Success Story

Olympic Renovation

Thermo-Fluid Analysis to Convert the Olympic Tower

PARC OLYMPIQUE

The Olympic Stadium is one of Montreal's most iconic buildings. Although the structure's distinctive inclined tower remained vacant for 30 years following its opening, it has recently been occupied.

The Régie des installations olympiques (RIO) has converted the tower into an office space, creating 1,400 workspaces on 7 of the tower's 12 floors, including common areas for meals, leisure and meetings. Desjardins has signed a 15-year lease on the space for the headquarters of its AccèsD department.

Challenge

The extensive renovations involved replacing the external concrete and window panels with a curtain wall made entirely out of glass.

As the Olympic Stadium is a site of great symbolic and heritage value, the renovations had to remain in keeping with the structure's original architecture.

The RIO engaged Maya HTT to perform the analysis needed to improve the heating and ventilation systems and avoid any risk of condensation. Maya HTT conducted the analysis using its own NX Thermal-Flow software.

Success at a Glance

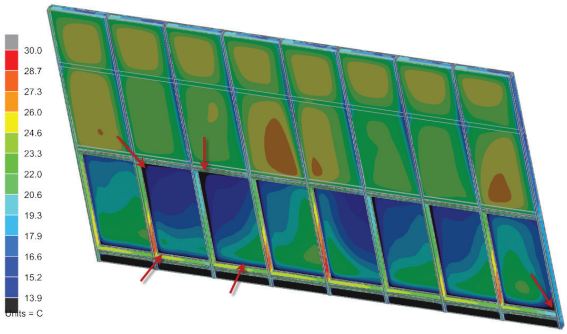
- **Optimized air speed and air temperature vectors**
- **Obtained optimal humidity for seasonal temperature fluctuations**
- **Selected best heating solution to minimize cost**

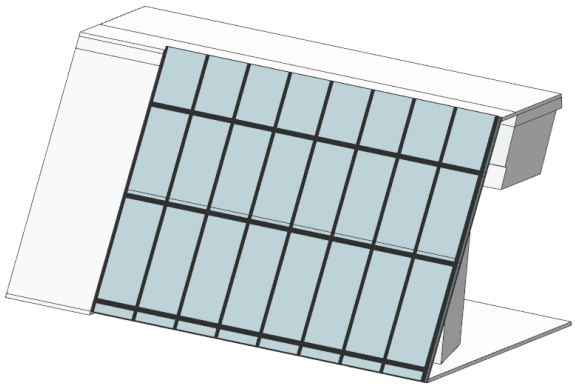
Solution

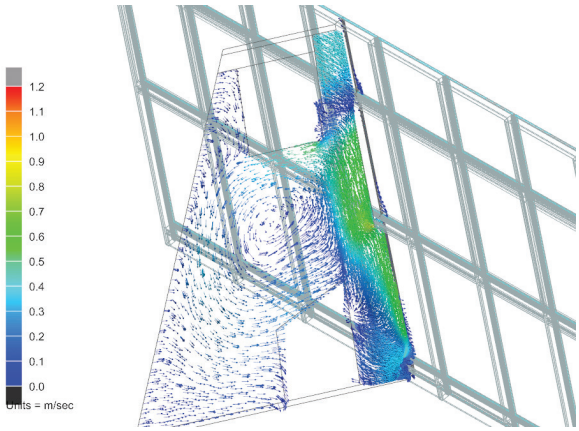
CLEB, a leader in building science, was charged with obtaining energy validation of the solution for the tower's casing. To complete the validation process and determine the condensation risks of the curtain wall, CLEB required thermo-fluid CFD simulations, which Maya HTT was uniquely positioned to provide.

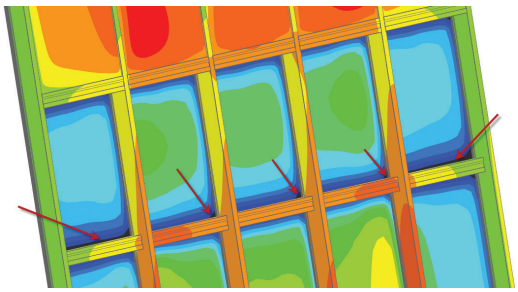
The work was divided into stages:

1. First, a purely thermal model of the curtain wall was developed. It was tested and validated in a lab using known interior and exterior surface temperatures.
2. Next, the curtain wall model was inclined at both acute and obtuse angles, corresponding to the geometry of the Olympic Stadium's tower.
3. Finally, the three models – right angle, acute angle and obtuse angle – underwent steady-state 3D fluid and thermal digital simulations to assess condensation risks.









Results

By running different iterations of the simulation, Maya HTT was able to optimize the air speed and air temperature vectors and obtain the optimal humidity for seasonal temperature fluctuations between 40°C and -40°C. The simulation results also made it possible to determine how powerful the electric baseboards should be to minimize cost and maximize energy efficiency.

Maya HTT is proud to have contributed its world-class simulation expertise to creating a comfortable environment for the Desjardins AccèsD employees.

> ***"The replacement of external walls proved to be an important subject of architectural interest in favor of an office development project in the Stadium's tower, instead of going to a traditional building."***
>
> Mathieu Desrosiers
>
> Project Manager, AccèsD

About Maya HTT

- **Industry leading software developer and provider of engineering services in CAE, Product Lifecycle Management (PLM) and Datacenter Infrastructure Management (DCIM)**
- **Extensive experience in design, analysis, systems integration and deployment**
- **Specializing in mechatronics, thermal, fluid and structural analysis, and composites**
- **Technological partner, software editor, and provider of Siemens CAD/CAE/PLM solutions for more than 30 years**
- **Worldwide customer technical specialist support**

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