

Consumer products and retail

# Great Wall Wine Company

Using data as a key ingredient for winemaking

## Product

SIMATIC IT

## Business challenges

Maintain high quality standards

Carefully manage vineyards

Optimize complex, sensitive processes

## Keys to success

Apply advanced technologies to the craft of winemaking

Replace manual processes and paperwork with automation

Implement Siemens' MES solution

## Results

Standardization of the entire production process

Improved efficiency and quality

Fewer process errors

Traceable production information



## Great Wall Wine Company maintains high quality by optimizing processes with SIMATIC IT

### Data – a key ingredient for wine-making

From vineyard to wineglass, the SIMATIC IT manufacturing execution system (MES) from Siemens has transformed every part of the winemaking chain at Great Wall Wine Company, a subsidiary of China Oil and Food Import and Export Corporation (COFCO). The company is one of the biggest wine firms in Yantai, Shandong Province – China's most renowned grape growing region on the eastern coast. Great Wall Wine Company has successfully

incorporated modern technologies into the traditional craft of winemaking.

Great Wall Wine Company has been the benchmark of China's wine industry, with products sold all over the world. Brewing 50,000 tons of red and white wine annually, the Yantai winery started production in 2000.

To guarantee product quality, the winery is concerned with every detail involving grape growth – winemaking, quality control and lifecycle management – to ensure a systematic production line. The value chain of information is quite mature in the beer-brewing industry, but it is a totally different picture in winemaking.

Great Wall Wine Company enjoys a global reputation, with products sold all over the world.



**"It's gradually becoming a must for the wine industry to achieve a traceable process chain in response to heightened requirements for management and food safety. I believe Siemens technologies and experience will be a great help for us."**

Li Zefu  
Chief Engineer  
Great Wall Wine Yantai Winery

The winery faces a series of challenging tasks, from vineyard care that heavily relies on weather, to complex and delicate processes, to high requirements for both taste and safety. Today the winery is better at adapting to these challenges with an information system serving the entire process chain: SIMATIC IT.

"Traditionally, the grape quality and vintner's skills were the deciding factors of the wine that goes to market," says Li Zefu, chief engineer of Great Wall Wine Yantai Winery. "With the help of Siemens' digital technologies, we have standardized the overall production process management."

#### **Vineyards become transparent**

The quality of a single grape depends on many factors – weather, water, soil, geographic distribution and even the routines of growers. "As the saying goes, 70 percent of winemaking depends on the quality of grapes, while the rest relies on the process," explains Ding Jianqiang, project manager with Siemens Industry Software. "Better vineyard management is the foundation of better wine quality."

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Late September is harvesting season, the busiest time in Longshan vineyard in Yantai. On a typical work day, a laborer can fill up to six baskets (120 kilograms) of grapes. The factory is open until two a.m. to offload trucks of grapes during this time.

Before a single grape is harvested, the winemaker depends on the information provided by the Siemens MES to manage some 12.7 square kilometers of vineyards, some run by the winery itself and some by local farmers.

The winery uses Siemens-built meteorological stations to gather data on soil nutrients, moisture, and temperature – basically anything that could affect a plant's vigor. Field technicians also use a Siemens-developed application to record how much pesticide the vineyard will receive during a given period of time. All of the information is uploaded to the MES.

Technicians set up archives for vines of each variety based on all of the uploaded information. The data is used to analyze the health of the vines and the possibility of damage by insects. "Together, the data gives us an accurate picture of the whole vineyard," says Liu Jianbo, head of the information technology (IT) department at Yantai Winery. "The data also allows us to make informed decisions about how to tend our vines in response to weather changes and insect problems. We can get better grapes based on collected data instead of relying solely on experience."

### Higher quality with fewer errors

Given the delicate processes, including pressing, fermentation, aging, conversion, racking, testing and bottling, wineries face a barrage of complex, and sometimes customized production requirements. In a labor-intensive industry, mistakes are bound to happen along the way.

Nevertheless, the process has become more orderly and smooth. Vintners can give operators precise instructions through the MES to avoid wrong or missing steps. Instead of recording all data manually on paper and sending it to the next production line, operators can record entries directly by scanning bar codes (tagged on a tank, for example), and the recorded information is uploaded to the MES via a local area network within the factory environment.

"Operators do not need to go back and forth between different steps to transfer the production order and data," says Li. "Nowadays they can just do what they are supposed to do. Data from production and quality checks will flow along the entire chain and carry all the necessary information with them."

**"In the future, the winery is expected to use more automation equipment to further enhance the MES solution with shop floor data, thus improving operational efficiency."**

Li Zefu  
Chief Engineer  
Great Wall Wine Yantai Winery



*Key information about soil nutrients, moisture, temperature and pesticide application is collected and uploaded to the MES.*



*Operators scanning bar codes on tanks to record information about every stage of processing in the MES.*



**"The dream of transforming winery management through information technology is quickly becoming a reality."**

Li Zefu  
Chief Engineer  
Great Wall Wine Yantai Winery

Grapes must undergo at least 10 processing steps from fermentation to aging in stainless steel tanks and racking inside oak barrels. The MES system makes it possible to determine which employee used which tank for each specific step.

#### **Standardizing the process**

In addition, the MES solution enables standardized process management. With the automatic uploading of entries that cannot be changed manually, the MES system can detect any process deviations and send warning notifications to prevent damage.

Information from real-time production processes is also collected and stored in the MES. For example, real-time data from the automated temperature control system can be compared with existing data to give further step-by-step instructions to employees.

"Within the winery, efficiency and quality will improve as more automation hardware and sensors are installed," says Ding. "And the MES system can further link the control level to the operation management level more efficiently."

#### **Exciting future**

In addition, the winery is working with Siemens to develop an application for customers that delivers traceable production information, which will help bring customers closer to the producer and even the vineyards. On their smartphones, consumers will have access to information about grapes, fields, production, barrels and other details, giving them a better understanding of wine culture."

*With the help of Siemens' MES system, winemaking at the Yantai Winery has become more transparent and highly efficient.*



#### Solution/Service

SIMATIC IT  
[www.siemens.com/mes](http://www.siemens.com/mes)

#### Customer's primary business

Great Wall Wine Company, a subsidiary of China Oil and Food Import and Export Corporation (COFCO), is China's largest wine enterprise by production volume.  
[www.greatwallwine.com.cn](http://www.greatwallwine.com.cn)

#### Customer location

Shacheng  
China

It's gradually becoming a must for the wine industry to achieve a traceable process chain in response to heightened requirements for management and food safety," says Li. "I believe Siemens' technologies and experience will be a great help for us."

With the Siemens MES, Li believes, vintners will be freed from piles of paperwork and can realize something interesting: personalized and better-quality wine to meet varied consumer demands.

In the future, the winery is expected to use more shop floor data to further leverage the MES solution and improve operational efficiency. The dream of transforming winery management through information technology is quickly becoming a reality.

*"Together, the data gives us an accurate picture of the whole vineyard. The data also allows us to make informed decisions about how to tend our vines in response to weather changes and insect problems. We can get better grapes based on collected data instead of relying solely on experience."*

Liu Jianbo  
Head of the Information Technology Department  
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