Best Practices: Rohm and Haas Company: Manufacturing Excellence One Step at a Time

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With the help of company veterans like Dave Rosenthal and others, the Philadelphia-based maker of specialty chemicals has embarked on a manufacturing-excellence initiative tailored to the unique needs of its worldwide businesses. Credited for increasing capacity and reducing costs, it has helped transform a solid, old-line company into a streamlined, world-class supplier.

Best practices come in many forms. Some are high-profile, dramatic and large scale. Others, such as those used by the Rohm and Haas Co., a 93-year-old, Philadelphia, PA-based producer of specialty chemicals, tend to be more pragmatic than experimental, and implemented one small step at a time. Known for products made from its acrylic technology, such as water-based paints and Plexiglas resins and sheet, Rohm and Haas has, nonetheless, maintained a low profile among chemical makers. The innovative company has chosen to stay well-focused on its mission both as a business and as a caring employer.

To this day, for example, Rohm and Haas retains a paternalistic approach to its employees, a connection with its formative years in Bristol, PA, when everyone in the town either worked for Rohm and Haas or knew someone who did. This nurturing approach to employee relations, combined with the care the company has taken to develop and manufacture new products, has helped keep it positioned toward the top of chemical-maker ranks. According to an annual list prepared by the American Chemistry Society (ACS), Rohm and Haas places 15th among the nation's top 75 chemical producers. Its $5.7 billion in sales in 2001 make it about one-fifth the size of diversified industry leaders Dow Chemical and DuPont, but larger than all other specialty-chemical makers on the ACS list. The company operates 140 manufacturing and research sites worldwide, 100 of which are manufacturing locations.

Formed in a century when chemical breakthroughs were almost an everyday occurrence, Rohm and Haas has regularly made outstanding contributions. Chief among them was its development of acrylic chemistry in the mid-1930s and the resulting line of widely accepted Plexiglas products that followed. The company also became known for its development of acrylic emulsions and polymers used in latex paints, as well as its adhesives, sealants, fungicides, biocides, and a variety of other specialty chemicals.

In the 1990s, however, Rohm and Haas entered a period of change more dramatic than any it had known. First, it divested its franchise in the Plexiglas product line, considered by this time a commodity business that no longer fit the company's position as a maker of specialty chemicals. Second, seeking new revenue streams, Rohm and Haas acquired two companies that specialized in electronics-industry chemicals used to make semi-conductors, circuit boards and electrical contacts. The company made its most significant purchase ever in 1999 when it acquired $2.5 billion Morton International, a maker of salt and specialty chemicals.

The company's new, combined product lines at this time gave it leadership

positions in salt, adhesives, specialty coatings and electronic materials. But the booming '90s also brought another change to Rohm and Haas: the realization that it needed to better utilize its manufacturing assets in order to successfully meet the demands of its new markets. Many of the company's operations _ considered individual businesses, based on product lines _ needed to significantly boost capacity. "In 1993, downtime cost our businesses quite a bit, when they were doing well and demand was heavy," says Dave Rosenthal, process manager for manufacturing excellence and 21-year Rohm and Haas veteran, located at the company's Bristol, PA-based engineering division. "Our businesses needed every minute of equipment uptime they could get. At the same time, we were trying to avoid spending capital to increase plant capacity." The company had also begun to integrate manufacturing into its supply chain, requiring it to operate with shorter lead times and less inventory. Under these conditions, downtime posed a greater risk to company efforts to develop customer service as a competitive advantage. To reduce that risk, the company first focused on maintenance.

Like many companies during that time period, says Rosenthal, "We discovered that maintenance could be an asset-management function as opposed to fixing things when they break," which had been the traditional approach. The company soon began benchmarking with other chemical makers and with process manufacturers outside the industry that had achieved superior performance. It also used the petroleum industry's Solomon Report to gauge its efforts. But while the company drove its businesses to build a supply chain that was Class A status, the drive to achieve manufacturing excellence, interestingly, was less prescriptive. "There was not a master plan where you had to be at a certain place at a certain time," says Rosenthal.

As a result, the program began on an as-needed basis, using company-specific initiatives instead of standard approaches such as TPM and others.

"It was not as formalized as a TPM program because the company's culture wasn't geared to doing it that way," says Rosenthal. "We were more interested in working with our maintenance managers and trying to start to change the company's view toward equipment, just like we were doing with safety. In safety, we have long believed that all injuries can be prevented. We're slowly getting to the point of saying that equipment should not fail either."

That day hasn't yet arrived, says Rosenthal, but the company is closer to it now than it was 10 years ago. "The program quickly gathered speed," he says. "Our reliability improvement work gave businesses we worked with the capacity they were looking for. We were able to get them, say, another million pounds out of their plant without large capital investment, and that was important to them."

Stories of successes, such as the company's Grangemouth, Scotland, plant that quadrupled capacity, began to multiply, which helped the manufacturing excellence program expand. "We partnered with the University of Dayton, with consultants who specialize in planning and scheduling, and we partnered with people in reliability," says Rosenthal, "but not everything. A lot of it we still did in-house." This included a range of company-produced printed materials for its businesses to use, such as books that cover best practices, manufacturing excellence, improvement-process and self-assessment, and other topics.

One reason for the high level of in-house direction was that efforts to improve manufacturing excellence were based solely on the needs of a given business. This is why, says Rosenthal, businesses within the company that were already focusing

on operational excellence, such as coatings and plastic additives, for example, were quicker to take advantage of manufacturing excellence resources than others. "Manufacturing excellence only enables those things the business really needs to have happen," says Rosenthal. "You don't do it for the sake of manufacturing excellence. You do it because a business has a strategic need to improve competencies to improve customer satisfaction."

Which leads to another interesting aspect of the Rohm and Haas approach to manufacturing excellence: The need to improve a business' manufacturing capabilities is discovered and communicated by the business itself, not from corporate headquarters. In his role as the process manager of manufacturing excellence, Rosenthal responds to that need, but only when asked by the business. "I will visit a site only if the business invites me," says Rosenthal. "This is not a corporate edict, but something the corporation offers for improvement."

The unique arrangement is typical of the company, says Rosenthal, though he stresses that it does not apply to environmental health and safety mandates, which are strict top-down requirements. The differences among its many businesses, located around the world, make it an efficient way to implement manufacturing excellence, he says, because businesses don't place a request unless they are ready to accept help. "The businesses have different goals," says Rosenthal. "And each is relied upon to know its own market best."

All Rohm and Haas businesses currently pay for the services of Rosenthal and his counterparts through the corporate budget whether they use him or not (though an a-la-carte plan is in the works). Rosenthal, with 15 years experience in manufacturing alone at Rohm and Haas, understands the businesses' issues and needs. As a result, he fields a steady stream of requests for assistance from around the world that keep him on the road for much of the year. All requests are generally handled in the same manner, he says: An initial preparation and self-assessment process that may culminate up to three months later in a week-long assessment from Rosenthal and a team of Rohm and Haas experts chosen specifically for each mission.

"We try to first determine the opportunity and how many dollars are associated with it," says Rosenthal. "We understand what the business is looking for before we do the actual assessment. If they want to be the low-cost producer of product X, from their strategy, we go to their site to learn what the barriers are that prevent them from doing that. We find out which gaps they need to fill to achieve that, but we only try to match our practices with where they're going with their strategy."

When Rosenthal travels for the week-long assessment, he's accompanied by a team of Rohm and Haas experts "structured by the competencies the business needs to assess and improve," he says. "If they want to assess operational consistency and reliability, I go to our asset-management group, describe the problem, and ask who they would send with me. We generally bring a team of four or five, and the site develops a home team of four or five. Then we visit the site and make the assessment. At the end of the week we generate a report, which indicates the best practices they are currently doing, and which ones they need to adapt to meet their business strategy." Rosenthal says he spends up to 70% of his time during the visit in conversation with plant personnel.

"We have sets of questions we ask, but we also attend their daily meetings, tour the facility, and walk around with their mechanics, operators and foremen. We find out what barriers they face, what their issues are. We try to understand their

operation." Rosenthal says that while he and the team might not spend as much time at the plant as an outside consultant would, the assessment is only the beginning of the process.

"The site generally will develop its own improvement plan and it will be held accountable by its business for making that plan happen," he says. "But we can be called back. Sometimes we do a reassessment, or, in most cases, we're asked for resources. It's consistent contact after the assessment," he says. "Their manufacturing manager will always be in touch with us to let us know what he or she needs and how that site is doing. It's not the kind of thing where we go away and are forgotten."

Responsible for driving the assessment process and making sure the team meets its goal, Rosenthal says his biggest challenge is "to get people to move through the assessment process to where they need to be, all in a fairly short period of time." And it needs to be accomplished with respect. "Respect is important," he says. "They might think we're pushy, but they should never think we're disrespectful."

Rosenthal and his counterparts are not only on call for past and current site-improvement projects, they're continually refining the company's initiative. Since manufacturing excellence began, it has evolved to include five competency areas: reliability; process technology; operating consistency; workforce practices; and environmental health and safety. Successful world-class procedures continue to be documented and updated in company workbooks.

For example, says Rosenthal, "We're constantly revising our sections on operational consistency and competency and workforce practices because we are developing new perspectives for cultural change." The company has been working with the Work in America Institute, a New York-based non-profit group that gathers information about how human-resource practices can improve industrial productivity. Rohm and Haas has incorporated some of its best practices into its workforce-practices manual. "But our sites have a lot of flexibility in how they can evolve those practices," says Rosenthal. "They select how they want to do it. We can give them advice, but most will do it their way." Rosenthal says this issue is as tough as any engineering challenge "because people are the glue between all the competencies. Without their participation, it's hard to progress on other fronts."

The business environment has also introduced new demands. Ten years ago, most Rohm and Haas businesses were interested in boosting capacity. Today, emphasis has shifted to cost-reduction. "Demand is not what it was back then," says Rosenthal. "Now our businesses are more interested in reducing operating costs and improving the bottom line. But we're learning that, as you become more reliable, it allows a site to be more flexible. When you have a manufacturing environment that's not chaotic from equipment breaking and you have process technology that is predictable, it allows you to be more flexible with scheduling, and allows you to reduce operating costs."

Operating consistency has also become a priority. "This is where we are expanding our knowledge base the greatest," says Rosenthal. "We aim to reduce the variability of the processes, and, thus, the variability in the product, which come from process interruptions, whatever they might be." Customers are demanding even more consistent product for their applications, says Rosenthal, "and they're asking for evidence from us that we're providing it. So we want to go farther back than the specification to how the process is run. We want to get to the point where, if you know your process well enough, and you operate it consistently, specifications may

no longer be needed." The goal? "To predict where the process is operating and what the quality of the product will be," any time, for any customer, says Rosenthal. For one who has devoted his professional life to manufacturing excellence, it's a perfectly reasonable expectation.

Sidebar:
Rohm and Haas Co. at a Glance

&#149 Founded in Germany as a maker of tannery chemicals in 1907 by partners Otto Röhm, chemist, and Otto Haas, businessman.
&#149 Established U.S. presence in Philadelphia, PA, in 1909; incorporated in the U.S. in 1917 with headquarters in Philadelphia, where they remain.
&#149 2001 sales: $5.7 billion
&#149 Worldwide employees: 17,000
&#149 Operates 140 manufacturing and research locations in 25 countries. Its four businesses produce specialty chemicals almost exclusively for manufacturers of other products. The businesses are: Performance Polymers (coatings, adhesives, sealants, plastic additives); Chemical Specialties (inorganic and specialty solutions, ion-exchange resins); Electronic Materials (printed wiring board, electronic and industrial finishes); and Salt (consumer products under Morton and Windsor brand names, as well as salt for food processing and highway ice control).
&#149 Worldwide sites have received 100 ISO 9000 registrations and 25 ISO 14000 registrations.

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