

The Burj Khalifa Tower in Dubai

Inside the tallest skyscraper in the world, the setting for the exclusive Armani Hotel

The official opening ceremony of the Burj Khalifa Tower in the United Arab Emirates capital of Dubai was held earlier this year on the 4th of January. In fact, in Arab "burj" means tower, and with its 162 floors and razor-edge spire which reaches 828 metres, it now holds the record as the tallest skyscraper in the world. The height of the tower was kept top secret right up to the inauguration to keep competitors in the dark, and its true height was only officially announced on the 4th of January. Designed by the Skidmore, Owings & Merrill LLP design studio from Chicago, whose signature is also on the Sears Tower in Chicago and the Freedom Tower in New York, construction work involved

12,000 site workers and 5,000 designers and consultants, and required 333,000 m³ of concrete and 31,400 tonnes of steel for a total investment of 4.1 billion dollars. The tower is served by 58 ultra-fast elevators which reach speeds of up to four floors per second to distribute visitors and guests over the 344,000 m² of total floor area. The area is divided into 354 residential apartments, 237 suites, a series of exclusive hotel rooms, offices, and fitness centres and even a mosque, while the 124th floor is entirely dedicated to the highest observation terrace in the world.

Construction work on the Burj Khalifa Tower started in 2004. The skyscraper is part of a development currently under construc-

tion which covers around 2 km² called Downtown Burj Khalifa, and includes the second tallest hotel in the world, the biggest artificial marina in the world the biggest artificial islands in the world (the three Palm Islands and the World Islands) and the biggest shopping mall built until now, the Dubai Mall.

The plan of the building was inspired by the form of the hymenocallis, a flower which is particularly loved in Dubai, and the skyscraper is composed of three elements with a central nucleus.

Mapei's "Signature" Inside

If the Burj Khalifa looks stunning from outside, the inside rooms are as interesting as its striking exterior.

Through its local subsidiary IBS (Innovative Building Solutions) LLC. Mapei played a key role in supplying the stunning Armani Hotel which is hosted in the skyscraper. It offers 160 guest rooms and suites. Guest rooms are located on levels five through eight of Burj Khalifa, with suites on floors 38 and 39. It also encloses 8 restaurants, luxury shops and one spa centre. The one- and two-

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IN THE SPOTLIGHT

GRANIRAPID

It is a high performance, deformable, fast setting and hydration, two-component cementitious adhesive for ceramic tiles and stone material. It is classified as **C2FS1** according to European standard **EN 12004** and has been awarded the **CE** mark in compliance with Annex ZA, standard **EN 12004**. It is

particularly suitable for the installation of stone material that is moderately unstable to moisture and requires a rapid drying of the adhesive. It is suitable for bonding floors subject to heavy traffic. Because of its extraordinary bonding and fast-setting characteristics, GRANIRAPID is particularly suitable for rapid re-tiling jobs and flooring that has to be in service within very short time (supermarkets, industries, hospitals, airports, swimming pools, etc.).

ULTRABOND P990 1K

ULTRABOND P990 1K is used for bonding pre-finished elements, lamparquet, slats, planks and all types of wood on: cementitious screeds; screeds made using MAPECEM, MAPECEM PRONTO, TOPCEM, TOPCEM PRONTO and similar products; old wooden floors; ceramic, marble, etc.; anhydrite screeds. It is also

suitable for heated floors. It is easy to apply, even at low temperature and has a 30% higher yield compared with conventional two-component products, thanks to the low viscosity and free-flowing properties of the adhesive when applied by trowel, even at low temperatures. It has an excellent straight line hold and excellent buttering on the back of tiles. It has been awarded the **EMICODE EC1 R** certification by **GEV**, as it is a product with very low emission level of volatile organic compounds (VOC).





Photo 1. An image of the tallest skyscraper in the world, the Burj Khalifa Tower. Mapei products were used inside the tower to complete the exclusive flagship Armani Hotel.

Photo 2. The parquet was laid using ULTRABOND P990 1K adhesive.



Photo courtesy of Margaritelli SpA.

bedroom luxurious residences, located on levels 9 through 16 of Burj Khalifa, have been personally designed by Giorgio Armani himself.

As for the Armani Hotel, Mapei Technical Service supported the project's hotel interior fit-out contractors and recommended the use of KERAFLEX high performance cementitious adhesive, with no vertical slip and with extended open time, for the installation of ceramic tiles and stone material slabs on walls and floors in several areas (front of house, reception, apartments, residence, boutique offices, restaurant, etc.).

Substrate preparation was carried out to certain critical areas such as the ballroom and business centre using Mapei's rapid systems, such as MAPECEM pre-blended, ready-to-use, quick-setting and drying, controlled-shrinkage mortar for screeds, and ULTRAPLAN and ULTRAPLAN MAXI ultra-fast hardening self-levelling compounds for smoothing the surfaces.

These systems enable the substrates to receive all kinds of floorings after 24 hours and this was an important reason for selecting them due to the tight program of works and commitment to quality. Joints were grouted with KERACOLOR FF high performance, polymer-modified, water-repellent, cement-based grout. In the bathrooms, ULTRACOLOR PLUS high performance anti-efflorescence grout was used for the joints. Natural stone slabs were laid on the walls of the bathrooms within the Armani Nightclub with KERAFLEX high performance, deformable, two-component cementitious adhesive with

no vertical slip, with Dust Free technology and extended open time. GRANIRAPID high performance, deformable, two-component cementitious adhesive with rapid setting and hydration was also used to bond the slabs on the floors to other areas. Before installing the tiles the substrate's wet areas were waterproofed with MAPELASTIC, a highly flexible cementitious waterproofing membrane which ensures complete compatibility with the subsequent tile installation. Tile joints were grouted with ULTRACOLOR PLUS and KERACOLOR FF. KERAPOXY coloured epoxy grout was used for the joints in the bathrooms and in the kitchen.

The project also included some of the highest quality pre-engineered

wooden flooring ever installed on high level corridors and in the main lobby. To ensure the complete success and long term durability of such an application, ULTRABOND P990 1K was selected and provided problem-free, safe and efficient use. This is a specially formulated one-component polyurethane adhesive with very low emission level volatile organic compounds (VOC) for all types of wooden flooring. It complies with the stringent GEV standards as class EMICODE EC1 R.

Mapei's involvement in Burj Khalifa is typical of its work with prestigious projects where the objective is to blend style and quality, working to world class standards with different materials and substrates, often to meet tight dead-



Photo 3. This rendering of the area illustrates the future development of Downtown Burj Khalifa, a vast area currently under construction characterised by the presence of the skyscraper.

lines. Mapei products consistently perform under such high pressure situations, serving as the systems of choice for professionals.

This just adds to the list of prestigious building projects which Mapei has contributed to complete in the Arab Emirates: among the Mapei references one also finds the development of Yas Island, the Atlantis Hotel on the Palm Jumeirah artificial island, the Emirates Palace Hotel in Abu Dhabi, the Burj Al Arab 6-star hotel and the terminals 1, 2 and 3 in the Dubai International Airport. 

TECHNICAL DATA

Burj Khalifa, Dubai (United Arab Emirates)

Designer: Skidmore, Owings & Merrill LLP, Chicago (USA)

Period of Construction: 2004-2010

Period of the Intervention: 2008-2010

Intervention by Mapei: supplying products for waterproofing the substrates, installing ceramic tiles and natural stone slabs in the bathrooms at the nightclub of the hotel and for bonding parquet floorings on high level corridors and in the main lobby.

Customer: Emaar Properties

Contractors: Fino International Interiors,

Laid Materials: ceramic tiles, natural stone slabs and parquet (by Margaritelli)

Mapei Co-ordinator: Laith Haboubi, IBS (Innovative Building Solutions) LLC (United Arab Emirates)

MAPEI PRODUCTS

The products mentioned in the article belong to the "Products for Ceramic Tiles and Stone Materials", "Building Speciality Line" and "Products for the Installation of Resilient, Textile and Wood Floor and Wall Coverings" ranges. The technical data sheets are available at the web site www.mapei.com. Mapei adhesives for ceramics and stone materials conform to EN 12004 and have been awarded the CE mark in compliance with Annex ZA, standard EN 12004. Mapei grouts for ceramics and stone materials conform to EN 13888.

Almost all the Mapei products for laying floors and walls are also GEV-certified and have been awarded the EMICODE EC1 ("very low emission level of volatile organic compounds") mark by GEV. Mapei levelling and smoothing compounds and pre-blended mortars for screeds conform to EN 13813 standard and have been awarded the CE mark in compliance with annex ZA, standard EN 13813. Mapei products for the protection and repair of concrete surfaces and structures have been awarded the CE mark in compliance with EN 1504 standards.

Mapei mortars for renders conform to standard

EN 998 and have been awarded the CE mark in compliance with standard EN 998.

Granirapid (C2F S1, CE EN 12004, EC1 R): high performance, deformable, two-component cementitious adhesive with rapid setting and hydration for ceramic tiles and stone material.

Keracolor FF (CG2, EC1 R): high performance, polymer-modified, water-repellent, cementitious grout, with DropEffect® technology, for joints up to 6 mm.

Keraflex (C2TE, CE EN 12004, EC1 R): high performance cementitious adhesive, with no vertical slip and with extended open time for ceramic tiles and stone material.

Keraflex Maxi S1 (C2TE S1, CE EN 12004, EC1 R): high performance cementitious adhesive with no vertical slip, with Dust Free technology extended open time and deformable for ceramic tiles. It is particularly suitable for the installation of large sized porcelain tiles and natural stone slabs.

Mapecem Pronto (CE EN 13813, CT-C60-F10 A1_n): pre-blended, ready-to-use, quick-setting and drying (24 hours), controlled-shrinkage mortar for screeds.

Mapelastic (CE EN 1504-2, coating (c) principles PI, MC and IR, EN 14891): two-component flexible cementitious mortar for waterproofing balconies, terraces and bathrooms.

Ultrapond P990 1K (EC1 R): ready-to-use polyurethane, one-component, solvent-free, elastic adhesive for all types of wooden flooring over Mapecem, Mapecem Pronto, Topcem and Topcem Pronto screeds, cementitious screeds, existing wooden flooring, ceramic tiles, marble, terrazzo tiles, etc.

Ultracolor Plus (CG2, EC1): fast-setting and drying, high performance, anti-efflorescence, water-repellent grout for joints from 2 to 20 mm. With DropEffect® and anti-mould with BioBlock® technology.

Ultraplan (CE EN 13813, CT-C30-F7 A1_n-s1, EC1): ultra-fast hardening self-levelling smoothing compound for thicknesses from 1 to 10 mm.

Ultraplan Maxi (CE EN 13813, CT-C35-F7 A2_n-s1, EC1): ultra-fast hardening self-levelling smoothing compound for thicknesses from 3 to 30 mm.