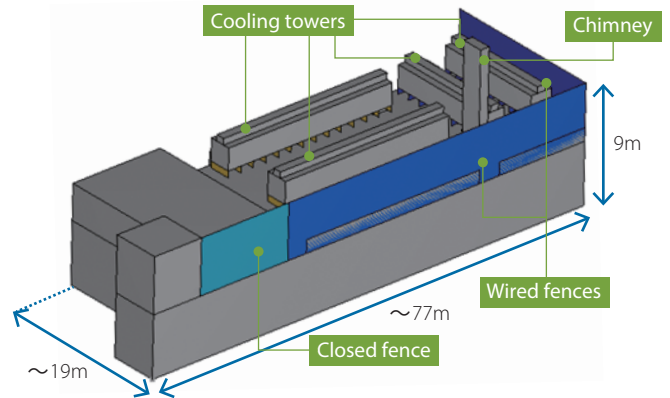
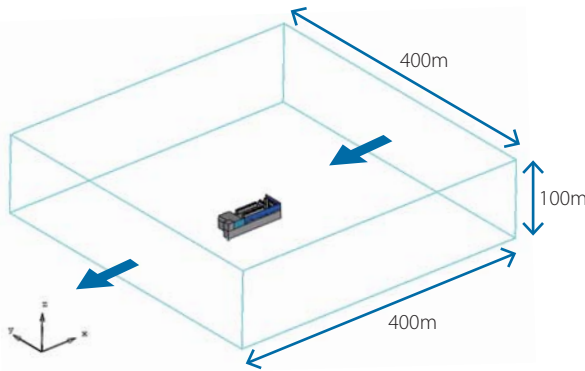


Wind Analysis of a Factory and Cooling Towers

scSTREAM is used to simulate the wind environment around a factory. The factory has four cooling towers to dump the heat generated from the inside to the outside. Concentration of a diffusive species, or vapor is calculated to evaluate the environmental effect of the cooling tower and the chimney exhaust.

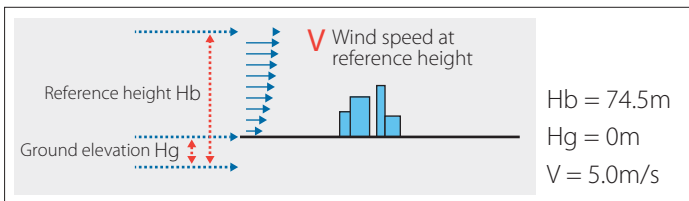
Simulation Model



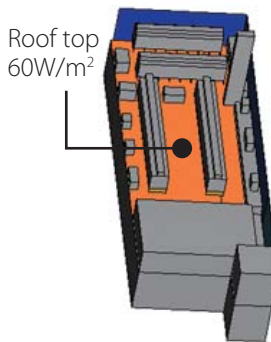
Analysis Conditions

Wind conditions

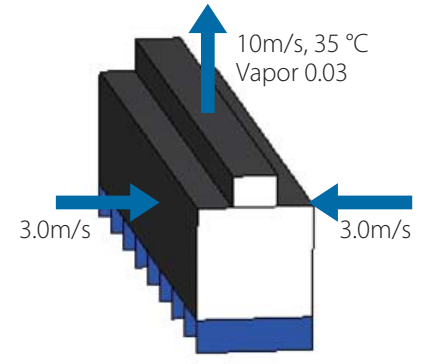
Due West at 20 °C
Suburban area
Power-law inflow boundary condition



Thermal condition



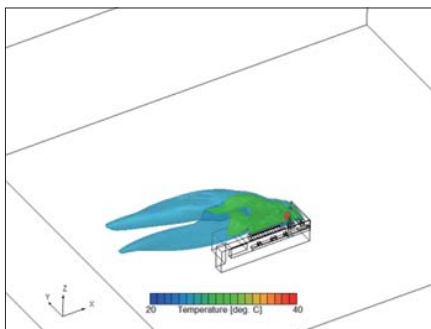
Flow conditions: Cooling tower



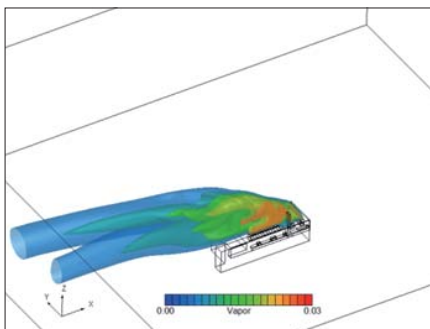
Flow condition: Chimney 1.0m/s, 160 °C, Vapor 0.01

Results

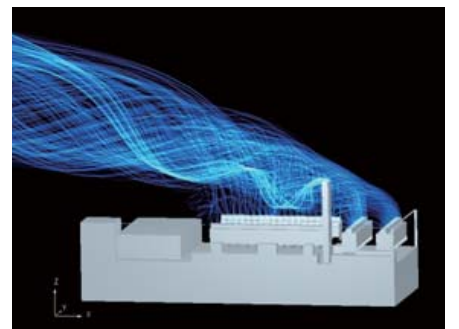
Isosurface of temperature



Isosurface of vapor concentration



Streamline plot



Notes

Airflow and diffusion simulations using scSTREAM shows that the exhausts from the cooling towers and the chimney, especially the diffusive species contained in the exhaust, influence the environment downstream. It is important to perform this kind of simulation for different wind conditions and to evaluate the environmental effects of industrial activities.