

La Sagrada Familia

Barcelona, Spain

The Expiatory Temple of the Sagrada Familia began its construction in March of 1882. During the following years, until Gaudí's death in 1926, he collaborated with different architects, sculptors, draughtsmen and modellers, in new architectural solutions. After his death, the project went through different architects, always respecting the original idea, but economic problems and a fire during the civil war that destroyed scale models and plans created by Gaudí, forced to stop the works on several occasions. The incorporation of new technologies in the project brings it close to completion, scheduled for 2026, the year of the centenary of the great architect's death.

The use of stainless steel has been a constant during the project in recent years through a modular solution. In 2008, Roldan, S.A., the long product factory of the Acerinox group, began supplying duplex stainless steel reinforcing bars, that are significantly increasing its use from 2014 onwards. Durability is the main reason why stainless steel is being used in the construction of the upper levels of the towers. The difficulty of replacement and/or any future intervention, as a consequence of the corrosion of conventional rebar in a saline environment as is the case in Barcelona, would have a high cost. There is a large number of types of stainless steel, however, the project team selected

duplex 2205 (EN 1.4462) for its high resistance to pitting corrosion, characteristics to be taken into account in environments near the sea with presence of chlorides.

The assembly works of the different modules are carried out in the facilities that the Sagrada Familia has got in Galera, a small town eighty kilometres from Barcelona. At present, the panels with which central towers are taking height by means of the innovative process of tensioning the stone are being manufactured. This tensioning consists of stones with a specific shape and finish together with stainless steel structures (image 4). Thanks to this construction system, the towers can be raised more quickly and easily. For instance a level of the Tower of the Evangelists, which has a height slightly higher than 3 meters, can be assembled in the basilica in less than 6 hours.

Four to six tensors are used per panel, sewn with stainless steel rebars to join one piece with another. On each side of the panels there is a pillar made of stainless steel sheet and rebar, which connects each panel with the next one (images 1 and 2).

When the assembly is too complex, as the Towers of the Evangelists in its final section, it is carried out entirely in Galera and finally concreted at the basilica.

In level 11 of the Tower "Mare de Deu", you can see the circular metal structure which the different panels are assembled on. The wide area available

allows to assemble simultaneously different levels of the paraboloid towers of the basilica.

Once assembled and verified their correct fit, they are disassembled by pieces and packed in boxes for transport to Barcelona.

The Temple of the Sagrada Familia is a perfect example of how a current, versatile, machinable, transformable, durable and resistant material as stainless steel, can solve important problems in emblematic buildings, providing constructive solutions never seen before.

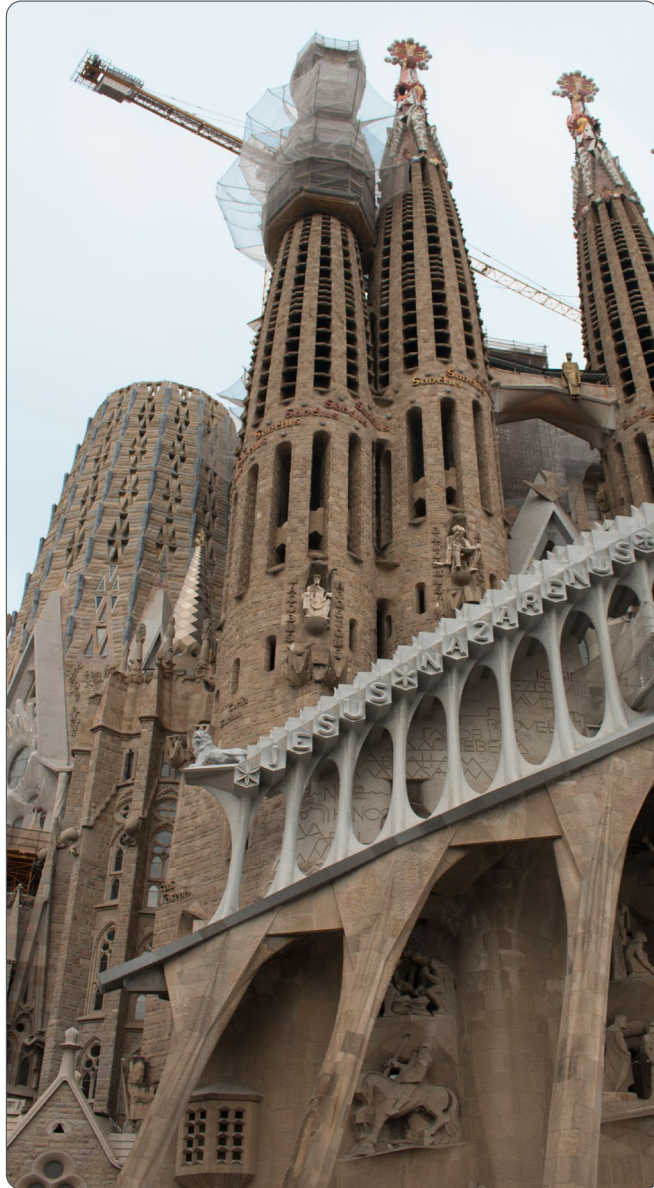
Environment:	urban
Material:	2205 (EN 1.4462) duplex stainless steel
Manufacturer:	Acerinox
Architects:	Antoni Gaudí
Photographs:	Acerinox
More information:	acerinox.com or cedinox.es



1.



2.



3.



4.



5.