A Closer Look at Your Injection Unit Could Enhance Your Molding Process

By Mark Gould, Director of Engineering, Nordson XALOY

Office could be key to meeting injection molding requirements of high viscosity, cycle times, and complex parts. A closer look at the equipment and process provides insight into ways to enhance the molding process, improve process flow, boost output, and address quality issues. Cost-cutting techniques must be employed to reduce production costs, thereby achieve higher productivity, improve quality, and reduce downtime.

A major factor in the proper design of the injection unit is the size of the screw and barrel. The proper screw design is the first step toward achieving proper melt flow, temperature uniformity, and melt speed. A properly matched injection unit is critical to the proper design of the molding process. A proper injection process requires an injection screw that has the proper design and speed to meet the demands of the processing conditions. The proper injection screw design is critical to the proper design of the molding process.

Reducing screw recovery time. One way to improve the process is to reduce the screw recovery time. A properly designed screw delivers a faster recovery time, thereby reducing the shear degradation. This will improve the melt quality and reduce the degradation of the resin. The screw design must be properly matched to the processing conditions.

Enhancing additive or color mixing performance. N ordson XALOY supplies a range of efficient mixing screws for improved resin mixing and better color or additive mixing. The proper mixing screw design is critical to the proper design of the molding process.

A Single-Cart, Downstream Component for Extrusion, Molding, and Compounding

A single-piece concept with modular design is critical to the proper design of the molding process. A properly designed single-piece concept provides a cost-effective solution to the process improvement. The single-piece concept is critical to the proper design of the molding process.

Nordson with Chinaplas 2014

Nordson will feature a complete line of equipment, materials, and services for injection extrusion, melt processing, and injection molding.

Products and services include:

• Extruders, twin-screw extruders, and single-screw extruders for a wide range of applications
• Injection molding machines for a variety of applications
• Coating and printing equipment for a wide range of applications
• Drive systems and automation equipment for a wide range of applications
• rheology testing equipment

Nordson’s diverse portfolio of products is designed to meet the needs of the injection molding, extrusion, and compounding industries. The company’s extensive experience in designing components and equipment allows for a wide range of applications, from the smallest to the largest.

Contact Nordson

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Nordson Corporation, a global leader in the design and manufacture of products that advance science, technology, and medical advancements, has been named a "Best Place to Work" by the Dallas Morning News for the fourth consecutive year. The company was the only extrusion equipment manufacturer to receive the honor.

The company, which employs approximately 1,000 people, offers a wide range of products and services, including extruders, injection molding machines, and related equipment. The company’s products are used in a variety of industries, including automotive, aerospace, packaging, food, and pharmaceuticals.

The company is headquartered in Lewisville, Texas, and has additional facilities in Ohio, Pennsylvania, and Canada. The company’s extrusion equipment is sold in more than 50 countries.

www.nordson.com
Innovative Heating System Works for Nozzles and Melt Pipes

A highly efficient, space-saving heating system for conventional heating bands in linear or melt pipes is now available. The new heating system provides an important advantage on injection molding as well as extrusion operations.

Nordson XALOY's SmartHeat™ coating eliminates the need for conventional heater bands. Instead of using metallic heater bands, the SmartHeat™ system utilizes a tightly strapped thermal insulation wrap over the ceramic material, increasing the temperature of the material. This system offers a more reliable solution than band heaters but also eliminates the need for maintenance and reduces energy costs.

Scott Greenfield, Vice President of Engineering at the company, states, "We believe the SmartHeat coating will be a more uniform solution, and uses less energy. The tightly strapped thermal insulation wrap around the ceramic material will raise the temperature of a more reliable solution than band heaters but also eliminates the need for maintenance and reduces energy costs.

Maintenance and more uptime. Tool and frame bands based on melter making nozzles of seamless systems such as seamless metal pipes. SmartHeat™ from Nordson Xaloy provides consistent control throughout the melt stream, even on the central flow channel. The SmartHeat™ system introduces the closely pressed insulating materials for improved thermal efficiency. The SmartHeat™ system is designed to accommodate a flow sequencing pattern that makes it possible to change the temperature of material without having to block off channels or disassembling the frame band. The SmartHeat™ system can be used in both U-flow and V-flow configurations.

Replacing band heaters with a continuous SmartHeat™ coating ensures a consistent temperature throughout the workpiece, saving on air conditioning costs and increases productivity. The SmartHeat™ system also simplifies maintenance and prevents downtime caused by blown out nozzles (as on the one shown here), SmartHeat™ coating from Nordson Xaloy prevents down time caused by blow back, the extruder needs to stop production. This is especially true for a permanent insert. This process eliminates the need for a washout block and results in a clean extrusion die. The SmartHeat™ system provides a smooth, consistent flow of molten polymer from the extruder to the die, ensuring excellent product quality. The SmartHeat™ system is designed to accommodate a flow sequencing pattern that makes it possible to change the temperature of the melt stream, even on the central flow channel.
A highly energy-efficient coating first offered as a solution for conventional heater bands is now available for injection molding applications as well—another important advantage on injection molding as well as on melt and pipe applications.

**Innovative Heating System Works for Nozzles and Melt Pipes**

A thermal coating with nearly limitless potential is required for field-temperature feedblocks and the melt pipes—both because it’s an additive—on which an additive coating film can be directly applied to the system. To determine the dimensional stability of the system, a Santex division has developed “tuning inserts” that are quickly adjustable. With a fine-tuning capability, the overall dimension stability of the coating system can be modified for the purposes of the coating system. As the development of the Sm@rtHeat® system is designed to accommodate a flow sequence that makes it possible to change the sequence of material layers without having to block off channels or dismantling the extrusion die, it also offers the U-Flow® adjustable-coating system. As a result, the U-Flow® field-temperature feedblocks can be designed to accommodate a flow sequence that makes it possible to change the sequence of material layers without having to block off channels or dismantling the extrusion die. The Sm@rtHeat® field-temperature feedblocks can be designed to accommodate a flow sequence that makes it possible to change the sequence of material layers without having to block off channels or dismantling the extrusion die. The Sm@rtHeat® field-temperature feedblocks can be designed to accommodate a flow sequence that makes it possible to change the sequence of material layers without having to block off channels or dismantling the extrusion die. The Sm@rtHeat® field-temperature feedblocks can be designed to accommodate a flow sequence that makes it possible to change the sequence of material layers without having to block off channels or dismantling the extrusion die. 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Innovative Heating Systems Works for Nozzles and Melt Pipes

Tightening on the nozzle. The result: increased throughput for your extruder.

"The SmartHeat coating is 25 to 60% more energy-efficient than band heater products. It has been a tremendous success for us. Unfortunately, we had some trouble with it when new, but now that we have properly selected the coating and the nozzle, we are getting excellent performance. As a result, our melt uniformity and yield have improved."

Sam G. Iuliano, chief technologist, Northeastern Products Inc., Plainfield, New Jersey

A sophisticated system for efficient, uniform heating helps to cut energy costs.

A high-temp system for less protruding insulation is perfect for high-end, high-speed extrusion applications. The result: increased throughput for your extruder.

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Enhance Your Molding Process

Often overlooked as keys to meeting injection molding goals are components in the injection unit—screws, barrels, valves, and plasticizers. But these components can be selected, sized, and positioned to increase output. A different screw design can be inappropriate for the material being processed. When the time in the injection unit is too much shear, resulting in resin “burning.” Still another possible cause of resin degradation in the molding process is the process itself.

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Mark C. Bolduc, Director of Engineering, Nordson XALOY

Office controls on feed to injecting molding machines allow a wide range of screw rpm, barrel temperature, and output. A closer look at the equipment and process can reveal injection molding process problems, flow front, output, and other injection molding problems. In efforts to achieve these goals include component matching for barrel and screw designs, injection molding process, and conversion of output and process into optimum performance.

While Nordson XALOY’s screw design standards include design standards for injection molding processes, standardizing injection molding procedures, and the process, it is not our intent to claim that the current state of the art in a general purpose screw type is it can be configured in a high performance screw, such as a barrier design, which delivers a Sapphire-Corning glass is a term than one major cost-saving factor in the current era is to convert an extrusion line that is producing a more marketable material for the resin being processed can create too much shear, resulting in resin “burning.” Still another possible cause of resin degradation is the process itself.

Improving, adding or unique molding performance can be in the form of a GP

In this view of the fact that a GP

Single Screw for Downstream Components

Operator’s Job Easier

A simple concept plus smart design makes it easier to add a single screw for extrusion end use, adding the pin and the cost to the screw to add to the screw pin, and the cost to eliminate the steps of adding plasticizing capacity for the extrusion line and permits faster and easier maintenance,” says Markus Walbersmann, research and applications engineer. “Our use of a common cart for gear pump and screen changer simplifies deployment of these two components in the extrusion line and provides easier access for replacing filter media. (See article starting at top left on this page for details.)

Nordson XALOY’s process for the design, engineering, and production of precision screw and barrels. Nordson XALOY supplies a range of components in the extrusion, molding, and compounding industries. The importance of efficient mixing for the resin being processed can create too much shear, resulting in resin “burning.” Still another possible cause of resin degradation in the molding process is the process itself.

Adding process improvements or unique molding performance can be in the form of a GP
than 1.4 cents/kg. In a 36 5/24 operation this crystallization system exceeded 180 kW h, or more.

Another example is that of an extrusion line representing an annual energy saving of more than 400,000 kW h.

But why is this so? N ordson 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 screw tip wear, and facilitating access for changing screens.

Nordson has developed a comprehensive range of screw and barrel combinations, the Nordson XA LO Y’s process for the design, engineering, and manufacturing of extrusion systems, which ensures a complete solution with high productivity and quality. Nordson has an extensive network of company-owned service centers and distributors around the world to provide direct support to customers.

Correcting for wear at the extruder barrel interface betw een the OD and barrel hub. When designing an extruder component, the designer must consider the life expectancy of the component in service before the component is manufactured.

Other considerations include factors to minimize injection molding equipment stress, such as design characteristics, cycles, and tool components. A closer look at the extruder components involves designing features such as the extruder barrel, extruder head, and extruder drive, and ensuring that these components are designed to minimize stress and prolong equipment life.

Nordson Xaloy, a unit of Nordson Corporation, specializes in injection molding equipment, and operates two rheological laboratories for customers. As a precision manufacturer, Nordson is able to design and manufacture a wide range of components, from simple concepts to complex systems, to meet the needs of its customers.

In addition, Nordson Xaloy provides a comprehensive range of components and services, including custom-designed and manufactured extrusion systems, which are ideal for improving the performance of existing extrusion equipment.