Referenties

# The Opera House in Copenhagen



**Betrokkenheid van Uponor**

3000

## The Opera House in Copenhagen

Uponor gives the audience a great and pleasant experience in the breaks between the acts in the new Opera House in Copenhagen, Denmark.

**Projectgegevens:**

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|---|---|
| Location | Afronding |
| Copenhagen, Denmark | 2005 |
| Type gebouw | Product systems |
| Industriegebouw | Apkure & Dzesēšana |
| Adres | Soort project |
| Nyhaven 71 | Nieuwbouw |

**Partners**

contractor
Rambøll
Rambøll Danmark Bredevej 2 2830
Virum
Denmark

In January 2005 the new Copenhagen Opera House was inaugurated. The spectacular and complicated building construction, which total area is 41,000 m2 divided in 14 stories, had several challenges.

One of them was when Uponor in a close cooperation with Rambøll, the leading engineering, design and consultancy company in the Nordic countries, accomplished the project engineering and installation of underfloor heating and cooling in the Opera's foyer. The goal was to create a pleasant indoor temperature both for summer and winter – with just the one system. In addition, the aesthetic and architectural requirements were to be considered, not to mention external factors like sun and emission of heat from over one thousand opera guests.

Uponor's manager for technical support, Jan Skjold Sørensen, described the task as follows: "Under normal circumstances it would not have been especially complicated to utilise a combined solution for underfloor heating and cooling. But Opera's foyer is far away a normal room partly due to its size but also due to the several architectural and aesthetic requirements. The balcony in the foyer is special and thin compared with standard sizes and tolerances, making special demands for a heating and cooling solution. The solution needed also to be a dynamic one, as a huge change in the temperature would take place when 1,400 persons enter the foyer simultaneously. Therefore the underfloor cooling should cool down the constructions and thus prevent the indoor temperature from becoming too high, because the air humidity would then increase and following this, the risk of damp and condensation is high. In the colder months, when there is need for heating of the foyer, the underfloor heating takes over".

Possible solutions were discussed and tested by Rambøll and Uponor. Once a solution was decided on, a phase planning took place in order for the installation people to enter the construction site when it was suitable The installation work itself was rather frictionless, the biggest challenge being logistic – the unbreakable flow of the 18,000 metres pipe in a construction site including hundreds of craftsmen.

Thanks to Uponor's heating and cooling system, nobody should be either cold or too warm when enjoying a drink or a sandwich in the enormous foyer. "To control the temperature when up to 1,400 people stand together on a 3,000 m2 floor area was a challenge – taking big windows, airflow from windows and doors, lights in the room, design and other parameters into consideration – but we made it", states Jan Skjold Sørensen gladly.

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