



Polymer Processing Systems

EDI[®] Extrusion & Fluid Coating Die Systems

Transforming polymer melt and liquid coatings into high-quality products has been our core competence since 1971. We deliver highly advanced extrusion, coextrusion, and fluid coating die systems, catering to ever-changing market and customer requirements. EDI[®] systems are designed to further enhance end product characteristics, making them suitable for various and demanding end markets. We want customers to experience trouble-free, highly automated processes for dependable and rewarding results.

You Require Innovative Solutions

We're Ready to Meet the Challenge

Extrusion Dies Industries was founded in 1971 as a small machine shop in the Midwest U.S. town of Chippewa Falls, Wisconsin. The company introduced its first manual Ultraflex™ die the same year, providing customers with a new solution for their sheet processing needs.

Since 1971, Extrusion Dies Industries has created a standard of excellence in extrusion and fluid coating die systems. The company remains committed to the changing needs of customers, developing new products that have resulted in performance improvements and increased production opportunities. These products range from the introduction of the Ultracoat™ die for fluid coating applications to the highly innovative and game-changing Prodigy™ motorized lip actuator system for film, thin sheet, and coating applications. Through it all, the business has engaged end users and key OEM partners, listening to feedback about what products and features are truly needed by the industry.

Nordson Corporation acquired Extrusion Dies Industries and Premier Dies Corporation in 2012 as part of the company's new line of business dedicated to serving the needs of the plastics industry. The newly formed division, called Nordson Polymer Processing Systems (PPS), brought together several legacy machinery manufacturers into one unique and collaborative organization.

Today, the PPS division employs experts in polymer processing solutions who have crafted systems used worldwide to melt, extrude, and pelletize polymers. Our team works to understand the needs of your business, designing our products to enhance the performance of your processes.

Whether you require an EDI® extrusion and fluid coating die system or a BKG® gear pump, melt filter, polymer valve, or a BKG® pelletizing system, we're ready to meet the challenge.



Engineering & Technology

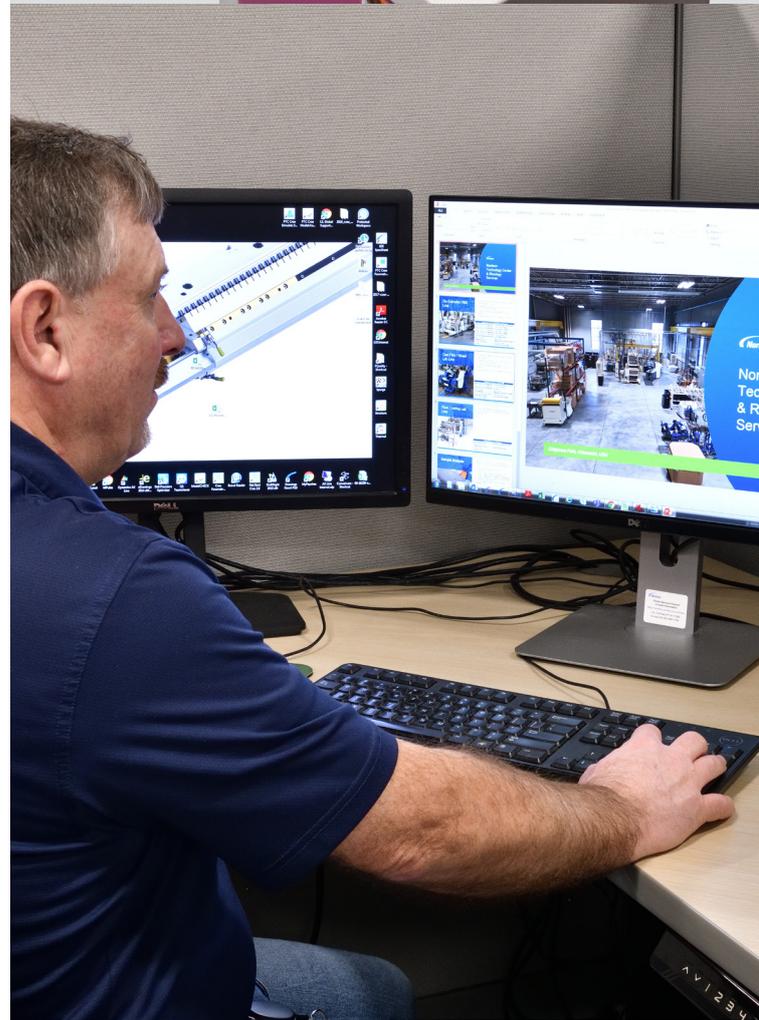
Designing a die or feedback requires extensive knowledge of the application and process requirements. Our engineering team uses the latest technology to ensure that EDI® systems are built to the specifications necessary to provide the expected performance.

Rheology Testing

- A dual capillary rheometer allows for efficient shear viscosity testing with Bagley Correction, as well as other rheological testing methods
- Ability to consider elongational viscosity so that the unique flow behavior of materials with similar shear viscosities, but differing levels of elasticity, can be accounted for in the design of a die
- Advanced analysis software allows for a detailed review of the rheological data, which ensures the accuracy of results while allowing for common corrections and fitting equations to be applied
- With each application, material is tested, and the resulting rheology data is used to optimize the flow channel design
- Polymer blending capability ensures proper rheological properties of homogeneously mixed melts are captured during testing

System Design

- With a significant history of computerized die system design, we have created a large library of 3D models, including standard and complex designs
- During the design process, CFD software is used to analyze flow characteristics, such as shear rates, flow viscosity, residence time, flow direction, and flow profile across the internal channel
- Internal die pressure can be directly imported into the 3D model, and die deflection can be calculated
- CFD software is used to improve layer interface stability and overall layer uniformity in coextruded structures
- Internal die pressure results are used in design software to create deflected flow channel dimensions, simulating actual performance with die deflection, resulting in optimally refined real-world results





EDI® Extrusion & Coextrusion Die Systems

Maximize Production Efficiency

A flat die system is a critical component in the overall melt stream, and as such, we design each EDI® die with the goal of improving efficiency and saleable output for processors.

Working with each customer, our team determines the manifold design, die body materials, flow surfaces, temperature controls, thickness adjustment, deckling, and other key elements that best meet the application's needs.

For coextrusion applications, processors have options that range from feedblock-fed single-manifold designs to multi-manifold dies for nine layers or more. EDI® coextrusion feedblocks provide precise layer ratio and sequence adjustments, further enhancing the desired properties of the end product or its intended use.

This extensive knowledge and expertise in designing and manufacturing extrusion and coextrusion die systems has enabled us to serve customers globally in every flat die extrusion and converting application, including cast film, extrusion coating/laminating, oriented film, and sheet.

Features and Benefits

- **Boost Productivity**
An extrusion die's optimized flow channel(s) promote uniform distribution of key polymer properties throughout the width of the film or sheet
- **Improve Material Cost Savings**
A variety of optional features, such as automatic lip adjustment and deckling systems, help cut resin consumption and reduce scrap
- **Increase Extruder Uptime**
Additional technologies may be incorporated into the extrusion die design to aid in quick online adjustments and product changeovers
- **Numerous patents that reflect continuous advancements in die technology**
Access to cutting-edge solutions that drive industry standards and deliver exceptional performance
- **Collaborative partnerships with customers to address the most challenging applications**
Efficient solutions to meet your specific processing needs

Cast Film Die Systems

Achieve optimal product quality with a cast film die designed for your specific application requirements.

- Ultraflex™ Dies with the Patented Bow-Tie Shaped Multiflow™ 10 Manifold
- Contour® Dies
- Multi-manifold Dies
- Coextrusion Feedblocks
- Optional features include automatic gauge control, deckling, & insulation packages



Coating & Laminating Die Systems

Save material cost by minimizing product width and reducing the size of edge bead.

- EPC™ (Edge Profile Control) Dies
- Multi-manifold Dies
- Coextrusion Feedblocks
- Optional features include automatic gauge control, motorized deckle drive, and deckle maintenance cart to assist with routine cleanings



Oriented Film Die Systems

Enjoy unsurpassed coextrusion uniformity and longer production runs of high quality film.

- Biaxially Oriented PA, PET, PP Dies
- Oriented PS Dies
- Distribution Blocks & Coextrusion Feedblocks

Oriented film dies are designed to accommodate coextrusion structures with skin layers of less than 10% of the total configuration, and structures with melt differentials up to 28°C (50°F). A variety of features, including automatic or manual gauge control, may be added.



Sheet Die Systems

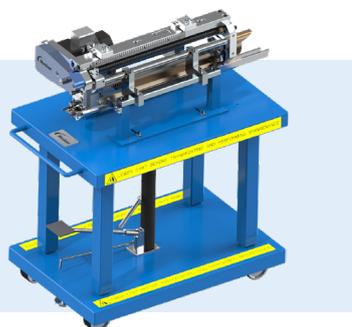
Easily changeover products and maintain uniform end product quality.

- Commodity Sheet Dies
- Specialty Sheet Dies
- Specialty Coextrusion Feedblocks for PVC Applications
- Multi-manifold Dies
- Options include automatic gauge control, restrictor bars, FastGap™ lip positioning system, and deckling



Ancillary Equipment to Improve Workplace Safety and Reduce Downtime

- Die Carts
- Deckle Maintenance Carts





EDI® Coextrusion Feedback Technology

Achieve Exceptional End Product Performance

Coextrusion technology has undergone significant evolution in recent years, with Nordson at the forefront of this advancement. Our versatile coextrusion feedbacks have been developed utilizing over 50 years of polymer processing experience. Our investment in cutting-edge research and coextrusion technology keeps us at the forefront of the polymer processing and extrusion world.

When you browse our world-class range of feedbacks, you'll find features designed for dedicated structures, optimal layering sequences, the creation of flexible packaging, and more. We offer a range of coextrusion feedbacks to ensure we have the right technology available to elevate polymer processing for a wide range of materials and applications. In fact, we have coextrusion feedbacks available for any product created by our extrusion dies that require multiple layers or multiple resins.

Our coextrusion technology ensures that when the polymer flows through the feedback, it's the correct structure and the right ratio compared to the next layer. Consistency is key throughout the width of each layer, and with EDI®, you can ensure accuracy.

Selecting the right coextrusion feedback for your specific application is crucial. Our polymer processing experts are here to make it easy. We invite you to contact us for a complimentary consultation to determine the ideal coextrusion technology that best suits your needs.

Features and Benefits

- **Maximize Your Production Output**
EDI® feedbacks are crafted using proprietary software that analyzes the characteristics of each layer, ensuring optimal coextrusion performance right from the first production run
- **Enable Optimal Layer Sequences**
With EDI® coextrusion feedback technology, multiple layers and multiple resins can be processed together in one consistent and exceptional production run
- **Ensure a Precise and Uniform Final Product**
By producing accurate layer-to-layer ratios, EDI® coextrusion feedbacks provide superior end product quality
- **Choose Adjustable Designs to Increase Efficiency**
Adjustable geometry feedback designs allow operations to increase production speed and reduce downtime for routine maintenance activities

Ultraflow™ Fixed Geometry Feedbacklocks

Fixed geometry feedbacklocks are well-suited for processes with a low number of product changeovers.

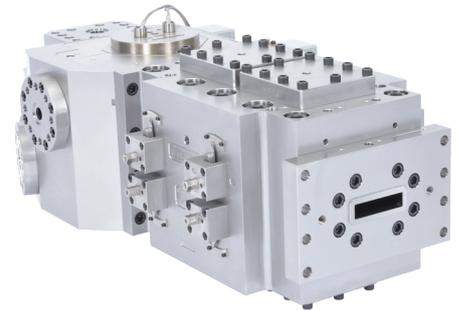
- Polymers are combined in a parallel path manner to optimize layer ratio stability
- Layer sequences may be changed using a combination of inserts and plugs, or by configuring an optional selector spool
- Feedbacklock is designed for easy access to the flow insert, minimizing the time required for routine cleaning and layer sequence changes



Ultraflow™ Adjustable Geometry Feedbacklocks

Adjustable geometry designs allow quick changes to a product with minimal impact on production output.

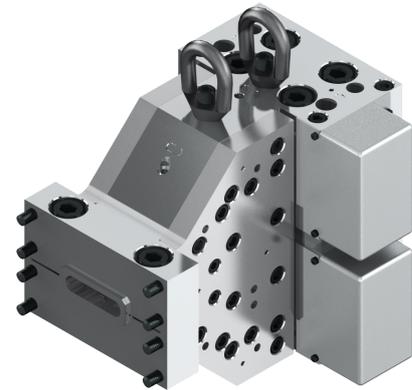
- Polymers are combined in a parallel path manner to optimize layer ratio stability
- Designed with controllable linear valves, which allow highly precise layer ratio changes "on-the-fly" for greater end-product versatility
- Optional selector spools enable layer sequence arrangements to be preset upstream of the feedbacklock's combing point



Ultraflow™ Streamlined Feedbacklocks

Specifically designed for optical applications, these feedbacklocks offer unsurpassed coextrusion uniformity.

- Polymers are combined in a parallel path manner to optimize layer ratio stability
- Designed with a split body, which minimizes physical space requirements when installing into a new or existing line and reduces downtime for cleaning procedures
- Optional selector plates and exchangeable distribution bars may be used to arrange layer sequences and optimize layer uniformity



Distribution Blocks & Adapters

Distribution blocks and adapters are used to optimize the flow of the melted polymer to the die.

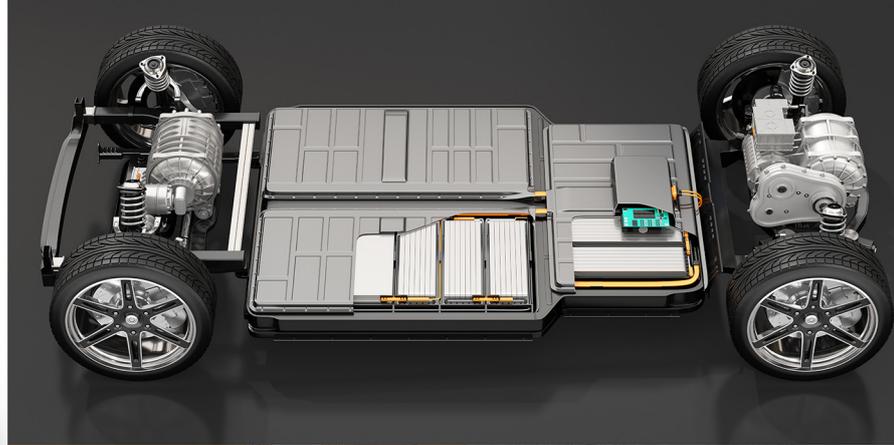
- Distribution blocks offer flexibility for connecting melt pipes to a multi-manifold die in a coextrusion process, and are available in a fixed geometry or adjustable geometry design
- Transition plates and simple adapter pipes help streamline the flow of material to the die, contributing to greater end product quality



Layer Multiplication Technology (LMT)

- Engineered to multiply some or all the layers within a coextrusion "sandwich" provided by a feedbacklock
- In food packaging, the oxygen transmission rate and total oxygen ingress are reduced over an extended period of time, resulting in a longer shelf life





EDI® Fluid Coating Die Systems

Create Optimal Coating Accuracy

Nordson offers slot die coating systems that deliver a precise, uniform flow to the web at a constant rate.

Premier™ fixed lip and Ultracoat™ adjustable lip slot dies can be custom-designed for a wide range of fluids, including solvent- and water-based coatings, slurries, paints, hard coatings, UV curable materials, adhesives, and many more.

Our team of experienced technicians utilizes state-of-the-art equipment to manufacture single- and multilayer slot dies to precise tolerances, following precision grinding and hand lapping. The result is a die that is not only flat and straight but also has an exceptionally uniform slot gap.

No matter what your coating needs are - from laboratory devices to production systems for adhesives, magnetic media, paint, solar, battery, glass coating, and more - a custom-designed slot die system will increase your production efficiency and provide significant cost savings.

Features and Benefits

- **Boost Coating Fluid Yields**
Apply the coating fluid onto the substrate in a metered fashion, using a positive displacement pump and slot die
- **Achieve Coating Property Consistency**
Slot dies are part of a closed system, designed to reduce contamination and emission of volatiles while maintaining consistent fluid properties throughout the production run
- **Improve Productivity**
A slot die's manifold geometry is designed to evenly distribute the fluid based on its rheology, delivering a uniform coat weight
- **Increase Production Output**
A slot die system allows for better control of the cross-web uniformity and the capability to increase the percentage of solids, thus reducing drying time
- **Reduce Downtime**
Slot dies may be designed for a large window of coating widths and thicknesses, helping to reduce lost time during product changeovers

Adjustable Lip Slot Dies

Gain flexibility to adjust for variation in web thickness and processing parameters.

- Ultracoat™ Single Layer Slot Dies
- Ultracoat™ Dual or Triple Layer Slot Dies
- Optional features include automatic gauge control, cored holes for liquid temperature control, and replaceable lip inserts



Fixed Lip Slot Dies

Enjoy extreme precision in an easy-to-use design.

- Premier™ Single Layer Slot Dies
- Premier™ Dual or Triple Layer Slot Dies
- Optional features include a hand-operated die opener for single-layer slot dies, cored holes for liquid temperature control, and die cavity plugs to increase the flexibility of the die without sacrificing performance



Slide Curtain Coating Dies

Increase production rates by uniformly coating one or more layers at higher speeds.

- Premier™ Single Layer Slot Dies
- Premier™ Multi-layer Slot Dies (2-10+ Layers)
- Optional features include a single or multiple-layer end plate with edge guide adapter and cored holes for liquid temperature control



Positioners & Stations

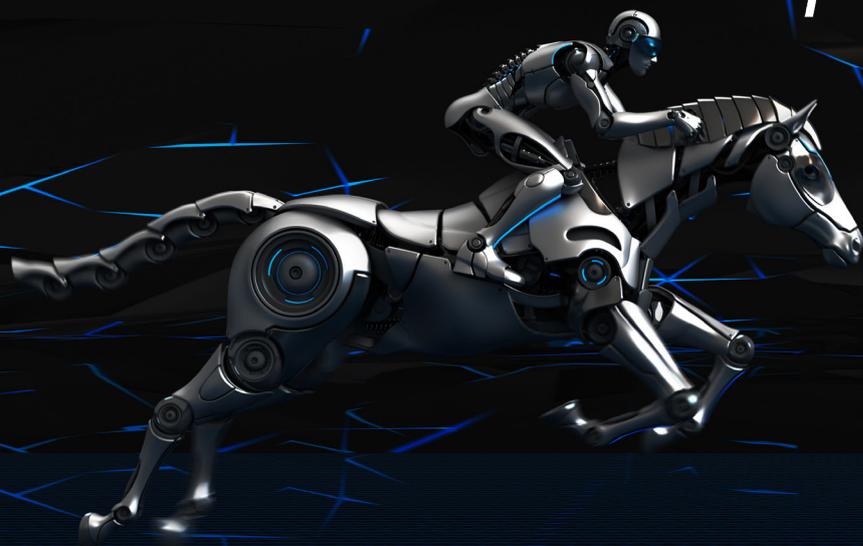
Ensure precise, uniform, and repeatable coatings.

- Premier™ positioners are designed for on-roll or off-roll (tension) coating
- Ultracoat™ stations feature pneumatic actuation via air cylinders with an optional vacuum box and regenerative blowers
- Options include table-mounted, cart/platform-mounted, or floor-mounted systems



Prodigi™

Patent Pending



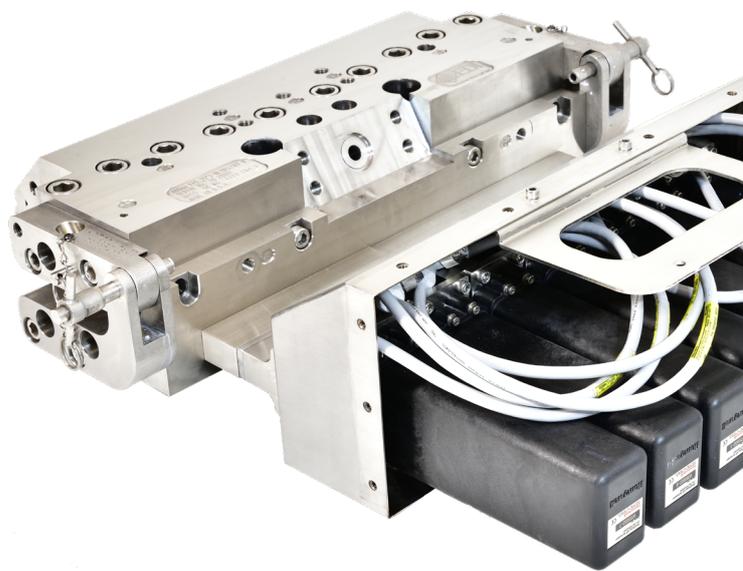
Prodigi™ Motorized Lip Actuator System

Game-Changing Technology Available for Extrusion & Fluid Coating Die Systems

For years, automated lip adjustment has been achieved using thermally actuated bolts. Thermal bolts are highly influenced by external factors, so achieving uniform thickness and consistency can be challenging. Thermal bolts typically require manual pre-tuning, making the process non-fully automated, and consistency can be difficult to achieve. While conventional systems are generally effective and proven, it is clear that the industry is ready for a next-level solution to meet production needs.

But what does a next-level solution truly mean? Feedback from global processors suggests it's more than achieving product uniformity. To truly offer game-changing performance, the technology must also offer increased automation. With skilled workers in short supply, straightforward process control and reduced operator intervention are key to increasing a production line's overall profitability.

At a time when the industry demands more efficiency from fewer resources, Nordson has developed a new automated lip adjustment system for its EDI® extrusion and fluid coating dies. The system, called Prodigi™, uses a series of Proflow actuators (manufactured by Honeywell Process Solutions) that are connected to the die's flexible lip. The actuators smoothly translate motor rotation into precise linear movement to locally open and close the lip. In addition, the accuracy and repeatability of the system enable operations to achieve saving tolerances four times faster than when conventional thermal bolt systems are used.



Increase Set-up Speed

Once your desired process parameters are established within the Prodigy™ system, the saved recipe may be simply relaunched for your next production cycle.

The integrated programming automatically adjusts your die lips from their neutral (or last) position to the correct gauge profile configuration for the production run. The entire process is approximately 80% faster, taking only a few seconds compared to several minutes with traditional lip adjustment systems.



Gain Additional Stroke

The Prodigy™ system features a series of motorized actuators that control the adjustment bolts. These actuators have an extremely wide range of stroke, meaning the system can traverse the entire useful flexible lip travel range without requiring any manual intervention.



Achieve Optimal Repeatability

While repeatability is possible with traditional die adjustment systems, it's difficult to achieve absolute consistency from one production run to the next. This is often due to a variety of factors that can influence how the thermal bolts react.

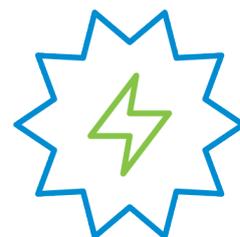
The Prodigy™ system operates with computer-based programming, designed to save the exact location of each bolt during a production run. By collecting and storing this data for future production runs, the exact bolt positions can be easily repeated.



Boost Your Energy Savings

The integrated Prodigy™ actuators operate at significantly lower temperatures than conventional, thermal expansion-based auto-bolt translator blocks.

While standard thermal bolt heaters typically average 50% power demand throughout the entire production run, the Prodigy system uses little to no power after achieving steady-state operation.



Improve Team Safety

The Prodigy™ system is designed to be fully operational from a remotely controlled panel. This removes the operator or technician from the hot zone near the die surfaces and melt stream components.

The Prodigy™ system is also safe for use in certain fluid coating applications where solvents are being applied. The integrated motorized actuators are safe for use near solvent fumes and do not pose a risk for ignition.





Research & Development

Bringing Product Innovation to Life

Nordson has been at the forefront of product innovation for the fluid coating and polymer processing industries, largely due to an investment in capital equipment and personnel dedicated to conducting research and development, testing, and trials.

Globally, Nordson operates several technology and testing centers, including one dedicated to the EDI® product line in Chippewa Falls, Wisconsin. Our technology center provides customers with an economical alternative to using their commercial-scale equipment for product and process testing, thereby reducing raw material costs and lost output due to machine downtime.

Our experienced team has successfully worked with extrusion customers to develop separator films for batteries, barrier sheet for thermoforming, puncture-resistant packaging films, barrier films for food packaging, decorative film and sheet products, layer-sequencing techniques for changing stripes, films for renewable energy/solar applications, window films, and optical-grade films.

Many slot die converters have also taken the opportunity to improve their existing slot die coating operations, try alternative slot die coating techniques, or investigate switching to an altogether different process, such as roll coating.

Our technology center also enables our own continued technological advancements, as it supports the creation, development, and refinement of new and existing extrusion and fluid coating die systems.

Whatever the extrusion or fluid coating application, we are ready to help customers optimize their process and increase their profitability.



Sheet Extrusion Pilot Line

Our pilot line can be configured for a variety of processing parameters, including mono-layer, coextruded, or multiplied sheet, ranging in thickness from 0.178mm (0.007") to 2.54mm (.100").

<i>EDI® Extrusion Technology</i>	<i>Lip Opening Range</i>	<i>Capabilities/Features</i>
812.8mm (32") Ultraflex™ H40 Die	0.762-1.778mm (.030-.070")	Exchangeable Multiflow™ Manifolds Prodigi™ Motorized Lip Actuator System
3 Layer Ultraflow™ V Feedblock	N/A	Layer Thickness Changes
3 Layer Ultraflow™ V-T Feedblock	N/A	Layer Thickness Changes Individual Skin Layer Profiling
Layer Multiplication Technology	N/A	Multiplication Capabilities up to 1,280 Layers

The pilot line is also equipped with an NDC gauge scanner from Nordson Measurement & Control Solutions, enabling closed-loop control for Prodigi™ system trials.

Cast Film & Sheet Laboratory Line

Our cast film and sheet lab line is also capable of producing small proof-of-concept samples of mono-layer, coextruded, or multiplied film or sheet, but is best suited for trial applications requiring a product thickness range of 0.127mm (0.005") to 0.381mm (0.015").

<i>EDI® Extrusion Technology</i>	<i>Lip Opening Range</i>	<i>Capabilities/Features</i>
203.2mm (8") Ultraflex™ H40 Die	0.0254-1.016mm (.001-.040")	
3 Layer Ultraflow™ I Feedblock	N/A	Highly Precise Layer Ratio Changes
5 Layer Ultraflow™ I Feedblock	N/A	Highly Precise Layer Ratio Changes
Layer Multiplication Technology	N/A	Multiplication Capabilities up to 1,280 Layers

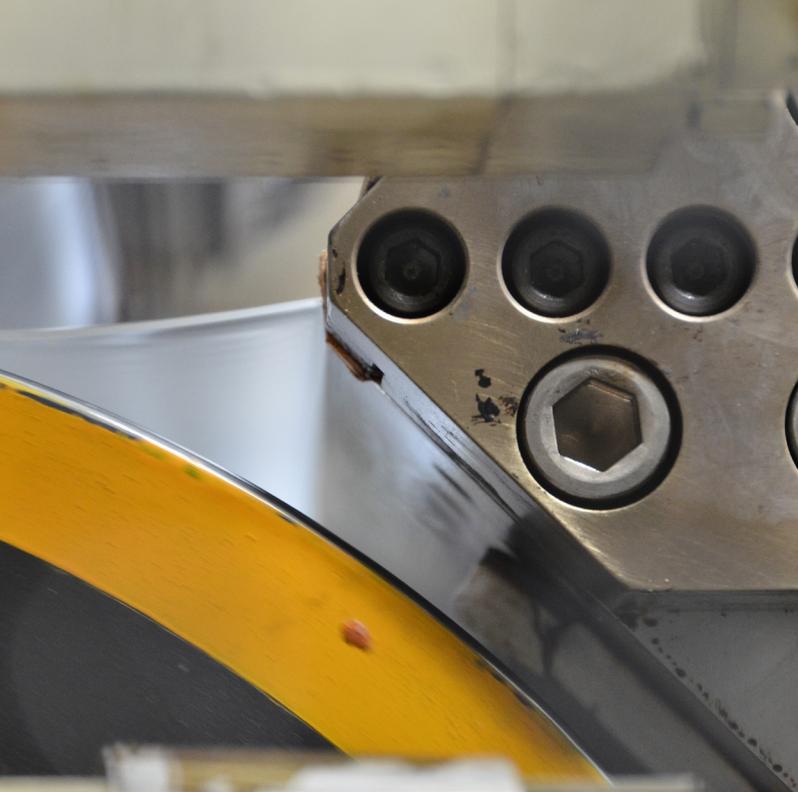
Fluid Coating Laboratory Line

At the laboratory in Chippewa Falls, customers can take advantage of a multitude of tooling options to establish their desired ambient temperature coating process or utilize the installed Nordson Adhesive Dispensing Systems VersaBlue® melter and lamination capabilities for trials with hot melt, water-based, and solvent-based adhesives.

<i>EDI® Slot Die System</i>	<i>Capabilities/Features</i>
354mm (14") Premier™ Single Layer Fixed Lip Die with Die Positioner	Suited for On-Roll Coating (with Vacuum) or Tension Web Coating
400mm (15.7") Ultracoat™ Single Layer Flexible Lip Die with Modular Coating Station	Suited for On-Roll Coating (with Vacuum), Tension Web Coating, or Hot Melt Coating Prodigi™ Motorized Lip Actuator System
533mm (21") Premier™ Dual Layer Fixed Lip Die with Die Positioner	Suited for On-Roll Coating (with Vacuum) or Tension Web Coating
550mm (21.6") Premier™ Single Layer Fixed Lip Die with Die Positioner	Suited for On-Roll Coating (with Vacuum) or Tension Web Coating

Nordson offers a selection of mobile fluid coating units that may be rented for production or trial use. Customers looking to refurbish their existing slot coating system may benefit from using a Premier or Ultracoat rental unit to avoid lost production time. Companies interested in updating their existing processes to include slot coating can test their capabilities in a controlled environment.





Remanufacturing

EDI® Aftermarket Services

Whether the goal is to reduce scrap material, increase line speeds, expand production capabilities, or minimize defects, remanufacturing your line's die system offers many benefits that ultimately help the bottom line.

Nordson's skilled Aftermarket team will work to bring your die back to like-new condition by analyzing your operation's needs, implementing the necessary updates, and delivering a die that is up to the challenge of meeting your goals.

Remanufacturing Service Offering

- Inspections
- Basic Cleanings (Split and Clean)
- Full Refurbishments
- Modifications
- Retrofits

By sending your die system to Nordson, you can expect:

- A high quality flow surface finish, which reduces mechanical transfer of defects, improves slip release, and lessens the potential for polymer degradation
- Restored die body seals, which protect the integrity and alignment of the flow channel and deter leakage along the backline of the manifold
- Restored flow channel and flatness of final land, which brings the die back to original dimensions and output capacity

Field Service

EDI® Aftermarket Services

Ensure unsurpassed product quality and performance by partnering with our team of knowledgeable, field-trained experts to optimize your extrusion die system.

Field Service Offering

- Installation and Start-up Support for New or Stored Equipment
- On-Site Maintenance and Repair
- Online or On-site Classroom Training
- Rapid Response Service with 24/7 Phone Support and Emergency Site Visits

How can your operation benefit from EDI® Field Service?

- Increase extruder uptime by ensuring operators and maintenance technicians are trained on the proper ways to handle and maintain equipment critical to your extrusion process
- Minimize scrap and lost production time by establishing a preventive maintenance schedule with the support of experienced die system technicians
- Reach a broader audience with a variety of training types, including classroom-style, online, and hands-on opportunities



Engineered Parts

EDI® Aftermarket Services

Die and feedblock systems have many parts that help define the width and thickness of the extruded material or coating, including:

- Adapters
- Autoflex™ Assemblies and Power Leads
- Body Shims
- Deckle Parts and Systems
- End Plates
- Feedblock Inserts and Spools
- Removable Lips
- Restrictor Bars
- Transition Plates
- Trunnions
- Ultracoat™ Inserts

These custom-engineered components are designed to fit each specific die or feedblock model and can be assembled onto a unit currently installed in the field for production.

Spare Parts

EDI® Aftermarket Services

Not having the correct parts when a line is shut down, preventing goods from being produced, is the stuff of an operations manager's most frustrating nightmare. By ensuring that your organization has the proper materials and tooling for a die shutdown, downtime can be significantly reduced.

Nordson has a large inventory of spare parts and cleaning supplies, including:

- Manual and Automatic Adjustment Bolts, Inserts, Nuts, and Screws
- Die Bolts and Washers
- Cartridge Heaters and Plugs
- Gaskets and Seals
- Die Soap and Other Cleaning Supplies

Our dedicated spare parts team will review your specific die's parts list in order to provide the most accurate and dependable parts to keep shutdowns as brief as possible.



Interested in learning more? Scan our QR code with your mobile phone to request more information.

A Global Mission

At our core, we aim to transform the polymer processing sector with our inventive and top-performing offerings, which cater to the ever-changing demands of our customers worldwide.

Our unwavering dedication lies in delivering exceptional quality, unmatched customer service, and state-of-the-art technology that propels our industry partners towards success.

Through our ongoing pursuit of research and development, we strive to push the boundaries of what is possible, empowering our clients to achieve new levels of effectiveness, productivity, and environmental sustainability.

Our ultimate goal is to become the top choice for polymer processing systems globally, setting the bar for excellence and instigating positive transformation in the markets we operate in.

EDI® Extrusion & Fluid Coating Die Systems

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