The Minsk Ice Palace

A joint-free rink in the sports complex dedicated to ice-hockey, ice-skating and curling

The Ice Palace in Minsk, the capital of Belarus, was inaugurated this year on the 30th of January and is considered by many to be the largest ice-skating arena on the European mainland. An Italian construction company called B. Nord Pavi 2000 was awarded the contract for the complex, after having previously constructing the skating rink in the Palavela and Palahockey complexes for the 2006 Winter Olympics in Turin (Italy).

The total surface of the ice rinks is more than 13,000 m², divided over two structures, the stadium and the arena. The rink in the arena has a surface area of 1,860 m² with space for around 15,000 spectators, while the surface area in the stadium is 11,517 m² and may hold 3,000 people.

The structure is used for speed-skating races and curling and ice-hockey matches and, when necessary, may be transformed into two regulation-size ice-hockey rinks for training sessions and warm-ups before matches.

The flooring of the rinks covers approximately 25 km of pipe-work for cooling in the arena and 140 km in the stadium.

Photo 1. A view of the Minsk Ice Palace. Some Italian companies were contacted to carry out the project, including Mapei.

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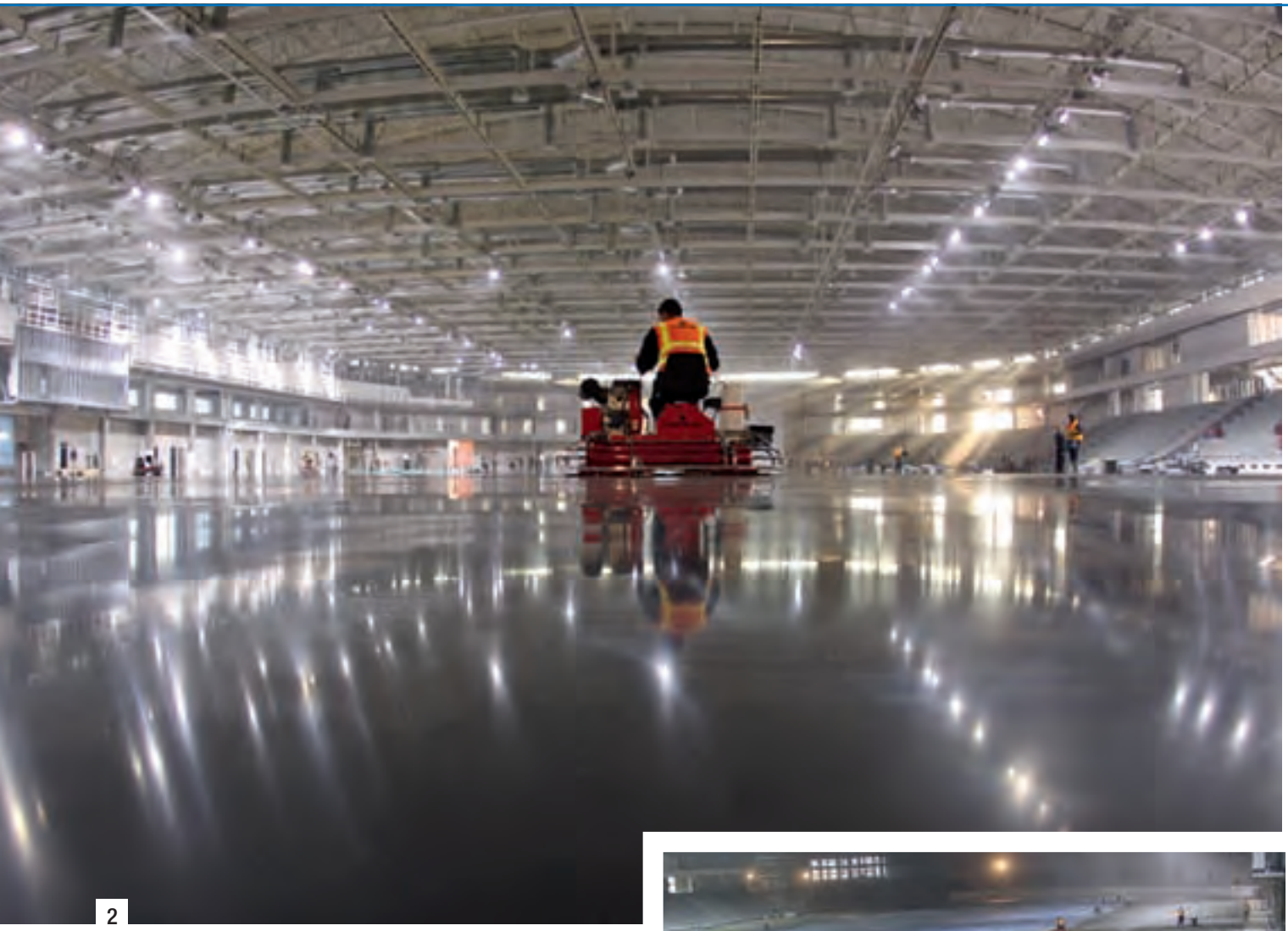
Construction of an Ice-rink

The special techniques and problems encountered when installing this type of flooring surface are mainly due to the fact that this type of surface must be free of joints and concrete cast to form the floor must neither shrinkage nor expand. The floor must also be monolithic and be made from a single concrete casting.

The concrete used in the Minsk



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Photos 2 and 3.
The mix design for the concrete included the use of EXPANCRETE and MAPECURE SRA 25 admixtures which are part of the MAPECRETE SYSTEM.

Ice Palace had to be technologically advanced and was specially developed by B. Nord Pavi 2000, Matassina (a company from Vicenza, Italy, which produces fibres used for structural strengthening) and Mapei, which proved to be yet another example of what makes it a world's leading company in a production of admixtures. After carefully studying the intervention to be carried out, Mapei proposed the use of the MAPECRETE SYSTEM, an advanced system for large concrete structures with no shrinkage joints. Concrete mixed for the MAPECRETE SYSTEM (which includes superplasticising admixtures from the DYNAMON SYSTEM range, EXPANCRETE expansive agent and MAPECURE SRA, an additive which promotes expansion even under non-humid conditions when damp-curing is not carried out) develops a level of expansion which compensates for plastic shrinkage, even if cur-

IN THE SPOTLIGHT

MAPECRETE SYSTEM

It is an advanced system for large concrete structures with no shrinkage joints. It includes super-plasticising admixtures from the DYNAMON SYSTEM range, EXPANCRETE expansive agent and MAPECURE SRA, an additive which promotes expansion even under non-humid conditions.
MAPECRETE SYSTEM may be used to build any kind of structure, from large paved areas and foundation slabs to long walls, as well as for repairing concrete.
It is extremely versatile: it is possible to regulate the fluidity, workability and development of the strength of the concrete, without effecting its expansion and crack control characteristics.

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ing conditions are not ideal.
Before casting the substrate with the cooling system pipe-work, it was reinforced with electro-welded mesh. The casting of the concrete lasted 13 hours non-stop, and was finished off by smoothing over the floor 20 hours after work had been started.
A total of 18 floor-laying specialists and four technicians were sent to the Belarus capital to carry out the work using double tamping machines with 120 cm diameter disks.
The concrete mix was made using EXPANCRETE, a powder admixture added to the rck 35 S5 concrete and fibres to compensate for hygrometric shrinkage, and MAPECURE SRA 25, a liquid additive especially formulated to reduce the formation of cracking from hygrometric shrinkage in standard and self-compacting concrete.
MAPECURE SRA 25 works by reducing the surface tension of the water in the capillary porosity. This process reduces the intensity of the forces which act upon the walls of the pores to guarantee better dimensional stability and, therefore, a drastic reduction of cracks caused by this phenomenon.
Because of the particular climatic stresses and temperature changes to which the surface is exposed, the high level of deterioration of the concrete also had to be taken into consideration.
Therefore, the surface of the flooring was "reinforced" and smoothed over with a special mix developed for this project using pure quartz, cement and microfibres.
The Minsk Arena project represents an important milestone, above all for the future project for seven ice-rinks for the next Winter Olympics to be held in Sochi in Russia in 2014 (when Mapei will again be present as a supplier of products for building or restoring sport facilities), and the other 30 ice-rinks stadiums which the President of Belarus has programmed over the next 12 years.

Photo 4. The surface was smoothed over with a special mix of quartz, cement and microfibres.

TECHNICAL DATA

Minsk Ice Palace, Minsk (Belarus)
Period of Construction: 2007-2009

Year of the Intervention: 2009
Intervention by Mapei: supplying admixtures for concrete
Customer: Republic of Belarus Government
Contractor: B. Nord Pavi 2000 from Mel (Province of Belluno, Italy)
Mapei Co-ordinators: Stefano Dussin, Ettore Menegaldo, Gianluca Bianchin - Mapei SpA (Italy)

MAPEI PRODUCTS

The products mentioned in this article belong to the "Building Speciality Line" range. The technical data sheets are available at the web site: www.mapei.com.
Expancrete: powder expansive agent for preparing shrinkage-compensating, crack-free, waterproof and highly durable concrete and mortars.
Mapecure SRA 25: curing additive for cementitious mortar and concrete, which has the property of reducing hydraulic shrinkage and micro-cracking.