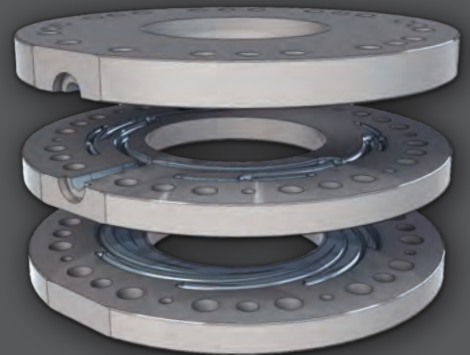
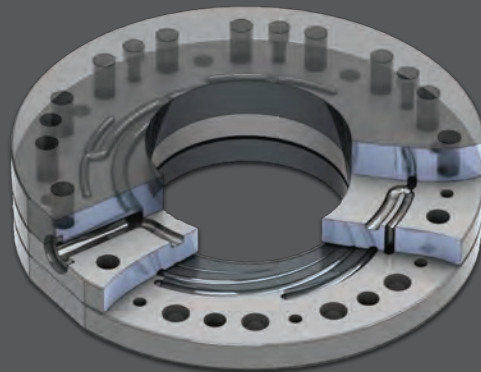
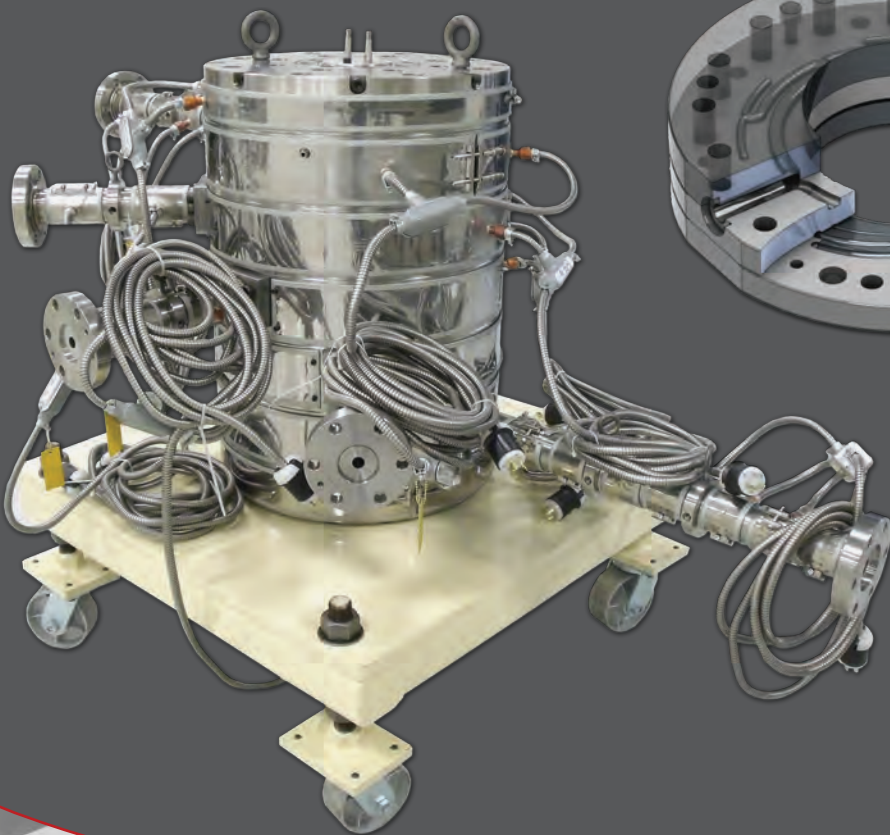
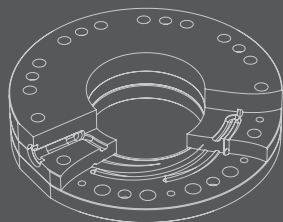


PREMIER DIES CORPORATION

Opti-Plate™ Blown Film Die

**Optimize your blown film production to support
your existing and new customer demands.**

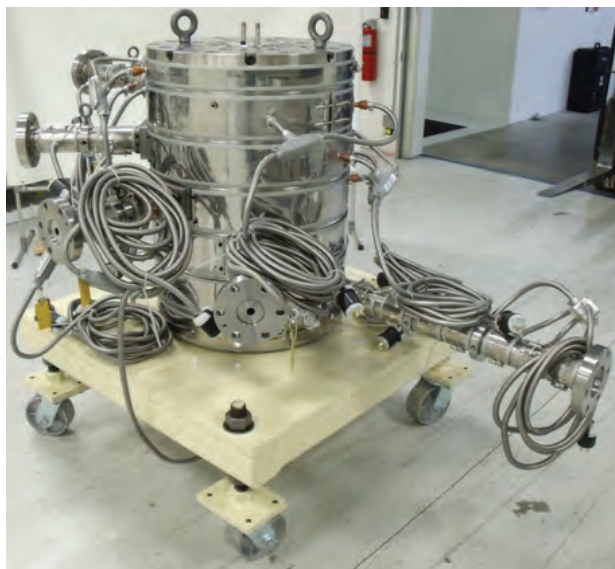




PREMIER DIES CORPORATION

Upgrade and Maximize Blown Film Production by Adding or Retrofitting an Opti-Plate™ Die

Through employing manufacturing techniques commonly used in the production of high precision flat dies, Premier Dies has developed the Opti-Plate™ Die, a new annular die for the blown film industry.



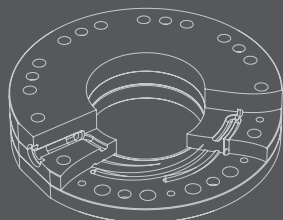
Limitations of Nested Spiral Mandrel Technology

Most current blown film designs are composed of a series of machined rings typically referred to as nested mandrels. While this style can be utilized to produce multi-layer barrier style films and other films, the technology has significant limitations:

Temperature inconsistencies: Reliance on heat conduction between mandrel layers can cause temperature inconsistencies and result in poor polymer flow performance.

Long residence time: As layers increase, the diameter of the mandrel die increases resulting in longer radial distances. Longer distances equal longer residence time which leads to a higher risk of degradation.

High gauge variation: Clearance is built into the design of the mandrel die to enable parts to slip over one another and be able to come apart. That clearance results in greater gauge variation.



PREMIER DIES CORPORATION

Premier Dies' Optimized Solution for Blown Film Dies

Through our extensive plastics extrusion experience, Premier Dies has successfully designed a pioneering pancake-style die called the Opti-Plate™.

The Opti-Plate™ improves the performance and efficiency without the need for a completely new blown film line.

The Opti-Plate™ die easily retrofits on most blown film lines and has the ability to:

- include an IBC system
- include a rotating upper lip for gauge randomization
- add more layers when needed



The Opti-Plate™ Die offers a significant payback to the end user in terms of:

4-5% thickness variation without added gauge control

Increased production rates through:

- faster and more efficient material transition
- faster purge times
- easy and quick assembly and disassembly

Reduction of leakage and maintenance issues because of:

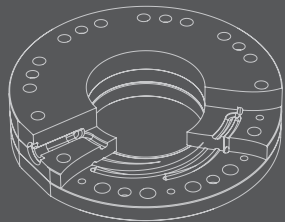
- no port holes, slip-fit components, or seals

Faster heating capabilities and improved temperature control through:

- a central pin incorporating internal heaters

Ability to process materials with very different thermal properties together for a longer period of time through:

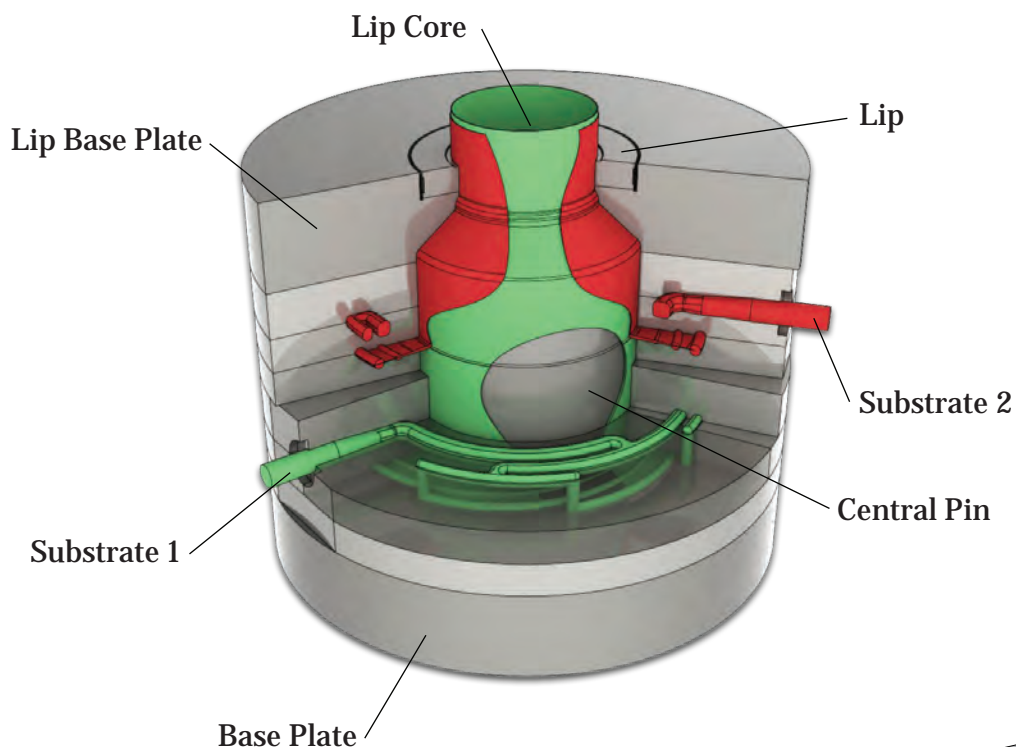
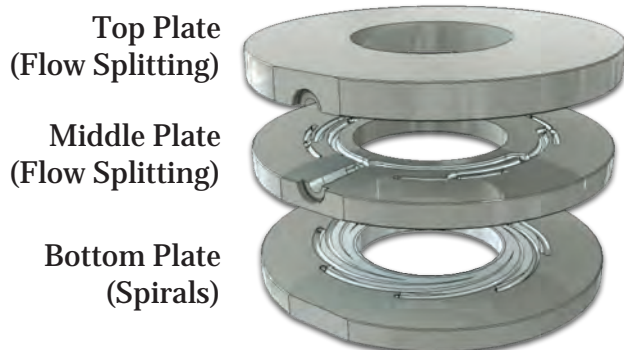
- isolating the temperature of different layers

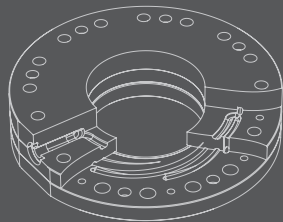


PREMIER DIES CORPORATION

The Opti-Plate's Die Flow Design

The Opti-Plate™ die is designed to achieve optimal flow distribution and thermal uniformity. The Opti-Plate™ incorporates a set of three round plates. Each plate in the three-plate layer configuration is precisely aligned with the plate below using special tapered expanding pins. This pin design results in uniform gaps to minimize flow variations as well as repeatable precise alignment of all parts.





The Opti-Plate's Flow Design (cont.)

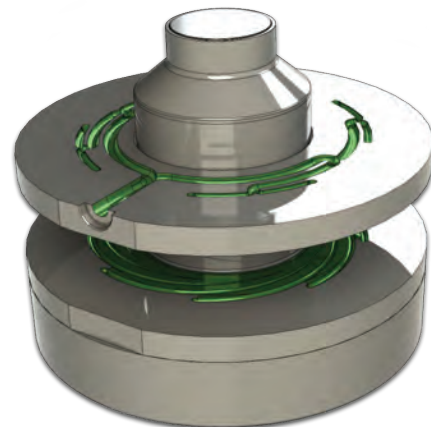
Contact our team to discuss your needs and requirements and learn how Premier Dies can help you achieve superior products, cut down on defects and realize true material and production cost savings.

Steve Jonjak
President
sjonjak@premierdies.com

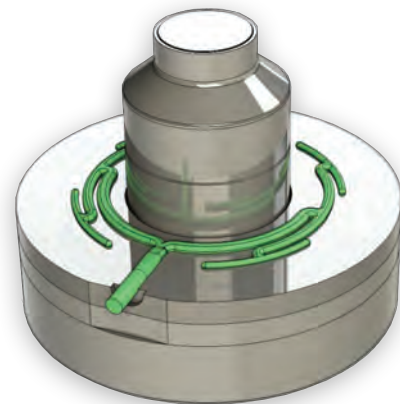
Scott Niedfeldt
Sales Coordinator
Scott.Niedfeldt@premierdies.com

2700 Olson Drive
Chippewa Falls, WI 54729
715-723-0513
www.premierdies.com

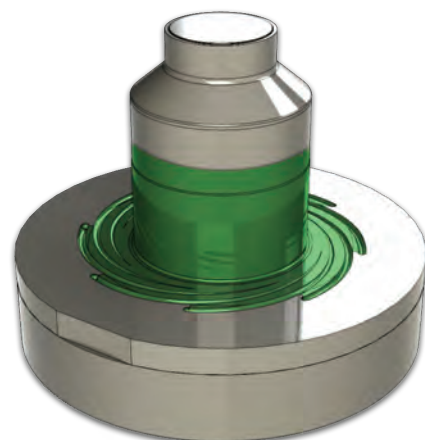
Polymer is distributed around the flow splitting channels located between the top and middle plate. Traditional designs, like the spiral mandrel, place these channels around the outer circumference of the die and direct the feed inward toward the center of the die. The Opti-Plate™ flow channel design results in almost a 20% reduction in the length of each channel. The 20% reduction reduces polymer residence, changeover and purge times.



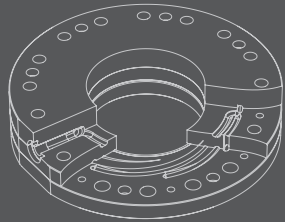
The flow splitting channels direct the polymer from the die entry location to each spiral. The flow splitting is performed in such a manner that the length of the channel is the exact same for each individual spiral. The die uses round cross-section flow splitting passages up to the spiral distribution zone to prevent dead zones and hang-up locations.



The spiral distribution zone, located between the second and third plates, is incorporated to provide better mixing, thermal uniformity and polymer distribution. The polymer flows across the spiral distribution zone toward the central pin. When the polymer reaches the central pin it turns 90 degrees upward to the next layer or die lip. The central pin has internal heaters to aid in start-up and maintain process control.



PREMIER DIES CORPORATION



Opti-Plate™ Success Story

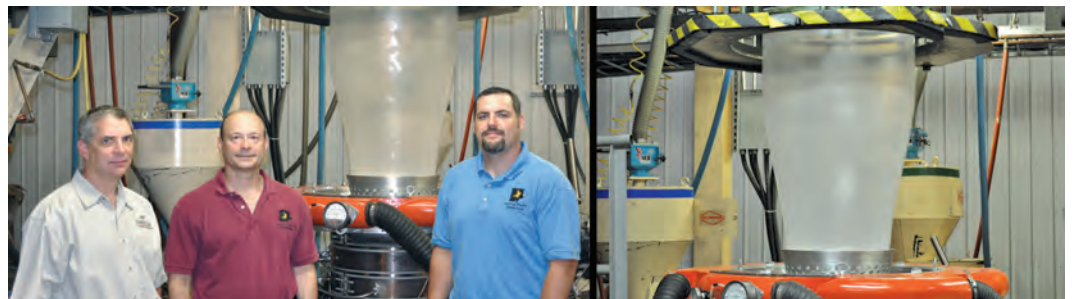
Based in Prescott, Wisconsin, General Plastic makes a variety of packaging film and bags. In General Plastic's business, quality and the ability to change products quickly is crucial. General Plastic made the decision to expand into five-layer films for packaging food products. The used blown film line they purchased was in good condition but the die did not meet their needs. According to Grant Durhman, President of General Plastic, the "quality we needed was not there. And the difference between what we produced and what others in the five-layer business had out there was visible."

General Plastic turned to Premier Dies for an upgrade. General Plastic needed a new die that would achieve the following:

- Produce highly accurate barrier film in thickness of 0.01 mm to 0.12 mm
- Five layers with thermal isolation between layers
- Two sizes of exit lips, 6" and 10" [152 mm and 254 mm]
- Virtually any polymer in any layer
- Changeover from one polymer to another in any layer in under 2 hours (previous average was approximately 4 hours)
- Total thickness variation around the circumference to be less than $\pm 5\%$ without feedback control of die or air
- Achieve uniform distribution with minimum residence time

A five-layer Opti-Plate™ Co-Extrusion Die was successfully designed and manufactured by Premier Dies and retrofitted into General Plastic's blown film line.

With its original die, General Plastic was producing at an approximate rate of 150 lbs/hr. Durhman was hoping for rates of 350 lbs/hr on the new die, but that has actually been exceeded for some products. Durham explains: "We're getting about 16 lbs/in of die circumference, generally speaking, which is good output for what we do...The die also transitions into and out of nylon structures much faster than the previous version. And the quality of the film we are making now is measurably better."



Contact our team to discuss your needs and requirements and learn how Premier Dies can help you achieve superior products, cut down on defects and realize true material and production cost savings.

Steve Jonjak
President
sjonjak@premierdies.com

Scott Niedfeldt
Sales Coordinator
Scott.Niedfeldt@premierdies.com

Premier Dies Corporation
2700 Olson Drive
Chippewa Falls, WI 54729
715-723-0513
www.PremierDies.com