

Cast film extrusion line - Stretch film



The history

TCE was founded by **Prandi and Gini families** in 1989 but, the company real background dates back to the early 60ies under the name of PRANDI Officine Meccaniche.



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So, the TCE top management can count on more than 50 years of experience in the extrusion field with a background of hundreds of extrusion lines manufactured with the full satisfaction of Customers.

In particular we are proud of our technical resources and our high experience in engineering and process of the extrusion of polymers.

On the basis of previous worldwide experience since first extrusion line took shape in 1989, TCE has led the industry both in quality and in technology of flat-die and blown film extrusion.

TCE grants their customers also in the levels of service and technology.

The present

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TCE has become a prominent force in the flexible packaging industry by contributing to the effectiveness of the industrial process.

TCE has established a well deserved international reputation achieved in caring about product quality and customer service.

In TCE you will find knowledgeable and efficient staff that is providing

to our customers a service which is both effective and thoughtfully personal; practically a well qualified team to partner the industries we serve. Building a company on quality means seeing the job through, and TCE is capable of handling complete “turnkey” projects from site survey and feasibility study to full installation and commissioning.

Together with our responsive spares and service department, we ensure that your capital plant always achieves maximum performance levels.



Cast Lines Coex Stretch

Co-Extrusion Section

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The overall layout of the extrusion section is studied for having a safe, clean and easy access area.

The polymers feeding section is normally installed on a separate and dedicated platform, polymers loaders and gravimetric systems have easy and fast access.

TCE extruders are constructed with the most advanced materials; bimetallic barrels are installed together with screws designed to give the best performance with the most used resins, worldwide.

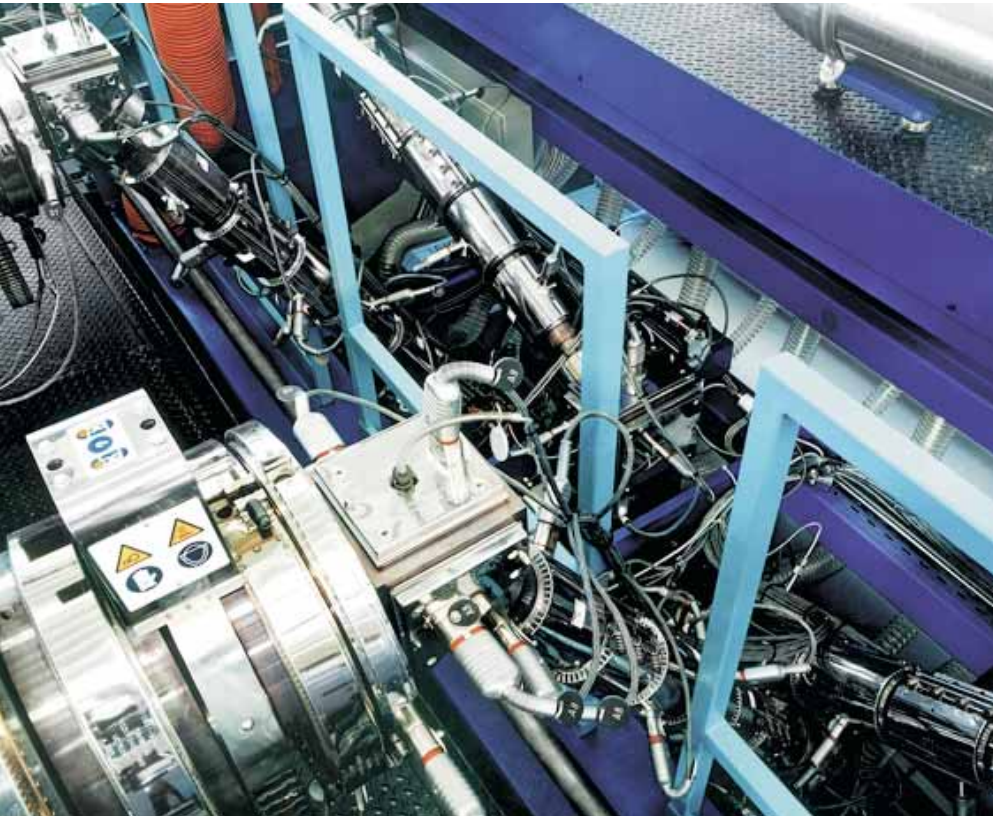
The screws surfaces are Colmonoy 56 treated. Extruders feeding section and gearboxes are cooled by chilled water. The electrical heating is controlled by a thermo-regulating system able to keep barrel zone temperature always under control reducing so the energy consumption. The use of maintenance free AC motors is in our standard configuration.



On the extruders TCE engineers foresaw a special assembling of the barrel, gearbox and AC motor in order to permit a quick removal of

the extrusion screw also from the back side without the of necessity of motor and gearbox disassembling.

Five-layers feed block



Coextrusion die

As T.C.E. is not a manufacturer of Coextrusion T-Dies, through the years T.C.E. tested T-Dies from specialized constructors and on the basis of his own worldwide experience in film application can advise the correct T-Die model and supplier to precisely fit your applications.

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The control of the thickness profile is by means of the adjustment of the flexible lip of the T-Die.

Automatic T-Dies are normally installed on Stretch film cast lines that, in conjunction with the automatic thickness control system, ensure the highest film quality.

Manual T-Dies can be installed, with the option, to be up-graded later to automatic control.



◀ Water distributing unit

6 Cast Stretch film, due to the increased production speeds, needs an efficient cooling.

The cooling unit is specially designed to produce film with excellent mechanical and optical properties.

The internal design of the rolls and an accurate temperature control assures a uniform heat transfer on the surface of the chill-rolls.

The chill-roll unit was studied and designed to give the maximum

flexibility: on request this unit is easily replaceable with rolls having different surface finishing that can either be matte or mirror finished. The chill-roll unit, driven by AC motors, features movements in both axis directions.

Chill-Rolls diameter range is available up to 1200 mm. The rolls are dynamically balanced in order to minimize the risk of vibrations. TCE studied Vacuum Box (mono or dual chamber) specially designed for Stretch film application; the multipoint regulation allows accurate and balanced vacuum effect on the entire the casting width.

Each unit is equipped with a roll for cleaning the main chill roll surface from wax residuals produced during the polymer extrusion and so granting all the time the best heat-exchange.

The Chill-Roll is the main part of the cooling unit but not less important are the other units related to this section: The Chiller and the Water distributing unit.

The Chillers are carefully chosen by



▲ The T-Die position over the Chill Roll is particularly studied for the perfect extrusion

TCE on the basis of the produced film, Customer necessity and the environmental requirements of the Customer working place. The Water distributing unit grants constant cooling water temperature at the Chill-roll unit, Extruders feeding sections and Gearboxes. A control panel allows the perfect control of the different water flow-rates. The cooling circuit is a "close ring" type.

▼ Dual chamber vacuum box



Winding section



▲ Robocast Series winding unit

T.C.E. has a long tradition in the study and construction of winding units; our Customers will find for every kind of film application and dimension the most suitable winding-unit.

Winders for LLDPE Stretch film are available in the configuration "Sliding Carriage" or "Planetary" type winder, specially designed to produce directly on one single shaft, Hand Rolls Stretch film.

▼ "Sliding Carriage" winders



▼ "Planetary" winders



8 Winding units are available with a net web width from 1500 mm up to 4000 mm.

The perfect control of the film winding tension is achieved on T.C.E. winders by the use of PLC and load cells producing always rolls featuring excellent geometrical properties.

The PLC and a TCE dedicated software allows the easy management of the rolls winding.



Spreading rollers and antistatic units are standard equipment.

All our winders are equipped with automatic “no-glue” change of the winding shaft.



The trimmed sides of the film are sent to a mill, cut and recycled in the main extruder, dedicated to feed the central layer of the film.



Safety section



At T.C.E. Safety is not an option. All our lines are equipped with the required Safety devices, according to the latest CE rules but at the same time taking care to an "operator's friendly" machine design.



Control section

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Process control

T.C.E. cast lines are supplied with a Supervisor that allows to control and manage the following line parameters:

- The line process and set-up
- The extrusion parameters
- The gravimetric system
- The processing parameters
- Extruders and T-Die thermoregulation
- Winder parameters
- Receipt management
- Alarms
- Maintenance
- The information can be displayed in different languages and printed
- Modem connection for remote service

Main Process Control



Gravimetric System



Extruder Parameters



Set-up Data



Winder Control



Chill Roll Control



Thickness control

The thickness of the produced film is measured by an automatic scanner using Beta Rays source (or other Rays).

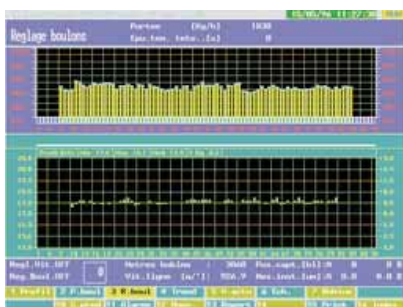
The film thickness profile is shown on an operator console and kept within the tolerance range by manual or automatic adjustment.

The automatic control of the film thickness can be obtained joining the measuring system with an automatic T-Die.

The thermal bolts of the automatic T-Die will act and modify the flexible T-die's lips correcting the film thickness.control.



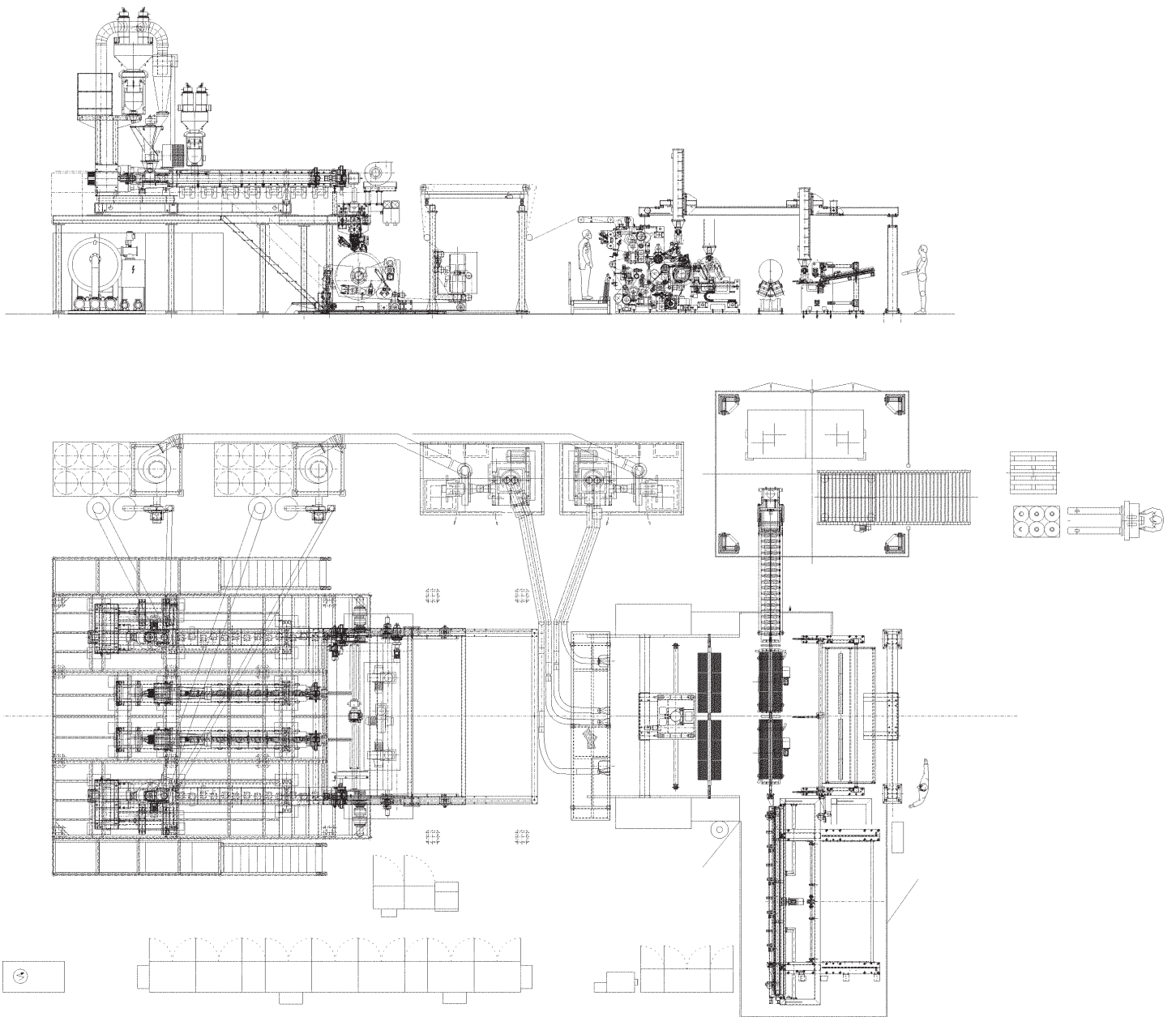
▲ Automatic thickness control ▼



T.C.E. Cast Lines

Robocast configuration layout

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Robocast series

CAST LINE MODELS	1500S-3E	2000NG	2000S-4E	3000S-4E	2500NG-5E-CLING
Net web width [mm]	1500	2000	2000	3000	2500
Application	LLDPE	LLDPE	LLDPE	LLDPE	LLDPE (CLING)
Nr. of extruders	3	3	4	4	5
Nr. of layers	3	3	5	5	5
Thickness range, min - max LLDPE [microns]	15÷30	15÷30	15÷30	15÷30	10÷30
Net output @ 23 micron LLDPE [kg/h]	850	1250	1300	1900	1000 (Cling 600kg/h)
Extruder configuration	65/130/65	100/160/100	160/130/80/80	100/160/160/100	50/50/100/50/50
Chill-roll diameter and net width [mm]	700 x 2050	1200 x 2450	1200 x 2450	1200 x 3500	1200 x 3000
Standard flat die type	Automatic	Automatic	Automatic	Automatic	Automatic
Winder type	Sliding carriage	Sliding carriage	Sliding carriage	Sliding carriage	Sliding carriage
Rolls dimensions - External diameter min-max [mm]	250 - 600	250 - 600	250 - 600	250 - 600	150 - 400
Multiple rolls, max nr.	3x500 / 3x450	4x500 / 4x450	4x500 / 4x450	6x500 / 6x450	6x420 / 8x300 / 10x250
Shafts types [inches]	3"	3"	3"	3"	3" / 4"
Max. line mechanical speed [m/min]	600	600	600	600	500

Remarks:

The table is referred to lines in the standard configuration; changes are possible on request and upon technical/commercial discussions. Data are not binding. TCE reserves the right to change data any time and without notice based on the technical developments of the equipment and/or availability of the components.

Stretch film Cast lines

for Hand and Machine Rolls with
integrated Packaging System

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Excellence has no limits: T.C.E. can supply complete packaging lines of the finished product, ready to be supplied on pallets to the retailers.



Dedicated Stretch film Cast lines

for Hand and Machine Rolls

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T.C.E. production program includes special Lines for the in-line production of finished hand rolls, on 2" shafts or machine rolls on 3" shafts.

Our Cast lines in the special "Planetary" type winder configuration are designed for net outputs of 1.800 kg/h or 960 hand rolls per hour.



Integrated packaging system

for Hand and Machine Rolls Packaging System

18 Today, cost saving is one of the major challenging tasks Companies have to compete with.

T.C.E. taking advantage of it's long experience in the film business, has developed Automated Packaging Systems that are fully integrated with our Film Casting Equipment. Lines equipped with similar systems are able to produce finished rolls ready to be supplied on pallets to the final retailers, avoiding

complicated and expensive off-line rewinding and packaging operations. T.C.E. Packaging System is designed to pack hand rolls in a diameter range from 80-150 mm on 2" shafts or machine rolls with max. diameter of 250 mm on 3" shafts. Cardboards cores lengths are between 415 and 530 mm; at 70% of its efficiency the equipment features a production capacity from 320 up to 960 hand rolls per hour.



Palletising Unit for boxes



Standard supply includes Roboting System for Rolls Packing and Boxes Palletising as well as dedicated labelling equipment for production management.

The Palletiser handles pallets with dimensions from 800 x 800 mm up to 1200 x 1400 mm and with a max. palletising height of 2.200 mm, pallet included. The average palletising storing cycle is of 20 seconds.

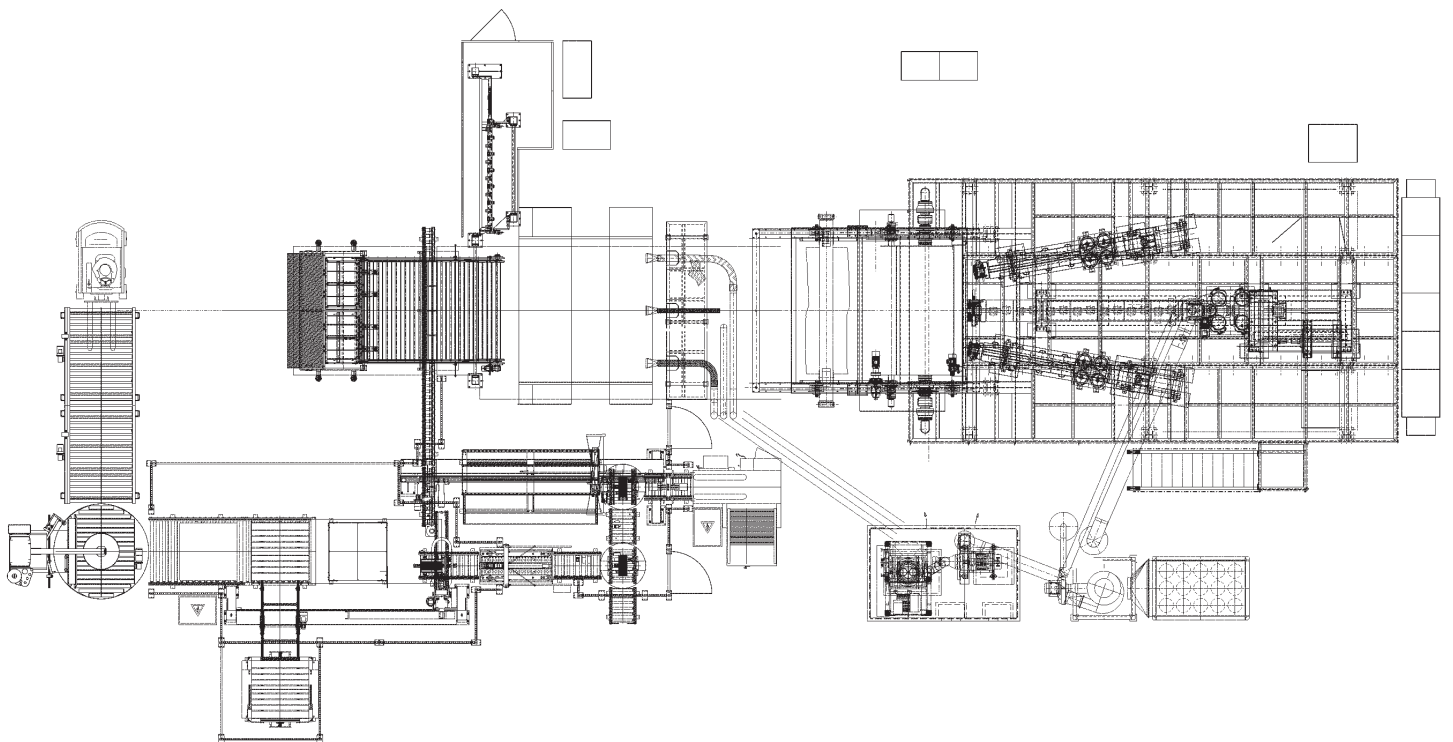
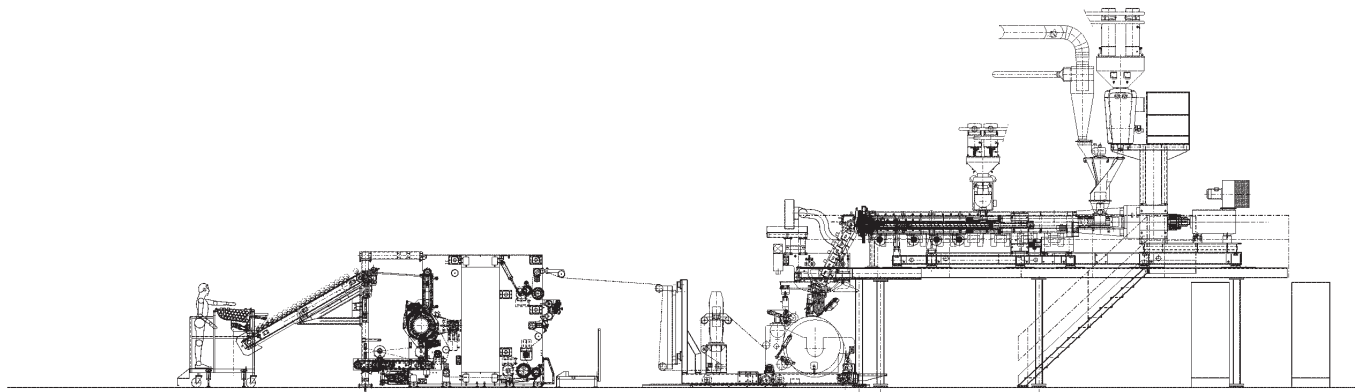
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T.C.E. Cast Lines

Hand Rolls configuration layout

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Hand Rolls series

CAST LINE MODELS	2000NG-3E-B	2000NG-5E-B	3000NG-4E-B
Net web width [mm]	2000	2000	3000
Application	LLDPE	LLDPE	LLDPE
Nr. of extruders	3	4	4
Nr. of layers	3	5	5
Thickness range, min - max LLDPE [micron]	15÷30	15÷30	15÷30
Net output @ 23 micron LLDPE [kg/h]	1200	1200	1900
Extruder configuration	100/160/100	80/100/160/80	100/160/160/100
Chill-roll diameter and width [mm]	1200 x 2450	1200 x 2450	1200 x 3500
Standard flat die type	Automatic	Automatic	Automatic
Winder type	Planetary	Planetary	Planetary (twin)
Rolls dimensions - External diameter min-max [mm]	80-250	80-250	80-250
Multiple rolls, max nr.	4x500 / 4x450	4x500 / 4x450	6x500 / 6x450
Nr. of cycles max. [cycles/h] or nr. of rolls [rolls/h]	120 [480]	120 [480]	120 [720]
Shafts types [inches]	2" / 3"	2" / 3"	2" / 3"
Max. line mechanical speed [m/min]	600	600	600

Remarks:

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■ **TCE production program includes:**

- CAST lines for stretch
- CAST lines for CPP film
- CAST Lines for Barrier film up to 7 layers
- BIAxIAL ORIENTATION lines (Double Bubble) for POF film
- BIAxIAL ORIENTATION lines for ARTIFICIAL CASING
- BLOWN FILM lines up to 7 layers
- EXTRUSION COATING & LAMINATING LINES
- WINDERS and UNWINDERS
- IMPREGNATION LINES FOR " MASKING TAPES " PAPER PRODUCTION
- HOT MELT ADHESIVE COATING

