

# Ready to set off again

**THANKS TO MAPEI PRODUCTS, THE FLOORS IN FRANKFURT CENTRAL RAILWAY STATION WERE QUICKLY INSTALLED WITHOUT CAUSING PASSENGERS TOO MUCH DISTURBANCE**



*The walkways leading to the platforms before the redevelopment work. The main entrance to Frankfurt Central Station.*





**F**rankfurt Central Station is the most important crossroads of people and goods in the Rhine and Main area and also, along with Leipzig and Hamburg stations, one of the busiest railway complexes in Europe ever since it first opened on 18<sup>th</sup> August 1888.

700 long-distance trains and a further 1000 serving the city transport network arrive at and depart from the station's 25 platforms (24 main and 1 secondary platform) every day, serving a total of 350,00 passengers.

The outside of the station complex stands out for its neo-Renaissance style façade with three entrances separated by two huge columns. Up

above them there is a clock decorated with statues representing the day and night, and the logo of Deutsche Bahn, the German company which runs the national rail network.

There are two main areas inside the station: the lobby or, in other words, the area designed to welcome passengers, and the area over by the platforms providing access to the trains. There are four lateral wings to the north and south combining with the central lobby, where the ticket office and supermarket are located plus other services; the top floor, on the other hand, accommodates the lounge for VIP passengers on the German railways. The area leading to the 24

platforms extends just beyond the lobby over towards the west. Right below this area, a network of tunnels caters for the underground and local transport service lines serving the city and surrounding areas.

#### **Cutting-edge Facilities and Maximum Comfort**

Over recent years a series of building projects have involved this station and really boosted the image of both the city of Frankfurt and the German Railways Company.

Railway stations are nowadays expected to take on some real challenges in terms of facilities and safety, particularly in order to withstand rising com-





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Photo 1.  
Preparing the concrete substrate reinforced with metal meshing.



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Photo 2.  
The bonded screeds made from Mapecem were treated using Eporip epoxy adhesive.



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Photo 3.  
All the screeds were prepared with Mapecem special hydraulic binder.

Photos 4, 5 and 6.  
Mapestone 1 adhesive was used for laying the granite floors and pre-cast concrete square blocks for the guided pathway for the blind.

Photo 7.  
The granite surfaces after the installation operations had been carried out.

petition from German airports, many of which (i.e. those in Munich, Hamburg, Düsseldorf and Stuttgart) have been given genuine makeovers over the last few years. As well as expecting the station facilities to be as functional as possible, German railway passengers are also looking for top-class services in an extremely pleasant environment. This is why the building works also included targeted projects designed to make the station look extremely modern and up-to-date.

**New Floors for a Revamped Station**

The project to redevelop Frankfurt Central Station involved a number of areas, such as the shops, ticket office, general offices, etc.

Notable among all the key works were the restructuring of the vaulted roof (protected by law as part of the national architectural heritage) carried out from November 2002 to September 2005, and repair work on the floors, which began in 2006 and was completed in January 2007.

The laying of the 10,000 m<sup>2</sup> of flooring was divided into two stages, the first regarding an area of 3,000 m<sup>2</sup> and the second involving the remaining 7,000 m<sup>2</sup>.

The client, Deutsche Bahn AG, chose a dark grey-coloured G 654 Chinese granite, highly resistant to foot, goods and luggage traffic, as well as to the effects of cleaning and maintenance operations.

Because the works had to be carried



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out without interfering with the smooth running of the station, the installation materials used had to have very specific properties such as, for example, fast setting and drying and high resistance to compression attainable in a very short lapse of time.

It was, therefore, decided to choose an installation system capable of meeting these needs, which, down the years, has risen brilliantly to the challenges posed by numerous building site projects.

To ensure all the flooring could withstand heavy loads, repair work began by preparing a new concrete substrate reinforced with metal mesh. The screed on top of it was formed in two ways: bonded screeds were formed for thicknesses of less than 65 mm (with EPORIP\* epoxy adhesive then applied to help adhesion) and unbonded screeds were formed for thicknesses equal to or over 65 mm.

In both cases the screed was prepared using MAPECEM\* special fast setting and drying hydraulic binder.

Once the substrates had been completed, the slabs of granites were installed using the improved MAPESTONE 1\* mortar (a product which is only available on the Austrian and Swiss markets).

MAPESTONE 1\* was used for installing about 350 m<sup>2</sup> of pre-cast concrete square blocks with straight grooves creating a guided pathway for the blind.

As regards the flooring located beyond the platforms, on the other side of the railway bumpers, installation was carried out over a highly deformable and flexible steel substrate.

This metal structure is designed to absorb any bumps and bangs from trains in case of brake failure.

The granite slabs were bonded to the steel substrate with KERALASTIC\* high-performance polyurethane adhesive.

The floor joints were grouted using KERACOLOR FUGENSCHLÄMMMÖRTEL\* cementitious mortar (a product only available on the Austrian and German markets).

The joints in those sections which needed to be laid particularly quickly, because pedestrian traffic could not be blocked for long, were, on the other hand, grouted using ULTRACOLOR PLUS\* high-performance grout. This product, guaranteeing fast setting and drying, allows grouted slabs to be cleaned and brought back into operation without blocking pedestrian traffic for too long.



Our thanks go to "Realta Mapei", no. 5, the in-house magazine published by Mapei's German, Austrian and Swiss subsidiaries, from which this article was taken.

#### \*Mapei Products:

the products referred to in this article belong to the "Products for Ceramic Tiles and Stone Materials" range. The technical data sheets are available on the "Mapei Global Infonet" DVD or at the web site: [www.mapei.com](http://www.mapei.com). Mapei's adhesives and grouts conform to EN 12004 and EN 13888 standards.

**Eporip:** two-component epoxy based adhesive for cold joints and monolithic sealing of cracks in screeds.

**Keracolor Fugenschlämmörtel (CG2):** cementitious grout for joints from 4 to 14 mm of inside and outside floorings. N.B. This product is distributed on the German and Austrian markets by Mapei's local subsidiaries.

**Keralastic (R2):** high performance two-component polyurethane adhesive for ceramic tiles and stone material.

**Mapecem:** special fast setting hydraulic binder for the preparation of fast-drying screeds (24 hours) with controlled shrinkage.

**Mapestone 1 (C2F):** fast hardening and drying mortar for small and medium laying beds.

N.B. This product is distributed in the Austrian and Swiss markets by Mapei's local subsidiaries.

**Ultracolor Plus (CG2):** fast setting and drying, high performance, anti-efflorescence, polymer modified grout, for joints from 2 to 20 mm. Water-repellent with DropEffect® and antimold with Bioblock® technology.

## TECHNICAL DATA

### Frankfurt Central Railway Station,

Frankfurt on the Main (Germany)

**Work:** preparing the substrates and laying natural stone floorings and pre-cast concrete blocks

**Years:** 2006-2007

**Customer:** Deutsche Bahn Station & Service

**Project:** Deutsche Bahn Projektbau, Frankfurt

**Work Management:** Roland Kraft of Zeidler & Wimmel, Würzburg (Germany)

**Contractor:** Zeidler & Wimmel

**Installation Company:** KLK Estrich- und Fußbodenbau, Wiesbaden (Germany)

**Installed Materials:** G 654 Chinese granite slabs supplied by Zeidler & Wimmel; pre-cast concrete square blocks with straight grooves supplied by ÖBS GmbH, Ahrensburg (Germany).

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