COLLIN

LAB & PILOT SOLUTIONS

TEACH·LINE

- Extruder
- Compounder
- Roll Mill
- Blown Film Line
- Blown Film Die
- Flat Film Line
- Stretching
- Pelletizer
- Water Bath
- Pipe Line

NGA

Collin Teach Line is a series of compact table-top machines for the processing of polymers especially for apprenticeship & training as well as research & development.

By means of these lines, it is possible to simulate different discontinuous and continuous processes of plastics processing or to test samples.

Your advantages at a glance

- Complete processing lines for the production of pellets, blown and flat film or sheets, hoses or tubes, profiles and strands can be installed.
- Regarding design, performance and installation height, all machines are adapted to each other, therefore, retrofitting or extension can be realized in no time.
- The electric drive technology and the control are in the machine sub-frame.
- Robust, flawless test samples, also suitable for production use.
- High service life and production of perfect test samples.
- First screening of new materials requires less efforts and material consumption.
- Excellent training possibilities on table-top machines without long starting processes.
- Optimally suitable for quality control.

Extruder

Variable plastification of polymers

E 12, E 16, E 20, E 20 H

The table-top machines combine high procedural variability with exact control of all parameters. The single-screw extruder is the standard machine for continuous plastification of polymers.

Technical description

- **Drive.** The extruder is driven by a motor.
- **Cylinder.** High-quality nitrided steel, equipped with a hopper made of stainless steel. Feed zone cooled via an aluminium mould cooling jacket, zone tempering via heating bands and air cooling. Cylinder and heating bands are completely covered with stainless steel in order to guarantee safe operation.
- **Screw.** Extra on demand. Standard geometry 3-zone screw. Others on demand.
- **Measuring devices.** Melt temperature sensors and one melt pressure sensor at the end of the cylinder.
- **Clamping flange.** Because of the solid flange design, coupling the dies on the cylinder is safe and easy to realize. Sealing between adapter and cylinder flange via spacing ring or breaker plate.
- **Control.** 7” Touch Screen Control, function keys and a data wheel.
- **Electrical cabinet.** The extruder is mounted on an electrical cabinet, which contains the power electronics, connections and main switch, Type of Protection IP 44.
- **Safety.** The melt pressure is safely controlled with a pressure sensor (PLc). Temperature control of all extruder zones.

Technical data

Parameters / Extruder	E 12	E 16	E 20
Nominal diameter cylinder	12 mm	16 mm	20 mm
Cylinder length	33 x D	25 x D	25 x D
Drive capacity	0.64 kW	0.96 kW	1.96 kW
Speed	max. 200 rpm	max. 200 rpm	max. 200 rpm
Max. Torque	30 Nm	44 Nm	112 Nm
Max. throughput LDPE	1.1 kg/h (micro pellets)	2.5 kg/h	4 kg/h
Max. operating pressure	405 bar	405 bar	405 bar
Hopper volume	3.2 l	3.2 l	3.2 l
Max. temperature	300°C	300°C	300°C
Max. feed temperature	80°C	80°C	80°C
Necessary network	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz	3 x 400 V, 50/60 Hz

Parameters / Extruder	E 12	E 16	E 20
Cooling water inlet/outlet	hose nipple Ø 6 mm	hose nipple Ø 6 mm	hose nipple Ø 6 mm
Cooling water temperature	16 - 30°C	16 - 30°C	16 - 30°C
Extrusion height (without table)	355 mm	355 mm	355 mm
Dimensions (L x W x H)	approx. 780 x 710 x 720 mm	approx. 780 x 585 x 720 mm	approx. 850 x 611 x 720 mm
Weight (net)	approx. 60 kg	approx. 65 kg	approx. 70 kg
Table-top design	√	√	√

The extruder is complete and can be connected with connector cable 5-wire, 5 m long and CEE plug. Furthermore, the most important tools (wrench for clamping flange, control cabinet key, cleaning brush etc.) are included.

Compounder

Enormously flexible due to co-rotating or counter-rotating operation

ZK 12, ZK 16, ZK 25

The Collin compounders are suitable for continuous melting, mixing, homogenizing, alloying and discharging of plastic masses.

All Collin compounders are available for co-rotating or counter-rotating operation and can be retrofitted. The table-top compounder consists of a processing section with drive, mounted on the electric control cabinet.

Technical description

The compounder is driven by a servomotor with planetary gear, the distribution gear is directly attached. The separate gear unit allows easy maintenance and retrofitting from co-rotating to counter-rotating. The processing section with cylinder segments, hopper, water-cooled feed zone, heating/cooling zones as well as covering of the cylinder as protection against contact is flanged to it.

Control

Microprocessor control with HMI, function keys and a data wheel.

Control parameters

- Cylinder and downstream heatings
- Melt temperature and melt pressure indication
- Screw speed
- Speed and indication of motor current consumption

Distributor gear

This is flanged to the drive unit as separate unit. The design allows easy service as well as quick retrofitting of the machine from co-rotating to counter-rotating and vice versa.

Cylinder

On the bearing, exchangeable cylinder elements made of nitrided steel or made of special steel are flanged. Thus, the machine can be adapted to individual processes.

End flange

The end of the cylinder unites the melt to one outlet.

Screws

The screws are designed as modular plug-in screws i .e. individual elements with different screw pitches and length and in different designs are assembled (e. g. closely intermeshing, open lengthwise and crosswise, with mixing and shear elements). Standard material: nitrided steel

The compounder needs dosing devices, which are designed and offered according to customer`s specification.
The compounder is complete and can be connected with connector cable 5-wire, 5 m long and CEE plug.
Furthermore, the most important tools (wrench for clamping flange, key for control cabinet, cleaning brush etc.) are included.

Technical Data

Parameters / Compounder	ZK 12	ZK 16	ZK 25
Screw Ø	12 mm	16 mm	25 mm
Cylinder length	36 x D	36 x D	18 x D / 24 x D
Drive power	1.0 kW	1.9 kW	2.5 kW
Screw speed	5 - 200 rpm	5 - 500 rpm	5 - 200 rpm
Screw torque	2 x 6.5 Nm	2 x 15 Nm	2 x 44 Nm
Max. throughput (LDPE)	powder: 0.9 - 22.5 g/min micro pellets: 1.5 - 25 g/min	micro pellets or powder: 0.1 - 2.2 kg/h	pellets: 0.3 - 5.0 kg/h
Max. operating temperature	300°C	300°C	300°C
Max. operating pressure	100 bar	100 bar	100 bar
Cooling water temperature	16 - 30°C	16 - 30°C	16 - 30°C
Connected load only kneader	7 kW	7 kW	8.2 kW / 9.2 kW
Required network	3 x 400/230 V, 50/60 Hz	3 x 16 A	3 x 400/230 V, 50/60 Hz
Required electric network	L1; L2; L3; N; PE	L1; L2; L3; N; PE	L1; L2; L3; N; PE
Type of network	TN-S-net	TN-S-net	TN-S-net
Fuse protection	3 x 16 A	3 x 16 A	3 x 16 A
Cooling water inlet/outlet hose nipple	hose nipple Ø 6 mm	hose nipple Ø 6 mm	hose nipple Ø 6 mm
Water consumption	approx. 1,5 ltr/min	approx. 1,5 ltr/min	approx. 3 ltr/min
Center height screw	330 mm	330 mm	375 mm
Dimensions: L x W x H	1020 x 525 x 480 mm	1020 x 525 x 480 mm	1060 x 670 x 515 mm 1210 x 670 x 515 mm
Weight (net)	approx.100 kg	approx. 110 kg	approx. 110 kg

Roll Mill

Ideal for training and testing of small quantities. W 100

The roll mill is used for mixing, plasticizing, kneading and stretching of plastics and elastomers.

Technical data

- Roll diameter x roller width: 100 x 210 mm
- Working width: 150 mm
- Batch weight (LDPE): approx. 20 - 50 g
- Working temperature: max. 250°C
- Drive capacity: 1 x 1.1 kW
- Speed variable: 2 - 20 rpm
- Torque: 262 Nm
- Heating capacity: 2 x 1.35 kW
- Gap fine adjustment: 0.2 - 2 mm
- Electrical connection: 3 x 400 V/50 Hz, TN-S-net according to IEC 364-4-41/VDE 0100 (L1, L2, L3, PE, N loadable)
- Suitable for AC/DC sensitive FI ground fault circuit interrupters
- Dimensions (W x D x H): approx. 760 x 455 x 650 mm
- Net weight: approx. 150 kg
- Table-top version

Technical description

- **Rolls.** Made of hardened chrome steel, grounded and polished.
- **Gap adjustment.** The roll distance can manually be adjusted by mechanically adjustment of the front roll.
- **Sealing jaws.** For limiting the working width.
- **Drive.** The rear roll is driven by a gear motor via a multiple chain, the front roll via a pair of gears.
- **Roll heating.** Electric heating via one heating cartridge with reinforced edge zone heating.
- **Safety.** The roll gap is covered with a safety grid, emergency stop equipment.
- **Control.** This is positioned in the machine in a closed switch cabinet.

Blown Film Line

Extremely even blown film

BL 200

The new Blown Film BL 200 T is a compact and easy-to-handle unit for the production of blown films made of all standard polymers. Special characteristics are the height-adjustable take-off, a separately driven winder as well as a blower, which is integrated in the machine base. The control panel includes all electric and pneumatic control units and control elements. A blown film die (up to 30 mm Ø), which has been optimized regarding melt guidance with a gap-adjustable cooling ring guarantees extremely thin and uniform blown films.

Technical description

- **Blown film tower.** Centered on the sub-frame, on a central support, the take-off unit with lay-flat device for the film is mounted. The take-off rolls are pressed against each other pneumatically.
- **Blown film die.** Available as mono or multi-layer die.
- **Winder.** Motor-driven central winder with manual clamping device for fixing e.g. cardboard sleeves on the winding shaft.
- **Control.** Beveled control panel with function keys with touch screen and controls for optimal operation.
- **Electric cabinet.** Electrics, pneumatics and blowers for cooling the blown film are in the sub-frame of the machine.

Technical data

- Roller width: 200 mm
- max. lay-flat width: 170 mm
- max. Blown film diameter: 110 mm
- Tension: approx. 250 N
- Take-off speed: max. 13 m/min
- Total connected load: approx. 530 W
- Compressed air demand (support air): 3 - 5 bar
- Max. bobbin diameter: 300 mm
- Sleeve diameter for winder: 2“
- Traction winder: 95 N
- Dimensions (L x D x H): 715 x 480 x 1280 mm
- Weight: approx. 65 kg

Blown Film RW 25, AW Mono

The blown film die ensures extremely thin and even blown films.

Due to very short purging times, quick material changes are possible.

Technical description

Mandrel and female die are centered by screws.
The die is equipped with insulated heating band and bayonet connection for the thermal sensor.

The die will be delivered together with handle bars and centering holder for the Teach Line Blown Film Line BL 200.

The cooling ring has tangentially running air supply channels.
Air quantity and air die gap can be adjusted. The support air blower is integrated in the Blown Film Line BL 200.

Technical data

- Adapter for clamping flange of the Teach Line extruder in the die body
- Axial melt distributor, on demand also with radial spiral mandrel distributor
- Nominal diameter: 30 mm
- Nominal gap: 0.8 mm
- incl. mandrel and female part
- The areas having contact with the melt are chemically nickel-plated.
- 2 x thermal sensor (die and adapter)
- Max. operating temperature: 300°C
- incl. air cooling ring
- Suitable for standard polymers (e.g. LDPE, PP)

The Collin blown film die is available as 3-, 5- or 7-layer version with radial melt distributor.

Collin Bubble Control CBC

The Collin bubble control is a measuring and control unit, which determines the hose diameter on a blown film line in order to adjust the set value. Essentially, it consists of three ultrasonic sensors, which are radially arranged around the film hose. Each sensor measures the distance to the film hose. The control processes the measuring value and controls the hose diameter.

- Adjustment range, hose Ø: 40 - 110 mm;
- Control accuracy Ø: ± 3 mm; this value also depends on the material

Flat Film Line

Several functions combined in one line

CR 72/72/72-200

In compact assembly, this line combines the well-known functions of a cast film line with those of a small calender.

By the roll which is designed to be movable, different procedures are possible:

- Calendering of films
- Laminating of films
- Stretching of flat films with horizontal die assembly
- Casting of melts with low viscosity with vertical die

Via pneumatic cylinders, the upper of the 3 rolls is designed to be movable and allows to calender films. The gap width can precisely be adjusted. With the swiveled upper roll, the unit can be used for casting thin films. For exact temperature guiding, all three rolls are double-walled, the surface is hard-chrome plated and polished.

The 3 rolls of the chill roll are together driven by one motor. The winder is driven by another motor. A quick-release device facilitates the clamping of winding shafts.

Flat Film Take-Off

Application

The Flat Film Take-Off CR72/72/72-200 is the universal device for the production of flat sheets in research and development but also in production control.

The essential functions:

- Casting of films
- Smoothing of sheets
- Coating and laminating

Coextrusion

The compact design allows easy arrangement of a coextrusion line with 2 or 3 extruders for the production of AB, ABA or ABC composites.

Available tools:

- Manifold die
- Feedblock 3-layer
- Feedblock with sight glass

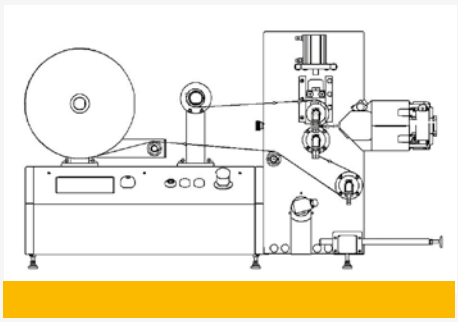
Advantages

The advantages of the Teach Line flat film line are:

- Compact design
- Ease of use
- Universal use for the production of flat sheets in mono and coextrusion

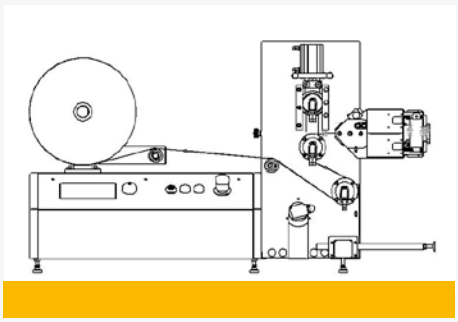
Possible applications

Smoothing/laminating



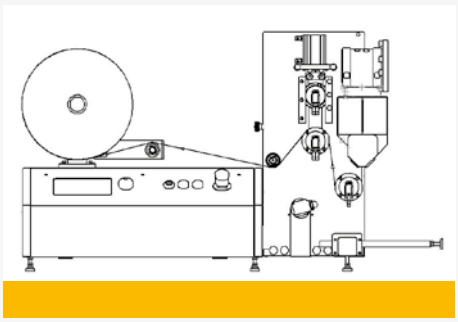
For smoothing, the upper roll is deepened pneumatically to an exactly adjustable roll gap. An unwinding station, which is arranged above the die, allows to laminate sheets with polymers.

Pulling horizontal



At the upper roll swiveled up, with the horizontally arranged die, the film is pulled via the center roll. Here, the center roll is tempered, the lower roll is cooled.

Casting vertical



At low-viscose melt, for casting to the lower cooling roll, the die is arranged e. g. at an angle of 90°.

Technical data

Parameters	CR 72/72/72-200
Roll diameter	72 mm
Roller width	230 mm
Max. die working width	200 mm
Take-off speed	0.5 - 14 m/min
Fine-adjustment gap	0.1 - 2 mm
Total el. connected load	500 W
Pneumatic quick opening	50 mm
Line pressure at 100 mm	at 4 bar air pressure=100 N/cm at 6 bar air pressure=150 N/cm
Electrical connection	1x230 V, 6A, 50/60 Hz
Connection cooling water rolls	2x3/8” internal thread
Connection compressed air	6 bar / hose 6 mm Ø
Bobbin Ø	max. 300 mm
Tension	95 N
Necessary cardboard sleeves for winder	2“ Ø
Length cardboard sleeves	170 - 200 mm
Dimensions: Length x Depth x Height	922 x 702 x 645 mm
Weight	70 kg

Stretching

Changing characteristics of polymers by stretching

MDO A, MDO B, MDO C, MDO FT

**Stretching lines are used for monoaxial stretching of tapes and monofilaments.
As with many Collin lines, also here, the modular design is the center of attention.**

By the procedure, the properties of polymers can essentially be modified which results in a wider range of application. Moreover, the mechanical properties like tensile strength, elongation and barrier effect against different media are improved.

The line consists of the inlet and retaining module with different, selectable central heating and stretching zones as well as the stretching and take- off module

Applications

- Short-gap stretching for films made of PP and PE
- Long-gap stretching with IR supplemental heating for films e. g. made of PET
- Long-gap stretching with hot air channel for monofilaments and tapes

Features & optional extras

- Water bath in table-top design
- Water bath with manual height adjustment
- Water bath with motor-driven height adjustment
- Fibrillating unit

Pelletizer

Ideal small machine for the production of pellets SP

The Collin Teach Line Strand Pelletizer SP consists of a pelletizing unit with a pair of feed rolls, guide piece, fixed counter-knife and rotating guillotine knife.

Via pressure and tension screws, the gap between rotating and static knife can be adjusted. Because of a transparent door, the feed and cutting procedure can safely be observed.

Parameters	SP
Take-off speed	up to 20 m/min
Cutting length	approx. 2.5 mm
Drive power	0.3 kW
Connected load	0.5 kW
Number of strands	1 or 2
Diameter of the strands	< 4 mm
Inlet height above table	330 mm
Max. possible dimensions of the pellets collecting tank	140 - 200 mm
Electrical connection	230 V, pres-fuse 10 A, 50 Hz
Length x Depth x Height	290 x 500 x 540 mm
Weight (net)	50 kg

Water Bath

Table-top machine for cooling polymer strands

WB 850

Small and compact – The Collin Teach Line water bath can be positioned on every table.

The strand guide in the water is effected via two guiding rolls. Furthermore, the water bath has two curved supports and four rubber feet. With an adjustment valve at the inlet, the optimal water throughput capacity can be adjusted.

Technical data

- Max. cooling water volume: max. 11.5 l
- Roller guide with grooves
- Connection cooling water inlet / outlet: hose nipple 10 mm (3/8“ nipple)
- Material: stainless steel
- Dimensions: (L x D x H): 850 x 130 x 140 mm
- Weight: (empty, net): 10.5 kg
- Table-top machine

Pipe line

RW

The pipe line consists of a pipe die, the Vacuum Tank VKT 1000, calibration plate, compressed air drying device and Belt Take-Off BAW 130 with Horizontal Winder WR 650.

Technical data

- Max. pipe diameter: 6 mm
- Max. take-off speed: 18 m/min length
- Calibrating section: 400 mm length
- Cooling section I: 650 mm
- Length cooling section II: 150 mm
- Dimensions (L x W x H): 1500 x 480 x 460 mm
- Weight: 65 kg
- Max. belt length: 130 mm
- Belt width: 25 mm
- Take-off speed: max. 18 m/min
- Traction take-off: max. 120 N
- Traction winder: max. 30 N
- Bobbin inner Ø max./min. 220/500 mm
- Bobbin outer Ø max. 650 mm
- Bobbin height max. 120 mm
- Dimensions (L x W x H): 1100 x 540 x 425 mm
- Weight: 55 kg

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TEACH·LINE

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