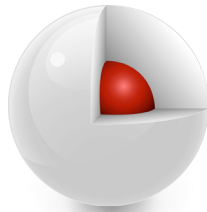




engineering



**ICC**

lasting results



## Design to Completion: **ICC**'s 3D Modeling Approach

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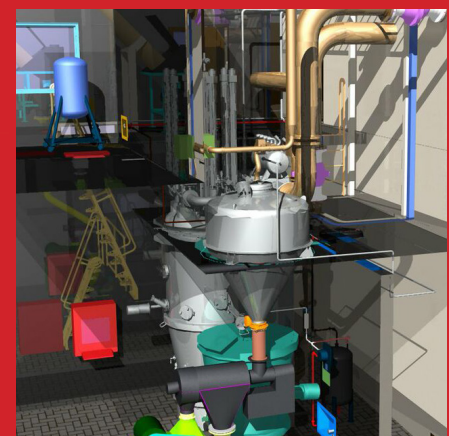
“What new technology does is create new opportunities to do a job that customers want done.” – Tim O'Reilly



26 years ago, a team member at **ICC** led the construction of a blood plasma plant for Bayer using 3D modeling design. At the time, CAD was still in its infancy, but **ICC** clearly saw its potential as a game changer. The success of that project proved to **ICC** that computer modeling could not only be extremely useful internally for project control, it could significantly enhance the client experience and enable delivery of completed projects more quickly at significantly lower costs. From that day forward, **ICC** believed Smart 3D modeling is invaluable in the work we do. As a result, we've continually dedicated resources and funding to developing innovative ways to utilize it to deliver more value to our clients.

Today, **ICC** has designed over 1 billion dollars in Smart 3D/BIM-based projects and is one of the leaders in computer based model engineering for the process industry. Using smart 3D modeling, we've been able to provide our clients with shorter project schedules, reduced reliance on field contractors, less onsite construction risk and cost, higher quality installation, as well as better control of contract growth. In addition, because we can incorporate the client's knowledge base into the model, our clients feel more involved in the design process, which reduces design changes. Overall, we've been able to complete projects up to 50% faster with savings of up to 25% on total project costs.

We believe our success with Smart 3D modeling is a result of a combined strategy that integrates our scan teams and our design teams, as well as utilizes our in-house technology and our technology expertise to customize programs to work within our specific requirements. This approach not only sets us apart in the industry, it's yet another way we prove our commitment to always raising the bar to deliver above and beyond client expectations.









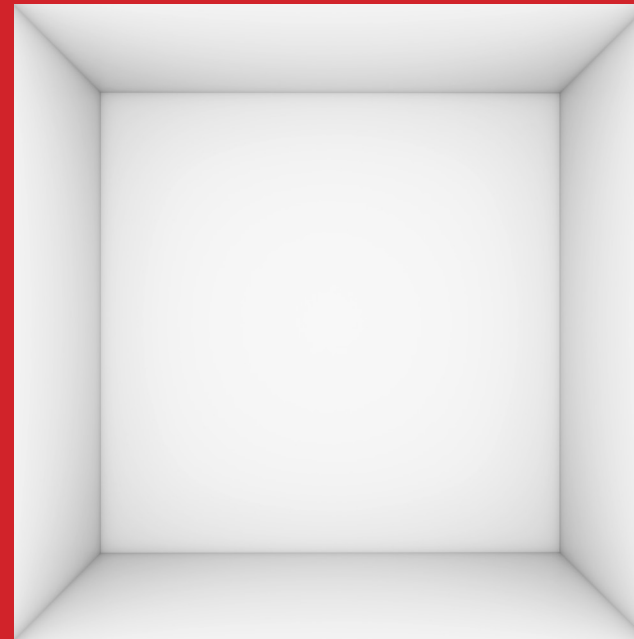


## A Team of Extraordinary People

“Some people can do one thing magnificently, like Michelangelo, and others make things like semiconductors or build 747 airplanes -- that type of work requires legions of people. In order to do things well, that can't be done by one person, you must find extraordinary people.” – Steve Jobs



## The ICC SmartBox: Fast, Precise Project Delivery



“An organization’s ability to learn, and translate that learning into action rapidly, is the ultimate competitive advantage.” – Jack Welch



With each project **ICC** completes, we take the time to assess our strengths and weaknesses. This reflection is what drives us to continually evolve, improve and get better and better at what we do. While our initial expertise was in the brewing industry, we have grown into a diverse, full-service engineering company with the knowledge, skills, and expertise to deliver exceptional results in a multitude of industries.

Today, we clearly understand the standards Petrochemical companies must adhere to in order to do their work successfully. We recognize delivering every project in highly compressed timelines, and being on budget at the same time, is simply not enough. We know, to be considered successful, our solutions must also satisfy the overarching goals petrochemical clients set for themselves and, thus, for **ICC**. In order to deliver to these standards, we believe our project management must be as transparent and as elegant as the design itself. That's why we invest in identifying and employing the most experienced Project Management professionals, and in continuing to improve our PM SmartBox of robust project management tools.

With SmartBox, **ICC** PMs can integrate weekly deliverables into our project schedules. Instead of the work stream being shown as a single continuous line, often months long, from kick off to completion, our SmartBox timeline shows finite bits of work assigned in 40-hour weekly streams. This small, but relevant change enables our PMs to review weekly progress reports and provide more short interval control. More importantly, it offers our clients greater transparency by giving them the ability to quickly see if we are delivering on our promises. Using the entire suite of SmartBox tools **ICC** can offer clients the most timely, concise, and complete communication in the industry. The result is even the most complex projects are delivered on time, on budget and with minimum surprises.

"Based upon my global CAPEX experience, the **ICC** PM Smartbox is one of the strongest and most professional PM tool boxes I have experienced and has delivered our projects on time, and at the right price and quality." --  
Jao Guimmaraes Unicer Group, Portugal



# Bio-Fuel Project



## ENGAGEMENT:

Mascoma Rome NY  
Feedstock Processing Facility

**Mascoma** is a leader in advanced bioconversion products. Their Feedstock Processing Facility (FPF) occupies 56,000 square feet dedicated to the first step in conversion of biomass to cellulosic sugar from tree bark.

The client reached out to **ICC** for help making process improvements that would allow it to meet a DOE (Department of Energy) demonstration deadline for continued funding. This Extended Validation Run (EVR) called for installation of new equipment as well as 9 major changes to the processes. The project required us to have everything in place and running smoothly in just under 6 months.

In attempting to complete this project, Mascoma had engaged 3 other engineering companies. None of them successfully met any of the set milestones. With the deadline looming, Mascoma's Eric Olesen turned to **ICC** on a recommendation from their plant manager. We signed up to make the impossible, possible.

### PLAN:

To make the target date, we knew we had to employ innovative design, fabrication and installation techniques. By altering the typical design, using virtual tools and enlisting multiple equipment suppliers, we aimed to optimize the final product early in the conceptual design phase. This approach displaced the traditional thinking of how a plant is manufactured and erected.

### ACTION:

We dove into this daunting task by using **ICC's** Virtual Design Build, a living, breathing model using all of the physical properties of the actual components, thus allowing simulation of the final operating processes and all physical forces and flow characteristics of a large integrated system. When orchestrated efficiently, this method can reduce total project cost by a third and shorten time by 50%.



The smart model allows components to be exported early to be shop fabricated and tested, limiting in-field work to a minimum. Pre-fabricated parts come to the plant in shipping containers to be installed when needed. As a result, we were able to install the evaporator, and have it running within 12 weeks.

We also had to be innovative when it came to procuring the decanters needed for the project. The lead time for new kit, would not allow us to meet the deadline. Instead, we located and refurbished used equipment. Need for efficiency also drove design. We made improvements to the distillation column to increase production yields, from 60% to 95% by adding additional trays and making reflux modifications.

#### **RESULTS:**

**ICC** delivered an exceptional experience for Mascoma, with all process improvements meeting their requirements, on time and under budget achieving the goals set by DOE and succeeding in the EVR test, brining an additional \$5M from the DOE.

#### **Feedback From the Client**

“**ICC** innovation in the use of three-dimensional modeling and a primary tool to generate engineering product represents a paradigm shift from traditional engineering methods. Improving the speed of delivery, accuracy and the ability to visualize complete elements, ultimately drives down the owner’s costs as has been our experience”

Eric Olesen

#### **From The Contractor - Rozell Industries**

“I remain amazed how **ICC**’s integrated plant design approach strategically delivered the precise construction packages utilizing a small team that was up against an impossible time frame. It was very obvious to our construction supervisor that **ICC**’s team brought their boots on the ground experience to the installation drawings. Your visual technology, innovation speed and accuracy is unmatched by any firm we have work with in the last 20 years of Rozell history. I believe **ICC**’s collaborative virtual 3-D design approach is the most cost-effective and expeditious way to deliver a successful project to the client”

Brain J. Rozell, President







**ICC**

Engineering Lasting Results



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