

REFERENCE: AMBEV

Driving sustainability through automation

Fully integrated Simatic PCS 7 plant-wide automation concept makes Ambev's new glass bottle plant more efficient, transparent, and sustainable.



The new glass bottle plant opened by Ambev in Carambeí, in Brazil's Paraná state, is the company's first factory to feature a fully integrated, plant-wide automation concept based on the Simatic PCS 7 process control system. The concept delivers a whole host of advantages that supported the Anheuser-Busch Inbev subsidiary during the planning phase, are boosting its operations right now, and will continue to pay dividends in the future. It is also helping Ambev work toward its sustainability targets.

Ambev opened its Carambeí glass plant in Brazil's Paraná state at the end of 2025. The facility is the second glass plant the company has established in Brazil in addition to its main factory in Rio de Janeiro. In just a few months, the new-build site has already earned a name for itself as an exceptionally sustainable glass plant. For example, it runs on 100 percent renewable electricity and has also been designed to utilize biofuels. Added to that, the up to 600 million bottles it is set to manufacture each year will be composed of up to 80 percent recycled glass. Ambev supplies glass products from Carambeí to various customers, including its own breweries in a number of Brazilian states. In total, Ambev has over 30 beverage brands in its portfolio, such as Budweiser, Brahma, and Michelob Ultra. The global player is represented in 19 countries and employs more than 30,000 staff in Brazil alone.

First automation concept with plant-wide integration

During the approximately four-year planning and implementation phase for the new plant, Siemens was responsible for the plant-wide automation (PWA) solution, including its coordination and overall integration. That saw the company work closely with planners from cm.project.ing GmbH, plant engineering companies such as Zippe Industrieanlagen

GmbH (Zippe) and HORN Glass Industries AG (Horn), and other partners in the ecosystem. One of the key features of a PWA solution is that it takes effect across the entire lifecycle of the production plant, including planning and services. The modular turnkey package for Ambev combined digitalization, automation, drive, instrumentation, and energy technologies. The focus was on integrating all the sub-plants and systems into one standardized automation structure with central data storage. At Siemens, the building blocks of plant-wide automation based on the Simatic PCS 7 process control system are established system architectures, including products and systems for optimum electrical power distribution. "Furthermore, Siemens has extensive technical knowledge of the sector, covering the entire supply chain, which facilitated synergy with other global suppliers in the sector. This really impressed us," explain Helton Pinto Monteiro and Rafael de Paula Lima from Ambev.

The benefits of end-to-end solutions

Sustainability is a strategically important issue for Ambev and, right from the start of the project, the company appreciated the Siemens concept, which factored in environmental and collaborative dimensions as well as commercial



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Siemens supported Ambev from the early planning stage, ensuring that the PWA approach was put to good use from the outset and that all the essential conditions for achieving a cohesive plant were established.

Image source:
Ambev



aspects. This holistic approach encompassed the entire glass plant lifecycle, from consulting in the very earliest planning stage, through production, to comprehensive global services.

Sustainable planning, commissioning, and production

Siemens supported Ambev from the early planning stage, ensuring that the PWA approach was put to good use from the outset and that all the essential conditions for achieving a cohesive plant were established. Industry insiders understand that a conventional glass plant is made up of many elements supplied by multiple engineering companies. There will often be components from a range of manufacturers and various different protocols, to name just two examples. Siemens is confident that all parties benefit most when the companies supplying systems, and even subsystems, offer the same hardware, software, and precisely specified interfaces. That conviction led to Zippe and Horn, both experienced companies, being brought on board as technology providers for the batch house and hot end respectively. This made it simple to integrate everything into one shared process control system, not least due to the clear stipulations Siemens laid down in the PWA design specification. As a result, it was possible to achieve data continuity throughout the entire plant. In other words, the groundwork was laid during planning to ensure that all parties involved in the design and implementation processes were pulling in the same direction.

That included rolling out Simatic Virtualization as a Service (SiVaaS) at Ambev. In a PCS 7 environment, this is essentially a standard kit for virtual PCS 7 systems, and it greatly simplifies planning, construction, and operation. PCS 7 systems

typically comprise several computers – an engineering station, OS server, OS clients, batch server, process historian, potentially Simit as a test system, etc. Instead of having to install several physical PCs and/or servers, virtual machines are run on shared server hardware. Simatic Virtualization as a Service provided corresponding templates that had been tested on site at Siemens in Karlsruhe and are supported there, as well as a clear architecture specifically for the Simatic PCS 7 system designed for Ambev.

Finally, Simit simulation software was used in the Factory Acceptance Test. Simit has become a kind of standard simulation tool for PCS 7 projects. It helped to reduce the commissioning time at Ambev, for example, and gave the operators a better understanding of the process and the control technology.

Plant-wide automation is also bringing benefits in live operations at Ambev. Even though the initial investment was found to be higher during the CAPEX/OPEX analysis, the plant's running costs are much lower when viewed over the course of a lifecycle that can often stretch to 15 years.

If the plant operators at Ambev are to optimize their production processes, they need to know them inside out, and the central data storage system offered by Siemens gives glass manufacturers the data transparency they need for that. For instance, they can see how much energy and what volume of raw materials the plant is using where, and draw conclusions that will help them run the plant more efficiently. Thanks to centralized data storage, Ambev also has access to detailed information on the condition of plant components, which is crucial when trying to safeguard availability. Repairs

and preventive maintenance can also be implemented in good time and adapted to actual requirements.

The Siemens concept also covers a standardized operating and monitoring philosophy for processes and standardized user interfaces throughout the entire plant. This has reduced the necessary outlay for engineering, commissioning, and training.

Contributing to the overall concept

As part of this holistic concept, Zippe contributed to the standardized automation philosophy at Ambev through its technologies. Besides machinery and electrical control and monitoring systems, the company also supplied a batch plant with an automated pre-mix system and a capacity of 450 metric tons per day, which can be extended to 900 metric tons per day. Also included in the company's scope of supply was an integrated internal cullet return system that maximizes the plant's ability to utilize recycled glass and reduces the volume of raw materials required. "By integrating an advanced cullet return system and external cullet into the production process, Ambev significantly reduces raw material consumption and energy usage while reinforcing its commitment to sustainability and resource efficiency," says Joachim Ullrich, Director of the Process Automation Department at Zippe.

cialist in glass melting technology, was commissioned under the integrated holistic concept to supply an innovative and energy-efficient glass melting furnace with three fore-hearths. The new furnace is designed to produce 400 metric tons of bottles per day in flint, amber, and green. Horn e-Fusion power boosting technology ensures that all three colors can be manufactured using between 6 and 20 percent electrical energy. "Moreover, the furnace can be run on natural gas, liquefied gas, or biofuels and utilizes cutting-edge technologies to achieve the best possible energy efficiency standards," says Markus Frank, Deputy Director Glass Plant Technology at Horn. All in all, Horn was responsible for supplying the furnace design, all refractory materials, the steelwork, the e-Fusion power boosting technology, and the furnace equipment. It also supervised the construction and provided staff for the construction project and tools for the installation and commissioning phases.

"We were really happy with the coordination and overall integration of the subsystems by Siemens. The result is an integrated automation system and we have been really impressed by the approach," say Helton Pinto Monteiro and Rafael de Paula Lima from Ambev, adding: "The groundwork has been laid for further connectivity."

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