

# MARSHALL AND WILLIAMS PLASTICS

## Biaxial Orientation Systems

Marshall and Williams Plastics is a recognized global leader and innovator in stretching lines for biaxially oriented and other plastics production lines. Films include BOPS, BOPP, BOPET, BOPLA, BOPTFE, PETG and many other special films that require or are enhanced by the biax process. Founded in 1920, Marshall and Williams has been offering customers a single source supply by providing complete biaxial orientation system integration.



Biaxial Orientation System

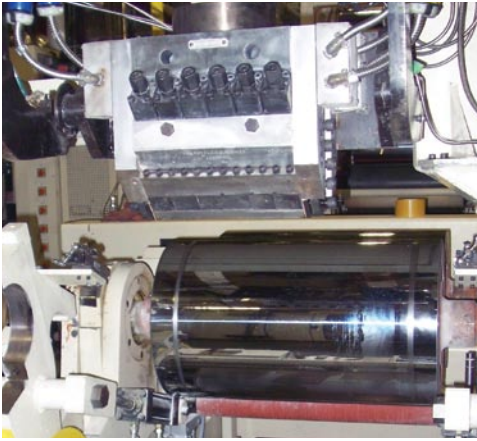
### System Offerings

- Turnkey solutions from resin feeding and extrusion to winding and slitting
- Sequential biaxial orientation lines
- Flexible designs
- Broad range of widths and outputs
- Project engineering/ Project management
- Installation and startup assistance
- Training
- Integrated system controls



**PARKINSON TECHNOLOGIES INC**

DUSENBERY® CONVERTING SYSTEMS  
MARSHALL AND WILLIAMS PLASTICS  
PARKINSON WINDERS  
KEY FILTERS



Extruder with Flat Sheet Die and Polish Rolls

## Marshall and Williams Plastics Advantages

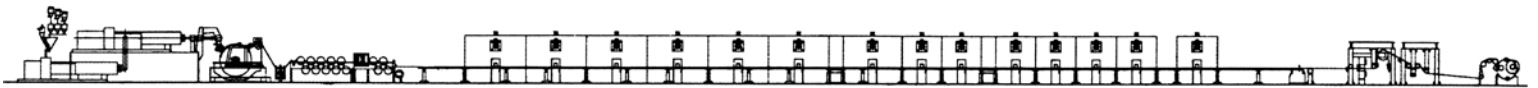
- Systems are designed, built, assembled and tested in Parkinson Technologies' state of the art facility
- World class Pilot Lab provides an opportunity for customers to develop products, optimize processes and generate samples
- Flexibility to meet customer specific requirements
- Engineered solutions based on proven performance
- Innovative designs for technology advancement
- Large market share in BOPS and other specialty film applications
- Superflex® rail hinge system

## Available Options

- Single or multi stage draw sections
- Compression roll drawing
- Simultaneous biax solutions
- Co-extrusion and multi-layer capabilities
- Web monitoring inspection and surface treatments
- Inline and offline slitting solutions



Superflex® Rail Hinge System



## Biaxial Orientation Systems at a glance

Features	Benefits	
Custom engineered solutions	Solves your unique production requirements	• <b>Stretch Ratios</b> Up to 20:1 MDO Up to 30:1 TDO
MDO : Innovative casting and MDO solutions	<ul style="list-style-type: none"> <li>• Matched to material and/or process requirements</li> <li>• More economical solutions for less demanding applications</li> <li>• Most precise process control and the highest quality films</li> </ul>	• <b>Line Speeds</b> Up to 1500 fpm (450 mpm)
TDO: Robust TDO designs with 475DJ tenter clips and Superflex® joints	<ul style="list-style-type: none"> <li>• Low maintenance; Increased productivity</li> <li>• Exceptional process flexibility</li> <li>• Can process a wide variety of materials and thicknesses</li> </ul>	• <b>Production Rates</b> Up to 5 tons/hr.
Integrated controls	State-of-the-art controls for advanced process control and monitoring of the line	• <b>Finished Widths</b> Up to 10 meters
		• <b>Finished Thickness</b> 3 - 1000 microns