Go East, Young Man

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It was not long ago that I had the opportunity to explore one of the most legendary chemical campuses of its kind for the grand opening of a new plant dedicated to the production of Eastman Tritan™ copolyester. Eastman Chemical Co.'s Kingsport headquarters—measuring approximately 868 acres—is one of the single largest chemical manufacturing sites in the U.S. Founded in 1920, Eastman is a FORTUNE 500 company with 2009 sales of $5 billion and approximately 10,000 employees around the world.

A Place to Call Home

Nestled amongst the backdrop of Kingsport, TN, the company's site is impressive to say the least, not only in sheer size, but also self sufficiency. I think that most would venture to say that it is large enough to house a small town, including not only its own restaurants, but also its own wastewater treatment plant and fire department. While only one of the many facilities houses the new plastics operations, the media was additionally afforded bus trips around the campus to absorb the size and organization of its operations.

The main feature of the tour, however, was the facility manufacturing a next-generation plastic without the use of bisphenol A (BPA). It's called Tritan copolyester, and it claims to ideally balance the properties of clarity, toughness, and a resistance to heat and chemicals. A focus on markets, applications and customers that benefit from the attributes of Eastman Tritan copolyester has enabled business to quadruple in the past 12 months.

The Tritan plant was constructed as a part of Eastman's Project Reinvest program, which according to Eric Kniedler, director of polymers manufacturing at Eastman Chemical Co, is "an Eastman program focused on a commitment to invest more than $1.3 billion dollars in the company's Kingsport manufacturing site during the next five years. This program includes utilizing and expanding on valuable assets, such as Eastman Tritan copolyester.

"The plastics business has been a big part of Project Reinvest, if not the biggest." Kniedler asserts, "We are a growth business and growing requires a lot of capital to support the new polymers we're introducing. Tritan contributed both [in the form of] a new monomer plant and a new polymer plant here in Kingsport, TN, but for my business, there's a cellulose triacetate manufacturing plant expansion here as well."

Kniedler says it made sense to open and operate the new Eastman Tritan copolyester plant in Kingsport due to established infrastructure, the competent and capable associates, supporting assets, integrated manufacturing and the supportive Kingsport community.

Kniedler mentions that as an extra benefit for the area, "There was a short-term two-year employment gain in terms of contractors, construction and engineering. I'm not sure exactly what it was, but I know that it was not insignificant. [Project Reinvest] definitely created and preserved some jobs for some people who were shifted over from other parts of the company."

The new Eastman Tritan™ copolyester plant utilizes the latest equipment technology and distributed control

techniques.

Brewing the Formula for Success

“Prior to the 2007 introduction of Eastman Tritan copolyester, two Eastman chemists began researching the company’s proprietary chemical streams that had originally been created in the 1950s and 1960s. The chemists identified the exact combination to develop a new copolyester to meet marketplace needs, including a need for higher heat resistance, easier processing and higher impact resistance,” according to Kniedler.

The family of Eastman Tritan copolyesters are polymers made from dimethyl terephthalate, 1,4-cyclohexanedimethanol (CHMD) and 2,2,4,4-tetramethyl-1,3-cyclobutanediol (TMCD). The proprietary proportioning of CHMD to TMCD provides Tritan with its chemical resistance, toughness, temperature resistance and stiffness, which sets it apart from competing materials.

Opening in May 2010, the Eastman Tritan copolyester plant is dedicated exclusively to the production of Tritan and generates 30 kMT annually, in addition to the capacity on the initial commercial production line.

As far as environmental conditions are concerned, according to Kniedler, “Innovative operations within the plant increase overall sustainability by minimizing the environmental impact of processes and products, showcasing Eastman’s continued commitment to sustainable material solutions. The toughness and impact resistance of Eastman Tritan copolyester requires less protective packaging, supporting retailer-driven packaging-to-product ratio requirements. Processing efficiencies of products made with Tritan can reduce energy consumption, and the durability of products made with Tritan leads to a longer life cycle that may reduce end-of-life landfill pressure.”

Kniedler adds, “What sets the facility and its operations apart is that no other material supplier has an operation in place to produce a material that offers the unique balances of properties found in Eastman Tritan copolyester.”

An Expanding BPA-Free Market

Especially attractive to those markets susceptible to BPA opposition is the fact that Tritan can circumvent the worries of public safety. The results of independent third-party testing of Eastman Tritan copolyester have been published and are available on Eastman’s website. These studies confirm that Tritan is free from BPA. In addition, separate studies show Tritan is free from estrogenic and androgenic activity.

According to Kniedler, “[BPA-free plastics] have been percolating for a long time in the background as a consumer concern. There have been a variety of different tests conducted all around by different organizations, but it seemed to come to a head around 2008 when the Canadian government got involved, and that seemed to accelerate the concern. We were, from a market needs standpoint, aware of that

percolating concern, so when we were introducing Tritan in the early days, we thought there may be some interest from companies that may have wanted to get ahead of it.

“CamelBak [hydration systems company] was a good example. We saw this need coming. We’ve got a material that addresses that need, and [CamelBak] was interested in evaluating it, so it was a pot that got to really boiling. Though Tritan was developed as a higher heat-resistant material, we happened to be in the right place at the right time for the BPA concerns. But we did anticipate the trend—it’s more than just getting lucky. We could see it coming and we were in a position to take advantage of it.”

Since its launch in 2007, marketplace use of Tritan has increased from three initial industries to eight target markets, including medical, infant care, bulk water and signs. Kniedler continues, “The BPA [issue] has to do a lot with food contact, household appliances, housewares, infant care, [and particularly] water bottles, of course, which was one of our first markets. Our newest market launch is face protection.

“Any time you go into a new direction like this, you’re stepping out. Our customers have a lot of courage for doing that, and I think they’ll be pleased that they did. We’re continually on the prowl for that next new application. We continue to look around. Where else can we take this material? We’ve got good marketing and technology teams, so we’re looking for those customer needs where our product brings value to the table.”

Staffing & Safety of Utmost Concern

Maintenance is a high priority at the Eastman headquarters as management of the equipment is paramount to ensuring uptime and maximizing profits. (Kniedler admits that Eastman allocates a fairly significant maintenance budget to keep the plants in necessary condition.) With a focus on continual improvement of raw material yields and energy conservation, Kniedler says, “the Eastman Tritan copolyester plant uses the latest equipment technology and distributed control techniques. The designs and manufacturing processes used in the new facility leverage the experience gained in commercial production since the 2007 product launch.”

When it comes to maximizing productivity, Kniedler says, “For years, Eastman has fully utilized the Six Sigma approach to process improvements of manufacturing plants and other business processes, including the use of the lean tool. Furthermore, Eastman employs highly trained, certified specialists and operators, and uses stabilization projects to ensure a high-quality product.”

Safety is of utmost importance at the plant: “First and foremost, before the process is even built, we have a Process Safety Review committee look at the design and engineering and construction plans. Our first focus is safety as a company—both operating and environmental safety. We go to great lengths: We even have our own fire department staffed on site and our own fire safety training grounds, so we can

respond quickly to any emergencies. Safety is in everything we do—from design to operations to maintenance.

“We also have a regulatory affairs group that we work very closely with to understand any impending legislation and how it may affect us, and make sure we’re ready. The European Union’s Registration, Evaluation, Authorization and Restriction of Chemical Substances (REACH) is a great example where we actually had full-time employees dedicated to it when the legislation was pending and coming our way three or four years ago. We were already working on plans.

“The [regulatory affairs group] worked closely with my business team and myself, asking what products we want to register, so we hit the ground running. In fact, I think that we’re leading a couple of the REACH sub-committees because we wanted to be able to steer it in the right direction, making sure we have all the right information as an industry representative and get things in place. We stay ahead of the curve when it comes to those types of regulatory things.”

Aiming for Eastman Success?

When asked his advice for a start-up company, Kniedler concludes, “Stay focused. Have clear management support, so barriers can be removed. Keep open communication. The success of Eastman Tritan copolyester can be attributed to teamwork, dedicated and competent personnel, a clear vision and goals, strong support from upper management, and a strategic approach to market development and communications. The success of Tritan is in line with Eastman’s long-standing legacy of working with our customers to apply innovative approaches that lead to practical solutions and enable market success.”

For more information, please visit www.eastman.com [1].

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