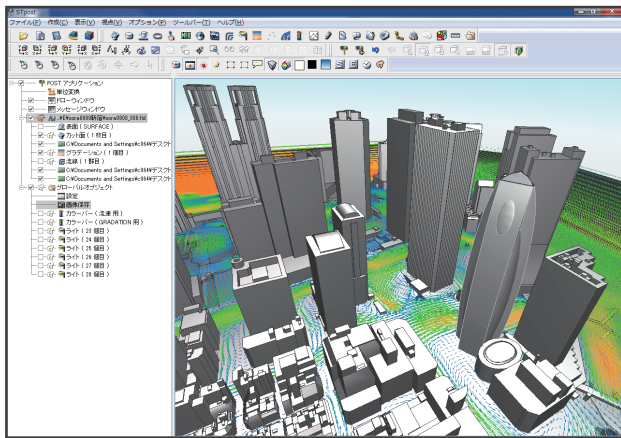


# Solutions for BIM (Building Information Modeling)

Thermal-fluid Simulation with Direct Interface to BIM Software

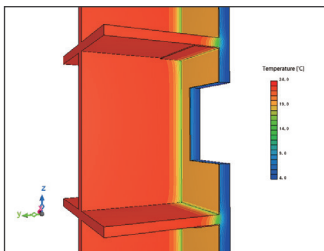


## Features

- Offers direct interface with ArchiCAD®, Autodesk® Revit®
- Compliant with IFC, 3ds and other intermediate format
- Compliant with air-conditioning CFD components provided by Subcommittee of Integration of BIM and Modularization of Elements for CFD
- References ASHRAE solar radiation database developed from data collected at over 5000 locations around the world
- Includes capabilities to add, delete, and edit model components
- Achieves large-scale and detailed model calculations using multiblocks
- Offers parallel solver for high-speed computations
- Equipped with state-of-the-art multi-functional post-processor

## Main Solver functions

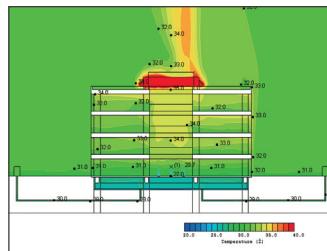
- Wind velocity (velocity)
- Concentration
- Radiation
- Free surface
- Temperature (incl. radiation)
- Particle tracking (considering mass)
- Solar Radiation (direct, sky radiation, reflection)
- Humidity (incl. dew condensation & evaporation)



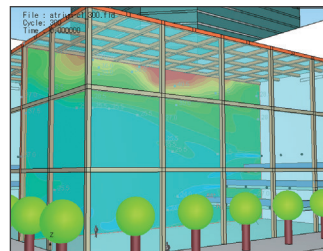
Evaluation of insulating wall

## Specific functions for building

- Air-conditioning model
- Moving object
- Outdoor wind profile
- Moisture absorption (incl. transport within a material)
- Diffuser models
- Fan models
- Forest canopy mode
- Humidity (incl. dew condensation & evaporation)



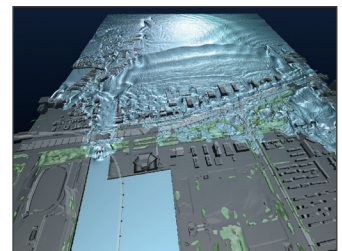
Evaluation of cooling tube effects



Thermal environment of an atrium

## Useful indices

- Ventilation Efficiency Indices (lifetime of air, age of air, residual lifetime of air, contribution ratio of supply / exhaust openings)
- Thermal comfort indices (PMV<sup>\*1</sup>, SET<sup>\*2</sup>)
- Murakami's criteria for wind environment index

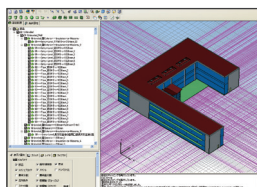


Water overflow along coast

\*<sup>1</sup> Predicted Mean Vote  
\*<sup>2</sup> Standard Effective Temperature

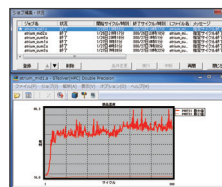
## Analysis flow

### Pre-processor



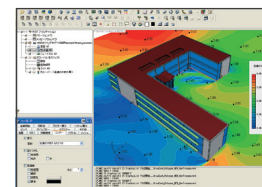
- Model generation (can import CAD data)
- Condition setting (using wizard)
- Mesh generation (automatic)

### Solver



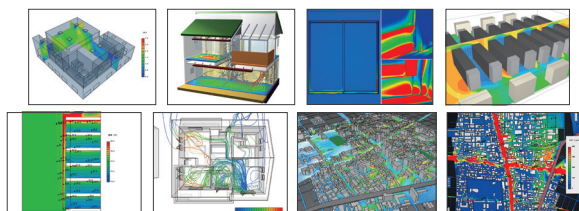
- Calculation (possible to monitor progress)
- Possible to monitor the calculation

### Post-processor



- Display (contour, vector, etc.)
- Operation (user-defined variables and their graphs)
- Export (still image, animation, or CradleViewer)

## Major Applications



- Thermal environment inside of an office
- Natural ventilation in a residential home
- Airflow control of a cleanroom or a data center
- Evaluation of window opening specifications
- Wind environment around buildings
- Aerial short circuit of an outdoor air-conditioning unit