



SIEMENS

PROCESS INSTRUMENTATION

A glass full of automation for Italy's largest wine producer

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With help from Siemens instrumentation and control system, operators at Italy's largest wine producer, Caviro, with an 8.3% market share, ensure each glass of wine poured lives up to the company's worldwide reputation.

Caviro is an agricultural cooperative, the largest in the Italian wine-producing sector, with wines from 12,000 winemakers, cultivating 10% of Italian grapes in eight regions. Quality is the key factor in Caviro's success throughout the world.

Tavernello is the most commonly known and sold wine brand in Italy, in addition to being the first Italian wine brand worldwide. Various Caviro brands, from popular "daily" table wines to super premium brands, including Amarone and Brunello, are bottled in four different facilities throughout Italy.

To guarantee the correct management of a very complex range of wines, system integrator S.A.I.I.E. srl - a company that delivers hardware and software solutions for advanced automation systems world-wide - designed an complete automation solution for Caviro's storage vessels and bottling area in the Forlì facility.

The stored quantities of wine are not subject to any blending. The wine's maturation process takes place directly in the vessels of the member wineries that ship the wine to the headquarters. Prior to bottling the wine remains in the storage vessels for ten days minimum, usually longer.

Up to 480,000 hectoliters of wine is stored in Caviro's vessels before moving to the bottling area. During the bottling process, operators need to know how many hectoliters of wine are in each storage vessel.

Bottling becomes inefficient if operators have too many or too few containers for each type of wine, so continuous monitoring is essential.





Siemens SITRANS F M MAG flowmeters and sensors monitor wine flowing from storage vessels to the bottling area.

A high level of automation

With 6000 hectoliters of wine bottled or packaged each day at this facility, S.A.I.I.E.'s engineers designed an automation solution for 124 of Caviro's storage vessels.

The wide range of storage vessel sizes and shapes at the facility means that any level measurement solution must be flexible, able to suit both the stainless steel and the fiberglass vessels.

Initially Caviro considered using a radar transmitter with a horn antenna, but after Siemens released its SITRANS LR250 radar transmitter with flanged encapsulated antennas, Caviro decided to give it a try.

Operators mounted the transmitters on the vessel hatch located at the top of each vessel. During cleaning cycles, operators do not need to unbolt the radar transmitter from the top of each vessel. Instead, they can simply open the hatch!

Wine flow measurement

On the seven automatic outflow pipes that move wine from vessels to the filling area, Caviro uses SITRANS F M MAG 6000 flowmeters with SITRANS F M MAG 1100 stainless steel sensors to continuously monitor the flow of wine.

The flowmeters provide totaled amounts of wine flowing from the vessels to the packaging areas. Seven SINAMICS G120C inverters control the velocity of the pumps attached to the outflow pipes.

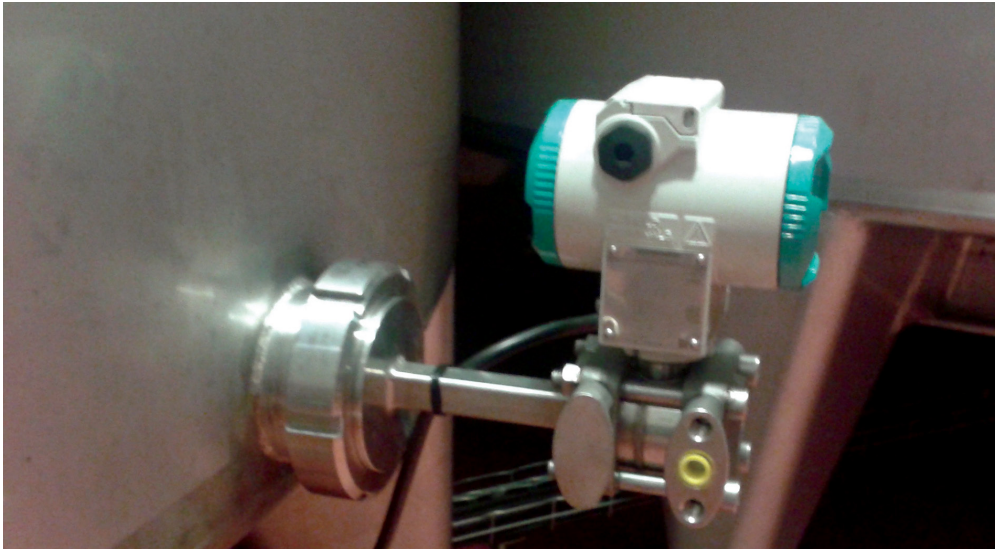
Also on these outflow pipes, operators installed SITRANS LVL100 vibrating level switches. The point level devices provide minimum and maximum levels so that operators know exactly when the vessel is empty and to avoid overfill, respectively.

S.A.I.I.E.'s engineers were challenged by 24 of the wine vessels that have another vessel mounted directly above them. There isn't space above the bottom vessel to install a radar transmitter, so engineers decided to take advantage of Siemens' wide level measurement portfolio.

Instead of top-mounted devices, Caviro uses SITRANS P DS III pressure transmitters to continuously monitor the differential pressure at the bottom of the vessels and the PLC converts that to a volume measurement.



SITRANS LR250 radar transmitters continuously monitor levels of wine in Caviro's 124 storage vessels.



SITRANS P DS III pressure transmitters measure levels in the storage vessels without enough headroom for the top-mounted radar transmitters.

High-quality integration

Tying all of these process instrumentation devices together is the brains behind the operation: SIMATIC S7-1500 and Siemens Totally Integrated Automation (TIA) Portal.

SIMATIC ET 200 SP input/output (I/O) system receives radar signals and sends them to the SIMATIC S7-1500 PLC. The PLC converts real-time level readings to volume measurements, giving operators the information they need to make the exact mixtures of wine.

Weekly inventory is also essential for a facility of this size, with such a variety of different wines stored and bottled. The radar transmitters, differential pressure transmitters, and PLC give operators the volume measurements needed to take precise inventory of all storage vessels.

Bottles of benefits

With exact capacity/volume measurement of the storage vessels, Caviro ensures that each glass bottle, tetrapack, or bulk bag is filled with the highest quality of wine. The filling process is fast paced, so real-time measurements are essential.

Siemens TIA Portal allows operators to see all processes from the control room. If there is an issue with a piece of equipment or instrumentation, operators know immediately. They can then fix the problem before it impacts production.

"An advanced instrumentation and control system such as the one provided by Siemens allows us to concentrate on process quality," says Domenico Dosio, General Maintenance, Investment and Technical Service Manager at Caviro.

From the vineyards of Italy to Caviro's storage vessels in Forlì to your wineglass, Siemens instrumentation and control system help ensure each sip is perfect.

The brains behind the operation, SIMATIC S7-1500 control system gives operators the information they need at every step of the process.



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