

DeltaV Product Information CD



SUCCESS STORIES

Akzo Nobel

PlantWeb architecture at Akzo Nobel's Mannheim plant

Multinational Akzo Nobel has long been called "the world's largest little-known chemical company," and even today, only industry insiders know that Herbol®, Glasurit®, and Sadolin® are trademarks of Akzo Nobel, as are the corporate designations Organon, Lesonal, or Sikkens. Its Mannheim plant is a member of Eka Chemicals' Paper-Chemicals Division.

Paper chemicals are employed in the manufacture and treatment of a wide variety of papers and paper products, from letterhead through cardboard, packing cartons, offset-printing paper, photocopier paper, and carbon paper to unsized tissue paper. Akzo Nobel's Mannheim plant manufactures sizings, i.e., chemicals that convert relatively loose-weave cellulose matrices, the familiar blotting paper, into paper that may be written on or used for printing.

The Process

PlantWeb architecture with the DeltaV automation system has been incorporated into one of the plant's production lines that is being used for manufacturing a resin-based sizing employing a new process in which two components, the resin involved and an emulsifier, are combined in a single-stage, high-pressure process. Both components are metered online, predispersed, and the resultant mixture homogenized. The entire process takes from one to three hours, depending upon the quantity being manufactured. The final product is a viscous, milky suspension of particles whose diameters should be less than 2 μm in order for them to remain in suspension. Manufacture of this suspension is a continuous batch process. The raw materials involved are prepared in batches and fed to one of the plant's existing production systems, which is equipped with conventional process-control instrumentation and control systems.

Decision-making criteria: Favorable experience with the system and an innovative approach

Dieter von der Ruhr, manager of the Mannheim plant, had this to say regarding the decision to adopt the DeltaV system and PlantWeb architecture: "Akzo Nobel, and particularly Eka Chemicals, are currently of the opinion that any new system built should be equipped with a process-control system, since system controllers and system reliability should conform to a certain state of the art and allow meeting the more stringent quality standards demanded of certified systems, as dictated by Eka's Swedish parent firm." As he went on to say, "The first step is taking a look around and finding out which systems have yielded favorable experience, and we found that Fisher-Rosemount's DeltaV system was already being used at several plants in, e.g., China and Sweden. In-house, we rapidly came to the conclusion that the DeltaV system was the system of choice, since its performance/price ratio seemed to be better than those of competing systems from other suppliers, where the fact that it was already being used with favorable experience, could be used to control several systems without making any changes, and employed an innovative approach were the major criteria." Controllers have been used on older sections of the system involved for several years. One controlled the operations of an extensive tank farm. Another controlled the manufacture of the wax-based suspension. These two controllers did not communicate with one another or with the plant's network. However, the DeltaV system is incorporated into our plant's internal network and is thus also able to communicate with the outside world.

Home
Product Data
Key Technologies
Success Stories
News
Map
Contact Us



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Dieter von der Ruhr emphasized that "The system had to be innovative, provide facilities for interfacing it to our existing in-house plant-network systems, include data-logging facilities so that we could analyze data offline, and employ a data standard that could be accommodated everywhere. It needed to have facilities for interfacing it to the various manufacturing operations and laboratories at our plant, which are internetworked via Windows NT. We operate a leased line to our German headquarters at Düren, which also allows us to transmit and receive company-internal business data via SAP. Those communications facilities were, so to speak, a special decision-making criterion." He described his role in choosing the system as follows: "We played a relatively minor role in the selection process. Since there were no process-control systems here at the plant at that time, i.e., there were no grounds for choosing any particular system, it was, of course, difficult for me, as plant manager, to say '... I prefer Manufacturer X or Manufacturer Y.' Choosing a system is an area where one has to follow the standard prescribed by the parent company. The basis for the process involved, along with what was available in the way of useful prescription, had all been developed in

Sweden, where Fisher-Rosemount was heavily favored."

Lower manufacturing costs, thanks to single-stage operation

Starting out with the conventional two-stage process for manufacturing the resin-based sizing involved, Akzo Nobel investigated the matter of whether a direct, single-stage, process would be cheaper than the process currently employed, which was very expensive, since the materials employed had to be handled twice. Of course, the new process could also be manually run, since automation was not essential. As Dieter von der Ruhr put it, "However, the idea of automating the process arose from the consideration that it would allow running several processing systems from the existing control room, with probably just a single person working in the control room and one or two people working in the field. That was the reason for automating the process. Once the process has been started up, it will usually continue to run without further human intervention."

A Foundation Fieldbus for interfacing field instrumentation

Foundation fieldbus has been employed for interfacing field instrumentation. The criteria involved in making that choice were varied. One was that Akzo Nobel regarded Foundation fieldbus as an innovative advance that will be around for a while. As Dieter von der Ruhr put it, "That technology will become the state of the art in certain types of manufacturing operations." Yet another argument that surely favored fieldbus technology was that it is much simpler and much easier to install and takes up much less space. The system was installed in an existing building with a control room that was nearly filled to capacity with equipment, so space was at a premium. Now that the system has been installed, there is no room left for future expansions.

To Eka Chemicals, this represents a test, since this is the first time that a fieldbus has been employed on comparable systems anywhere within the company to date. Although the same types of systems have been operated using Fisher-Rosemount instrumentation and DeltaV systems, those systems employed instrumentation controlled by 4 mA - 20 mA current loops. Most of the systems at its Mannheim plant have been designed for fieldbus control. However, some of the systems involved in this project, namely remote sections of the plant's infrastructure, such as its tank farm, are still controlled by 4 mA - 20 mA current loops. The decision to test fieldbus technology at the Mannheim plant was also based on the fact that the process involved is inherently safe. Although it involves high temperatures and high pressures, the hazards involved are understood and can be reliably controlled.

Nevertheless, Dieter von der Ruhr believes that there still are some psychological barriers to employing fieldbus technology throughout the industry: "In the case of systems that demand high safety standards, we here in Germany still have some reservations about fieldbus technology, since we prefer to rely upon proven standard technologies that may be configured to provide full redundancy if circumstances warrant, and we still have a few problems in adapting fieldbus technology to suit our applications."

All items of field instrumentation interfaced to the fieldbus were supplied by Fisher-Rosemount. Employing exclusively Fisher-Rosemount instrumentation was regarded as a sensible approach for several reasons. One was that Akzo Nobel did not want to risk other manufacturers' instrumentation being incompatible with the system or the bus. Another was that the plant's operator would have a single supplier as its contact point for everything, from the control system, right down to the last item of instrumentation in the communications chain. It could call upon Fisher-Rosemount whenever there were any problems with any item of instrumentation, the control system, or the bus. Dieter von der Ruhr added that, "This was a joint project. I must say that Fisher-Rosemount's internal communications proceeded smoothly throughout all phases of the project. Even urgent requests for information from parent firm in the USA were promptly answered."

Dieter von der Ruhr summarized his experience to date with PlantWeb architecture and the DeltaV system as follows: "The system has been running for just under a year now and if I had to do it all over again, I wouldn't change a thing. I doubt that we made any major errors in our development effort. We also trained our operating and system-maintenance personnel on the system, and I regard it as particularly important that someone should be on hand to handle system maintenance at all times. Our collaborations with Fisher-Rosemount's personnel proceeded smoothly. All of our questions were answered in short order. I also found their post-installation support to be good, almost too good. The extremely useful aspect of fieldbus technology is that Fisher-Rosemount can take a look inside individual items of instrumentation from outside our plant, e.g., from its headquarters operation at Haan, using PC Anywhere. That helped us a great deal during system startup and while instrumentation was being installed."

| [Home](#) | [Product Data](#) | [Key Technologies](#) | [Success Stories](#) | [News](#) | [Map](#) | [Contact Us](#) |