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## Not Just a Catalog House, GFS Chemicals Highlights Toolbox

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Custom Manufacturing

WIDELY KNOWN for its catalog of analytical reagents, acetylenes, other organics and high-purity inorganics, GFS Chemicals Inc. is also a manufacturer with a deep and unusual toolbox, which the company uses to customize solutions for its clientele, whether that means adjusting packaging, specifications, or even molecular structure.

"That makes us a little more unique and valuable," says Steel Hutchinson, president. "When [customers] work with us as a problem-solving support staff, we're there with our experience not as a catalog house, but as a manufacturer."

The company's capabilities in acetylenes and anhydrous materials are taking front stage.

Technology has played an important role in GFS's long history. A family business now in its third generation, the Columbus, Ohio-based company was founded in 1928 by G. Frederick Smith, a professor of analytical chemistry at the University of Illinois. Professor Smith's research on perchloric acid had stirred so much interest that he and two brothers established GFS Chemicals specifically to satisfy the requests he received for samples of various perchlorate compounds.

GFS broadened its portfolio with Professor Smith's interests and the needs of his customers, primarily the analytical market. A wide range of rare earth compounds, high-purity acids, heteroaromatics such as phenanthrolines and bipyridines, and other compounds entered the catalog over the years, and GFS became a primary manufacturer of specialty chemicals that were hard to find or hard to make.

The company also acquired outside product lines and business units, which brought products such as pyridine-free Karl Fischer reagents, analytical reagent-grade quaternary ammonium salts and solutions, organic halogen reagent and cholesteryl derivatives.

In 1997, GFS acquired Farchan Laboratories Inc., a Gainesville, Fla., company specializing in acetylenic, olefinic and silyl chemical intermediates, and took it to Columbus. "We were moved in that direction by what we felt was a need to have more specialty products, things that are more difficult to find or make, that have more value added," explains John Long, director of technology.

Accommodating the use of liquid ammonia, the solvent for many reactions involving acetylenes, was a ready fit for GFS's engineers, who already had broad expertise in working with complex systems for handling reactive materials, he adds.

"We have since invested a significant amount of money in engineering and facilities to do this kind of chemistry at a considerably larger scale than Farchan did," Mr. Hutchinson says.

In 2000, a \$3.5 million, 14,000 square-foot manufacturing facility was constructed in Columbus. Whereas Farchan had reactors up to 25 gallons, the new facility has vessels as large as 200 gallons, and further investments are ongoing, with plenty of room available to build out over the next five to 10 years.



GFS Chemicals moved the manufacture of acetylenes to its new facility in Columbus, Ohio, in 2000.

To some extent, the size of the business was a surprise for GFS: The company that sold Farchan to GFS had planned to keep a few large volume products for itself, but it soon dropped the idea. "We couldn't let the business die on the vine," says Mr. Hutchinson. "We had customers that were in need of materials and had nowhere else to go. So we went ahead and expanded the business to serve those folks."

At the same time, new catalytic technologies have made acetylenic building blocks more useful than ever before, while appearance of acetylenic building blocks in the chemical literature is becoming increasingly frequent, says Mr. Long. "High-profile chemists are calling about the use of these materials and the possible availability of custom products, items that would be similar to things listed in the catalog, but tweaked in a way that they might want for their research," he adds. "We look at things like that very carefully."

"That's really where doors are opening," Mr. Hutchinson says. He notes that GFS has two Ph.D. chemists with extensive expertise in acetylene chemistry. "That's one of our particular strengths. We have the ability, with the guys on staff, to go beyond some of these core acetylenic products to support customers with derivatives." Several customers have accepted GFS's offer, he says.

The company promoted these capabilities and the overall potential of acetylenes in its presentation at the Informex 2004 trade show by including 35 slides featuring extracts from the chemical literature, rather than more typical descriptions of equipment and services. "We're promoting not just, say, phenylacetylene, but what phenylacetylene can be used to make, given today's technology, that 10 years ago would have been a pipe

dream due to its cost or associated issues,” Mr. Hutchinson says.

GFS has not ignored the rest of its business, and commissioned a new dry room this year. Anhydrous inorganics can be difficult to manufacture and handle. Packaging them so that they will be dry on delivery to a customer is still more difficult, Mr. Hutchinson notes. “We’ve done that successfully,” he adds. The new dry room raises the standard higher by allowing GFS to provide end users with batch-oriented product sizes—that is, packages that are exactly the quantity used in a single batch, so that a drum of sensitive material does not have to be resealed, creating the risk that it will go bad before it is used again.

“Some of our customers actually send us custom totes that we fill for them, so they can literally hook the tote to a reactor, open it up and put it in,” he says. “These are specialized requirements done with a high degree of confidentiality and under rigorous controls.”

GFS also manufactures other anhydrous materials, including Grignard reagents, metal triflates and catalysts such as cerous chloride, a versatile ketone-activating agent, Mr. Long observes. “We think there

are a lot of things in the GFS catalog that people would be surprised to find if they just took the time to look at it.”

The same can be said of the company’s capabilities as a manufacturer, according to Mr. Hutchinson. Its production facilities number 19 buildings, and the growing staff now totals 85. “We’ve got capacities from glassware to 2,000 gallon Pfaudler equipment. We have glass/steel, stainless steel, Hastelloy, the ability to do liquid ammonia,” he points out. The company has invested in infrastructure to support customers, and like larger companies, it has health/safety/environmental, engineering and comprehensive analytical capabilities.

“We are big enough to do interesting chemistries for people, and small enough to do it with flexibility and service they appreciate,” Mr. Long says.

“The perception is that we’re a little catalog house, but we’re more than that,” adds Mr. Hutchinson. “It’s fun to have prospective customers visit. Oftentimes they are amazed. They never imagined we were doing these things.” 