



3M™ Liqui-Cel™ Membrane Degassing Modules Improve Ice Production at the Ice Palace in Moscow

An innovative approach to high quality ice production has been adopted by the new Ice Palace in Moscow. In addition to hosting hockey matches, the arena also hosts many international events such as figure skating and short track competitions.

To achieve high quality standards for the ice that is used in large ice arenas, Gelios Star, a Russian OEM, has designed a state-of-the-art water treatment process. This process utilizes 3M™ Liqui-Cel™ Membrane Contactor technology to take gasses and bubbles out of the water used to make the ice. Gasses in the water can produce a cloudy appearance in the ice which negatively impacts what the fans and TV cameras see during events held in the Ice Palace.

The overall water treatment system used in the ice palace includes the following elements that work together to improve ice production:

- Water pressure boosting multi-stage pump
- Sedimentation granular medium filtration unit with automatic back-wash
- Activated carbon for Cl₂ removal
- Ion-exchange softening
- Reverse osmosis unit for 2 × 1.5 m³/h capacity
- Permeate storage tanks
- DI multi-stage vertical pump
- Two 3M™ Liqui-Cel™ EXF-6×28 Series Membrane Contactors
- Polishing Mix-Bed

Two Liqui-Cel membrane contactors are connected in parallel and operated with a combination of air and vacuum. Carbon dioxide and oxygen are removed from the DI water stream, which helps to produce a crystal clear ice that looks like glass. The system



3M™ Liqui-Cel™ Water Degassing System used at the Ice Palace to produce crystal clear ice at the arena

can process up to 31 gpm (7 m³/h). Due to the modularity of the Liqui-Cel membrane contactors and the variety of sizes available, a system to process flow rates much higher or lower can also be built.

For additional information, please contact your 3M representative or visit 3M.com/Liqui-Cel.

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