

Compact Machine Direction Orientation (MDO) – Design for Inline Cast & Blown Film

The **Machine Direction Orientation (MDO) Type LMDO-200** is designed to stretch films/sheets in the machine direction, reducing their thickness by up to 10 times while simultaneously enhancing their strength and barrier properties. Films stretched by MDO technology can be used either as high-performance packaging materials or as base films for lamination.

At Labtech, our existing LMDO machines have been full-sized units intended for lab-scale extrusion and beyond. To better support users working with Mini or Benchtop Blown Film and Cast Film lines, we have developed the **LMDO-200**; a compact model that is practical, efficient, and ideally suited for small-scale research.

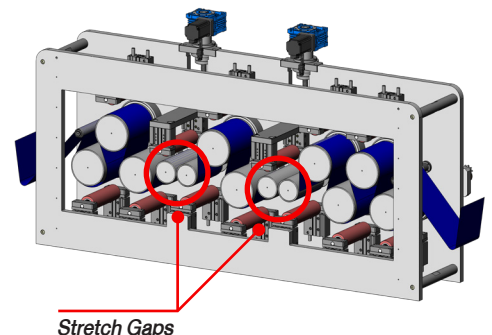
This compact version is capable of both inline and offline operation, with an initial film take-off width of up to 175 mm. The film path is positioned at approximately eye level, allowing operators to easily access and thread the film during setup or adjustment. The **LMDO-200** retains the processing flexibility of our larger models and is compatible with polymers such as **PP, PE, and PLA**. It is an ideal tool for laboratories and R&D centers that work with small film samples but require the same level of quality and performance as full-sized lines.



Machine Features

MDO Roll Section

- Placed inside a protective cabinet.
- Includes preheating rolls, stretching rolls, annealing rolls, and cooling rolls.
- Can operate with one or two stretch gap, with a maximum stretching ratio of 10:1. Standard setup includes one stretch gap, with an optional two-gap configuration for greater orientation control.
- Roll width is 200 mm, suitable for a maximum film width of 175 mm.



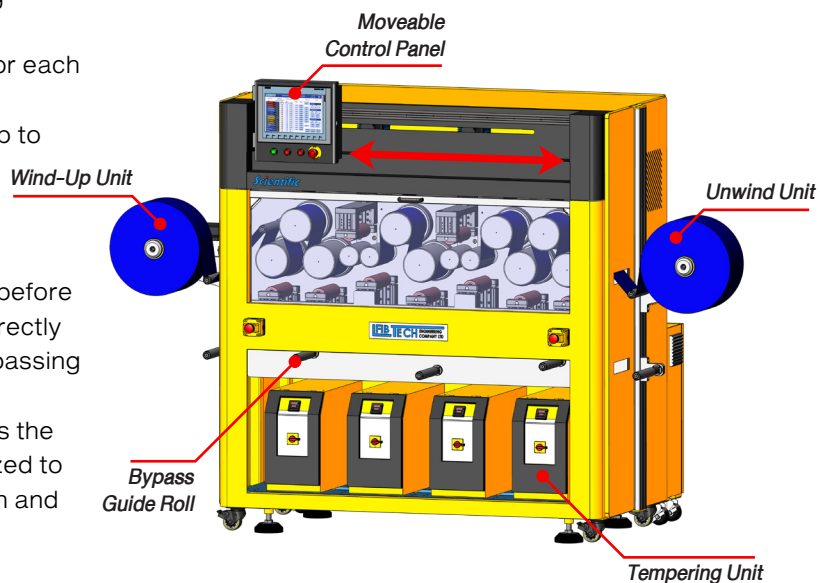
Tempering Units

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- The line can be equipped with up to six heating tempering units, depending on whether one or two stretching points are used.
- These units provide precise temperature control for each roll.
- Water tempering up to 120 °C and oil tempering up to 180 °C are available.

Unwind and Wind-Up Units

- For offline operation, rolls of film can be unwound before stretching, while in inline setups the film passes directly from the extrusion line to the pre-heating rolls, bypassing the unwind unit.
- At the end of the process, the wind-up unit collects the stretched film, with the winding system synchronized to the final cooling roll speed to ensure stable tension and smooth film take-up.
- Maximum winding speed is up to **30 m/min**.



Control Panel

- Computerized system for setting of roll temperatures, stretching ratios, and line speeds.
- Recipes can be saved with secure access.
- Mounted on a horizontal sliding rail, the control monitor can be moved along the line and locked in place with a handle clamp at any position.
- The monitor can also tilt $\pm 30^\circ$ to provide the best viewing angle for the operator.
- Equipped with a **12-inch color touchscreen** for clear and responsive operation.

Counterweight Safety Door

The front safety door uses a counterweight system, allowing safe opening and closing during operation. Opening the door causes the rolls to stop instantly and retract from the press roll for operator safety.

Mono-axial Film Stretching Unit Type LMDO-200 Technical Data

LMDO	
Stretch Gap	1 or 2
Maximum Stretch Ratio	10:1
Maximum Film Inlet Width	175 mm
Maximum Linear Outlet Speed of Film	30 m/min
Roll Widths	200 mm
Maximum Processing Temperature	120 °C (Water Tempering Unit) 180 °C (Oil Tempering Unit)
Dimensions (L x W x H)	2509 x 1258 x 1930 mm