Breaking the Fever

Temperature Control
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ADEPT ACROSS THE SPECTRUM

Tray production helps Commodore master tooling, processing

By Angie DeRosa

MOST TAKE THEM for granted, but those trays that hold meat at the grocery store have a lot of science behind their creation. A thorough understanding of that science has motivated officials at Commodore Plastics LLC, Bloomfield, N.Y., for more than three decades.

In the company’s 70,000-square-foot manufacturing facility near Rochester, officials extrude expanded PS (EPS) foam and thermoform it into trays used by food processors. They also form the foam into absorbent trays (called A-trays), label foams and other custom products. Commodore Plastics President Brad Braddon says, are exceptionally selective about the trays in which their products are packaged. Colors have become very important, and proper sizing is an imperative. The food has to have enough space on the tray so that sausage, for example, does not bunch together. Some of the company’s accounts include major names in the food industry. Commodore originally started making cake trays for Pepperidge Farm and the business evolved from there.

“Our foam business is known as premium,” says Brad Braddon. Rolls upon rolls of foam sheet occupy a 30,000-square-foot warehouse where they must be cured for three days. This warehouse is big and full because of the science. In spring 2016, officials will add a 120,000-square-foot storage facility in nearby Honeoye, N.Y.

“Foam takes up so much space,” says Brad Braddon, explaining the need for warehousing for these products, which use butane as a blowing agent. When it comes to the need for curing, he said this: “Air goes into the cell faster than the butane comes out, so it’s under pressure. And then when we heat it, it expands. So foam is expanded twice — once when you extrude it and then the second time when you thermoform it. If you thermoform it right away, then you only get part of the secondary expansion. To optimize that secondary expansion, you have to age it for at least three days.”

HOME GROWN EQUIPMENT

For the science to happen in the foam, the machinery and equipment used to extrude and thermoform it are critical. It is within sister company Commodore Technology that machinery and equipment have been developed, built and honed. Before starting his own business, George Bradzonen, Commodore Plastics’ president, had been a process engineer with Mobil Chemical in Canandaigua, N.Y., but noticed that the foam industry was growing. He purchased a used extruder and some used thermoformers from a scrap yard. He made trays that were purchased by grocery store chains like Wegmans and Tops.

Commodore Technology became so adept at making machinery, foam processors began requesting it. Its primary markets are in Russia and Central and South America for food packaging. Until now, the equipment primarily has been sold into those regions because Commodore did not want to sell to potential meat tray competitors in the U.S. market.

Through the vertical integration with Commodore Plastics, officials could test out the equipment and improve upon it. Trays made by Commodore Plastics are sold into the U.S. market.

With newly acquired technology, however, the company has begun moving into other markets for its machinery and has sold its first line to a foam processor in the United States. During a tour by Plastics Machinery Magazine, that machine, which represents a new process of PE coextrusion using an annular die, was being built. It can extrude material in A-B-A or A-B-C configurations, says Bradzonen.

In the factory, the coextrusion line was undergoing final testing and preparing for shipment. Engineers custom designed the line for an application in which they gave full consideration to feed systems, edge scrap reclaim, gas system (McC8), screen changer, screws, dies and waterways.

“Proper control eliminates dust and angled hair,” says Bruce Hayward, president of Commodore Technology. “With food packaging, you don’t want that process dust in your product.”

The machinery and equipment made by Commodore Technology includes dies, extruders, thermoformers, molds and trimming equipment and grinder technologies. Commodore also offers gas systems. It even sells its gas systems and dies to other extruder manufacturers.

“We work with other extruder manufacturers,” says Brad Braddon. “They partner with us. We’re strong on the foam side. We’re happy to supply pieces of systems for other people.”

Commodore also has developed some of its own testing equipment.

“Foam trays break,” he says. “Food processors cannot tolerate it when food trays break. We need to test our trays as we’re making them so that we

Just the facts

- **COMPANY:** Commodore Plastics LLC
- **OWNER:** The Bradzonen Family
- **NUMBER OF EMPLOYEES:** 185
- **LOCATIONS:** Bloomfield and Honeoye, N.Y.
- **ANNUAL SALES:** Undisclosed

Food tray production at Commodore’s Bloomfield, N.Y., facility
don't send trays to customers that are going to crack. It's a big deal.

One machine that's been designed in-house and sold to others is an impact testing device. The other big deal here is the working relationship Commodore has with Bob Beckwith, an expert in die technology and gas-injection systems. About 18 months ago, Commodore acquired Beckwith's product line, which includes the BCC technology die and gas-injection systems. This move alone is catapulting Commodore into new markets.

"For years, we paralleled ourselves in regard to food packaging," says Hayward, in terms of the way that Commodore Technology grew alongside Commodore Plastics for its foam needs. "But now we're stepping into different industries — medical, building and construction, automotive. So that's where our drive is, with the technology group, to explore those markets. We're not really pigeon-holed in the food packaging, polyethylene field. We can branch out into polyethylene and polypropylene in food, but also in automotive, building and medical. We bought the BCC product line and that supports it."

The BCC product line includes dies and gas-injection system technologies.

"We looked at how we can supplement our product offering in regard to looking at some of the key ways to differentiate ourselves from the competition, and that is the die itself," says Hayward. "That is where the rubber hits the road. And then your gas system, too, with how you deliver the gas. That is a mystery to a lot of folks."

THE SCIENCE OF THE DIE

Beckwith is a pioneer in the foam extrusion industry and the owner of BCC Inc., based in Barnstable, Mass. BCC still is taking orders for developmental designs and doing consulting, says Beckwith, whose career spans decades. One of his patents is for an apparatus for nonmechanical die lip temperature adjustment in an extruder.

Working with Beckwith, Commodore was focused on improving its die technology, which had a simple spider design. Although Commodore

The use of BCC Inc.'s gas-injection technology has catapulted Commodore into new markets.

Technology has offered its own die technology, Beckwith's product line kicked it up a whole new level, says Hayward. "BCC has the extrusion technology, too," he says, "which will be a game changer because you eliminate the need for a second operation of laminating or coating."

Hayward explained that in a generic die concept, the die housing is an open pipe and a bullet or torpedos hangs in the middle of the pipe. The plastic flows between the internal diameter of the die housing and the outside of the bullet. A spider is used to physically hold the bullet in the middle of the die body. The choke is in the mid-section of the die in the plastic flow. This choke constrains the flow to help control uniformity, flatness and pre-foaming, for example.

The BCC die has multi-lip designs that can make adjustments to the flow (choke) in different areas before it gets to the die lips. The die lips are adjustable as well using Beckwith's technology. These adjustments can be made on the outside of the die so that the die does not need to be disassembled.

FINESSED EXTRUSION AND A CONVERSION TO ALL-ELECTRIC THERMOFORMERS

Within Commodore, officials live by a strict philosophy that you can take a good sheet and form a good tray. You can take a good sheet and form a bad tray because you have a bad process. But you can't take a bad sheet and form a good tray.

"All that really important is to make sure your extrusion process is dialled in," says Hayward, noting the importance of controlling the process. "Managing the dependent relationships between mechanical systems, resin/additives, mixing, temperature control, physical science and chemistry requires a unique talent that comes from years of experience."

For application engineers around the world, this wealth of knowledge is critical to help Commodore Technology's customers improve performance by increasing output, reducing weight and scrap.

"If you're going to make a really good sheet, you're going to be successful on the thermoforming side," Hayward says. "If you have a bad sheet, then you're going to have a lot of scrap."

Within the foam extrusion and thermoforming operations, the company processes 1 million pounds of EPS per month. Fourteen lines, including an all-electric thermoformer, are hard at work. Commodore has been one of its long manufacturer-journeying for eight years, says Chuck Gallagher, president of Commodore Plastics. Part of that includes implementing all-electric technology on thermoformers.

A great example of how this technology is being used is Commodore's SX-285 thermoformer. Officials converted its form station from hydraulics to servo. In the spirit of lean manufacturing, Commodore eliminated at least 50 percent of the mechanical components of a traditional servo form station. Rather than toggle at each corner, the SX-285 uses a center drive for the forming platen on a 28-inch wide machine. The form station can run as many as 60 cycles per minute and is geared toward high-volume applications.

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