

# Scientific

**Co-Extrusion Film Blowing Lines with up to 11 layers**

**Available in many different sizes with lay flat widths from 200 to 950 mm  
and extruder sizes from 12.5 to 45 mm**



**Also available with in-line or off-line  
MDO film stretching attachment**



**Labtech Engineering**

**TECHLABSYSTEMS**

## Large variety of film tower versions



The film towers are made to suit the specific co-ex film blowing line in respect of die size, number of layers and extruders, as well as required output. The nip-roll width of the towers varies from 250 to 600 mm and all towers have motorized height adjustments. The maximum height is made in accordance to customer requirements, but as an example our largest 600 mm tower has a standard height range adjustable from 3.2 to 4.2 meters.

The towers are all equipped with adjustable A-frames which are equipped with almost friction-free carbon fiber rollers, including adjustable cross rollers inside the frame.



The film bubble is stabilized with a cage made with a multitude of Teflon rollers which are all simultaneously adjustable with one turning wheel. High power single-as well as multi- channel air rings are available for optimum cooling efficiency.



### Pancake Type Co-Ex Die Types

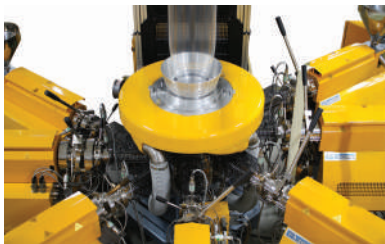
Available with up to 11 layers and in sizes from 20 to 120 mm die lip diameters. The dies are produced in-house and designed in consultation with a Canadian expert. Each die tier is custom made for a specific resin e.g. for PE, PP, EVA, EVOH, PA, and adhesive layer. The die is also made to handle the optimum melt flow from each specific extruder and each is also custom made for each customer. The die layers have dual channel designs and are individually heated. Each longer is partially filled with insulation in between, which allows for different temperatures for optimum flow properties.

## A complete range of extruders to feed all die layers



The co-ex film blowing attachment can be connected to a large range of our single screw extruders, ranging from our smallest 12.5 mm size to the largest 45 mm version. All of our extruders are 30 L/D long types and come with a large variety of screw designs to handle the complete range of co-extrusion film blowing polymers. The extruders are available with a variety of motor drives where the most suitable versions are the Vector Servo drives with high torque at low RPM. The screws and barrels are available with normal nitriding, as well as bimetallic and other corrosion resistant steels. The smaller extruders are also available with convenient large range height adjustments so that they can be easily moved from one layer to another. All extruders are equipped with high capacity barrel heating and forced air cooling systems which allows for fast temperature regulation of each zone.

## Options for Co-Ex Film Blowing Lines



### High Power Duplex Air Ring

The optional Duplex air ring is designed for optimum cooling efficiency. It is equipped with a large, variable speed blower (up to 3 HP) that will ensure highly efficient cooling of the air bubble for multilayer film applications. The air ring is supplied with a large dial gauge showing the air pressure and a second dial gauge showing the air temperature. The air ring will be made to fit the requested die diameter.

### Automatic Web Guide System

The optional automatic web guide system will guide the film over the center of the guide rolls and ensure that the film is centered on the roll at all times. With this system, the film will not move from one side of the roll to the other. The unit is equipped with an ultrasonic, high precision, position sensor which, if the film tends to want to move sideways, will send a signal to the control panel and the oscillating platform (shown here) will immediately turn in the opposite direction to the sideways moving of the film, so the film remains in its center position at all times. This system ensures very consistent positioning of the film edges, and is an important feature when using edge trimmers-to enable minimum width of the edges being cut away. *See next item for details of the edge trimmer unit.*

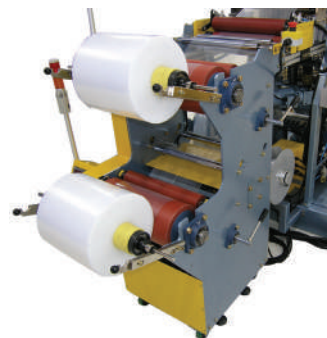


### Edge Trimmer, Pull Rolls and End Trim Cassettes

The optional edge trimmer unit consists of an edge trimmer and a set of rubber nip-rolls (pull rolls) with adjustable speed drive to provide good film tension as the film is being cut. The cutting blades are adjustable sideways and the entire assembly is covered with a Plexiglas hood for operation safety. The edge trimmings are collected in two separate rotating windup units. The sides of the windup cassettes are fitted with quick operating handles for fast and easy removal of the edge trim rolls. Each cassette is fitted with a friction clutch device to provide good tension to the film strips. The edge trimming system is used for splitting the edges of the film and is usually supplied together with the optional two station windup systems, described below

### Two-Station Surface Wind-Up Unit

The two-station surface windup unit is practical and very easy to use. Each of the two film is wound up, separately, by surface friction from a large rubber support roll and the film is guided over a set of rubber following rolls which will ensure content tension and very even wind up. Changeover of the rolls is very fast and easy. It is done by simply removing the whole roll, together with the bobbin and gear shaft, and then inserting a new empty bobbin mounted on the additional spare bobbin holder and gear shaft. The windup station is available with 400 and 600 mm roll widths and can be used with a large variety of bobbin diameters in accordance to customer requests



### Two-Station Constant Film Tension Windup System

The film tower can be optionally equipped with a two-station constant tension windup system where the film windup is driven by a designated torque motor for adjustable film tension. Load cells detect the tension of the film and will adjust the torque drive so that the set tension remains the same at all times, regardless of the diameter of the film roll. The two-station windup system can be used for easy and uninterrupted changeover from one roll to another, or for individually winding up each part of a split film. Film can be wound up to 600 mm in diameter.

The tension is regulated by means of a torque motor drive, one for each station, which in turn is connected to a central drive unit. The windup speeds are typically controlled from the central control panel

The windup unit can also be supplied with expansion shafts (shown in this picture) to be used with bobbins of any diameter from 3 inches upwards. The system has a very user-friendly control panel where you can digitally set the tension individually for each windup station. The film tension can also be set while the line is running.

The same system can also be supplied with only one windup station, if requested.



## Oscillating Nip-Roll Haul-Off with 360° Rotation

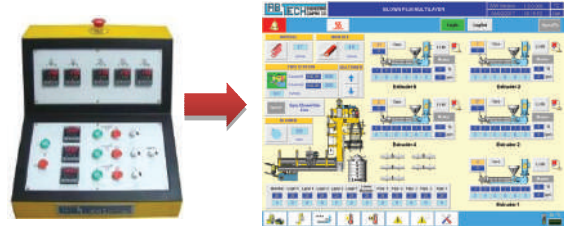
The film tower can also be optionally equipped with an oscillating nip roll haul-off system mounted on top of the tower. Here the nip rolls and film-collapsing frame slowly rotate 360° in each direction during film production. The collapsing frame uses low-friction carbon fiber rollers to ensure that they do not impair the quality of the film surface. The film passes through the nip-rolls and is guided around a series of vertical rollers positioned in a cage on an oscillating platform, which is driven by a gear motor. This system will slowly turn the film melt coming out of the die, and thereby distribute any gauge variation uniformly across the width of the roll of film, thus ensuring a perfectly flat roll of film, free of any gauge bands

## Controls and Options

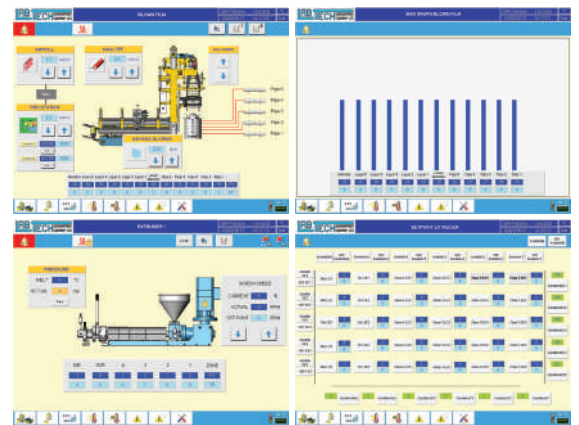
The co-ex lines can be equipped with three types of control systems which are all independent from the computerized weighing hopper system, as follows:

- As standard, the lines are equipped with manual controls with digital instruments for setting and displaying all parameters of the line.
- Optionally, all machines in the line are equipped with digital instruments. All of the machines have data ports and are linked to a central system where all data can be downloaded to an external PC. Graphic illustrations display all of the machines in the line with their current data such as temperatures, pressures, screw RPM, etc., and these data can be saved and recorded on the external PC.
- A fully computerized system with large touch screen and high capacity PLC. Here all machine controls are embedded in the PLC and are entered with a keyboard on the large touch screen. All data from the line can be downloaded or uploaded using Scada software to and from a PC. The touch screen has a multitude of graphic screens where all machine parameters can be set and displayed in real time. There are also many functions that display the current status of all machines as well as giving alarms. This fully-computerized system replaces the conventional digital controls on all machines.

## Data acquisition system



**Fully computerized with large touch screen controls and setting of all data**



## Brief Technical Data

Film Blowing Tower and Dies		LF-250 CO-EX	LF-400 CO-EX	LF-600 CO-EX
Total height of film tower ( motorized adjustment )	mm	( 2,050-3,050 )	( 2,500-3,500 )	( 3,200-4,200 )
Nip-Roll width	mm	250	400	600
Max. film lay flat width	mm	200	350	550
Film Speed ( Windup speed ) Other on request	m/min	0-15 (0-15)	0-35 (0-40)	0-35 (0-40)
Pancake film die lip diameter range	mm	20-40	40-75	80-120
Die lip opening ( Other on request )	mm	1.5	1.5	1.5
Height from die to nip-roll for 3 layer die	mm	820-1,820	1,450-2,450	1,950-2,950
Blower power for standard air ring	kW	0.75	2.2	4.0
Blower power for Duplex air ring	kW	-	2.2	4.0
Total Electrical Power for tower (w/o die)	kW	0.18	0.18	0.37
Two-Station surface windup speed	m/min	-	0-40	0-40

**For extruder sizes and data please see our separate extruder catalogue**