Cover Story...
UC Berkeley’s Sustainable Energy Biosciences Building (page 12)

Inside this issue...
Commercial Building Energy Code Compliance Sustainability Claims HOA Litigation
Energy Code Compliance
Utah Valley Convention Center, Provo, Utah, Finds Right Tool for the Job
by Tom Herron, senior communications and marketing manager, National Fenestration Rating Council
(Editer’s Note: Tom Herron, senior communications and marketing manager, National Fenestration Rating Council. He holds an MBA from the University of Maryland.)

odd Reynolds, a dedicated building design professional with more than 15 years of experience in the glass and glazing industry, is committed to delivering energy efficient and sustainable projects to his clients. Reynolds, a naturally curious visionary, is always looking for innovative techniques and tools to enhance productivity and maximize his company’s return on investment. He was intrigued when he learned that EFCO, a manufacturer of curtain wall systems for commercial architectural applications, chose to implement the National Fenestration Rating Council’s (NFRC) Component Modeling Approach (CMA) program to meet code compliance for the 44,100 sq. ft. of glazed curtain wall that makes up the Utah Convention Center.

Once he discovered that CMA enables building professionals to mix-and-match existing NFRC ratings for pre-approved window components, including glazing, frames, and spacers to generate whole product ratings, Reynolds, both a risk taker and a critical thinker, was eager to see the innovative CMA Software Tool (CMAST) in action. His interest grew when he found its intuitive platform provided the specifying authority with a convenient method for inputting design criteria and generating pre-qualified ratings for various configurations. It was that moment when he saw for himself how easy it was to determine how changing one component affected the energy performance rating of the entire product, from a virtual environment, that he became convinced CMA was the right tool for the job and fully embraced it.

Value and Efficiency
Reflecting on CMA’s successful application to the Utah Convention Center project, Reynolds, a principal with a manufacturer’s representative known as ASC, is convinced that collaborating with NFRC added value and efficiency for everyone involved. “NFRC has credibility and clout that stretches across the industry, and using their label certificates and aligning ourselves with their strong reputation enabled us to demonstrate our commitment and leadership to our target market,” said Reynolds.

Reynolds also discovered that the benefits of CMA endure once the project is completed. The software tool will provide the kind of project-specific performance data that building owners can use to conduct building energy analyses over the lifecycle of the facility, which opened in May 2012.

Meeting Code Compliance
Persistent and dedicated to ongoing improvement, CMA was a natural fit for Reynolds, who enjoys combining new ideas and refining them as they advance through the various stages of development and execution. While taking deep pride in his skill in predicting the energy performance of his projects, Reynolds also enjoyed sharing his expertise with others on the Utah Convention Center job site as they navigated the features of CMA and applied them meticulously to the task at hand, achieving code compliance.

According to Reynolds, CMA made the entire process more straightforward. Rather than concerning themselves with managing the challenging task of testing product samples, Reynolds and the team enjoyed the convenience of CMA’s ability to provide them with the energy performance information they needed on-demand by querying a database of pre-defined, NFRC-approved glazing, frame, and spacer options. The building designers used these components to build whole products that were molded to obtain project-specific label certificates, and this facilitated easier compliance with the codes in Utah County.

The resulting label certificates clearly indicated the U-factor, Solar Heat Gain Coefficient (SHGC), and Visible Transmittance (VT) values for each product. What truly impressed Reynolds, however, was the fact that once a product is certified, the same product design can be used in successive projects without the need for recertification. Reynolds believes this is what makes CMA a desirable and truly sustainable product in the fenestration industry. “Anytime you can avoid starting from scratch, it’s a major advantage,” Reynolds said. “As we all know, building on previous knowledge is the hallmark of progress.”

Leadership
In addition to viewing his own organization as a committed leader, Reynolds sees the same quality in NFRC. He views the development and rollout of CMA as a bold and innovative step forward, one that is likely to attract not only innovators and early adopters but also the mainstream users who are eager to creatively serve the growing demand for certified glazing on non-residential buildings.

Overcoming a Key Challenge
According to Reynolds, one of the primary challenges of choosing high-performance fenestration for a non-residential project, in that unlike residential windows, it is often assembled on the project site. Consequently, rating and labeling the energy performance of each product becomes impractical. Reynolds found, however, that CMA resolved this fundamental challenge. By accessing CMA’s online performance data, the project team manipulated various data for the three primary components of a fenestration product: glazing, frame, and spacer, to generate overall product performance ratings for U-factor, Solar Heat Gain Coefficient (SHGC), and Visible Transmittance (VT) to meet the ASHRAE 90.1-99 prescribed 0.35 U-factor and 0.40 SHGC required in Utah County.

The entire process exceeded Reynolds’ expectations. “I have yet to receive a push back from the NFRC certifications,” he said. “I’m pleased EFCO made the investment and commitment. CMA has really paid off for us.”

Furthermore, Reynolds envisions CMA leading to more benefits from above-code incentive programs. More accurately rated fenestration and more precise whole building energy calculations could help building owners qualify for programs that provide financial incentives for exceeding building codes.

Looking Ahead
Reynolds foresees using CMA on future projects and predicts other companies will adopt the tool. He says the fast changing pace of dynamic markets and the complexity of competition demand that companies respond quickly to changes in the external environment.

For those concerned about implementing the program into their work, Reynolds says the CMAST will not only make it easier to work with code officials but also to facilitate more upfront involvement, which can help project teams and building owners anticipate energy savings over the long term. This ability, of course, allows owners to present the findings to their clients as an enduring benefit, thereby improving the project’s marketing. “CMA can be implemented to reduce a building owner’s or tenant’s operating costs,” Reynolds said. “Users can calculate more accurate thermal load estimates and install right-sized HVAC systems, which may lead to decreased utility bills.”

Additionally, Reynolds says CMA has already gained traction among other design-build professionals in Utah, pointing out that several architects are planning to start specifying only products listed in the publicly available, online CMA database.

Effectiveness
According to an independent study conducted by the Hessong Mahone Group (HMG), during 2010, the use of CMA provided an increase of up to 7.7% in energy compliance margins compared to default fenestration-rating values in California buildings. While this study was confined to California, the results imply that similar results can be achieved elsewhere. The 11.7% additional compliance margin was obtained by modeling an office building with 20.8% window-to-floor area ratio. Additional compliance margins were found to be generally associated with buildings using more fenestration. For example, the model of a retail store building with only 15% window-to-floor ratio showed no additional improvement.

The purpose of the study was to determine CMA’s actual benefits compared to the California Energy Commission’s Title 24 default energy rating values, after CMA was incorporated as a standard approach in the state’s latest Title 24 Energy Efficiency Standards for non-residential buildings. The CMA Simulation Study compared CMA generated window energy values to Title 24 default values and equation-based values, running simulations on eight building models under conditions in each of California’s 16 climate zones to determine whole building energy-related performance values based on varying fenestration product performance.

Added Benefits
CMA can demonstrate fenestration products specified in bids will meet energy codes. CMA provides the most accurate fenestration energy-rating values so design and construction professionals can confidently select the right windows for their project. Additionally, the tool may increase LEED scores by facilitating the selection of windows with higher energy ratings. The LEED program calls for the use of ASHRAE 90.1-07, which requires NFRC 100 and 200. CMA is based on NFRC 100 and 200 to provide the most accurate fenestration energy-performance values.

The Bottom Line
According to Reynolds, CMA ended up doing more than proving itself as an efficient and effective tool for meeting building code compliance on the Utah Convention Center project. One of the more intangible benefits he didn’t anticipate from the outset was the contribution to the sense of camaraderie the team shared throughout the project by encouraging everyone to bring their creative ideas to a new endeavor.

As he looks back over all he was able to accomplish, Reynolds views CMA as a valuable tool that will continue to attract attention and ultimately enjoy widespread adoption in an industry that needs such innovations to keep growing. “CMA was integral in streamlining the selection, certification, and code compliance processes for the fenestration on this project,” Reynolds said. “It’s the kind of tool you can rely on to get things done easier than ever before.”