

## Single Cart for Downstream Components Makes Extrusion Operator's Job Easier

A simple concept plus smart design makes it faster and easier to deploy and maintain the gear pump and screen changer on an extrusion line. By combining the two components on a single movable cart, Nordson Kreyenborg has created a system that takes up less floor space than separately mounted machines, and provides easy access for replacement of filter media.

Developed at the request of one customer, the concept of a single support cart can be applied for equipment custom designed by Nordson Kreyenborg for other companies, including extrusion processors, compounders, and recyclers, replacing the standard configuration involving separate carts for the two components.

The single cart (see photo on this page) is mounted on fixed casters that permit transverse-direction movement into and out of the extrusion line, while precisely aligned movement in the extrusion direction is provided by rails installed on the floor of the cart. At the same time, linear guides on the cart permit independent extrusion-direction movement of the gear pump and screen changer. To save space *Continued on P. 5.*

## Inside....

- Better way to heat injection nozzles and melt pipes
- Feedblock inserts increase uptime for film and sheet
- Integrated pelletizing and crystallizing of PET
- Injection unit components and process improvement

## Nordson at Chinaplas: Wealth of New Melt Stream Components for Extrusion, Molding, and Compounding



Nordson Corporation will present four of the world's renowned brands of melt stream component technologies, including recent innovations for extrusion and molding processors, web converters, compounders, and recyclers, at Chinaplas 2014. Featured in the company's main exhibit at **Booth W2 J01** will be Nordson Extrusion Dies Industries, Nordson XALLOY, and two product lines acquired since the last Chinaplas: BKG and Kreyenborg. In addition, a combined Nordson BKG and Nordson Kreyenborg exhibit in the German Pavilion at **Booth E1 F03** will focus on equipment engineered and produced in Germany.

Nordson acquired and added these melt stream component product lines to their polymer processing portfolio during the past two years, adding their regional manufacturing, sales, and service capabilities to the company's already extensive presence in China and throughout Asia, as well as in Europe and the Americas.

"Our combined resources have increased the availability of local sales and technical service for customers and provided them with the opportunity to source components in our various product lines from a single supplier," says Peter Lambert, senior vice president for Nordson's polymer processing product lines. "Because Nordson uniquely understands all of the components in the melt stream, we can draw on this knowledge to help customers by recommending ways to optimize their overall melt stream process, increasing productivity, reducing costs, and enhancing product quality."

Current innovations are detailed in separate articles in this issue of NORDSON ADVANCES. They will also be highlighted at the Nordson booths during Chinaplas. For each of the product lines, a wide range of products will be on display:

- **Nordson Kreyenborg.** At Booth W2 J01: screen changer K-SWE-121 and gear pump GPE 70/70-01. At Booth E1 F03: screen changer K-SWE-125-4K-75/RS and gear pumps 70/70-01, 70/70-01/MB (masterbatch), and 70/70-03.

*Continued on P. 5.*



**COMPACT AND OPERATOR-FRIENDLY, this single cart from Nordson Kreyenborg combines gear pump and screen changer. New design makes deployment of components on an extrusion line faster and provides easier access for replacing filter media. (See article starting at top left on this page for details.)**

# PET Pelletizing System Saves Cost by Making Double Use of Melt Heat

Why take away the heat from pelletizing PET when heat is just what's needed in the crystallizing step to follow? Nordson BKG has addressed the question by developing an integrated system that uses the thermal energy of molten polymer in pelletizing for crystallization as well. The CrystallCut® pelletizing system, a patented process, not only reduces energy costs for compounding or recycling but also eliminates problems caused by the agglomeration of amorphous material.

As an integrated network that incorporates underwater pelletizing, drying, and crystallizing, the CrystallCut system avoids the need to cool PET after pelletizing, then reheat it for crystallization. It is designed for precise control of material temperatures throughout the process, preventing production and quality problems caused by insufficient crystallization and excess levels of amorphous material. The energy efficiency of the CrystallCut system can save more than €3,000,000 in annual energy costs for a typical PET resin plant and nearly €200,000 for an extrusion line recycling PET bottle flakes, according to calculations based on actual commercial installations (see graph for an example relating to polymerization).

“The CrystallCut system provides substantial relief to the cost pressure on PET polymerization and recycling, particularly as prices for PET fall,” says Ralf Simon, managing

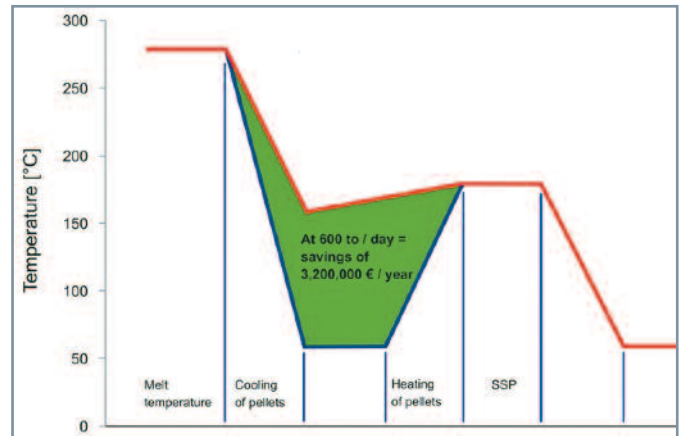
director of Nordson BKG™. “In addition, because the system utilizes residual thermal energy within the material to crystallize pellets from the inside out, it yields an enhanced crystalline structure that results in lower energy costs for re-melting the material.”

In the CrystallCut system, the hot PET granulate produced by the face cutter of the underwater pelletizer is transported rapidly to the pellet dryer in hot water (up to 95 °C) through closed conveying pipes, where pellet cooling and solidifying takes place. This conveying medium and the short distance between die head and dryer are keys to conserving the heat from melt processing. The pellets are at a temperature in the 150 to 160 °C range when they exit the dryer onto a vibrating conveyor. This keeps the pellets in constant motion, generates a uniform distribution of thermal energy, and prevents pellets from sticking together. At the completion of the process, the pellets have a temperature of approximately 180 °C, have achieved up to 40% crystallinity, and may be transferred directly to solid state polycondensation (SSP).

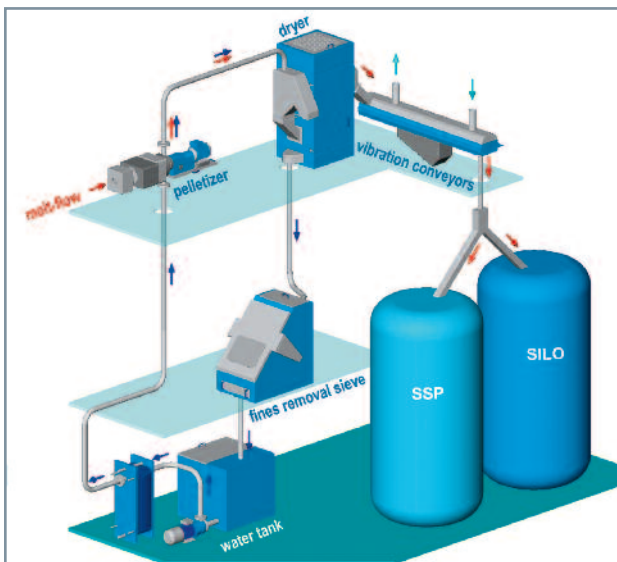
In addition to saving energy costs and preventing amorphous PET clumping, the CrystallCut system yields an almost dust-free product and increases bulk density by 8% in comparison with a conventional process.

## Big Savings in Energy Costs with CrystallCut® System

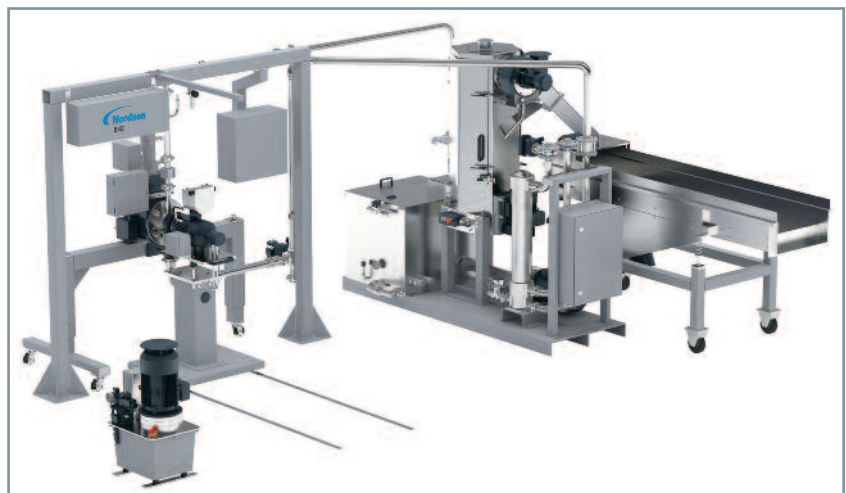
Assuming an average energy cost of 12 cents/kWh, Nordson BKG estimates that the CrystallCut system yields energy savings of up to 125 kWh or €15 per ton of PET in a modern PET polymerization plant. Since such a plant can achieve a production capacity of 600 tons per day, these savings amount to *Continued on P. 5.*



**ENERGY SAVINGS IN A PET RESIN PLANT.** At an energy cost of 12 cents/kWh, the CrystallCut® system from BKG saves up to 125 kWh or €15 per ton of PET in a modern PET polymerization plant. With production at 600 tons per day, these savings amount to €9,000 daily and €3,200,000 per year—an annual energy saving of more than 26 gigawatt hours.



**ENERGY-SAVING CRYSTALLCUT® SYSTEM FOR PET,** developed by Nordson BKG, re-uses heat from underwater pelletizing to crystallize the polymer. The system delivers finished resin directly to storage or to solid state polycondensation (SSP).



**CRYSTALLCUT® SYSTEM** rapidly transfers hot PET granulate in hot water from the face cutter of the underwater pelletizer to the pellet dryer through closed conveying pipes, where pellet cooling and solidifying takes place. This conveying medium and the short distance between die head and dryer are keys to conserving the heat from melt processing. The pellets exit the dryer onto a vibrating conveyor, which keeps the pellets in constant motion, generates a uniform distribution of thermal energy, and prevents pellets from sticking together.