

NEW LABORATORY SCIENTIFIC SINGLE-LAYER CAST FILM EXTRUSION LINE MARK II



A. CHILL ROLL ATTACHMENT MARK II

- Suitable for producing films in many different resin types such as PE, PP, PS, ABS, PVC, PET, PC, etc.
- As standard, the roll stack is supplied in a fixed factory-set vertical (upright) roll stack and a horizontal extruder die connection.
- Film chill roll attachment can also be factory-set in fixed horizontal stack position. With this configuration, the die will be equipped with an angled extruder adaptor so that the die will point down against the chill roll. This position is most suitable for the production of thin films made from low viscosity resins.
- Roll stack with 2 large chill rollers having a 145 mm diameter and roll widths of 350. Both rolls are equipped with internal cores for efficient water-cooling and heating, allowing precise temperature control of the roll surface.
- Polishing roll (top roll) with pneumatic lay-on nip opening and closing, as well as a micrometric fine adjustment of the nip-gap with dial gauges for distance readout.
- The chill roll attachment is fitted with lockable casters and levelling feet to easily roll the attachment away from the die and the extruder for access to the die opening.
- User-friendly computerized interface control panel mounted on the control cabinet and swingable for user ease and comfort.
- Contains all essential controls, including temperature zones for the flat die to regulate individually the left, center, and right side of the die and obtain a very precise and even film thickness over the entire film width. Also includes speed controls for chill rolls, nip-rolls film pulling and wind-up
- Film is wound onto a PVC bobbin secured on a center wider with a 3" air expansion shaft for quick and easy removal



NOTE: For 200 and 220V electrical systems, additional charges apply. The electrical service/voltage form will be sent to you upon order for completion.

B. LABORATORY SCIENTIFIC 25 MM SINGLE-SCREW EXTRUDER MARK II

TYPE LEX25-30/MARKII

GENERAL DESIGN

- Compact unit in modern design with full steel cover over the extruder barrel with air venting grid for safety and ventilation.
- C-Clamp type flange on the extruder head for easy connection allowing quick and secure connection of the die.

BARREL AND SCREW

- Screw diameter of 20 mm and 25 mm with an L/D ratio of 30.
- Screw and barrel made of high-grade nitride-hardened steel.
- 30 L/D screw equipped with Maddock mixing at 21D and pineapple mixing at the screw tip for efficient mixing and homogenization of resins and additives.

HOPPER

- Large rectangular in-feed opening in the barrel for efficient feeding of both pellets and powders.
- Polished stainless-steel hopper with the lid mounted on a slide gate assembly that directly closes the in-feed port or opens it to release the resin from the hopper into the screw feed section. It also has a drain slide gate to discharge the resin from the hopper.

BARREL HEATING AND COOLING SYSTEM

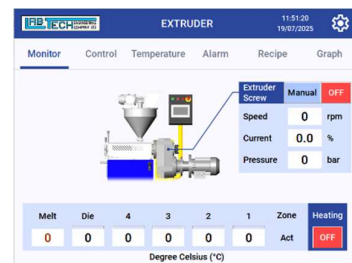
- Water cooling of the feed section and lower part of the hopper funnel for temperature control.
- Each barrel zone features multiple rows of copper fins for high cooling efficiency, coupled with efficient forced-air cooling fans mounted at the rear of the extruder barrel assembly.
- The barrel also includes four high-wattage heating zones to enable fast heating to process temperatures.

DRIVE AND SPEED CONTROL

- Screw speed infinite variable from 0 to 300 RPM
- Equipped with 4.0 kW AC servo motor drive coupled directly to a worm gearbox.
- The gearbox is flange-mounted directly to a thrust bearing housing containing the screw-connecting shaft, which is resting in a heavy-duty thrust bearing arrangement.
- Programmable frequency inverter for infinite-variable precise screw speed control and high torque even at low screw speeds.

CONTROL SYSTEM

- Convenient control panel mounted into the extruder body, providing easy access and visibility from the operator's position.
- User-friendly computerized interface containing temperature control for three-barrel zones and screw speed control, and motor power monitoring.
- The controllers are coupled with solid-state relays for accurate heat control, equipped with auto-tuning and linear compensation for very precise temperature regulation over the entire working range.



C. FLAT COAT HANGER TYPE DIE



The flat die is equipped with adjustable lips from 0.3 to 2.0 mm and is suitable for thin films as well as thin sheets with a thickness up to around 1.5 mm. The die will be designed specifically for your resins. It is made with mirror polished hard chrome internal surface, but it can also be supplied with high polished nickel plating and other surface treatment.

The die lips are adjustable with a multitude of push-pull adjustment bolts. It is equipped with cartridge heaters that divide the die into three heating areas, left, center and right zones which are individually regulated with designated temperature controllers. The die as standard is made for a max temperature of 300 degrees C but can also be supplied in a high heat version for up to 450 degrees C.

Optionally, interchangeable lip inserts can be supplied for other die lip openings to accommodate thick films running over our standard thickness. These inserts are available in two versions: Standard (300°C) and High-Heat (450°C). If this is required, please let us know the necessary die lip opening range.

D. ROLL TEMPERING UNITS

The rolls are equipped with internal spiral channels for heating and cooling media that are close to the roll surface. This gives a very even temperature across the entire width of the roll. The rolls can be tempered with either water or oil, both for heating and cooling.

NOTE: At least one unit is needed to regulate the temperature of the center roll alone or the center and top polishing roll together.

WATER TEMPERING UNITS

The water tempering units can reach a maximum temperature of 140°C giving a roll temperature of around 120°C. Each of the three rolls can be tempered individually or in pairs. If two rolls are tempered with the same water tempering unit, the maximum temperature is somewhat lower, around 100°C.

We recommend a minimum amount of one roll tempering unit, which can then regulate the middle roll alone or the top and middle rolls together. However, depending on the positioning of the rolling stack and the application, two units can be used to control the upper and middle rolls, while the lower roll can be connected to water cooling. Alternatively, one of the two units can be used to control the two upper rolls and the second unit can be used to control the lower roll. However, the most ideal configuration which gives optimum flexibility, is to use three units, where each unit is designated for one roll.



E. EDGE-CUTTER OPTIONS

EDGE-CUTTER WITH WIND-UP CASSETTES FOR THE EDGE TRIMS



When a cast film or sheet is produced on a chill roll line, the molten resin is drawn out from the flat die onto the large chill roll. During this draw out process, the molten plastic from the die will draw in towards its center, and you will get a "Neck-In"

effect, which will result in thicker edges. The Neck-In effect depends on how much you draw out the film or sheet before it is cooled down on the chill roll. Since the outer edges are thicker than the remaining parts, you cannot achieve a nice and even wind-up on the bobbin. The substrate will wrinkle and sag in the center the more film or sheet is being wound up. Thus, if you need a nice and even substrate, we recommend equipping the chill roll line with the optional edge cutter which comes with a separate practical twin cassette wind-up unit for the trimmed edges. The edge cutter has two knives that can be adjusted to cut any size of edges along the entire width of the substrate.

