

THE CHALLENGE



Insufficient Capacity

A global beverage manufacturer needed to increase production capacity to expand a new product nationally, but developing the processes requires highly complex batching technology and accurate ingredient tracking.



Meeting Demand

Technology costs and timeline constraints were considered before developing the process, bottling, and warehouse capability to meet the demands for the new production.



Vertical Startup Ensures National Beverage Rollout Gets to Market Sooner

Solution: Leveraging Simulation Software

A “digital twin” simulation software facilitated virtual commissioning to allow verification of the process controls and batch management solution before equipment installation. Emulation enabled a quick startup, cutting two weeks of time and expenses. No test batches were needed, and salable product was ready for market on the first day of production!



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EXECUTIVE SUMMARY

► National Beverage Rollout Gets to Market Sooner

Client: Global Beverage Manufacturer

Challenge

Beverage manufacturer's new product is growing and ready to expand nationally – but production capacity was insufficient to the task.

The company would need more accurate ingredient tracking for its complex recipe and a partner to support the selection and design of the right batching technology.

Solution

Polytron used emulation software to facilitate virtual commissioning, which enabled:

- Verification of the process controls and batch management solution before equipment was installed
- Training on the new equipment for new staff in advance of launch

Results

Emulation enabled fast start up, cutting two weeks of time and expenses out of the project. No test batches were required and salable product was ready for market on the first day.

Developing a Complex Batch System

When a global beverage manufacturer planned to launch a new and growing product line nationally, they called on one of their own – an experienced and well-qualified leader – to ensure all was in place and went well. Not only would the new operations director be responsible for raising a facility, but also developing the process, bottling and warehousing capability to meet the demands for the new production.

Unlike their typical and relatively simple process of distillation, the new beverage would require a new, highly complex batching system comprised of 16 ingredient streams, multiple ancillary systems, flexible recipe system, highly accurate ingredient tracking, and completely new and high-speed packaging.

For the company, it was a great opportunity to expand market share. For the operations director, the project was a chance to prove what he could do, but it also presented significant risk.

Smart manufacturing is a complex and rapidly changing field, and he was unsure how best to evaluate the thousands of options available.

Also, would he be able to meet the tight timelines and get the right technology implemented by the deadline? Beyond the equipment and technology, the entirely new and much-expanded process necessitated new staff to operate and maintain the systems. Would they be sufficiently trained in time to meet the planned launch date?

Budget was another concern. With the amount and variety of equipment and software necessary to launch, could he keep the project within prescribed financial constraints?

Challenge: Design and Select the Right Batching Technology

Producing the new beverage required a system that would enable the easy addition and modification of recipes. The manufacturer wanted an off-the-shelf solution that would include:

- Highly accurate ingredient tracking
- Extensive reporting features
- Multiple human-machine interfaces (HMIs)
- Provisions for scheduling, batch reporting, and future expansion
- Batch S88 standards

The operations director needed guidance on options that would reliably satisfy these requirements and give an insight on making the right choice for his specific situation. He also wanted assurance that he could get new staff fully trained to operate and maintain the new system.

The manufacturer chose Polytron for its expertise in defining, designing and deploying Smart Manufacturing solutions and for its proven results with previous beverage manufacturing projects. The system integrator consulted with the operations director, helping to clarify challenges and goals.

Solution: Create a Virtual Version of the New System for Testing and Training

In addition to the new batching system and controls of the equipment, Polytron deployed PolySimsm, their method of leveraging simulation software to facilitate virtual commissioning. This allowed verification of the process controls and batch management solution before equipment was installed. It also enabled training for the new staff in advance.

Polytron has been implementing PolySimsm emulations for more than 20 years. The software allows creation of a “digital twin,” a virtual representation of a physical manufacturing system. Polysimsm is so accurate that operators often mistake it for the real software.

Results: True Vertical Start-Up and Two Weeks Taken out of Timeline

Due to the ability of PolySimsm to emulate and allow thorough pretesting of the new batching system, the operations director and his project staff had the confidence to skip all water testing, **which saved the project two weeks** in the schedule and the associated costs.

There were no test batches. The line went straight to ingredients, the first batch ran in spec, and salable product was ready for market **on the first day**.

The operations director could focus his energy on other concerns knowing this new batch system was online and fully operational. He had a huge success on his hands.

In addition, his new operations staff were fully trained in the batching practices and able to write SOPs in a conference room before the equipment was on the plant floor.

With startup time cut back and staff fully prepared, the project delivered high-quality product within the tight time frame and under budget.

Postscript: Three Years Later, New Regulations Force Major Changes to Recipes

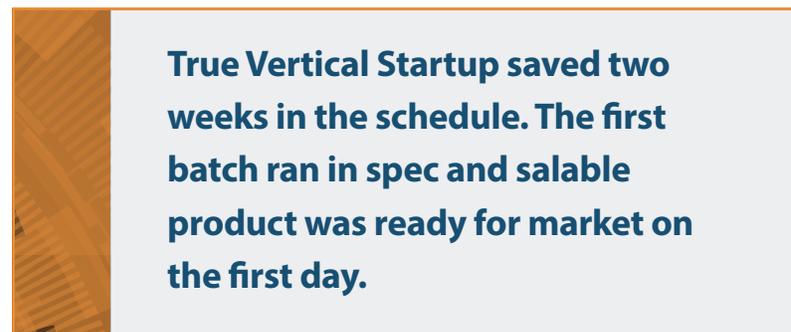
The government issued new regulations that affected the manufacturer’s beverage and subjected the company to requirements that necessitated drastic changes to all their recipes.

They installed several new 20,000 gallon storage tanks for the new ingredients and overhauled their batching methods, recipes and systems.

Once the new equipment was installed and ready, they shut down the line over the weekend, finished piping, and cleaned everything out.

That same weekend, Polytron deployed all new PLC programs, HMIs, and the batch management system. Again, they used PolySimsm to emulate and pre-test each sequence and recipe. With the manufacturer certain with the solution, Polytron loaded in all new programs and recipes.

The plant was once again ready to open on Monday morning.



True Vertical Startup saved two weeks in the schedule. The first batch ran in spec and salable product was ready for market on the first day.

After Emulation and Testing

As achieved three years earlier, the line went straight into batching on the first run, and the first batch was exactly on spec.



PolySimsm is valuable to the manufacturer and created such confidence that subsequent changes to the batch system or recipes would always be made and tested prior to being implemented over weekend shutdowns.



About Polytron, Inc.

Since 1983, Polytron has been an industry leading system integration and engineering consulting firm delivering a broad spectrum of innovative manufacturing solutions. Polytron serves manufacturers in the food, beverage, consumer packaged goods, chemical, and life sciences industries across North America.



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