

KE-REFERENCE: GÖRANSSON ARENA, SWEDEN

In co-operation with Kyl och Ventilation Svante Lundbäck and Grontmij, KE Fibertec has supplied the air distribution system for the largest multi-purpose arena of Sweden, Göransson Arena, in Sandviken 200 km north of Stockholm. The choice fell on a KE-DireJet® System of impermeable textile material that provides directional delivery of air through various types of nozzles. With 13,000 m² area under roof Göransson Arena is unique as to size, design and application possibilities. The construction of the arena cost more than 210 million DKK.

In May 2009, Sweden's largest multi-purpose arena, Göransson Arena, in Sandviken 200 km north of Stockholm opened. Göransson Arena is unique as to size, design, and application possibilities.

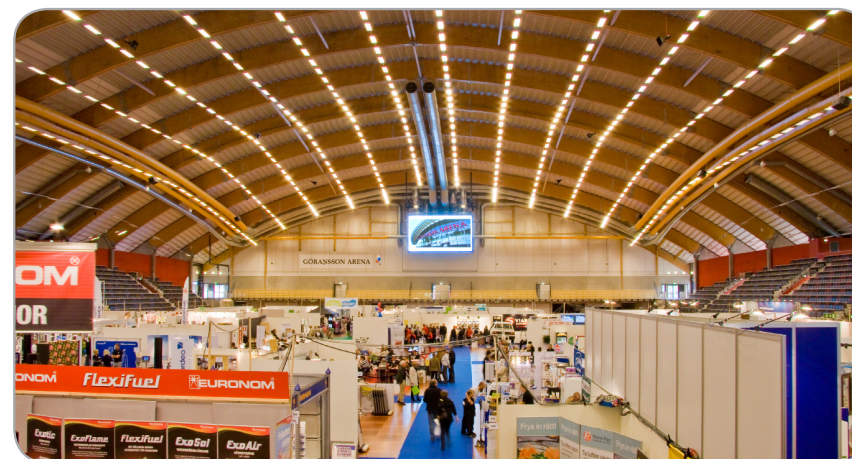
The arena is designed for sports and cultural venues as well as conferences and is a giant, dome-shaped building with a capacity of approx. 4,000 spectators during sports matches and a capacity of approx. 10,000 people during other venues.



The construction is made of laminated wood beams with max. spans of over 100 m. The total area is 13,000 m² of which 7,400 m² (67 x 111 m) are used for indoor bandy, among other things, that is on ice. The ice area is 3 times bigger than the ice area of Globen in Stockholm.

In cooperation with Kyl och Ventilation Svante Lundbäck and Grontmij, KE Fibertec AS has prepared an air distribution solution applying textile ducts. The choice fell on a KE-DireJet® System of an impermeable material with nozzles. In close co-operation with the consulting engineers, a layout featuring 3 textile ducts above the seats along both long sides was chosen, and 4 ducts were placed in two rows along one short side. The textile ducts are literally tailored for Göransson Arena. The ducts along the long sides are made of sections of approx. 8 m long and designed with elbows that gradually bend the textile ducts into large arches. In addition to a full view of the court from all seats, the ducts offer a great visual effect that aesthetically melts into the dome-shape of the arena.

The two outermost ducts at each side of the hall provide air distribution over the seats and are dimensioned for between 50 and 100% air volume. The two innermost ducts at each side of the hall distribute air towards the centre of the hall, e.g. for venues such as concerts and exhibitions. As the distance to the occupied zone varies considerably between the 3 textile ducts, a solution with Ø24 mm nozzles was chosen towards the spectators' seats, whereas a Ø48 mm nozzle was chosen towards the centre of the hall, a so-called KE-DireJet® Vario System. The KE-DireJet® Vario System is an innovation in textile based ventilation with a number of obvious advantages due to the multi-adjustable nozzles that allow adjustment of the inlet air direction of up to 30° in any direction according to the centre line of the nozzle - even after installation of the textile duct.

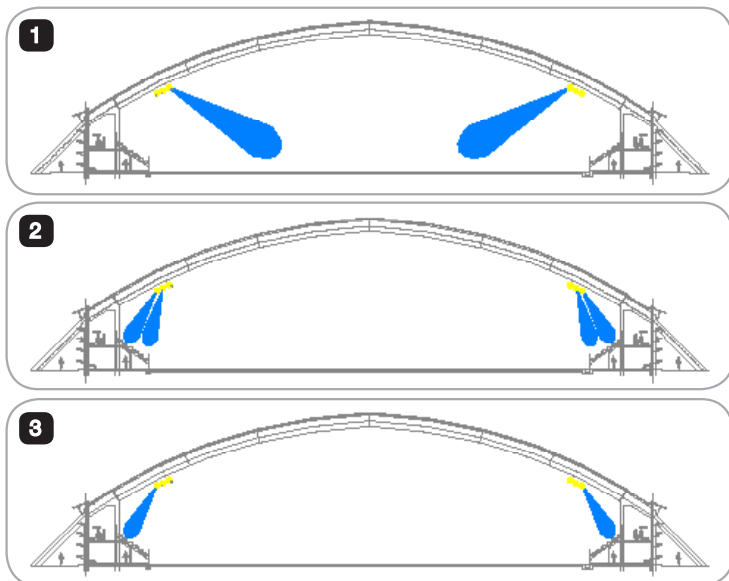


The KE-DireJet® Vario System in Göransson Arena

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The numerous activities that take place in a multi-purpose arena such as this make huge demands on the air distribution due to the varying and different indoor climate requirements. The operational situations cover everything from bandy to concerts with heavy, internal heating duties. A success criterion for the layout of the air distribution system was to direct the air to the correct areas, at the same time ensuring that the air would reach the occupied zones in question. This both in cooling and heating situations. The draught criteria must also be met and this demands high accuracy in dimensioning and makes high demands on the ventilation product.

During the entire layout phase there was great focus on the operational strategy to ensure the best possible energy economy. Therefore the work involved varying volumes of air determined by the type of arrangement. During exhibitions and concerts the ducts placed nearest to the centre of the hall are in operation whereas the outermost ducts are operating during top sports matches, e.g. bandy. As the number of spectators may vary, the focus has been on being able to vary the capacity of the seats at between 50 and 100%.



The layout of the textile ducts ensure an optimum operational strategy. 1: Air distribution during e.g. an exhibition. 2: Air distribution above the spectators' seats at 100% air volume. 3: Air distribution above the spectators' seats at 50% air volume.

By now the ventilation of Göransson Arena has passed most tests as a large number of activities have been held in the arena. During the week the arena is home ground of SAIK in the Swedish bandy top league. Apart from that there has been many concerts and exhibitions. In the near future the bandy world cup, the Swedish Eurovision Song Contest and the Swedish indoor racing championships will be held in the arena.



FACTS:

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| Customer: | Local authority of Sandviken |
| Consulting engineers: | Grontmij |
| Contractor: | Inneklimat Teknik |
| Textile ducts: | KE-DireJet® Vario System - 194 m dim Ø900 mm - 389 m dim Ø800 mm - 114 m dim Ø500 mm |
| Nozzles: | Ø24 mm & Ø48 mm KE-DireJet Vario |
| Suspension: | Double Safetrack |
| Total weight: | Approx. 1700 kg |
| System towards long side beams:: | max. 54.000 m³/h |
| System towards short side beams: | max. 12.600 m³/h |
| System towards inner area: | max. 32.400 m³/h |