



FOOD & BEVERAGE—BREWING

How Infor solutions help brewers plan around tank resource constraints

Create, manage, and optimize brewing production schedules to create the best plan at the lowest cost

No matter the size of the brewery operation, there's no getting around the importance of scheduling tanks efficiently. Large-scale brewers, or macro-brewers, who produce millions of hectoliters of beer annually, use dedicated tanks for maturation, storage, and filtration—but these tanks must be empty and cleaned for the next batch to come through the brewing process. Micro-brewers, or craft brewers, who produce six million barrels of beer (or less) annually, may only have one or two tanks in their breweries, which makes tank scheduling critical. These tanks must be used universally for all stages of production, which means that brewers must make sure that the right tank is available when it is needed.

In this paper, we'll discuss how Infor® Advanced Scheduling, part of the Infor Food & Beverage suite of solutions, helps brewers of all sizes manage the capacity of their tanks, as well as the flow of product between them.

Optimize tank scheduling for brewing

Each stage of the brewing process is time-sensitive and must be properly scheduled to maintain proper specifications for beer recipes and to prevent late or unfulfilled delivery orders.

Large-scale brewers can use dedicated tanks for maturation, storage, and filtration—but these tanks must be empty and cleaned for the next batch to come through the brewing process.

Micro-brewers might only have one or two tanks in their micro-brewery, which are used universally for all stages of production. Consequently they can only produce one to two batches at a time. The challenge for micro-breweries is to make sure they have the right tank available when it is needed downstream (such as for filtered beer).

How Infor solutions can help

For brewers of all sizes, efficiently scheduling tanks creates a challenging manufacturing environment where everything from variable flow rates and floating bottlenecks to constraints around fermentation, maturation, product-dependent filtration, and filling are practically impossible to optimize while using only manual methods.

Infor Advanced Scheduling, a part of the Infor Food & Beverage solution set, is a constraint-based scheduling software solution that addresses the brewing industry's unique challenge of managing the capacity of brewery tanks—and the flow of product between them.

Infor Advanced Scheduling gives brewers the tools they need to automatically create the optimal production schedule in the most efficient, timely, and profitable manner to keep their operations free from bottlenecks.

With Infor Advanced Scheduling, breweries can create a more profitable business plan and ease the strain on their complex batch production processes.

With Infor Advanced Scheduling, brewers get capabilities for:

- **Optimizing tank schedules**—Adjust tank schedules on a minute's notice with automated optimization techniques and drag and drop capabilities on an intuitive graphical Gantt chart planning board.
- **Creating visibility into schedules**—Create personalized views of tank schedules targeted toward specific production operations to improve communications and collaboration.
- **Synchronizing brewing processes**—Ensure tanks are scheduled so they are ready for bottling or keging exactly when production is finished to maximize available shelf life and reduce temporary tank storage that could upset future production.
- **Managing co-products and by-products**—Manage the complex interdependencies of products for mix, blend, brew, cook, react, or yeast management processes that are completed in tanks. Manage all materials used in these production processes.

Infor Advanced Scheduling can help brewers streamline their manufacturing operations, which eases the strain on complex batch production processes so they can deliver customer orders on time and create a more efficient and profitable business.

With Infor Advanced Scheduling, brewers can:

- **Manage tank-scheduling times**—Brewers cannot start a beer unless they have a plan to complete it. Each fermentation tank in a brewery has a minimum number of hours that the product must remain in the tank, which may extend to several weeks. Once fermented, a product must be filtered off so it can head to the filling stage. Every mature beer and bright beer storage tank (where beer is conditioned) has a maximum standing time and in some cases a minimum. Infor Advanced Scheduling can automatically create the optimal production schedule that adheres to all minimum and maximum standing times—so the right tanks are replenished or depleted on schedule.
- **Schedule tanks**—A tank is not a storage location like a warehouse bin with a set capacity. A tank can only store one product at a time, so the time to fill a tank is determined by the rate(s) of the process that are producing the inflow of product into the tank. And, the time to empty a tank is determined by the rate(s) of the process that consume the outflow of product or waste removed from the tank. To alter a tank start time and adjust production schedules, a planner needs to alter the first production process. Infor Advanced Scheduling defines tanks as a special concept that links producing and consuming processes. That way the right tank is always available when it is needed—giving the planner full visibility into how and when each tank is being used.
- **Account for tanks of different sizes**—A brewery has many tanks of varying sizes. An 800hL tank with 1hL of product, for example, and an 800hL tank with 800hL of product both have zero free capacity for use with a different beer. The correct product must be stored in the correct-size tank. When stored in a tank, beer needs "head-space" to help condition the beer. For example, a 700hL batch of a specific beer requires 200hL of head-space and will not fit into an 800hL tank. But, a 700hL batch of a different type of beer requires only 50hL of head-space and will fit into an 800hL tank. Infor Advanced Scheduling can automatically allocate the correct product to the correct tank to ensure that head-space rules are met, and tanks are being used properly. With Infor Advanced Scheduling, brewers can automatically allocate the correct product to the correct tanks, adhering to minimum and maximum volumes.

Using Infor Advanced Scheduling, breweries can manage their tank capacity and the flow of product between them—throughout their breweries.

- **Schedule inter-tank flows**—Not every tank is physically connected to every other resource in a brewery. Routing and plumbing constraints may exist. For example, the pipes that connect tanks to each other—or to other resources—help direct the flow of a liquid source to a liquid destination. Pipes also create constraints—perhaps only certain materials can flow through certain pipes. Or, because of the size of a brewery, connecting every tank with every necessary resource might not be physically possible. With Infor Advanced Scheduling, brewers can automatically allocate the product flow across the entire factory to enforce the constraints defined with tank-flow relationships.
- **Schedule tank tops and transfers**—It is inevitable that a brewery will have out-of-spec tanks. These batches will require a process to merge and top-up to bring the beer into spec. An out-of-spec tank might be prevented from providing inflow to further downstream processes. It may, however, be merged, transferred, wasted, or topped-up. To keep out-of-spec tanks from creating bottlenecks further down the line, Infor Advanced Scheduling accounts for out-of-spec tanks by providing the definition of merge and top-up rules. Meaning: Beer A and Beer B can be merged into Beer A.
- **Schedule clean in place (CIP) planning**—In brewing, a CIP may occur based on throughput of a product attribute. For example, a filter may need to be cleaned after 18 hours of a low-hopped beer, but only after 6 hours of a high-hopped beer (or 12 hours if there has been a combination of both). The CIP must be enforced, otherwise effective capacity is inaccurate. Infor Advanced Scheduling can automatically create the optimal CIP processes, while minimizing non-productive time to keep production on schedule.

How you benefit

With Infor Advanced Scheduling, part of the Infor Food & Beverage solution suite, large-scale brewers and micro-brewers can manage the capacity of their brewery tanks—and the flow of product between them. Infor Advanced Scheduling allows for easy adjustments to brewery tanks to accommodate, prepare, plan, and schedule the right changes at the right time for proper flow of product all the way from wort preparation to bottling, keging, and distribution.

Infor Advanced Scheduling gives brewers the tools they need to automatically create the optimal production schedule for each batch of beer that they brew and manage these schedules so each tank is used efficiently and profitably.

Why Infor?

With Infor Advanced Scheduling, part of the Infor Food & Beverage solution suite, large-scale and micro-brewers can automatically optimize and manage their production schedules to improve the way each tank is utilized.

[Learn more >](#)



Infor builds business software for specific industries in the cloud. With 16,500 employees and over 90,000 customers in more than 170 countries, Infor software is designed for progress. To learn more, please visit www.infor.com.

Follow us: [!\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#) [!\[\]\(16cd6e1a39784ecf52b4db09f4865f40_img.jpg\)](#) [!\[\]\(64f85e895c86bd992221df2da6f33c1f_img.jpg\)](#)