to innovate throughout architecture.

The project area was 26.184m² built storage. distribution and offices included. The constructive solutions of this project meet the criteria of industrial optimisation. The roof covers the two industrial units each by arches with skylights providing natural light to the units that helps with the air quality as well as with the climate control. The offices, sited at the stress point of the building, are intended to maintain the independence between both. Where both units are articulated, the façade gets interrupted by a porch around the offices in such way that though these are included under the same roofing they are also physically apart by means of a great stainless steel lattice, making reference to the stainless steel coils stored.

Outside stainless steel and glass have been combined, pushing the limits between

architecture and sculpture. The improvement of industrial architecture as mere functional architecture to a major quality one that through the combination in the use of different materials gets a final product that reflects the projection of the sector and future challenges of the Company that represents.

Environment: Industrial
Material: Stainless steel
Architect: vigumproject.com
Photographs: acerinox.com
More information: cedinox.es







National Graphene Institute

Manchester, United Kingdom

The new building for the National Graphene Institute at the University of Manchester was completed in 2015 and is a state of the art scientific and research facility. Its purpose is to commercialise the use of graphene. From the DesignScape™ collection of metal finishes, the façades to the 5-storey building are clad in Rimex's ColourTex® black mirror coloured stainless steel alongside glass to stunning effect as specified by Jestico + Whiles Architects. The black ColourTex® coloured material is 2mm thick and is 316 grade stainless steel that was perforated by Architectural Steel Ltd to detail formulae relevant to the graphene product. The liveliness of the product makes it a unique and dynamic material for stainless steel facades.

Environment: Urban Grade: 316

Surface: Rimex ColourTex® Architects: Jestico + Whiles More information: rimexmetals.com





POSCO PNS Tower

Seoul, Korea

Among the numerous high-rise buildings that symbolise Teheran-ro, the POSCO PNS Tower, located between Gangnam Station and Yeoksam Station in Seoul, is a building that shows its own individuality without harming the surrounding landscape. It presents an overall message of transparent management with wide skylights, while maintaining the image of iron, which symbolises Posteel Company Limited. The exterior walls of the building were treated with stainless steel louvers to evoke a clean, dynamic feeling, and the northeastern corner, which is exposed the most, is in the shape of a giant crystal formed with transparent reflective glass. The curtain wall system on the exterior wall of the building consists of glass, stainless steel open joint cladding, and stainless steel horizontal fins. The effect of a stainless steel exterior is well-expressed in general. Therefore, this can be said to be an instance where a modern, sophisticated building has been completed.

Environment: Urban
Grade: 316
Finish: Dull
Architects: POS-A.C
Constructor: ILJIN unisco
Photographs and text: posco.com
More information: posco.com





BUSINESS

The Aplix Factory

Le Cellier-sur-Loire, France

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A building set out in the landscape according to the strict geometric and syntactic rules of a crossword puzzle. Each square of the 20-metre grid takes up an industrial function or a part of a function like a square of the crossword takes a letter. These functions are crossed and woven with each other according to the production process, like the intersected letters form words. in the vertical and horizontal sense. A first and metaphorical reading finds in this image of woven functions an evident evocation of the principal trade of the Aplix Company: the production of self-gripping systems in all kind of widths and surfaces. A second reading, more conceptual and more contemporary, identifies a layout of very basic elements, able to grow in all directions and ways in a very aleatory way, though without changing the founding principle. Naturally, it is this uncertain and unexpected development of the building's architecture which interests us. In fact, a very radical use of notion of flexibility, set up as an esthetic principle, produces finally an undetermined architectural form. Actually, an industrial building prescribes, much more than any other construction program, that architecture adapts itself very quickly to transformation or extension process.

This wholly geometric conception of the factory



governed only by important, albeit imperative, functional requirements would stay sterile if it were not confronted with nature. Not gardens or parks, but the kind of nature that surrounds us every day, in the countryside as well as in the city. In fact, nature is everywhere, even inside the factory where rectangular gardens have been placed at the heart of this orthogonal geometry like black squares of within the crossword puzzle which organize the words around them. The factory's life does the same around the large patios full of light.

Environment: Rural

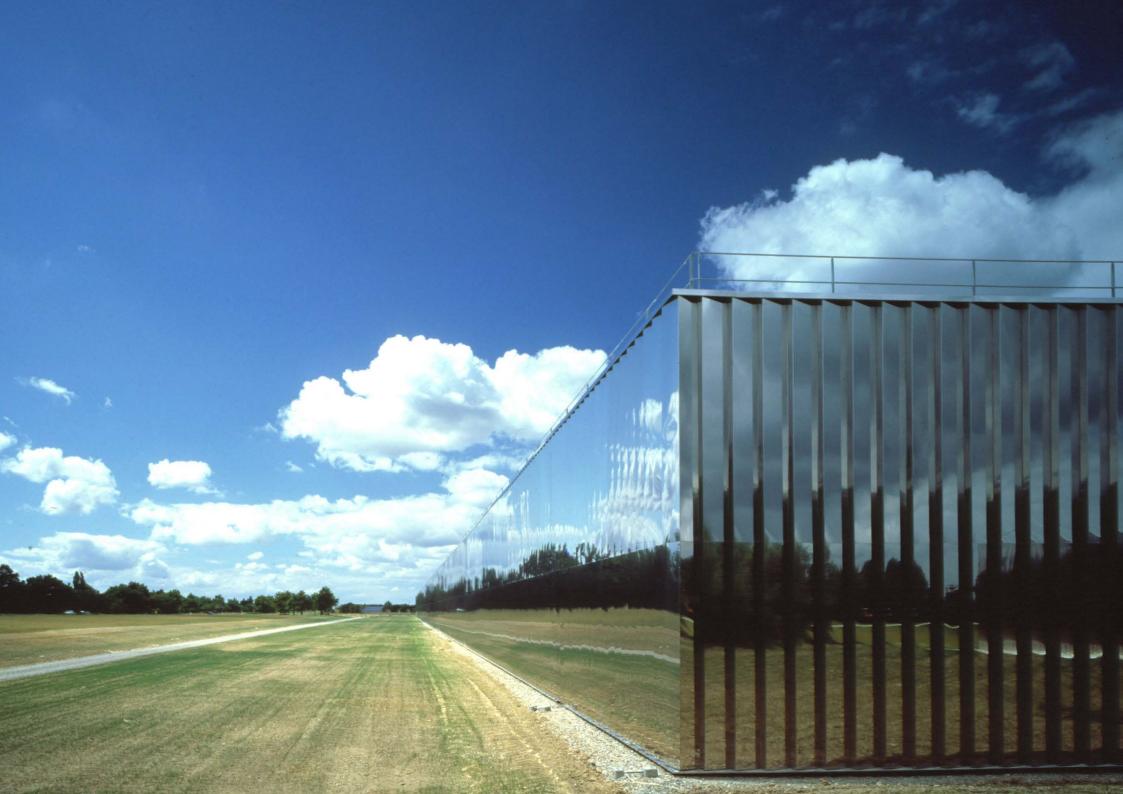
Material: Stainless steel

Architect: Dominique Perrault Architecte
Architectural engineering: Perrault Projects
Technical engineering: Boplan, Nantes

Photographs: André Morin and

Georges Fessy

More information: perraultarchitecture.fr



Contemporary Jewish Museum

San Francisco, USA

In 1994, the San Francisco Redevelopment Agency invited The Contemporary Jewish Museum to develop the historic Jessie Street Pacific Gas & Electric (PG&E) Power Substation, a 1907 landmark designed by architect Willis Polk. The museum selected architect Daniel Libeskind to design its new home, which was to be an adaptive reuse of the original substation. In his design Libeskind responded to The Museum's mission to be a lively center that fosters community among people of diverse backgrounds through shared experiences with the arts by focusing on the celebratory nature of the Jewish experience. The Museum's building embodies a number of symbolic references to Jewish concepts. Libeskind was notably inspired by the Hebrew phrase L'Chaim (To Life), because of its connection to the role the substation played in restoring energy to the city after the 1906 earthquake and the Museum's mission to be a lively center for engaging audiences with Jewish culture. To extend the old Jessie Street Power Substation beyond its original walls, Libeskind created a design based on the two Hebrew letters that spell the word life, the chet and the yud. From the outside, the extension is remarkable for its unique shape, as well as its skin: a vibrant blue consisting of over 3,000 luminous blue stainless steel panels, which change colour depending on the time of day, weather, or one's vantage point, creating a dynamic, "living" surface. Several theories abound about why blue was chosen, but Libeskind leaves it open to interpretation. Some think that blue was chosen because it connects to the idea of life, water as a life source, and is often a colour associated with Judaism. The blue colour is achieved through a procedure called interferencecoating. The stainless steel was treated with a chemical bath to create a blue colour that will not fade. This process involves shooting electricity through the stainless steel in a bath of a certain chemical mix, which causes the stainless steel to oxidize. Since there are no dyes or pigments to decay, the color will never fade. This building was the first to feature this unique cross-hatching surface finish, which helps to diffuse and soften the reflection of light off the blue stainless steel.

Environment: Marine-urban

Materials: Blue coloured stainless steel

Architect: Daniel Libeskind

More information: thecim.org





Geoje Culture and Arts Center

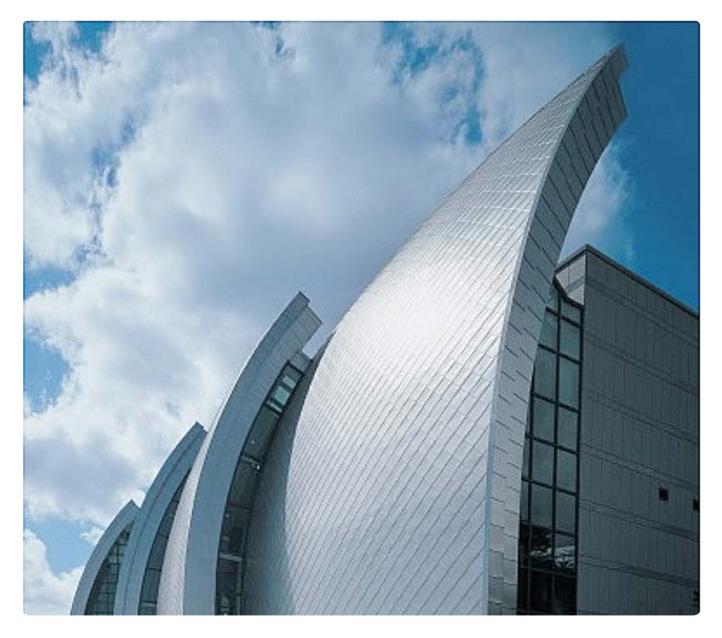
Gyeongnam, Korea

The Geoje Culture and Arts Center, which was designed to overlook the beautiful Jangseungpo Port and was made in the form of a boat sailing on the sea, is an outstanding aesthetic building that won the Korean Institute of Architects Award selected by the Korean Institute of Architects, boasting the finest view of archipelago from the building in Korea. A modern sensibility was produced by applying granite and stainless steel plate as exterior finishing materials. It is a representative building that promotes the external image of Geoje City as a culture and art space with a large theater, outdoor performance hall, and multipurpose hall.

Environment: Marine

Material: Stainless steel
Architects: ADOMOO Architects

Photographs and text: posco.com More information: posco.com





La Sagrada Família

Barcelona, Spain

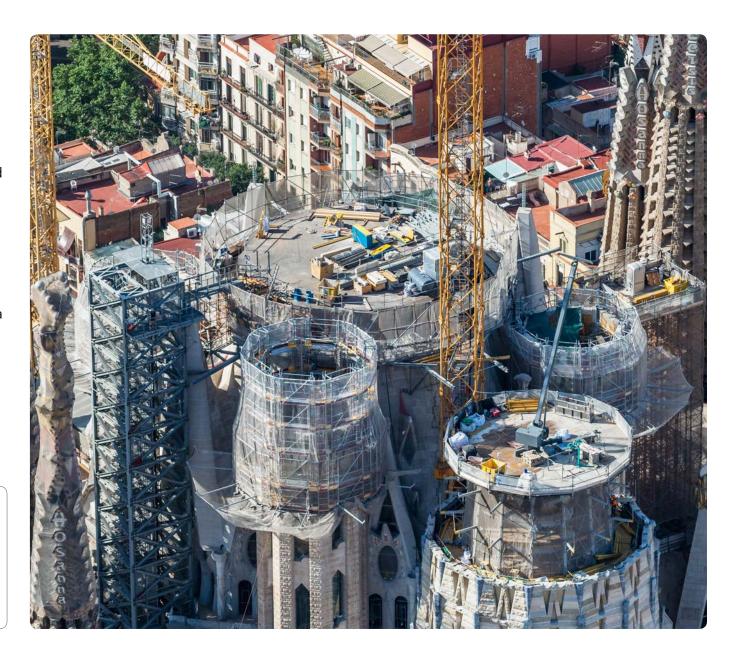
La Sagrada Família is a UNESCO World Heritage Site, designed by famed architect Antoni Gaudí, originally commissioned in 1882, but only planned to be completed by 2026. The basilica is a leading tourist attraction, with more than 3.2 million visitors annually. Outokumpu has supplied stainless steel for La Sagrada Família basilica since 2013 in rebar, bar, machined components and plasma-cut plate products. The building has exceptional lifecycle expectations and a unique design. When completed, 18 towers of La Sagrada Família will reach heights from 94 to 182 meters above ground level. Stainless steel rebar was selected first in the tower structures due to its high strength, exceptional corrosion resistance and reduced lifecycle costs.

Environment: Urban

Grades: Outokumpu Forta DX 2304 and

Forta DX 2205

Architect: Antonio Gaudí
Manufacturer: outokumpu.com
More information: outokumpu.com





"La Gota" Cultural Centre

Cáceres, Spain

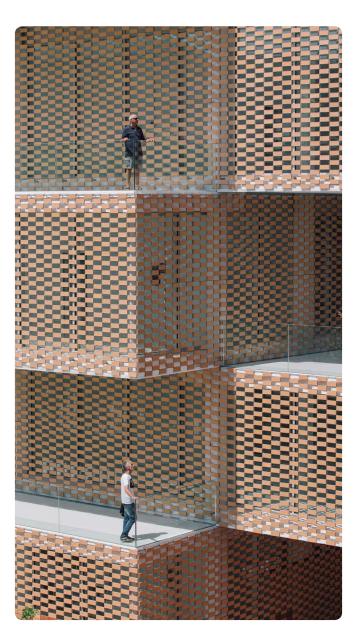
The building's façade consists of a double skin comprising a glass wall and Flexbrick ceramic material, a thermal protection system that prevents excessive solar heat gain during the summer months.

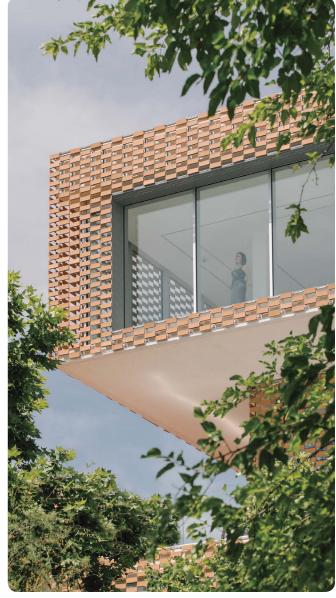
This is a 1200 m² hybrid building designed to house exhibitions. The cultural centre consists of box-like structures stacked irregularly to form five storeys and it is also home of the Tobacco Museum, in Navalmoral de la Mata in Cáceres, Spain. Flexbrick is a 1,204 m² flexible vertical lattice made of ceramic material braided using pre-waved stainless steel 2 mm wire AISI316. These lattices are hung in <10 m length pieces using a crane and vertical guides incorporated in the ceramic material itself, which are then placed into support brackets fixed to the structure.

Environment: Urban Grade: AISI316

Architects: losadagarcia.com Photographs: Miguel de Guzmán

Construction solution: flexbrick.net
Supplier: acerinox.com
More information: cedinox.es







Leeum, Samsung Museum of Art

Seoul, Korea

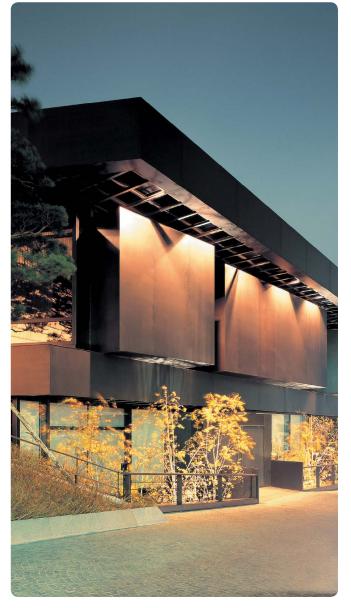
The Leeum, Samsung Museum of Art, which is located at the foot of Namsan Mountain, where nature can be found downtown, is like a sanctuary for domestic art lovers. Three top architects, Rem Koolhaas, Mario Botta, and Jean Nouvel, created a unique cultural space using their respective styles. For this reason, the museum boasts a beautiful appearance as the best art museum in South Korea. The corroded stainless steel-finish exterior also creates a unique atmosphere. The building has contemporary yet delicate, nonaggressive beauty to ease the minds of those who visit. The panel area of the building was constructed using 5-mm thick oxidation corroded stainless steel, and the curtain wall area was constructed using 25-mm thick oxidation corroded stainless steel.

Environment: Urban Material: STS304

Surface: No.4/HL/Polishing Architects: Ateliers Jean Nouvel

Photographs and text: posco.com More information: posco.com







Rose Museum

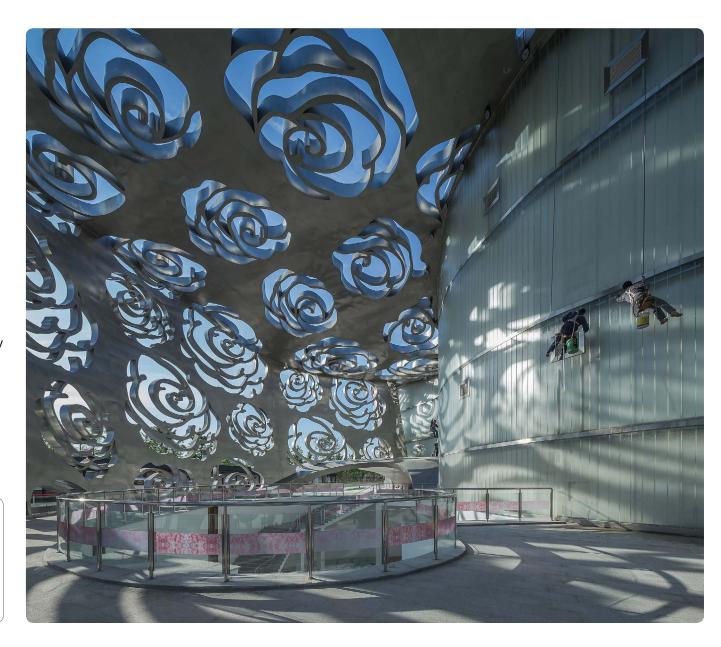
Beijing, China

Roses and floriculture are deeply rooted in Chinese culture, dating back at least to the 11th century BC. To showcase this history and the rose culture in general, NEXT Architects designed a large-scale, new museum building. The museum is covered by a soft, stainless steel façade of 300 meter long and 17 meter high and it is perforated by a rose-shaped pattern. This detached skin created four half open courtyards between the façade and the main museum building, where the rose pattern creates an ever changing play of light and shadow. The way these open spaces are embraced and enclosed by the building, is strongly reminiscent of the traditional Chinese walled-off courtyards. At night the building inverts itself: the museum façade lights up and projects shadows of flowers outside the building.

Environment: Urban

Materials: Stainless steel
Architect: NEXT Architects
Photographs: NEXT Architects

More information: nextarchitects-china.com





Walt Disney Concert Hall

Los Angeles, USA

The Walt Disney Concert Hall, designed by the architect Frank Gehry, opened in 2003 after many years of gestation. The history of the building began in 1987 when Lillian Walt Disney, widow of businessman donates \$ 50 million to start building a philharmonic hall. The idea was to create a reference point for music, art and architecture, which position the city of Los Angeles in the cultural level. The proposed Gehry was chosen after an international competition in which they were submitted over 70 proposals. The architect imposed its characteristic style, which can be seen in the rest of his works. While the construction of this building is later, the design was done before the Guggenheim Bilbao. Walt Disney Concert Hall is now the permanent headquarters of the Los Angeles Philharmonic. The design represents the style of their creator, architect Frank Gehry, could be considered a work of art in itself. The extravagance of its forms seems to defy any rules of harmony and symmetry. The forms are external inspired by a boat with sails drenched. The building is essentially a shell which consists of a series of interconnected volumes, some form of orthogonal coated stone and other forms of organic and surfaces covered with a corrugated metal skin of steel. As a bridge between the different volumes are used glazed surfaces.

Environment: Urban Grade: 316

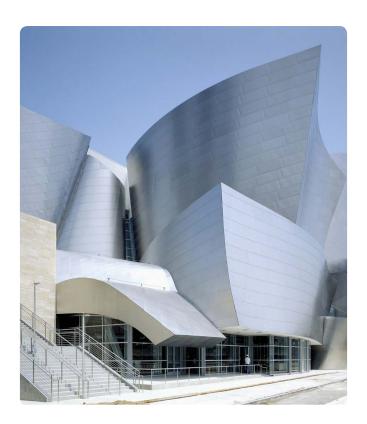
Finish: Angel Hair Architect: Frank Gehry

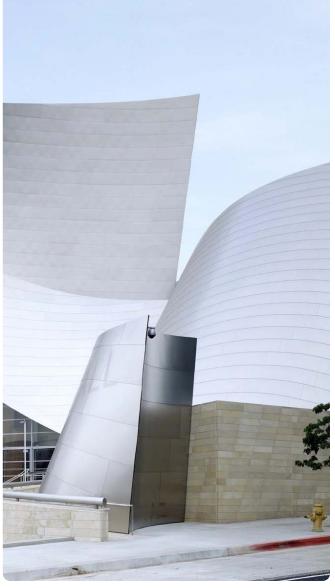
Photographs: Henry Salazar and Tom

Bonner

Supplier: Nippon Steel Corporation

More information: musiccenter.org







Wat Hua Suan Temple

Bang Khla ,Chachoengsao Province, Thailand

Wat Hua Suan is a Buddhist Temple in Thailand. It was completed in 2011. Stainless steel was used extensively for the fence, the roof, the windows and door, the pillars, the interior and exterior walls and the statue and image of the Buddha.

Location:

Environment: rural

Material: Fence: 304 stainless steel, BA finish

2-storey roof: 2B finish

Windows and door: hairline finish

Walls: hairline finish

Buddha statue: coloured finish Buddha image: 2B pickling finish Roof façade (gable apex): 2B finish

Photographs: Napon Rattanapian and Haruthai Saengsirichai

More information: poscothainox.com









Arganzuela Footbridge

Madrid, Spain

The construction underground of the highway along the river banks of the Manzanares River provided an opportunity to open up a new urban territory for the inhabitants of Madrid, the Manzanares Park. A number of bridges over the river have been planned. Linking the neighbourhoods on both banks of the river, the Arganzuela Footbridge will be the longest of all the planned bridges and will be for both pedestrians and cyclists. Cone-like in structure, the bridge has two interlocking metal spirals, wrapped by a metallic ribbon. Spaced wooden slats make up the floor of the bridge, allowing the rays of the sun to filter through to the park below. The cones' geographic location creates a belvedere over the park and the surrounding city as well as an exceptional location from which to admire the famous Toledo Bridge. Shaded during the day, the promenade becomes luminous at night.



Environment: Urban

Material: Stainless steel mesh Architect: Dominique Perrault

Architecte, Paris, France

Engineering: MC2 / Julio Martínez Calzón,

Madrid (structure); YPSA,

Madrid (mechanical

engineering)

Photographs: Georges Fessy

Completion: 2011

More information: perraultarchitecture.fr





MOBILITY AND INFRASTRUCTURE



BP Pedestrian Bridge

Millennium Park, Chicago, Il, United States

Frank Gehry's BP Pedestrian Bridge is clad in brushed stainless steel panels and complements the Jay Pritzker Pavilion (also by Frank Gehry) in function as well as design by creating an acoustic barrier from the traffic noise from the adjacent Columbus Drive. BP Bridge connects Millennium Park to the Maggie Daley Park to the east. This 925-foot-long winding bridge is Gehry's first and provides incomparable views of Millennium Park, the Chicago skyline, and Grant Park. A multiple lane thoroughfare, Columbus Drive is a significant physical barrier between the Eastern and Western areas of Grant Park. The bridge creates an accessible path for people with disabilities linking these two sections.

Environment: Urban

Architect: Frank Gehry

Cladding Material: 316 stainless steel plate, 0.79

mm thickness; angle hair

finish

Pedestrian Space: Enclosed on sides by Type

4 stainless steel parapet;

brushed finish

Photographs: Millennium Park Foundation

More information: millenniumparkfoundation.org



Holmenkollen Ski Jump

Oslo, Norway

Holmenkollen National Ski Arena is one of Norway's most frequently visited tourist attractions and includes the Holmenkollen Ski Museum & Jump Tower, shops, a café and a ski simulator. Holmenkollen hosts World Cup Nordic Skiing events every winter, and the entire ski jump and arena was rebuilt before the 2011 FIS Nordic World Championships. Inside the ski jump is the world's oldest ski museum, with 4000 years of skiing history on display. The ski jump was designed by the Danish firm JDS Architects. Their design brings together all the amenities contained in the jump. Everything from the judge's booths to the souvenir shop and the entrance to the museum are contained in one holistic diagram. The jump is made from 1000 tonnes of steel and rises about 60 metres into the air. The top is cut horizontally to accommodate a viewing platform with a panoramic view of Oslo and its surrounding areas. The towering steel structure is clad in a stainless steel mesh, which provides wind protection. At night, the mesh is illuminated from the inside, transforming the sports facility into a fascinating light-spangled artwork.

Environment: Urban

Material: Clad in stainless steel

mesh

Architects: JDS Architects

Completion: 2011

More information: visitoslo.com







Icade Ïlot Kurvau

Strasbourg, France

Icade Îlot Kurvau in Strasbourg is a complex of homes and offices next to the Rhine River. AEA Architects headed the project which features cladding with the fine stainless steel mesh Codina Eiffel 40100, which responds to environmental demands and sets the office area apart from the residential area with an air of elegance. Spiral meshes can be manufactured in different densities even within one unique panel. Stainless steel spirals on the right and left are joined by a crimped or straight cross rod. The transparency of the series Eiffel models can create dynamic façades and interesting effects.

The complex has won several prizes:

- Démarche de qualité environnementale : H&E RT2012
- Projet lauréat des Pyramides d'Argent 2014
- Prix de l'Immobilier d'Entreprise

Environment: Urban

Material: Codina Eiffel 40100 stainless

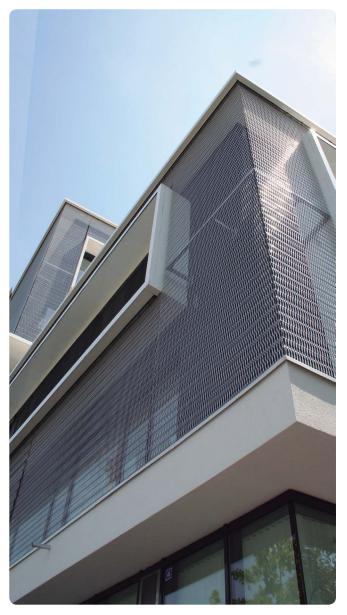
steel mesh

Architects: AEA Architects

Supplier: codinaarchitectural.com Photographs: codinaarchitectural.com

More information: cedinox.es







Kwandong Hockey Center

Kwandong, Korea

For the 2018 Pyeongchang Winter Olympics, lean duplex stainless steel was applied to the exterior of the Kwandong Hockey Centre.

The stadium is located 7 km away from the coast and it was required that the steel have at least 316L-grade corrosion resistance. Because of budget overrun concerns, POSCO recommended its Lean Duplex 329LD Steel. Its corrosion resistance is above that of the required 316L steel and because of its high strength, thinner applications of the steel could be used in the final design. In addition, vibration surface treatment was applied in order to add texture to the surface of the exterior, giving the building a more modern touch.

Environment: Coastal Grade: STS 329LD

Finish: Polishing and bead blasting,

Polishing and vibration

Manufacturer: posco.com
More information: posco.com





Queensferry Crossing

Edinburgh, United Kingdom

The Queensferry Crossing was opened on 30 August 2017. The new bridge forms the centrepiece of a major upgrade to the cross-Forth transport corridor in the east of Scotland, representing a total investment of £1.35 billion. The 1.7 miles (2.7 km) structure is the longest three-tower, cable-stayed bridge in the world and also by far the largest to feature cables which cross mid-span. This innovative design provides extra strength and stiffness, allowing the towers and the deck to be more slender and elegant.

In total, the overall scheme is 13.7 miles (22 km) long, including major motorway upgrades to the north and south of the bridge and also the first ever use in Scotland of variable mandatory speed limits to smooth traffic congestion via an Intelligent Transport System. This also controls dedicated bus lanes within the motorway hard shoulders – another first in Scotland.

Environment: Coastal

Material: Duplex stainless steel rebar

Photograph and text: Courtesy of Transport

Scotland

Supplier: acerinox.com More information: cedinox.es





School Sports Hall

Ville-du-Bois, France

This project consists of a school complex along with a gymnasium and staff living quarters. The three entities rise in a single field located between the residential neighbourhood of Villedu-Bois and the Forêt de la Turaude, a protected woodland. The new school complex welcomes children from the neighbouring houses and rounds out its educational brief with a gymnasium and a dojo. Nomade Architects went beyond the usual educational programs in order to refresh the school's institutional nature by building it in a natural environment.

Built of wood – structurally for the school and in the finishings for both the school and gym – the project demonstrates a commitment to the use of sustainable materials. Stainless steel, which is used for the most prominent part of the gym, helps to provide a transition between the natural environment and the town, as well as mirroring the surrounding countryside. Environment: Rural

Grade: 304L/1.4301 Finish: Uginox Bright

Architects: Nomade Architectes

Credit: Jean Philippe Hugron - Editor

– Le Courrier de l'Architecte

Photographs: Patrick H. Müller More information: uginox.com







Stadium FTC Budapest

Budapest, Hungary

Stainless Steel mesh covers the new FTC football stadium in Budapest. Without any doubt, this avant-garde look of the Stadium is due to the approximately 9000 m2 of stainless steel mesh used to create the façade envelope. The architectural stainless steel mesh offers multiple possibilities and spectacular results. In this project, the creative weave chosen is Eiffel 40100 manufactured by the company CODINA who has actively participated in the execution of the work. The mesh is made with ACERINOX stainless steel strip forming the laminated spirals from right to left and interlinked by INOXFIL stainless steel wire. It has 63% of open area which gives the desired light effect. This metallic envelope, made using panels specially created to adapt to this particular building's geometry, brings a modern and functional character to Groupama Arena.

Environment: Urban

Material: 316L stainless steel
Supplier: codinametal.com
Photograph: codinametal.com

More information: cedinox.es





62 - ISSF STAINLESS STEEL IN ARCHITECTURAL APPLICATIONS RENOVATION

City Hall

Illkirch-Graffenstaden, France

The rehabilitation and extension of this city hall connects three very different buildings: one dating back to the 19th century; and two others dating back to the 1970s. By adding a new reception structure and by improving the thermal performance and visual aspect of building envelopes, the project creates a new image of the City Hall, while adding a modern, open vision of administrative services.

The project's different components transmit a contemporary feel to the City Hall. The glass façades, stainless steel structure and mesh used for the connecting elements were designed as aspects of a new urban landmark that provides the city with a modern light.

The shell resembles a carved object, with a protective metal skin that is both strong and delicate. Made of stainless steel, the curved form creates an impression of softness, calling up images of work by the artist Anish Kapoor. Facing the city, the shell reveals and reflects urban areas. Its anamorphic surface projects slightly deformed images of the square surrounding buildings and the constantly changing sky. Although it looks like a precious object, it is very strong having been fabricated using 5mm steel sheets. It was designed in 3D and made to measure for the project. It is suspended with

pinpoint precision on steel tree structures and has no physical contact with the reception structure or the ground. It was fabricated and finished using techniques reminiscent of the city's industrial and mechanical heritage.

Inside, perforations in the shell's envelope filter the light entering the building while still allowing visitors to enjoy views of urban areas. Outside, the shell seems to float on the water that surrounds it.

This material does not need any maintenance or further treatment. Any dirt or dust can be removed by spraying it down with water.

Environment: Urban
Grade: 304L/1.4301
Finish: Uginox Mat
Architects: Atelier Filippini
Photographs: atelierfilippini.com
Completion: September 2014
More information: uginox.com





64 - ISSF STAINLESS STEEL IN ARCHITECTURAL APPLICATIONS RENOVATION

"Dear Jingumae" Building

Tokyo, Japan

This project renovated a 25-year old office building, located on a back street of Omotesando in Tokyo. The owner requested a design with a facade expression differentiated from the surrounding buildings, which would be helpful for branding for future tenants. The Amano Design Office designed it with a soft expression that would be pleasing to passers-by, while standing out from the surrounding buildings. By removing the out-of-fashion decorative frame structure on the existing building frame as much as possible, the primary shape was exposed. Then, metallic louvers were placed, using computer design to add a modern expression conjuring images of soft clothing. The louvers give a soft expression by connecting three-dimensionally misaligned radiuses. The louver components are welded to crossed SUS plates and protrude from the building frame by SUS pipes, resulting in a streamlined workability.





Environment: Urban

Material: Stainless steel pipes and

plates

Designer: amano design office inc.

Structural Engineer: Rhythmdesign Completion: March 2014

Photographer: Nacasa & Partners Inc.

More information: amanod.com



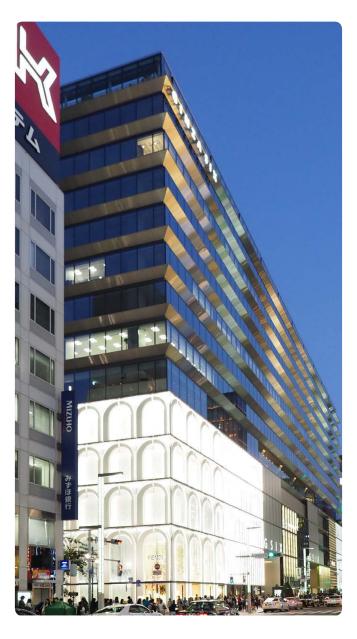


66 - ISSF STAINLESS STEEL IN ARCHITECTURAL APPLICATIONS SHOPPING

GINZA SIX

Tokyo, Japan

GINZA SIX was designed by the architectural firm Taniguchi and Associates and built by Kajima Corporation as a redevelopment project covering two blocks in Tokyo's Ginza neighbourhood. The building, which has 13 floors above ground and 6 floors underground, has a total area of 148,000 square meters. For the trademark eaves, which can be seen from a distance, Mitsubishi Chemical Corporation's stainless steel composite material "ALPOLIC/fr®SCM" which uses NSSC®220M was applied. This ferritic stainless steel has excellent rust-resistance and a lower thermal expansion coefficient. Moreover, SUS304 with a specially finished surface was utilized for the exterior walls as well as the interior walls of the elevator hall. The building is recognized as a new symbol of Ginza, one of the most famous areas for shopping and sightseeing in Japan.



Environment: Urban

Materials: Eaves: NSSC®220M 0.3mm

thick, hairline polished finish.

Exteriors and interiors:

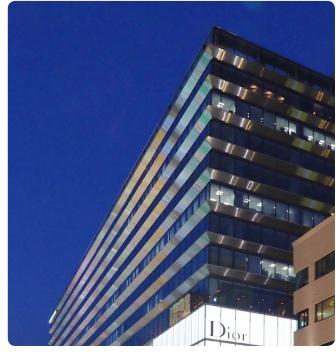
SUS304, 5.0mm thick, polished

and shot blasted

Architects: Taniguchi and Associates,

Kajima Corporation

Copyright: ginza6.tokyo
More information: nssc.nssmc.com





Hanjie Wanda Square

Wuhan, China

Hanjie Wanda Square is a new luxury shopping plaza located in the Wuhan Central Culture Centre, one of the most important areas of Wuhan City. The multifunctional organisation of the master plan - which includes cultural and tourist facilities as well as commercial, office and residential components – acts as an attractor to the area for visitors, inhabitants and commuters alike.

The façade design focuses on achieving a dynamic effect, reflecting the handcrafted combination of two materials: polished stainless steel and patterned glass. These two materials are crafted into nine differently trimmed, but standardised spheres. Their specific positions in relation to each other recreate the effect of movement and reflection in water, or the sensuous folds of silk fabric.

Environment: Urban

Façade skin: 42.333 stainless steel spheres

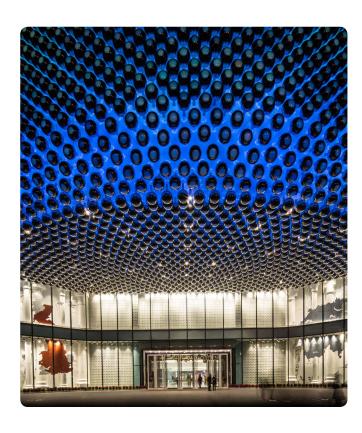
and aprox. 4700 aluminum

back-panels

Architects: UNStudio
Photograph: Edmon Leong

Completion: 2013

More information: unstudio.com



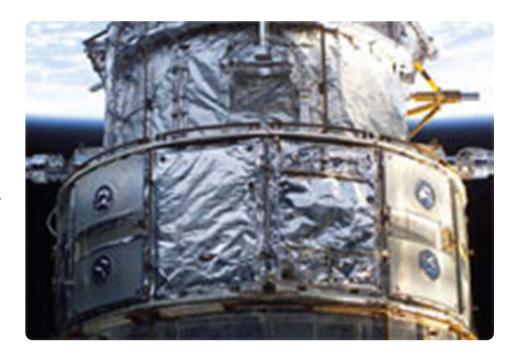




70 - ISSF STAINLESS STEEL IN ARCHITECTURAL APPLICATIONS OTHER

A Stainless Blanket for Hubble

During the Hubble Space Telescope Second Servicing Mission in 1997 and subsequent missions, astronauts observed damage to some of the Telescope's thermal insulation. Years of exposure to the harsh environment of space had taken a toll on Hubble's protective multilayer insulation, and some areas were torn or broken. This multi-layer insulation protects the observatory from the severe and rapid temperature changes it experiences as it moves through its 97-minute orbit from very hot sun to very cold night. The New Outer Blanket Layer, or NOBL, covers protect Hubble's external blankets. They prevent further degradation of the insulation and maintain normal operating temperatures of Hubble's electronic equipment. Each NOBL has been tested to ensure that it can withstand exposure to charged particles, X-rays, ultraviolet radiation, and thermal cycling for at least ten years. The covers are made of specially coated stainless steel foil which is trimmed to fit each particular equipment bay door. Each cover is supported by a steel picture-frame structure. Expanding plugs, like common kitchen bottle stoppers, fit into the door vent holes to allow quick installation by the astronauts. During Servicing Mission 3A in 1999, astronauts installed three NOBLS on damaged areas. During Servicing Mission 3B in March 2002, a fourth NOBL was installed. Three additional NOBL panels will be installed during Servicing Mission 4.



Environment: More information:

Outer space nasa.gov/hubble



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Elevator B

Silo City, Buffalo, New York, USA

Elevator B is an urban habitat for a colony of honeybees, which originally occupied a boarded window in an abandoned office building in Buffalo, NY. The project has generated a great deal of public curiosity because of the combination of the colony of honeybees, an interesting and until very recently, restricted-access site, and an aesthetically pleasing object. The site, Silo City, contains a group of largely abandoned grain elevators and silos on the Buffalo River. Elevator B is intended to be a symbol of the site's environmental and economic regeneration. The 22-foot tall tower is a honeycombed steel structure designed and built utilising standard steel angle and tube sections. It is sheathed in perforated stainless steel panels that were parametrically designed to protect the hive and it's visitors from the wind, and allow for both solar gain in the winter and shading in the summer. The bees are housed in a hexagonal cypress box with a laminated glass bottom through which the bees can be observed. This "beecab" provides protection and warmth and separates entry access between bees and visitors, who are able to enter the tower, stand below the cypress beecab, and look up at the colony of bees behind glass, as they build their hive. Beekeepers gain access to the hive by lowering it, allowing them

to ensure the health and safety of the bees. This feature also caters to school groups that visit the site, encouraging children to get a close up view. Visitors to the site range from school groups discussing the natural ecosystems of Western New York and the Great Lakes, to adult photography classes using Elevator B and the site as a subject.

A nearby nature preserve has also led several field trips to the project and is in the process of developing a formal education program centered on the bees and on colony collapse disorder, which threatens the species. Interpretive signage about honeybees and the site is currently under development and will be part of the larger redevelopment plan for Silo City.

The questions asked by visitors range from the simple to the complex, but they would never have been asked in the first place if the visitor did not have the access to bees that is fostered by Elevator B. This is a clear demonstration of how architecture can do more than serve aesthetic or structural purposes. In Elevator B, it sparks children to learn and adults to reconsider what they thought they knew. This includes the designers themselves, who have not only designed for the needs of their clients but have become inspired to become advocates for them as well.

Environment: industrial Material: stainless steel

Photographs: Hive City Design Team More information: hivecity.wordpress.com





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About ISSF

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.

More information

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

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