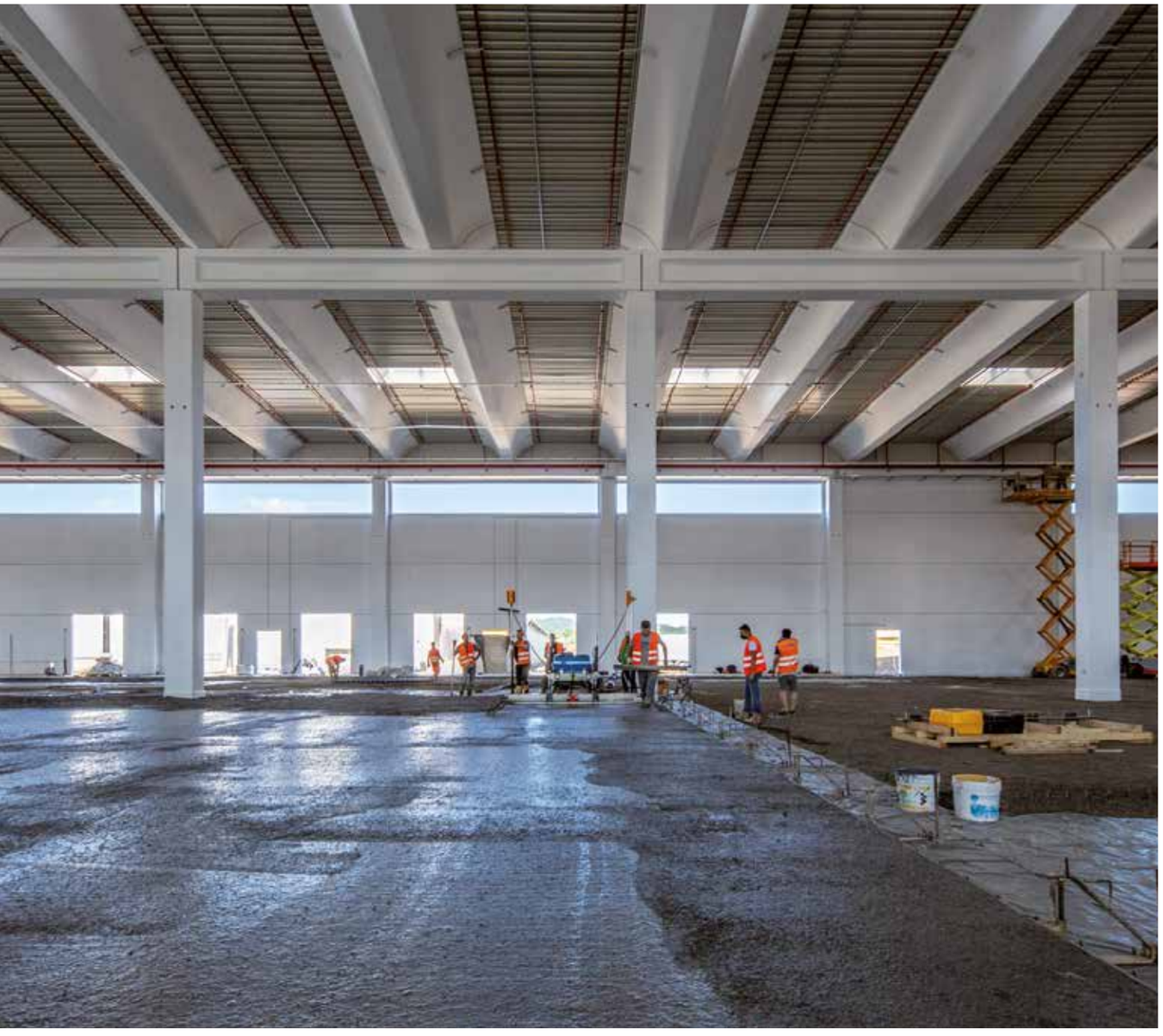
Arquata Scrivia (Alessandria, Italy)

Docks logistics centre

USING STRUCTURAL POLYMER FIBERS HAS ENABLED THE AMOUNT OF STEEL REINFORCEMENT IN THE FLOOR TO BE REDUCED



MAPEFIBRE ST 50 TWISTED macro structural fibers and the acrylic-based superplasticiser DYNAMON FLOOR 20 were added to the concrete mix used to make the floors.

Located at the crossroads between traffic networks running from the Liguria region (Western Italy) to Milan and from Turin to the other side of the Alps, as well as being the natural hub for the ports along the coast of Liguria (Northwestern Italy), the Docks integrated logistics centre in Arquata Scrivia is a support for traffic management operations for goods entering and exiting ports in Liguria. The integration of ports, rail and road networks, inland intermodal hubs and other infrastructures is a decisive factor in the area's competitiveness. Optimisation of the flow of vehicles will be further consolidated once the Terzo Valico (or Third Pass) high-speed railway has been completed, which will ensure that goods offloaded at the port of Genoa can reach the heart of Europe quickly, creating new logistics opportunities for this area.

Within the Docks centre in Arquata Scrivia, a new structure has been constructed that will be used to store tinned tuna. And within this area of around 13,000 m^2, a new floor was installed with the technical support and solutions from Mapei Concrete Flooring Solutions (CFS), the new line of products and services aimed at the industrial flooring sector.

The Mapei team took part in the design of the floor slab and in the prequalification phase of the concrete mix design – both at the mixing plant and by carrying out on-site testing, thanks also to the company's mobile laboratories – and suggested the most suitable products for mixing the concrete and finishing off the floor.

Quick application and cost containment with structural fibers

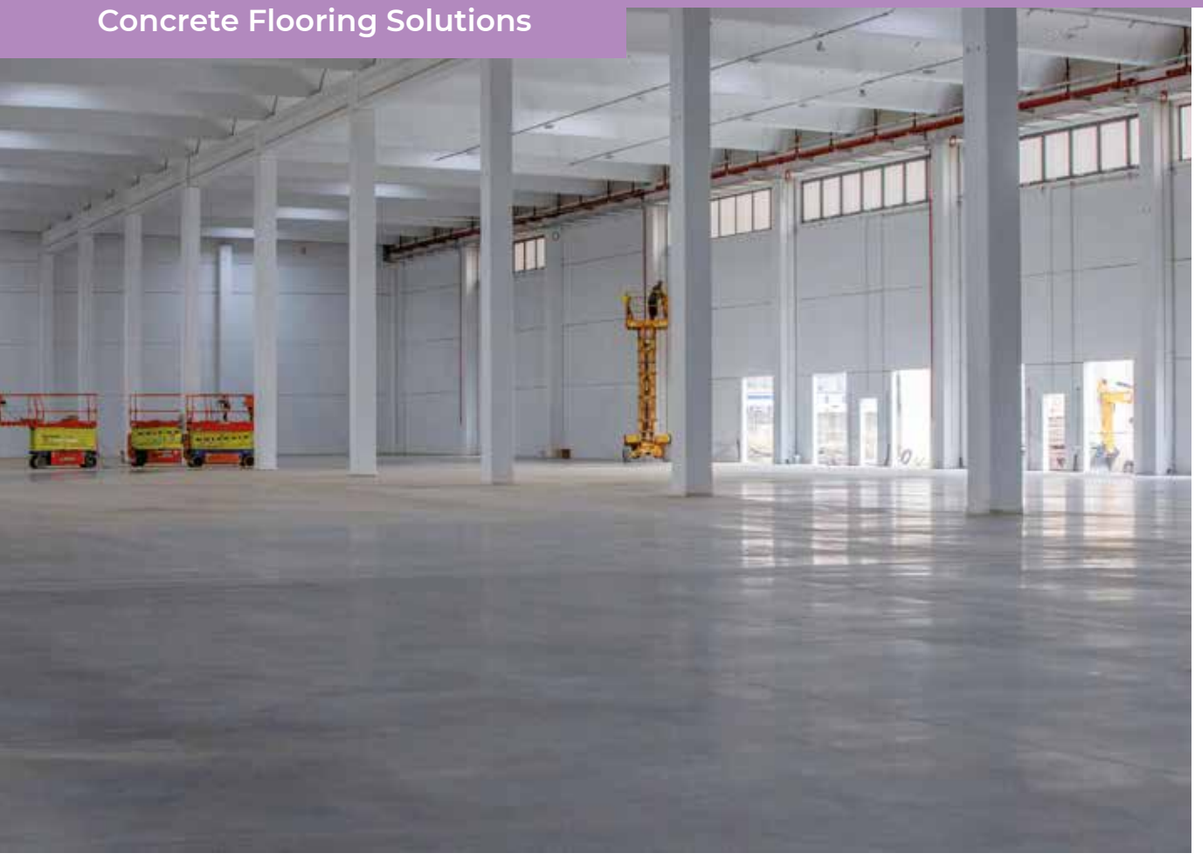
The first working hypothesis for the floor in the structure considered embedding two layers of steel reinforcement within the concrete slab. The CFS team, on the other hand, proposed the use of synthetic fibers to strengthen the concrete, a choice which reduced the amount of steel reinforcement required.

Thanks to this solution, the finished 20 cm-thick floor only required one layer of 8 mm diameter, 200 x 200 mm steel mesh, which was positioned at the base of the slab.

To make the actual concrete mix (strength class C30/37), MAPEFIBRE ST 50 TWISTED structural polymer fibers were included in the mix: 50 mm in length, the fibers were added to the mix at a rate of 1.5 kg/m^3.

The mix also included DYNAMON FLOOR 20, an acryl-

MAPETOP N AR6 and MAPECRETE LI HARDENER were used to finish the floors, before smoothing them with "helicopter" power trowel.



ABOVE. MAPECRETE LI HARDENER was chosen to finish off the floor, a surface treatment product in liquid form.

ic-based super-plasticiser specifically designed for making concrete in hot weather.
This design choice led to the following advantages:

- the concrete mix design was optimised and concrete could be placed more efficiently using a laser screed machine, without resorting to pumps;
- preparation of the steel mesh was much simpler and quicker and using less steel also helped contain costs;
- the floor was completed more quickly (1,200 m²/day).

Hardeners for the final surfaces

The surface was then broadcast with MAPETOP N AR6, a pre-blended, ready to use shake hardener made of special well-graded quartz, Portland cement and special admixtures. This product, as with other hardeners from the CFS line, creates surfaces that are hard, smooth, compact and resistant to wear and atmospheric agents, freeze/thaw cycles and de-icing salts.
MAPECRETE LI HARDENER was chosen to finish off the floor, a surface treatment product in liquid form with a consolidating effect made from lithium silicate, which improves surface hardness and resistance to abrasion and reduces the amount of liquid penetrating into the floor.
The final operation was to seal the joints with MAPEFLEX PU 45 FT high modulus, rapid-hardening polyurethane sealant and adhesive.

Find out more
DYNAMON FLOOR 20

PROJECT INFORMATION
Docks logistics center, Arquata Scrivia (Province of Alessandria, Italy)
Year of construction: 2021
Year of the Mapei intervention: 2021
Intervention by Mapei: supplying products for reinforced concrete floors
Owner: Opificio Area Logistica e Servizi
Flooring contractor: Ferrocemento RS srl
Photos: Elisa Todarello
Mapei coordinator: Marco Paparella, Mapei SpA (Italy)

MAPEI PRODUCTS
Concrete mix: Mapefibre ST 50 Twisted, Dynamon Floor 20
Finishing concrete surfaces: Mapecrete LI Hardener, Mapetop N AR6
Sealing joints: Mapeflex PU 45 FT

For further information on products, please visit mapei.com

Other projects

FROM ICE RINKS AND SPORTS PITCHES TO LOGISTICS HUBS IN PORTS AND AIRPORTS: SOLUTIONS FOR CONCRETE FLOORS FOR VARIOUS TYPES OF USE

Ice rink
Schilpario (Bergamo, Italy)

Over the course of the last few years, the ice rink in Schilpario has undergone various refurbishment works and now boasts a permanent ice rink. The most recent investment of 535,000 Euros was used to create an ice rink, which will also be used to hold training sessions for the Italian teams participating at the Milan-Cortina 2026 Winter Olympics. The base for the rink consists of a concrete slab made using the MAPECRETE SYSTEM, which included the use of DYNAMON FLOOR 20 acrylic-based super-plasticiser, MAPECURE SRA curing agent, EXPANCRETE expansive agent and MAPEFIBRE ST 50 TWISTED fibers. The result is a durable surface with high mechanical properties and very little risk of cracking, without having to use steel mesh.

TK Sparta sports centre
Prague (Czech Republic)

To create 9 tennis courts in this prestigious club located in the Czech capital, it was decided to use MAPECRETE SYSTEM, which included the PCE-based DYNAMON PCT 631 super-plasticising admixture, EXPANCRETE expansive agent and MAPECURE SRA shrinkage-reducing admixture. By guaranteeing a high reduction of hygrometric shrinkage in concrete, the system enabled contraction joints to be eliminated, thereby also preventing any risk of cracking and allowing work to be carried out more quickly. Thanks to the use of MAPEFIBRE ST 42 structural polymer fibers it was also possible to completely eliminate the use of steel mesh. The MAPECRETE SYSTEM solution using synthetic fibers is an ideal system for constructing concrete bases for flat, safe and strong surfaces including those of sport courts.