Door Handles

Why stainless?
• Aesthetics
• Smooth touch
• Feeling of sturdiness.

Fabrication process:
Drawn or ground bars are bent, machined and polished.

Grade:
EN: 1.4301 (AISI: 304).

Manufacturer:
Tecosur SA, Spain (tecosur.com).

Along with their elegant look, these stainless steel door handles provide a smooth touch and feeling of sturdiness.
Mont Blanc Tunnel Cladding Anchors

Why stainless?
Fire resistance.

Fabrication process:
Anchors are created by making a skin pass on a wire rod, straightening, cutting to length and cold threading.

Grade:
EN: 1.4404 (AISI: 316L).

Manufacturer:
G&B Fissaggi, Italy (gebfissaggi.com)

The Mont Blanc tunnel between Italy and France was the scene of a terrible fire in March 1999 which claimed many lives. The tunnel re-opened following three years of extensive work to repair the damage caused by the blaze.

Safety precautions in the tunnel are now extremely tight. Particular attention is paid to the fire resistance of all components in the tunnel.

The Italian National Roads Authority has published a circular which contains directives for the construction of tunnels. Stainless steel, thanks to its characteristic stability and resistance to high temperatures, is cited as the material of choice for the fabrication tunnel components such as smoke extraction fans and lighting systems.

The system used to anchor the fibre cement cladding panels that line the Mont Blanc tunnel is now composed of 16 mm stainless anchors. The anchors have been tested to ensure they maintain their support function for at least two hours at 1,000° C.
Glass Facade “Spiders”

Why stainless?
• Good mechanical properties
• Low maintenance
• Aesthetics.

Fabrication process:
Forged or cast body. Fastening elements machined from bar.

Grade:
EN: 1.4542 (AISI: 630) and EN: 1.4462 (ASTM: F51).

Manufacturer:
Not available.

The glass panels on the façade are held in place by high strength “spiders” which carry the weight of the glass.

Although their primary function is mechanical, their appearance does not detract from the overall elegance of the structure. They are expected to last as long as the building itself without any risk of damage or collapse.

Main image copyright Iconos SA, France.
Post-tension Tie Rods

Why stainless?
- Good mechanical properties
- Durability.

Fabrication process:
Not available.

Grade:
EN: 1.4057 (AISI: 431), EN: 1.4301 (AISI: 304) and EN: 1.4401 (AISI: 316).

Manufacturer:
GeodaG Sistemi Srl, Italy (geodag.com)

The great Roman theatre, the symbol of Verona, dates back to the first half of the 1st Century AD. It was once one of the most important open air opera theatres in the Roman Empire.

Recent restoration work involved the construction of new covering for the central orchestra pit, an underground room and the underground sewage tunnels.

The new covering slab is structurally supported by a system of roof struts and post-tension tie rods. These minimise strains and deformation from loads placed on top. The post tension system used, comprising stainless steel bars, guarantees structural safety, quality and durability.

Clockwise from above: the lower part of the tie rods, detail of the head, and the upper part of the tie rods.

Images courtesy of Centro Inox, Italy
In the reconstruction of the bridge at the Nedujinja Shrine, grade 410 stainless steel rebar was chosen for its durability as a reinforcement material in concrete structures.

A ferritic grade was selected over an austenitic grade because of its low thermal expansion properties and low cost. About 1.2 tons of stainless steel was used in the bridge.
Decorative Mesh

Why stainless?
- Aesthetics
- Suitability for harsh weather conditions
- Low maintenance.

Fabrication process:
Wire rod, drawn into wire, annealed and woven.

Grade:
EN: 1.4401 (AISI: 316).

Manufacturer:
Not available.

The architect chose stainless steel for the cladding of this building because of its aesthetic qualities, both by the day and by night.
Cable Anchoring Heads

Why stainless?
- Fire resistance
- Good mechanical properties.

Fabrication process:
Bent and threaded stainless steel bar.
Grade:
EN: 1.4301 (AISI: 304).
Manufacturer:
Cogne Acciai Speciali, Italy (cogne.com).

In April 2002, a light aircraft hit the Pirelli skyscraper in Milan, Italy. At least five people were killed in the accident and more than 30 injured.
The top floors of the 30-storey building caught fire. In particular, serious damage was caused to the 26th and 27th floors. The planking of the 26th floor took on a concave shape, bending more than 25 cm, while the floor of the upper story took on a slightly convex shape.

Restoration of the structure involved inserting a group of post-stretched cables. The anchoring of the heads of the active-reinforcement cables (or noses) against the core of the beam in reinforced concrete was done by means of 28 mm threaded stainless steel bars with a yield stress of >800 MPa.

Images courtesy of Centro Inox, Italy.
**Tensegrity® Glass Beams**

Why stainless?
- Aesthetics
- Good mechanical properties.

Fabrication process:
Cut and threaded bars.

Grade:
EN: 1.4401 (AISI: 316).

Manufacturer:
Experiment of Professor Ing. M. Froli and Dr. Ing. L. Lani, Department of Structural Engineering, University of Pisa, Italy (unipi.it).

A new type of glass panel beam has been developed at the University of Pisa, Italy. The basic concept involves preventing and guiding glass fracture by breaking it into triangular modular elements. The elements are connected to each other by applying a pre-stress in the form of pre-tensioned stainless steel cables or bars. The glass is predominately subject to compression. The final collapse of the structure depends on the ductility of the steel.

The structure relies on the principle of tensile integrity, or Tensegrity as it is better known. Tensegrity refers to the integrity of structures as being based in a synergy between balanced tension and compression components.

All ancillary are made of stainless steel. This is for both aesthetic and durability reasons.

Prototypes are currently being tested at the University of Pisa.

Images courtesy of Centro Inox, Italy.
Mesh Cladding

Why stainless?
• Aesthetics
• Resistant to harsh weather
• Maintenance-free.

Fabrication process:
Wire rod is drawn into a wire with suitable diameter and mechanical properties, then woven into mesh.

Grade:
EN: 1.4401 (AISI: 316).

Manufacturer:
Cambridge Architectural Inc, USA (cambridgearchitectural.com).

The carpark at Winnipeg International Airport is wrapped in metal fabric, dramatically differentiating the exterior of the newly constructed garage. This was the first airport project in Canada, and one of the first in North America to target Leadership in Energy and Environmental Design (LEED) Certification.

The metal mesh provides a durable, long-lasting and virtually maintenance-free cladding solution as for the parking structure.

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System was developed by the United States Green Building Council (USGBC) in 1998. It provides a suite of standards for environmentally sustainable construction.

Images courtesy of Cambridge Architectural Inc.
Guardrail Cables

Why stainless?
- Aesthetics
- Good mechanical properties.

Fabrication process:
Wire rod is drawn into high strength wire, then twisted into cables.

Grade:
EN: 1.4401 (AISI: 316) and EN: 1.4310 (AISI: 302).

Manufacturer:
Not available.

Initially used on yachts, these guardrail cables have found new uses in buildings and other public spaces. They enable elegant designs and still admit the maximum amount of light.

Images copyright of Iconos SA, France.
Insulating Connectors

Why stainless?
- Durable
- Good mechanical properties.

Fabrication process:
Bending and forming stainless steel rebar.

Grade:
EN: 1.4462 (ASTM: F51) and EN: 1.4362.

Manufacturer:
Ancon Building Products, UK  (ancon.co.uk).

The connector is a structural component used to join external concrete balconies to internal concrete floor slabs. Stainless steel reinforcement bars provide the load transfer and have a long service life. Rigid chlorofluorocarbon-free polystyrene insulation offers improved thermal protection. The connectors are easy to handle and to install.

Stainless steel provides the required strength, corrosion resistance and maintenance-free life in all weather conditions.

This system improves the thermal insulation of buildings by avoiding cold bridging, thereby reducing heat losses and improving comfort inside.

Clockwise from top: balcony connectors in place before concrete is poured, connectors awaiting installation of the balcony, detail of insulated balcony connector.