

BUILDING ENCLOSURE COMPUTER SIMULATIONS AND TESTS

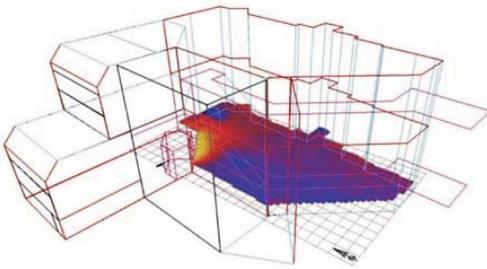
Computer Modeling and Simulations

We assist designers and attorneys in analysis and presentation of physical processes before or after these processes occurred in the buildings. We also test the conditions in the the real life and in the real time. Read more at the webpage www.FACADE-DOCTOR.com/simulations.html.

Spectrophotometric Simulations and Testing

Spectrophotometric simulations are performed to find the closest visual match for the architectural glass: either designed or existing on facades. The comparative optical analysis of glass allow for identification of commercially available matching glass by the current largest glass database in the world. Glazing is one of the most expensive components of facades. These analysis save millions of dollars which would otherwise be spent on a blanket glass replacement of an entire facade, while only few pieces of glass are broken.

Daylight Analysis
Building Enclosure
Simulation



Sample daylight studies.

Daylight Studies

Performed to verify the daylight factor. Particularly useful in verification of compliance with the LEED credit 8.1

Solar Heat Gain and Shading Studies

Performed for identification of comparative energy impact of individual components of a building.

Whole Building Energy Modeling

Performed for the comparative analysis of design trade-offs to meet the predefined energy goals.

Two-Dimensional Steady State Thermal Analysis

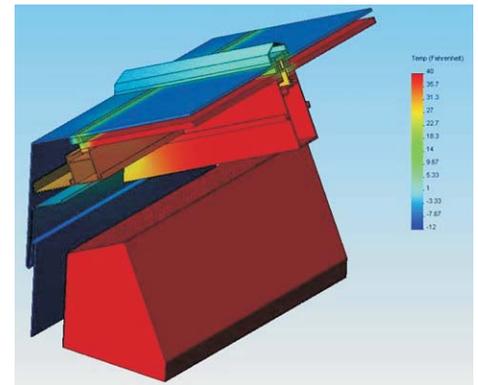
Performed on simple assemblies to identify the thermal resistance (R value) or assess the condensation risk.

Three-Dimensional Steady State Thermal Analysis

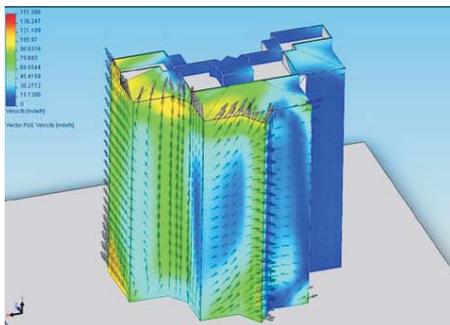
Performed chiefly to assess the condensation risk of those details that escape the 2D representation.

Three-Dimensional Transient Thermal Analysis

Performed to assess the passive solar design with materials of large heat storage capacity or to assess the condensation risk.



Sample 3-Dimensional Steady State Thermal Analysis revealing the irregularities at the skylight rafter and the risk of freezing at the condensate gutters' discharge.



Sample Computational Fluid Dynamics Analysis

One-dimensional Transient Hygrothermal Analysis

(WUFI) Performed to assess the moisture behavior of very simple assemblies. Most typically performed to assess the need and location of vapor retarding layers.

Computational Fluid Dynamics

The cutting-edge computational fluid dynamics (CFD) are performed as a virtual wind tunnel analysis (e.g. for shape optimization or tracing windborne projectiles) or for identification of boundary conditions for thermal analysis. These analysis also help e.g. in verification of directional scratches of glass and cladding, as well as the verification of origin of impact damages for separation of damages caused by separate wind events and identification of pre-existing conditions.

3D Static Simulations

Performed for verification of stresses in the material or assembly.

Field Testing

We perform and witness measurements and physical tests in the field to identify potential deficiencies and their sources following procedures established by major industry associations and Florida Building Code. we also develop custom tests to address specific field conditions.

The most typical tests include:

- Spray water tests (hose and rack) for cladding and fenestration leaks,
- Thermal imaging for wet materials, insufficient insulation, and air leaks,
- Hydrostatic pressure (flood) tests for roofs and plumbing leaks,
- Wind uplift resistance tests for hurricane winds,
- Glass evaluation and measurements of scratches and other potential deficiencies,
- Window and door framing evaluation and measurements for straightness and other potential deficiencies. -
- Smoke tests for air and water leaks,
- Acoustic tests for air and water leaks.

These tests typically yield data that allows for the definition of the optimal remediation method and allow for a verification of the repair or replacement methods previously proposed.



Field t est. following the AAMA 501.2 "Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems" procedure.

BUILDING ENCLOSURE CONSULTING, LLC provides design, consulting, simulation, inspection, research, testing, and investigation services of building facades. We specialize in high rise buildings. We are based in Hallandale Beach (near Miami) in Florida. T. (305) 600 0516 Email: INFO@B-E-C.INFO www.BEC-Miami.com