



Ferrari World in Abu Dhabi

Mapei products have had an important role in the construction of the biggest indoor theme parks in the world

On the 30th of November last year, H.H Sheikh Mohammed bin Zayed Al Nahyan, Prince of Abu Dhabi and Supreme Commander of the United Arab Emirates army, inaugurated the first ever Ferrari theme park in the world. The complex, which is also the biggest indoor theme park in the world, is located on the island of Yas just off the north-eastern coast of Abu Dhabi. It is just 10 minutes by car from the Abu Dhabi international airport and 30 minutes from the city centre, which is also the capital of the Emirates. The island is destined to become an important destination for international tourism, which is why numerous structures are also being built to welcome and accommodate the predicted flow of tourists.

Enjoyment for All

Ferrari World is owned by Aldar Properties PJSC, one of the biggest real-estate and investment companies in the Emirate of Abu

Dhabi.

Its most striking feature is its red roof, characterised by its clean lines and curvaceous form reminiscent of a Ferrari GT, and the biggest logo ever created in the world of the famous Italian car manufacturer.

The indoor area open for public use spreads over an area of 86.000 m², the equivalent of 10 full-size soccer pitches.

The complex offers the chance of a memorable multi-sensorial experience for all the visitors, whatever their distinction: adults, children, families, fans and adrenalin seekers alike.

With more than 20 attractions inspired by driving a Ferrari, areas dedicated to the history of the Italian car manufacturer, numerous videogames and displays of various Ferrari cars, six Italian restaurants where Michelin chefs offer refined dishes and a large array of shops, Ferrari World is able to cater for everybody's taste.

Mapei Solutions for a Complex Fit For a Prince

Because the intention of the owners was to present the entertainment complex as unique, not only in the Middle East but also in the whole world, Ferrari World has been constructed to the highest of standards.

Since the construction materials had to also be up to the standards required for such an ambitious project, the choice finally fell on solutions offered by Mapei,

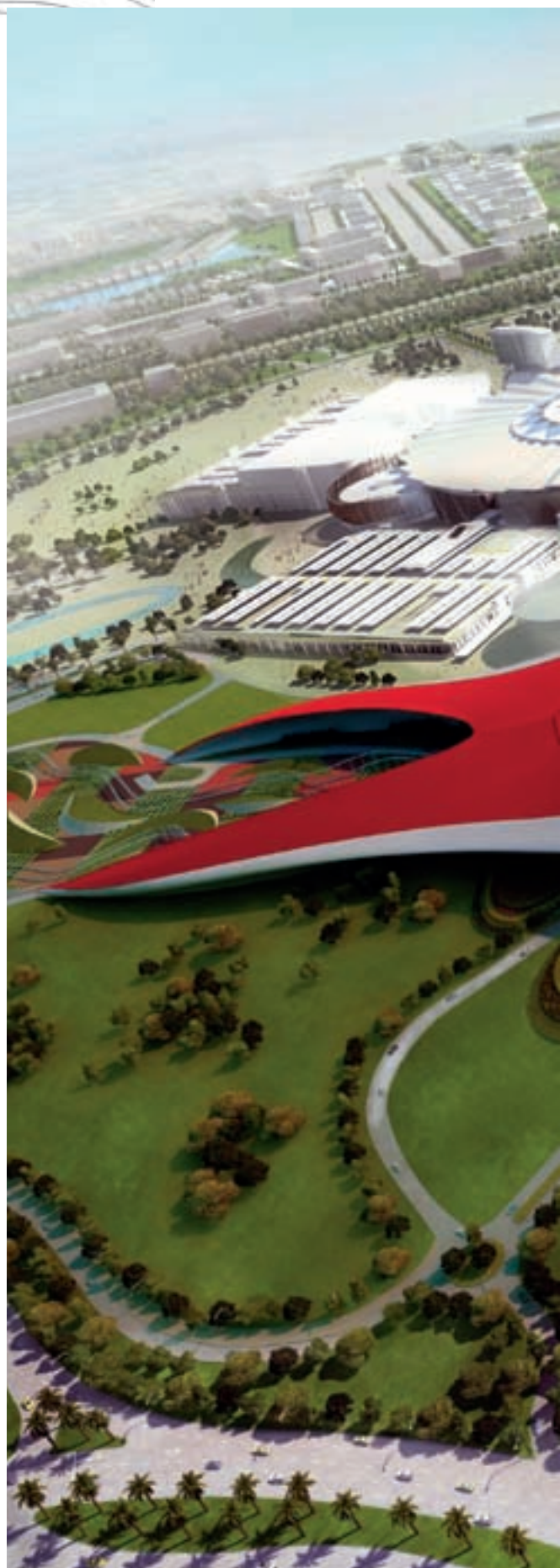




Photo 1. Some of the areas in the complex are dedicated to displays of various models of cars.
Photo 2. A bird's eye view of Ferrari World, the famous car manufacturer's only theme park in the world.



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which had already been used in the United Arab Emirates in other important construction projects, such as the Sheikh Zayed Bin Sultan Al Nahyan Mosque in Abu Dhabi (see *Realtà Mapei International* n. 32), the exclusive Armani Hotel located in the Burj Khalifa tower (see *Realtà Mapei*

International n. 33) and the Dubai international airport. Mapei products had already been used on the island of Yas to build the Yas Marina Hotel, the Rotana Hotel, the Stay Bridge Hotel and the Centro Hotel, thus proving to be a reliable supply partner hence able to again offer a quality con-

Photo 3. A bird's eye view of Yas island, home of the Ferrari World centre.

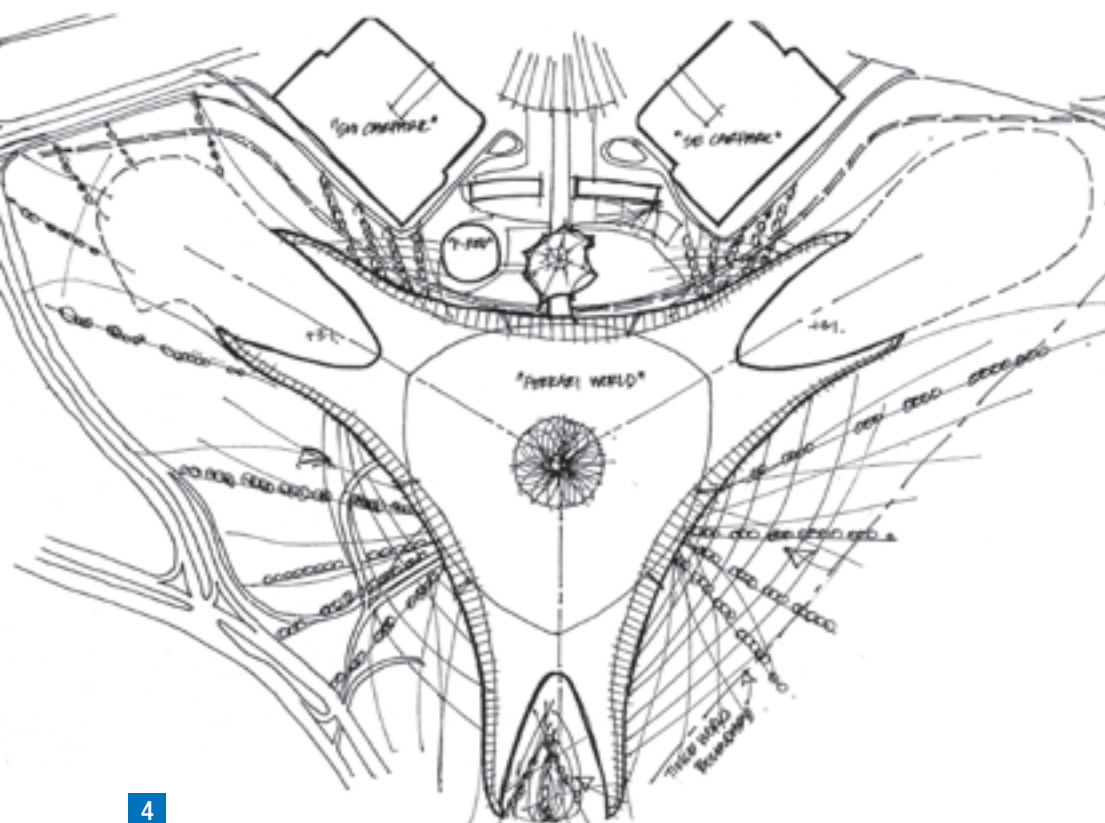
Photo 4. A drawing of the complex.

tribution for the construction of Ferrari World.

Going into detail, through the local subsidiary IBS-Mapei, headquartered in Dubai, Mapei supplied the materials used to waterproof the surfaces of various tanks, fountains and water features, to lay ceramic, stone, mosaic and resilient coverings, to treat the substrate in various areas and for a number of other interventions during construction.

Waterproofing Tanks, Fountains and Water Features and Sealing Joints

More than 25.000 m² of surfaces were waterproofed in the fountains, tanks, water features, planters and a host of other damp surfaces with MAPELASTIC SMART two-component, high-flexibility cementitious mortar reinforced



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with alkali-resistant FIBREGLASS MESH (which has now been replaced on several markets by MAPENET 150) and with MAPETEX SEL pre-punched, non-woven polypropylene fabric.

The waterproofing system was then completed by applying ELASTOCOLOR WATERPROOF acrylic paint on the treated surfaces. Black was chosen in this case. It took a whole five months of laboratory analysis and quality control to create the most suitable version of ELASTOCOLOR WATERPROOF.

MAPEBAND rubber tape was used to seal and waterproof the corners and edges between adjacent walls and joints between the walls and floors.

MAPEBAND TPE tape, bonded with ADESILEX PG4 two-component, thixotropic epoxy adhesive

with modified rheology and covered with a layer of quartz sand, was used to seal and waterproof the expansion joints.

MAPEFLEX PU50 SL one-component, castable polyurethane sealant with a low modulus of elasticity, suitable for joints with movements up to 25%, was chosen to seal the expansion joints in the surfaces, including some of the surfaces in the water features below MAPEBAND TPE.

MAPEGROUT ME 06 shrinkage-compensated, super-fluid mortar, on the other hand, was used to seal around the openings provided in the floor of the water features to allow for the installation of water pipes and floor drains.

Inside the tanks artificial rocks made from fibre-reinforced concrete were used to dress a metal frame which had been anchored

Photo 5. MAPELASTIC SMART, FIBREGLASS MESH and MAPETEX SEL were used to waterproof the surfaces in the fountains, tanks and water features.

Photos 6 and 7. After applying the first layer of MAPELASTIC SMART, FIBREGLASS MESH (replaced on several markets by MAPENET 150) was inserted before applying the second layer of MAPELASTIC SMART.

Photo 8. To waterproof the bases of the metal frame of the artificial rock formations in some water features, MAPELASTIC SMART was reinforced with MAPETEX SEL after applying ADESILEX PG4.

Photo 9. Sealing of the cross-piping elements and waterproofing of the edges was carried out with alkali-resistant MAPEBAND rubber tape.

to the base and sides of the tanks with bolts. MAPETEX SEL was applied around the anchorage points to guarantee continuity in the waterproofing layer.

Before applying the waterproofing treatment, the metal bases of the frame were first coated with ADESILEX PG4 covered with a layer of quartz sand to create a rough surface and improve the bond of MAPELASTIC SMART, which was applied afterwards.

Laying Resilient Floor and Wall Coverings

Products from the Mapei line for laying resilient materials were also employed in Ferrari World. MONOFINISH one-component, normal-setting cementitious mortar was used to even out irregularities and uneven areas on various walls throughout the complex before laying wallpaper with ADESILEX MT 32 adhesive in water dispersion, a product suitable for bonding all types of wall coverings (vinyl paper, flocked, textiles, glass fibre textiles, etc.).

PVC tiles were used to floor the entrance area for the games area, where visitors often have to queue before entering.

In this case, the substrates were initially treated with PRIMER G, a synthetic resin-based primer in water dispersion with a very low emission level of volatile organic compounds (VOC), which was then smoothed over and levelled off with ULTRAPLAN MAXI self-levelling, ultra quick-hardening smoothing compound.





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IN THE SPOTLIGHT

MAPELASTIC SMART

It is a two-component, highly flexible cementitious mortar, to be applied by brush or with a roller, for waterproofing concrete surfaces such as foundations, retaining walls, balconies, terraces, basins and swimming pools and for protection against aggressive chemical agents.

MAPELASTIC SMART is used to protect new concrete structures, concrete structures repaired using special mortars from the MAPEGROUT or PLANITOP ranges, renders with hairline cracks and cementitious surfaces in general which, being subject to vibrations, may suffer from cracking, and for waterproofing hydraulic projects such as channels and faces of dams and swimming pools, basins, storage tanks, balconies and terraces. It is particularly suitable for waterproofing irregular surfaces.

MAPELASTIC SMART meets the requirements defined by **EN 1504-9** ("Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - General principles for the use of products and systems") and the minimum requirements claimed by **EN 1504-2**,

coating (C) according to the **PI, MC and IR principles** ("Protection systems for concrete surfaces").

It can contribute up to **3 points** to obtain the **LEED** certification.

MAPENET 150

It is an alkali-resistant fibreglass mesh used to reinforce waterproof protection layers, anti-fracture membranes and cementitious smoothing and levelling layers.

The mesh is made from fibreglass treated with a special primer which makes it resistant to alkalis and improves its bond to all waterproofing and smoothing and levelling products, where its use is recommended. Once the smoothing and levelling compound or waterproofing layer has hardened, the fibreglass mesh reinforces the layer to protect against the formation of cracks due to movement in the substrate or the tiled surface. It also makes it easier to apply an even layer of smoothing and levelling compound approximately 2 mm thick and improves the systems resistance to temperature variations and abrasion. It is available in 50 metre rolls, 1 m wide.

Laying Ceramic and Natural Stone

Mapei also contributed to the construction of Ferrari World by supplying various products for laying porcelain, marble and glass mosaic on numerous surfaces, including in corridors, toilets and for the water features.

These products included a series of innovative adhesives, such as KERAPOXY ADHESIVE (two-component epoxy adhesive with no vertical slip) to lay marble slabs on the stairs; KERAFLEX MAXI high-performance, flexible cementitious adhesive (replaced on several markets by KERAFLEX MAXI S1) to bond white marble on the walls where the Ferrari logo was created and glass mosaic on the surfaces of the water features; KERABOND T cementitious adhesive with no vertical slip to lay ceramic tiles on the walls in the toilets and corridors.

Various grouts for joints were also used, such as ULTRACOLOR PLUS (high-performance, poly-



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Photos 12 and 13.

The artificial rock formations in some of the water features were made from fibre-reinforced concrete and used to cover a metal frame anchored in place with bolts. Before applying the waterproofing treatment, the metal bases were treated with ADESILEX PG4 covered with a layer of quartz sand to create a rough surface and improve bond of MAPELASTIC SMART, which was applied afterwards.


mer-modified, anti-efflorescence, quick-setting and drying mortar with water-repellent DropEffect® and anti-mould BioBlock® technology) to grout joints in the white

marble walls and for ceramic and mosaic tiles in various areas and KERAPOXY (two-component, high-performance, anti-acid epoxy mortar with no vertical slip) to

grout joints in ceramic coverings in the water features. The colours yellow and black were chosen for the latter product, available in 26 different colours, to blend in with the colours of the Ferrari logo.

KERAPOXY DESIGN two-component, decorative, anti-acid, translucent epoxy mortar was used where red was required to grout the joints. This product, offers a distinctive advantage in that it is available in 15 different standard colours. KERACOLOR FF pre-blended, polymer-modified cementitious mortar with water-repellent DropEffect® technology, was used to grout the joints in ceramic coverings on the walls and floors in the toilets and cor-

ridors. Once again, a prestigious project on an international scale has shown that Mapei has the ability to supply solutions at the highest level without compromising the construction schedule, while guaranteeing extremely high quality for the work carried out.

The drawings and Ferrari World logo used for this article have been taken from the Italian magazine TSport, issue n° 278/March-April 2011, whom we kindly thank. 

TECHNICAL DATA

Ferrari World Park, Abu Dhabi (United Arab Emirates)

Period of Construction: 2008-2010

Period of the Intervention: 2009-2010

Intervention by Mapei: supplying products for preparing, waterproofing and levelling the substrates; for laying ceramic and stone materials on walls and floors; for bonding wallpaper and PVC floorings; for sealing the anchoring points within steel structures

Project: John Robertson Architects (USA), Benoy Architects (UK) and Ramboll (Denmark)

Client: Aldar Properties PJSC

Contractor: Aldar Besix (UAE)

Works Direction: Fara Abaspour (DEPA)

Laying Company: DEPA (EAU)

Mapei Co-ordinator: Tarana Daroogar, Mohammed Qunber, Daniele Spiga - IBS L.L.C. (UAE); Enrico Geronimi, Mapei SpA (Italy).

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 and Textile Floor and Wall Coverings" ranges. The technical data sheets are available at the web site: www.mapei.com. 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's adhesives for ceramics and stone materials conform to EN 12004 standard 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 standard. 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 membranes and cementitious mortars used for waterproofing before laying ceramics comply with EN 14891 standard. 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 sealants comply with standard ISO 11600. More than 150 Mapei products contribute points to obtain the LEED (Leadership in Energy and Environmental Design) certification.

Waterproofing the substrates

Adesilex PG4 (CE EN 1504-4): two-component, thixotropic epoxy adhesive with modified rheology for bonding Mapeband, Mapeband Tpe, PVC strips and Hypalon and for structural bonds.

Elastocolor Waterproof: waterproof, easy-to-clean acrylic paint for internal and external surfaces in permanent contact with water.

Fibreglass Mesh: alkali-resistant fibreglass mesh for reinforcing protective waterproofing layers, anti-fracture membranes and thermal insulation systems. N.B. The product has been superseded in several markets by Mapenet 150.

Mapeband: alkali-resistant rubber tape with felt for cementitious waterproofing systems and liquid sheaths.

Mapeband TPE: TPE tape for flexible sealing and waterproofing expansion joints and cracks subject to movement.

Mapeflex PU50 SL (F-25-LM): paintable, castable polyurethane sealant with a low modulus of elasticity for movements up to 25%.

Mapelastix Smart (CE EN 1504-2, coating (C), principles PI, MC and IR; EN 14891): two-component, high-flexibility cementitious mortar applied by brush or with a roller, for waterproofing concrete surfaces such as balconies, terraces, bathrooms and swimming pools and for protecting against aggressive agents.

Mapetex Sel: macro-holed, non-woven polypropylene fabric for reinforcing waterproofing membranes.

Laying ceramics and stone materials

Kerabond T (CE EN 12004, C1T, EC1 R): cementitious adhesive with no vertical slip for ceramic tiles.

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

Keraflex Maxi (CE EN 12004, C2TE S1): high-performance deformable cementitious adhesive with no vertical slip, extended open time for ceramic tiles, particularly recommended for laying large porcelain and natural stone tiles. N.B. The product has been superseded on several markets by Keraflex Maxi S1.

Kerapoxy (CE EN 12004, R2T; RG): two-component, high-performance, anti-acid epoxy mortar and adhesive with no vertical slip for laying and grouting ceramic tiles and stone material.

Kerapoxy Adhesive (CE EN 12004, R2T): two-component epoxy adhesive with no vertical slip for ceramic tiles and stone material.

Kerapoxy Design (CE EN 12004, R2; RG): two-component, anti-acid, decorative, translucent epoxy mortar for grouting glass mosaic, ceramic tiles and stone material, used in combination with MapeGlitter for a particularly attractive and high quality finish. May also be used for bonding.

Ultracolor Plus (CG2; EC1): high-performance, anti-efflorescence, quick-setting and drying polymer-modified mortar with water-repellent DropEffect® and anti-mould BioBlock® technology for grouting joints from 2 to 20 mm wide.

Laying resilient coverings and wallpaper

Adesilex MT32: adhesive in water dispersion for laying all types of wall resilient coverings (tufted wallpaper, flock-print, heavy fabrics, fibreglass fabrics, etc).

Monofinish (CE EN 1504-2, R2; CE EN 1504-3 coating (C) principles MC and IR): one-component, normal-setting cementitious mortar for smoothing concrete and cementitious render.

Primer G (EC1): synthetic resin primer in water dispersion with a very low emission level of volatile organic compounds (VOC).

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

Sealing water system elements

Mapegrout ME 06: super-fluid mortar with compensated shrinkage. N.B. The product is distributed on the UAE market by IBS L.L.C.