Wronki, Poland - Nestled at the edge of the Notecka Forest near Wronki, Poland, is a large manufacturing complex that belies the notion that western-style consumer goods production only began following the fall of the Berlin Wall in 1989. Amica Wronki S.A. was founded in 1945 as a maker of gas ranges and ovens, and has since grown to be Poland’s largest manufacturer of “white” appliances – including the highest quality ovens, ranges, range hoods, refrigerators, dishwashers and washing machines.

The Amica complex of factories is located about 50 kilometers northwest of Poznan – Poland’s fourth-largest city – and is now considered Poland’s White Technology Center because of its high tech appliance production. The best example of the company’s leading edge technology is the washing machine factory, which was opened in 2000. Because the plant was built as a “green” plant, it features the latest in production technology. A key element of its state-of-the-art design is its use of the Wonderware FactorySuite A² which is the heart of a manufacturing execution system (MES) that is used to run the entire plant. This system interfaces directly with the company’s SAP enterprise resource management (ERP) system that is used to manage all financial, inventory, sales order entry and other business systems.

From Plant Floor to Front Office
The idea of integrating enterprise computing systems with plant floor production systems isn’t a new one, but Amica Appliances has used the two elements to create a sophisticated manufacturing system that is very responsive to market demand because of its great agility, yet provides the highest production efficiencies so that the company is profitable while offering retail customers high technology products at affordable pricing. Amica developed the system working with system integrators ENPOL, based in Gliwice, and ABIS, based in Krakow.
FactorySuite A² provides three primary functionalities that make this possible. The InTrack™ MES module schedules all production, based on customer orders. The InTouch® process visualization module provides a graphical overview of the assembly line so that management has a continuously updated view of production. And the IndustrialSQL Server™ real-time relational database module serves as the historian that collects data on every step of washing machine assembly, thus maintaining a complete genealogy on every washing machine built here.

All customer orders are placed into the company’s SAP enterprise system, then downloaded to InTrack for preparation of production orders and bills of materials from those sales orders. Each stage of washing machine assembly then simply follows the work orders and assembly instructions for the day’s schedule in InTrack. A magnetic ID tag on the frame of each washer alerts the system as the unit passes through each assembly station, verifying that each required step has been taken. Amica management knows exactly where each machine is during its production lifecycle and all product information is maintained on file for the useful life of the product.

Amica Wronki is a fully integrated facility. The company has its own plastic injection molding machines for making the washtubs and bases that go into each washer. They also manufacture their own sheet metal wash baskets that go inside the tubs. While many of the larger parts are standard, there are many product variations possible because Amica makes 10 different kinds of washing machine models and brand names, for sale in various countries. In addition, there are variations in local language documentation and labeling for export to Russia and western European countries.

Automated Parts Setup

Based on the bills of materials and work orders produced within Wonderware’s InTrack software, the Amica automated warehouse system picks the appropriate parts required for the day’s production from the master warehouse and feeds them to the assembly lines. Skilled assemblers then simply have to install the parts, which arrive in the proper order for just-in-time assembly. Amica uses a flexible manufacturing approach so that different models of machines can be made on the same line, to match customer orders. The internals of each washing unit are the same. Only the options, such as control panels and labeling, will be different. Each machine follows the same basic production sequence along the conveyors that snake through the plant. Amica presently only produces washers in one color (white) and one model type (front-loading), but they make both full size and slim models, for apartment use. They produce 10 different washing machine model names and logos to serve all their markets.

First, the drums and associated fittings are assembled, then added to the machine frame along with the electric motor and the drive belts. Different models receive different motors and drive systems for washing at 600 or 1,000 RPM speeds. Fill and drain hoses are attached, then the cabinetry is attached to the frame. All electrical and electronic elements are installed in one stage - the control panel is attached, along with its wiring harness. The door is attached and aligned.

As each machine is completed, it passes through a quality control test center where it receives an initial quality test for proper water fill rate, tumbler speed, leaks and other operating parameters. The quality test section is an integral part of the production line. Special software
from ELABO is integrated with the InTrack software and the database to match parametric operating parameters against actual test results. Any malfunctions are recorded in the InTrack records for that unit and transferred to a rework section for repair. Once it’s been fixed, it’s returned to the line for final assembly.

Five percent of all units receive an even more strenuous quality test procedure at the end of the production line and that data is retained in the InTrack software, as well. Managers study this data to watch for malfunction trends, and if any repetitive problems are detected, changes can be made in the assembly process. Two percent of that test group is also taken off-line for strenuous lab testing as if they were being used in customer homes.

All washers then have their top and bottom cabinetry installed. Nameplates are attached. Instruction booklets are placed in the tub. The magnetic ID plate is removed and a custom label is attached that has the unit’s serial number, motor number, customer code and other detailed ID information drawn from InTrack and IndustrialSQL Server. Each machine is then shrink-wrapped and palletized for shipment anywhere in the world.

Made to Order
Every washing machine that comes off the line is matched to specific customer and dealer orders so that Amica Wronki’s staff knows where each machine goes. The company literally maintains “cradle-to-grave” data files on every unit that comes off the line here - and all data is automatically uploaded to the SAP enterprise system as production occurs. This completes the information loop for managing incoming materials and supplies inventories as well as for informing management where every machine is shipped.

Amica currently runs one eight-hour production shift each day in the washing machine plant. Although they have the capacity to make 1,100 washing machines per shift, they’re presently only producing 820 washing machines per day during a normal five-day work week based on current market demand. This involves about 100 workers per shift from the company’s total employment rolls of more than 2,000 people. This makes Amica Appliances the largest employer in the Wronki area, as only 3,000 people live there.

“Our production systems are now so efficient that we can produce enough washing machines on just one shift to meet market demand, but we have the ability to expand quickly to two shifts per day when we need to,” said Wieslaw Hagno, production manager. It may not be long before they need to.

The company’s attention to Total Quality Management has helped Amica Wronki to earn ISO 9001 and 14001 certification for its quality and environmental management programs. The company also is a member of the European Management Through Quality Foundation. These certifications help ensure the acceptance of Amica appliances throughout the world.

The company has served the Polish retail appliance market since they began making washers, of course. But they began exporting appliances to western Europe and Russia in the 1980s. Amica’s export markets have grown to nearly 30% of annual sales and now include product shipments to North and South America, the Middle East, Asia and Australia. The new washing machine plant has helped the company grow to sales of nearly $850 million per year.

Thanks to the outstanding growth of Amica Wronki, customers all around the world now get their clothes sparkling clean with just a touch of Invensys and Wonderware in every load they wash.