

# Enhancing Project Safety & Efficiency with Innovative Technology

Technology serves as a catalyst for improvement in nearly every industry, and construction is no exception. In today's world, companies like Haskell are using innovative technology like Simulation, Emulation, Virtual Reality and Building Information Modeling (BIM) to improve safety and efficiency on all of our architecture, construction, and engineering projects.

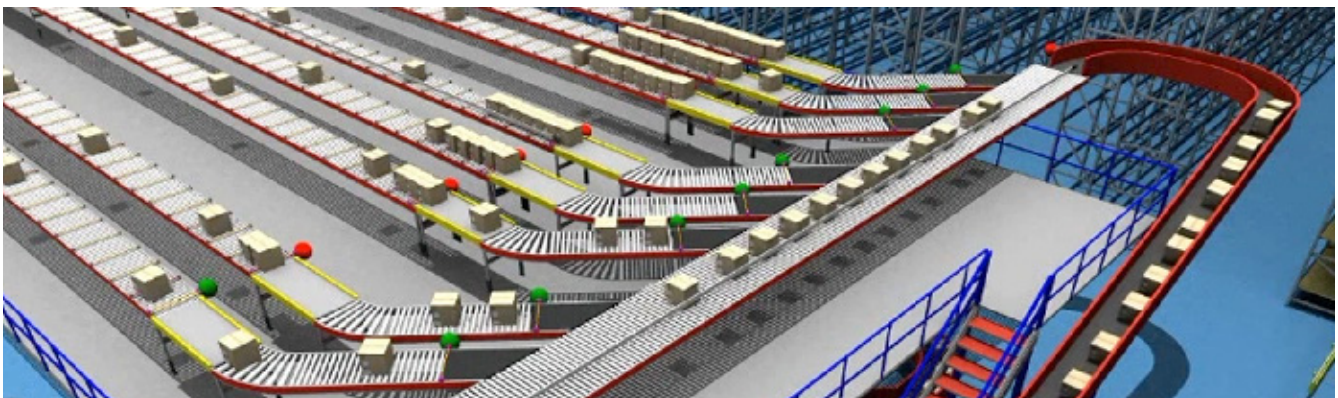
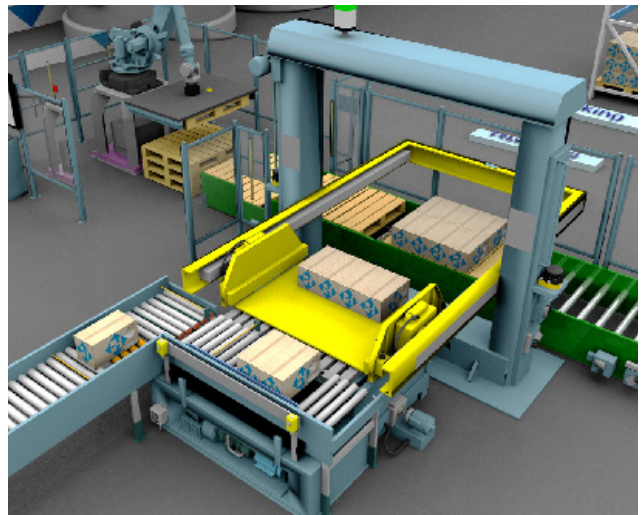
## System Analytics: Simulation, Emulation & Virtual Reality

Virtual Reality (VR) immerses the user into the 3D model with the capability of virtually touring a new or existing facility, interacting with real HMIs, and seeing the facility operations function long before startup.

A "Digital Twin" (or "emulation") is a virtual 3D model of a packaging system where everything is controlled by real PLCs and real HMIs. This PLC executes logic the same as it would in the factory, receiving input from photo eyes in the model and delivering instructions to the machines, conveyors, and other automated equipment.

VR technology has the capability to integrate with 3D BIM Models, render HMIs inside of the model, and thoroughly test the PLC program with extensive scenarios.

By foreseeing design faults and clashes, saving production time and resources, and training operators long before the first day of production, this innovative technology is a tremendous value-added opportunity for our clients.



## Building Information Modeling (BIM)

Where contractors and subcontractors previously relied on 2D drawings to communicate design intent for a project, now fully coordinated and constructible 3D models with precise installation information, can easily translate the engineering and architectural needs of a project to the subcontractors who are fulfilling those demands for construction project execution. These additional details reduce rework and requests for information within a project scope, allowing subcontractors to execute work more efficiently on the jobsite, which reduces risk, and saves time and money for the overall project.

Additionally, BIM provides opportunities for subcontractors to enhance safety for their craftsmen and women. Safety is always a top priority for Haskell, which means we are always looking for new and innovative ways to protect our workers on the jobsite. Since the 3D models generated through BIM equip subcontractors with fully coordinated detailed models of their scope ahead of time, our trade subcontractor

partners now have the opportunity to pre-fabricate large portions of work offsite within their own controlled fabrication shop work environments, instead of building each component in place on the more hectic jobsite. This pre-fabricated modular construction approach also allows production facilities to expand with minimal interruptions to existing operations. We are also leveraging 3D laser scanning technologies for rapid as-built measurements to further reduce risk, ensuring proper construction tolerances are met and fit together with work-in-place lining up with prefabricated components.

## Advancing Your Project with the Latest Technology

Across the board, BIM, Virtual Reality (VR), Augmented Reality (AR), 3D Laser Scanning, Aerial Imaging with Drones, and other new pieces of technology are changing the landscape of the architecture, construction and engineering world. At Haskell, we are embracing these changes and the benefits they provide for our clients.

