DesignBuilder SOFTWARE

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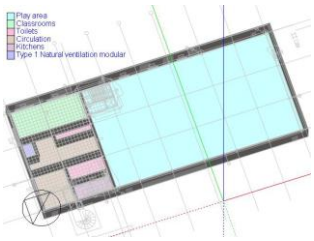
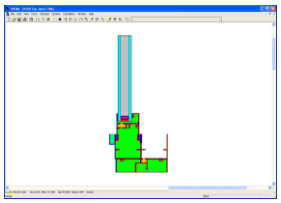
DesignBuilder SOFTWARE SERVICES

BUILDING ENERGY MODELING



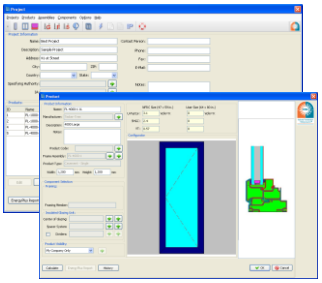
Modeling of energy performance and consumption of residential and commercial buildings is done with two EnergyPlus based software tools, **Design**Builder and EFEN. Energy modeling is either performed for early stages of design where glazing, insulation, etc. are being selected or for full energy modeling of the specific building design. CAD drawings are read into the energy modeling package and detailed energy simulations are done to determine loads, equipment size, annual energy use, comfort parameters, code compliance, Tax Credits and LEED ratings.

BUILDING ENVELOPE MODELING



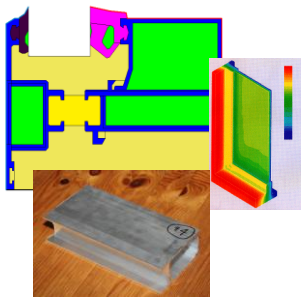
Modeling of windows, doors, skylights, walls, roofs, foundations, and other building envelope components is done for energy, moisture and structural performance. Several industry standard tools are used for this modeling, such as THERM, WINDOW, and WUFI and several in-house developed tools, such as FENSTRUCT and GLASTRUCT. Modeling is done for the purposes of determining performance of complex façade systems or for certification purposes, such as NFRC.

CUSTOM SOFTWARE DEVELOPMENT



Custom software is developed based on the customer request and needs. DesignBuilder Software has extensive expertise in the development of rich client tools, web and database driven applications. For most of the software projects, *Borland Delphi* Rapid Application (RAD) environment is used. Other software platforms, such as Microsoft C++, Intel FORTRAN, and Microsoft Visual Basic are also used, as per customer request or specific software needs. Microsoft SQL and several open source databases (i.e., Firebird, PostgreSQL) are used in database driven applications. While we specialize in building performance applications, we have successfully developed other types of applications as well.

R&D ASSISTANCE



When competitive market or ever changing code requirements ask for products and systems to be more energy efficient, it is imperative that new products incorporate critical design details necessary to accomplish the performance goal. Very often, design improvements do not have to increase the cost of the final product, or may increase it only marginally. Without the proper expertise in thermal performance field this can be daunting process and may cost manufacturer much more than necessary, while still struggling to make the “cut”. With our experience in helping numerous manufacturers achieve ambitious goals and with our experience in participating in US DOE grants for more energy efficient products we offer peace of mind and guarantee that our design help will perform as desired.

THERMAL CONDUCTIVITY MEASUREMENTS

Thermal conductivity measurements are done for variety of building materials using ASTM C518 standard. Material samples from 5 x 5 in. to 12 x 12 in. are measured in LaserFox 304 ASTM C518 apparatus, which has published uncertainty of 1%. Specimen thickness can vary from ¼ in. to 4 in., provided that the specimen conductance is less than 200 $W/(m^2 \cdot K)$. Specimen thickness is automatically measured with high precision and proper force is applied to the specimen to assure good contact. We also offer measurements for stacked specimens assuring intermediate contacts with the high conductivity paste

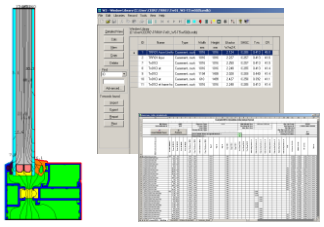
THERMAL EMISSIVITY MEASUREMENTS

Thermal emissivity measurements are done for building materials using ASTM C1371 standard. Material samples with the minimum of 1 x 1 in., square or round (no upper limit in size) are measured using Devices and Services D&S Model AE1 portable emissometer. Wide range of emissivities can be measured with this instrument ranging from near mirror surfaces to near black bodies in Far Infra Red (FIR) wavelength range (normally from 2 5 μm to 50 μm).

GLASS OPTICAL PROPERTY MEASUREMENTS

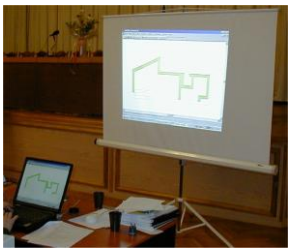
Optical properties of glass and other transparent materials are measured in two instruments, Cary/Varian 5000 UV-VIS-NIR (SOL) Grating Spectrophotometer and Nicolet 560™ FT-IR (FIR) Spectrophotometers. SOL range (0.3 μm to 2.5 μm) is used to fully characterize spectral performance of transparent materials for their solar performance and FIR range (2 5 μm to 50 μm) is used for measurements of thermal emissivity of transparent materials. Glass samples 1 x 1 in. up to 4 x 4 in. can be measured. Measured data is submitted to the international glazing database (IGDB), as per customer request.

NFRC CERTIFIED SIMULATIONS



Computer simulations and thermal testing of fenestration products is performed for the purpose of obtaining NFRC certified energy performance numbers in accordance with NFRC standard procedures. THERM5 and WINDOW5 programs are used in simulations in compliance with the NFRC 100 and 200 standards. As a result of the simulation, U-factors, SHGC, VT, and CR indices are produced and submitted to the NFRC database for the purpose of obtaining NFRC Certification for these products. Custom reports and labels are prepared for clients on demand.

SOFTWARE TRAINING



Software training is offered for a range of computer tools, DesignBuilder, EFEN, THERM and WINDOW, OPTICS, RESFEN, FENSIZE, FENSTRUCT, SPACER, etc. Workshops are also provided about NFRC certification process either as a part of THERM and WINODW training or separately. The training is streamlined per customer needs (i.e., whether customer needs to better understand codes and standards, or if the need is to improve the design of products or buildings). Trainings are offered from 1 day to full week, depending on the program and level of proficiency desired. Typically, trainings last 2-3 days. Trainings are conducted either in Miller Falls, MA or at the client facility.

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CODE REPRESENTATION

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