SIKA AT WORK
NEW CRUISE TERMINAL PORT OF LEIXÕES, PORTUGAL

REFURBISHMENT: AII-9000
WATERPROOFING: Rasolastik

BUILDING TRUST

NEW CRUISE TERMINAL PORT OF LEIXÕES, PORTUGAL

PROJECT DESCRIPTION

The new terminal of the Port of Leixões , inaugurated on July 23, 2015 and opened to the public on September 26, 2015, is located in the Matosinhos municipality close to the city of Porto in the northern region of Portugal.
This terminal was built specifically for cruise ships. Ideated with the purpose of re-launching, boosting the local tourism and developing the urban character of the location, the new terminal building sits upon a 340 meter long quay and includes a pedestrian access path for the general public and passengers. Leixões is the second most important national port as far as the container traffic is concerned, and it's going to play an important task within the new European commercial strategy as well. We have to consider its major role in view of the ratification of the TTIP (Transatlantic Trade and Investment Partnership).

Three important connections depart from the main building, which is around 1500 sqm: the new pier for cruise ships, the new nautical recreational port for vessels and the new road system to access the city. The main building hosts: the passenger station building, a plaza, a gallery-museum with laboratories to promote science linked to the Science and Technology Park of the Sea of the University of Porto, an aquarium, an underground garage, meeting rooms, a restaurant and a large covered amphitheater with a captivating view of the ocean.

The urban Plan extends over a public area of around 5 hectares, characterized by approximately 19.000 sqm of construction. The port and the extension of its pier, completed in 2011, are part of it.
The new building is located at the end of the new pier. The shape of the new building has been conceived to be like a helical spiral moving from the sea level in a continuous alternation of glazed and opaque surfaces, in order to create a structure with 4 levels. The winding shapes of the new building attract the visitors through a kind of centripetal force that drives them towards the great central hall, which is penetrated by filtered light, as a voyage to the open sea.
The total cost of the project (studies began in 2003) is around 26 million euros (initial budget of 28.3 million euros – project funded by the EU, with the aim of boosting the local economy based on maritime traffic and tourism).

More than 4,000 tons of steel were used to build the terminal, 20,000 cbm of concrete, 6,700 sqm of glass and 900,000 tiles in six different shapes. The new terminal was built between 2012 and 2014, and the tiles were fixed from March to November 2014. This project received the AZAward, the International Award of Architecture and Design in 2016 in Toronto. On March 2016 it has been published the book "Terminal de Cruzeiros de Leixões", printed worldwide, edited by the architect of the project: Luís Pedro Silva.

PROJECT REQUIREMENTS

The Project Manager, that prescribed the project of the main building of New Cruise Terminal Port of Leixões, wanted to install ceramic tiles of different thickness and shape on concrete walls, both internally and externally, and flat tiles for the ceiling. Tiles needed to be fixed without sealant with a gap of 2-3mm.

The whole design needed to be conceived for its location in an area exposed to chloride attack from seawater, temperature variations and thermal expansion.

A solution permitting the installation of 900.000 ceramic tiles in six different shapes needed to be identified.
The fixers faced considerable difficulties for the type of substrate and the uneasy access on vertical surfaces.

Therefore, installers only succeeded in carrying out 5 sqm per day per person.
The combination of these aspects also implied a series of cost-control issues to stay on the above mentioned budget, as regards construction and maintenance over time.

SIKA SOLUTION

Following the analysis of the substrate conditions (concrete curing, pull-off tests, compressive strength), a Method Statement was defined, including, first of all, the water blasting or the sandblasting of the substrate, in order to eliminate all dust and any traces of form-release agents, the mechanical removal of all protuberances and imperfections due to formwork in order to have a perfectly smooth surface, suitable to grant the complete adhesion of the tiles to the substrate (which was supposed to be perfectly dry).

For external and internal wall tiling, mainly hexagonal tiles of 15 cm diameter were used, with varying thickness and shape. They were laid with no grout, minimizing the use of the adhesive, which was also used as a leveling, also to maximize the three-dimensional and light-dark effects. The adhesion of the adhesive **ALL-9000** to the cast-in-place concrete and tiles was excellent, also due to the fact that the glue has no vertical slippage (it's a two-component polyurethane-based adhesive, class R2T according to EN 12004).

As far as the adhesion of the tiles to the wall was concerned, the procedure was as follows:

- Very slight leveling with **ALL-9000** by applying it with a minimal thickness in order to prevent blistering or imperfections on the surface of the adhesive;
- Installation of the tiles (after waiting at least 24 h) by spreading the adhesive at first with a notched trowel (4–5 mm), then with a smooth trowel in order to ensure a continuous, even layer of adhesive (around 2 mm thickness) on the surface;
- Application of the adhesive also on the edges of the back of the tiles by using a small spatula.
- Then installation (with due pressure) of the tiles on the substrate previously leveled;
- The tiles were not fixed close to each other; a minimum gap between them (2/3 approx.) was ensured through the use of spacers;
- Any excess adhesive on the sides or surface of the tiles was removed with a cloth soaked in ethyl alcohol when the adhesive was still fresh.

As regards the bonding procedure of the ceiling, Sika recommended the same installation procedure described previously, without following point 3. In this case, the still fresh adhesive was able to bear the weight of the tiles since they were installed on a flat surface, unlike those installed on the walls. **Rasolastik**, two-component cement-based waterproofing product (Class CM02 of EN 14891:2012 standard for waterproofing beneath tiles), was used in the pedestrian access ramps leading from the building to the sea, therefore in the areas having the greatest exposure to chlorides.

PRODUCTS USED AND SUPPLIED UNDER TECHNOKOLLA BRAND:

- ALL-9000 (105.000 kg)
- Rasolastik (14.000 kg)

NEW CRUISE TERMINAL
PORT OF LEIXÕES, PORTUGAL

Surface covered: approx. 17.500 sqm
Year of work execution: 2014

ORGANIZATION
Sika Italia S.p.A.

RESPONSIBLE SIKA
Export Manager Technokolla: Ms Roberta De Iuliis

ARCHITECT & PROJECT MANAGER
Luís Pedro Silva

CLIENT
APDL

BUILDER
OPWAY ENGENHARIA FERREIRA CONSTRUÇÃO

DISTRIBUTOR
Nortimper L.da

SIKA ITALIA S.P.A.
Via Luigi Einaudi 6
20068 Peschiera Borromeo (Mi)
Italy

Contacts
Tel. + 39 02 54778 111
Fax + 39 02 54778 119
www.sika.it - info@sika.it

BUILDING TRUST