

SML

EXTRUSION LINES – ENGINEERED TO PERFORM ►

100%
eXtrusion
COATING LINES

EXTRUSION COATING
AND LAMINATING

LINES FOR EXTRUSION COATING AND LAMINATING



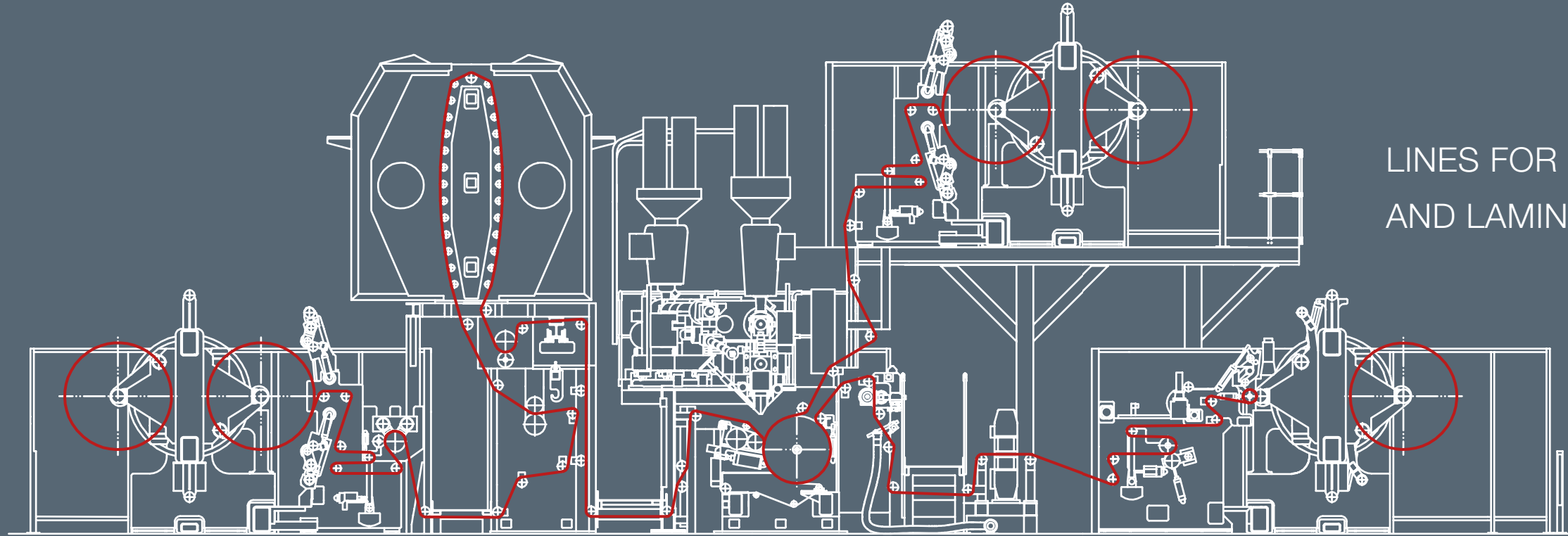
INTRODUCTION

The extrusion coating segment is one of the longest served product fields in which SML is active. The technology is used for a diversity of differing applications, which can involve packaging, textile or technical products. Analysts predict ongoing global market growth during the coming years, particularly in the flexible packaging segment.

Extrusion lamination does not merely consist of glueing substrates together, as, depending on the material extruded, the producer can influence the properties of the end product significantly, which represents a considerable advantage over other lamination methods. Co-extrusion facilitates the creation of complex barrier structures.

Owing to the fact, that extrusion coating is used for such a wide range of applications, the items produced and the related machine configurations differ considerably. SML has built extrusion

coating and laminating lines for almost every product type and therefore has extensive know-how that covers the entire market scope, which enables SML to supply its customers with carefully designed, tailor-made machines for their specific applications.

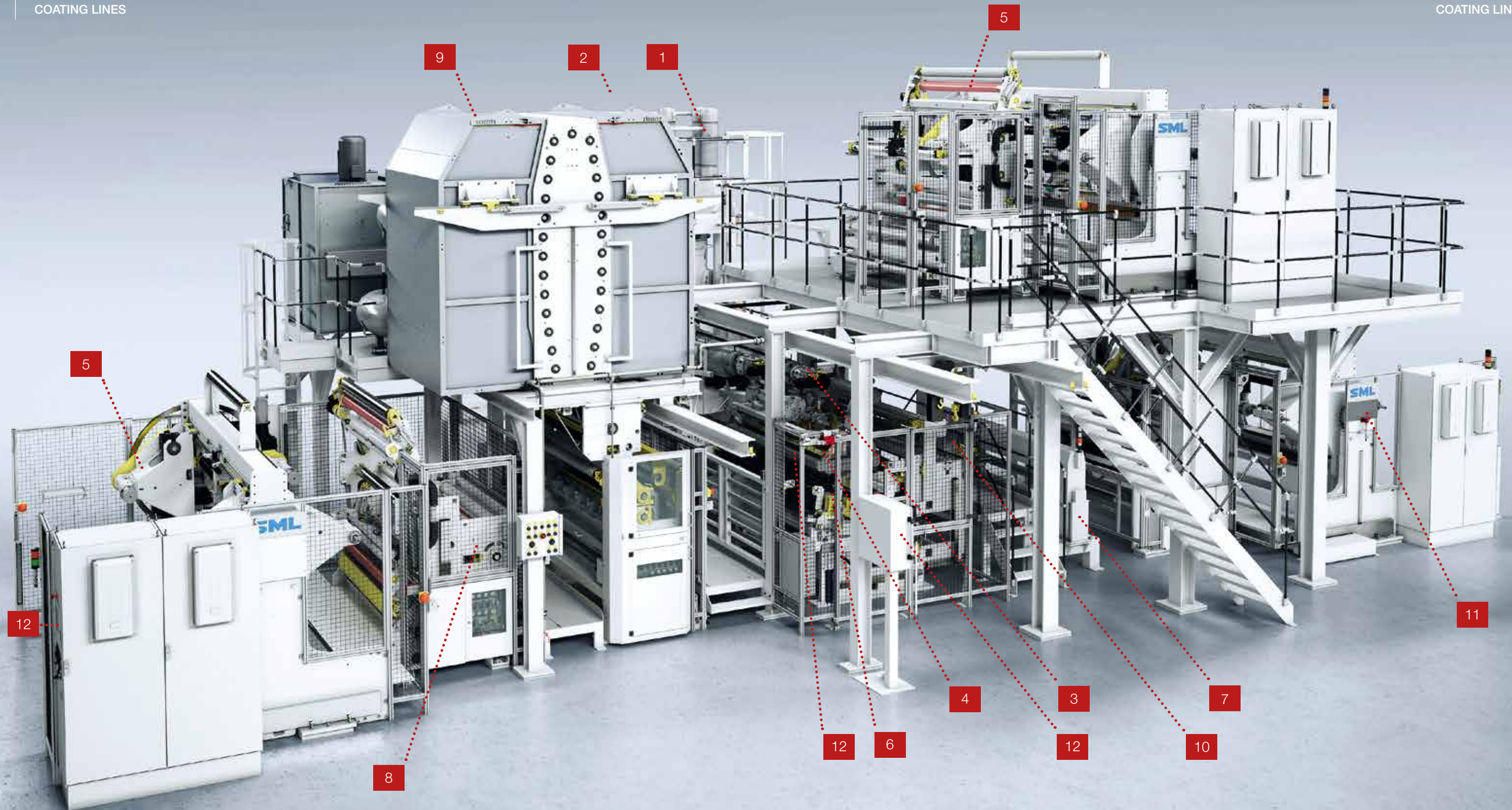


LINES FOR EXTRUSION COATING
AND LAMINATING

CONTENTS

Line Description	6
Extrusion Unit	8
Unwinding Equipment	14
Downstream Equipment	18
Winding Systems	21
FlexPack®	29
FlexPack® – DoubleCoat	30
FlexPack® – Tandem Lines	31
Woven Fabric	32
Extra Wide Extrusion Coating and Laminating Lines	34
Process Combinations and Integrations	36
Products	38





- 1 RAW MATERIAL HANDLING AND DOSING
- 2 EXTRUDER
- 3 MELT FILTRATION
- 4 TOOL UNIT

- 5 UNWINDING EQUIPMENTS
- 6 LAMINATOR
- 7 THICKNESS MEASUREMENT
- 8 CORONA TREATMENT UNIT

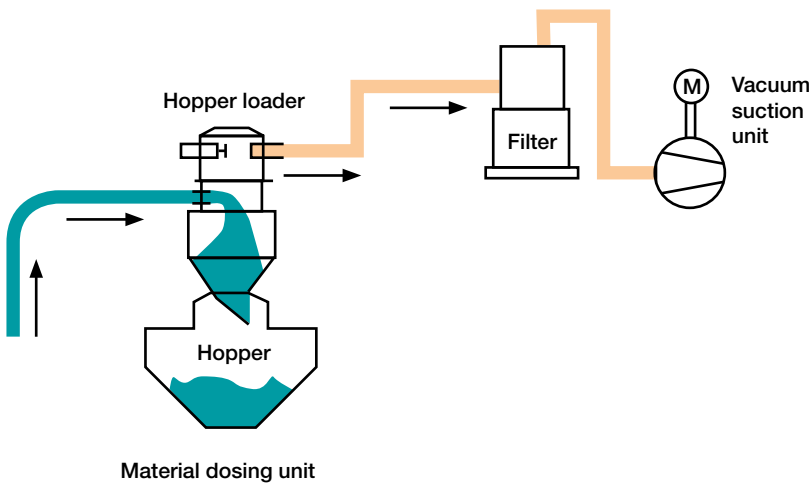
- 9 PRIMER STATION
- 10 TRIM HANDLING SYSTEMS
- 11 WINDING SYSTEMS
- 12 SMILE CONTROL SYSTEM



extrusion tool unit

1 RAW MATERIAL HANDLING AND DOSING

Gravimetric batch blenders and continuous gravimetric feeders guarantee great material blending accuracy and repeatability. Up to six components per extruder can be offered and this provides for maximum flexibility. Moreover, the complete dosing system, as well as all the material supply vacuum pumps, filters and valves are fully integrated into the SMILE control system, thus allowing recipes to be run and providing time and waste savings during product changeovers.



Material dosing unit



advanced heating/cooling system

2 EXTRUDER

SML standard extruders for coating are designed for all the relevant polymers used in this field of application. A choice of standard versions with screw diameters from 45 to 220mm is available. As a rule, the extruders are driven by energy-efficient, low-maintenance, water-cooled AC motors.

The L/D ratio can be 28 or 33, whereby 33 is the preferred solution for obtaining a high melt temperature and good mixing results even at high speeds.



HO-LT extruder

HO-LT EXTRUDER

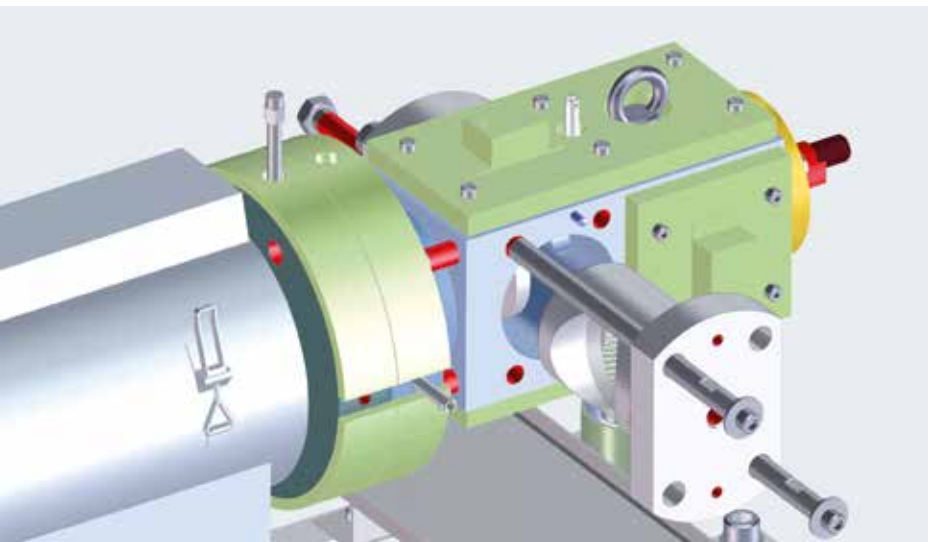
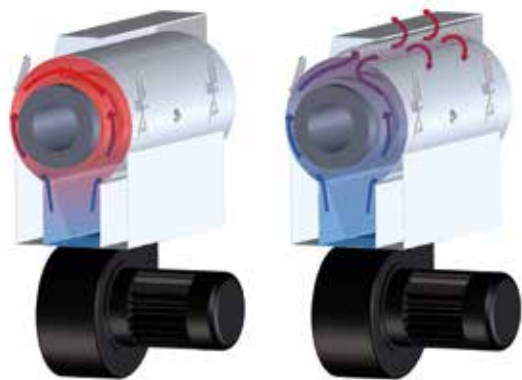
This extruder is specially designed for the processing of temperature-sensitive polymers such as EVOH or adhesives. It is also used for the thin functional layers of co-extruded products.

HO-LT stands for “High Output – Low Temperature” and a special screw and barrel configuration enables these machines to plasticize large amounts of polymer at relatively low screw speeds. The result is a very low melt temperature, extremely stable output and high pressure generation.

SML offers its HO-LT extruders in two differing sizes, which are typical of the co-extruder in multilayer structures.

	HO-LT 35/34	HO-LT 55/36
	kg/h	kg/h
EVOH	120	300
Tie	110	250
PP	120	300
PE	110	250
A-PET	110	200
PA6	100	200

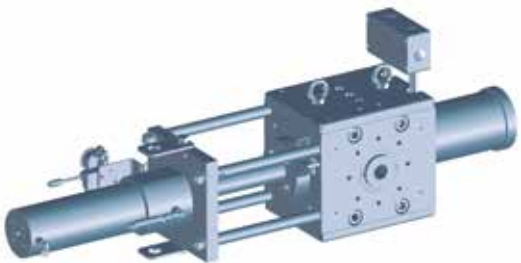
All extruder barrels are heated using SML’s advanced heating system. A flap, which closes through gravity, prevents escaping of warm air from the system and retains the heat in the barrel.



combi filter valve

3 MELT FILTRATION

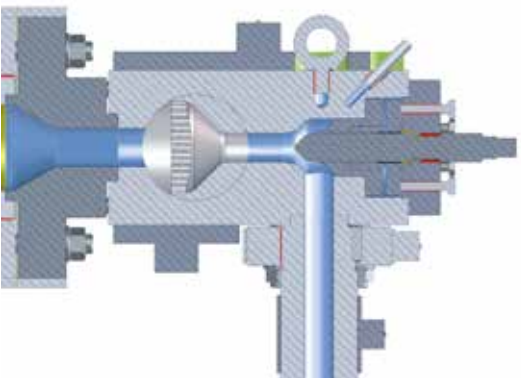
Effective melt filtration for the removal of impurities, such as unmelted or cross-linked particles, is most important and it’s execution depends on specific process requirements. Different solutions are available. Simple manual filters can be used for standard virgin coating grades, while SML usually installs hydraulic, single-piston filters for materials requiring more frequent filter changes. For special applications also continuous filtration systems are used.



MELT PRESSURE VALVE

An adjustable melt pressure valve can be integrated downstream of the filter. This allows the adjustment of extruder backpressure, which can have a beneficial effect on shear rates. Improved mixing results can thus be achieved even with low output and it is also possible to adjust the melt temperature at high output.

The valve can be equipped with an optional AC drive, which allows comfortable extruder back pressure adjustment from the main screen.





flat die with fume
suction hood



DIE SPLITTING SYSTEM

Enables quick and safe die opening for cleaning purposes. The die remains in its original position in the machine and continues to be heated, which eases the cleaning operation, saves time and reduces the risk of damage.



4 TOOL UNIT FEEDBLOCK AND FLAT DIE

SML relies exclusively on respected partners for its feedblocks and flat dies.

Multilayer structures require great flexibility with regard to feedblock adjustment. Therefore, as a rule, SML utilizes variable geometry feedblocks and inserts that can be profiled to optimize the thickness tolerances of the individual layers.

Different die designs are available in line with the respective application. Extrusion coating lines need to run with different product widths and therefore, die deckling is required. Flat dies with coat hanger design have good distribution characteristics, but can only be deckled with external decklings. Therefore, in recent years, the trend has been towards T-channel dies with internal and external decklings. The internal deckling consists of individually adjustable blades. This has the positive effect of influencing the edge bead and the neck-in of the melt curtain, which reduces the waste from overcoating.

Depending on the manufacturer, dies are either chrome- or nickel plated. Moreover, in applications where the extrudate is corrosive, stainless steel may be selected as base material. Profile adjustment can either consist of manual or automatic die control via thermally heated bolts.



extruder carriage

EXTRUDER CARRIAGE

In order to have access for die lip cleaning, it is necessary to move the complete extrusion system into the offline service position. For this purpose, SML can offer either a floor carriage with in-floor rails, or a hanging extruder platform. The floor carriage provides perfect access to all the installed equipment from the top, while the hanging extruder offers perfect stiffness for wide dies.

As the relative position between the die exit and the point of melt contact with the substrate is an important process parameter, that must be altered for different materials, the extruder carriage is adjustable in all three axis. For good repeatability, the actual positions are detected, displayed and stored in recipes.



hanging extruder arrangement



5 UNWINDING EQUIPMENTS

Between one and four unwinding stations are installed in one production line for unwinding the substrates, depending upon the structure of the products. Extrusion coating is a process that requires continuous production and therefore line stops for substrate roll changes would cause start-up waste and downtimes. To avoid these unnecessary losses during substrate roll changing, conventional extrusion lines are equipped with unwinds, where the new roll can be spliced with the ending roll at full production speed.

ACCORDINGLY, DIFFERENT TYPES OF UNWINDS ARE AVAILABLE. THESE CAN BE:

- simple double-station system with a manual splicing unit
- zero-speed splicers with thermo-welding or butt splice
- fully automatic turret unwind for splices

SML offers unwinds for every type of substrate, including simple shafted and fully automatic, shaftless systems with roll handling for minimized labour costs. The unwinds are all built as separate units with an independent control cabinet and a PLC with touch panel, which means that they can be easily integrated into existing lines. The control system is fully synchronized with the main line PLC via a bus system, together with all the relevant values, which make product changeovers easier and faster.

All SML turret unwinds are equipped with an lightweight dancer roll for sensitive tension control, while the substrate roll is center-driven by an AC servo motor. During splicing the new roll is automatically synchronised with the line speed. Splicing is carried out with a driven bump roll and a pneumatically operated chopping knife. With a defined splice geometry and a position detection, the splice length is minimized.

All fully automatic turret unwinders are built in a modular design, which allows to add special features to the basic machine, if needed. A second splicing unit for bi-directional unwinding or an optional constant gap device for smooth unwinding of thin, sensitive aluminium foil, can be installed.



UNWIND SERIES ECOFLEX WS

The series Ecoflex WS turret unwind is a cost-efficient solution for fully automatic unwinding of substrates with winding shafts. It is capable of production speeds up to 350 m/min and can be used for substrates with a maximum roll diameter of 1,200mm. Winding shafts with a special circular adapter in combination with sliding safety chucks are used for core fixation. Thus, centering of the substrate roll is improved.

The complete unwind is mounted on linear guides. An integrated edge guiding system ensures correct alignment of the substrate and therefore no additional web positioning equipment is required. The design enables easy roll handling with standard electric forklifts.



UNWIND SERIES ECOFLEX SL

The series Ecoflex SL turret unwind is an upgraded unwind in the medium price range with production speeds of up to 450 m/min for maximum roll diameters of 1,270mm.

Core clamping is done shaftless and uses mechanically actuated chucking heads, which can be equipped with adapters for all standard core diameters.

Each unwinding position is motorized in transverse direction and can be linked to an edge guiding system for appropriate positioning of the substrate, thus avoiding the need for additional web guiding equipment. Furthermore, this design facilitates easy roll handling with standard electric forklifts.



UNWIND SERIES POWERFLEX

The Powerflex turret unwind is the solution for large substrate width up to 4,500mm and a maximum roll diameter of 1,500mm. Core clamping is shaftless and employs pneumatically actuated chucking heads, which can be equipped with adapters for all standard core diameters. Integrated lifting tables can be utilized

for loading and unloading, which brings maximum roll handling flexibility in combination with minimum handling times. Each unwinding position is motorized in transverse direction and can be linked to an edge guiding system, for appropriate positioning of the substrate, thus avoiding the need for additional web guiding equipment.

Unwind type	Double unwind	EcoFlex WS	EcoFlex SL	PowerFlex
Max. mechanical speed	150 m/min	350 m/min	450 m/min	600 m/min
Max. substrate width	5,200mm	1,800mm	1,800mm	4,500mm
Max. mechanical diameter	1,500mm	1,200mm	1,270mm	1,500mm
Core clamping	shafted / shaftless	shafted	shaftless	shaftless
Max. roll weight	4,500kg	1,500kg	2,000kg	2,500kg
Unwinding direction	both	both	both	both
Roll handling	crane	crane / forklift	crane / forklift	lifting table



laminating nip

6 LAMINATOR

The laminator is the key component of an extrusion coating line. With its massive side frames the laminator is mounted directly on the floor, to ensure vibration-free production. A pressing unit, consisting of a rubber roll and a steel supporting roll, is mounted on linear guides to apply a defined pressure to the coating gap between the rubber roll and the chill roll. All rolls are equipped with quick change couplings in order to complete roll changes and perform product surface changes in minimum time.

An endless PTFE tape allows overcoating, to minimize substrate waste, and a stripper roll at the outlet of the unit ensures consistent peel-off of the coated material from the chillroll.

Parameters such as die position, pressing force, or chill roll temperature, which have a direct impact on product properties are adjustable and all these settings of the laminator are stored in recipes for repeatability reasons.



laminator with edge trimming station



thickness measuring unit

7 THICKNESS MEASUREMENT

As a response to the differing regulations in customer countries and specific product needs, SML supplies automatic gauging systems with infrared, X-ray or beta ray sensors.

Apart from single-frame solutions with total product measurement, SML also offers multiple frame differential measurement systems. All frames are synchronized to ensure measurements of the same track. This is required to achieve a constant coating thickness, even when the substrate thickness has variations.

8 CORONA TREATMENT UNIT

A corona treatment unit modifies the surface tension of the product. It can be installed upstream of the substrates, to increase bonding strength, and downstream to improve printability on the final product.

Depending on the conductivity of the material to be treated, either ceramic or stainless steel electrodes are used. Each station is driven and fitted with a rubber pressing roll to avoid backside treatment and to separate and control web tension.



corona treatment



9 PRIMER STATION

It is possible to apply a liquid primer coating on the pre-treated substrate surface to enhance adhesion. The primer layer is applied by a roll coating system with a gravure roll and a closed doctor chamber blade. Compared to conventional smooth roll systems, this method offers the highest precision, increased production speeds and less spillage.

The liquid is evaporated in a subsequent vertical dryer and leaves a thin layer of solids on the surface, as an anchor for further processes. Since drying is an energy-intensive process, SML only uses highly-efficient equipment with adjustable return air and optimized flow speeds.

10 TRIM HANDLING SYSTEMS

The edges of the product are trimmed immediately after the coating unit. Most products are wound as a mother roll, but some are slit inline into several part rolls.

As most coated products are not suitable for refeeding to the extruder, the cut trim is to be recycled off-line and therefore must be minimized. Precisely adjustable circular knives with driven counter knives give an optimum result.

primer station



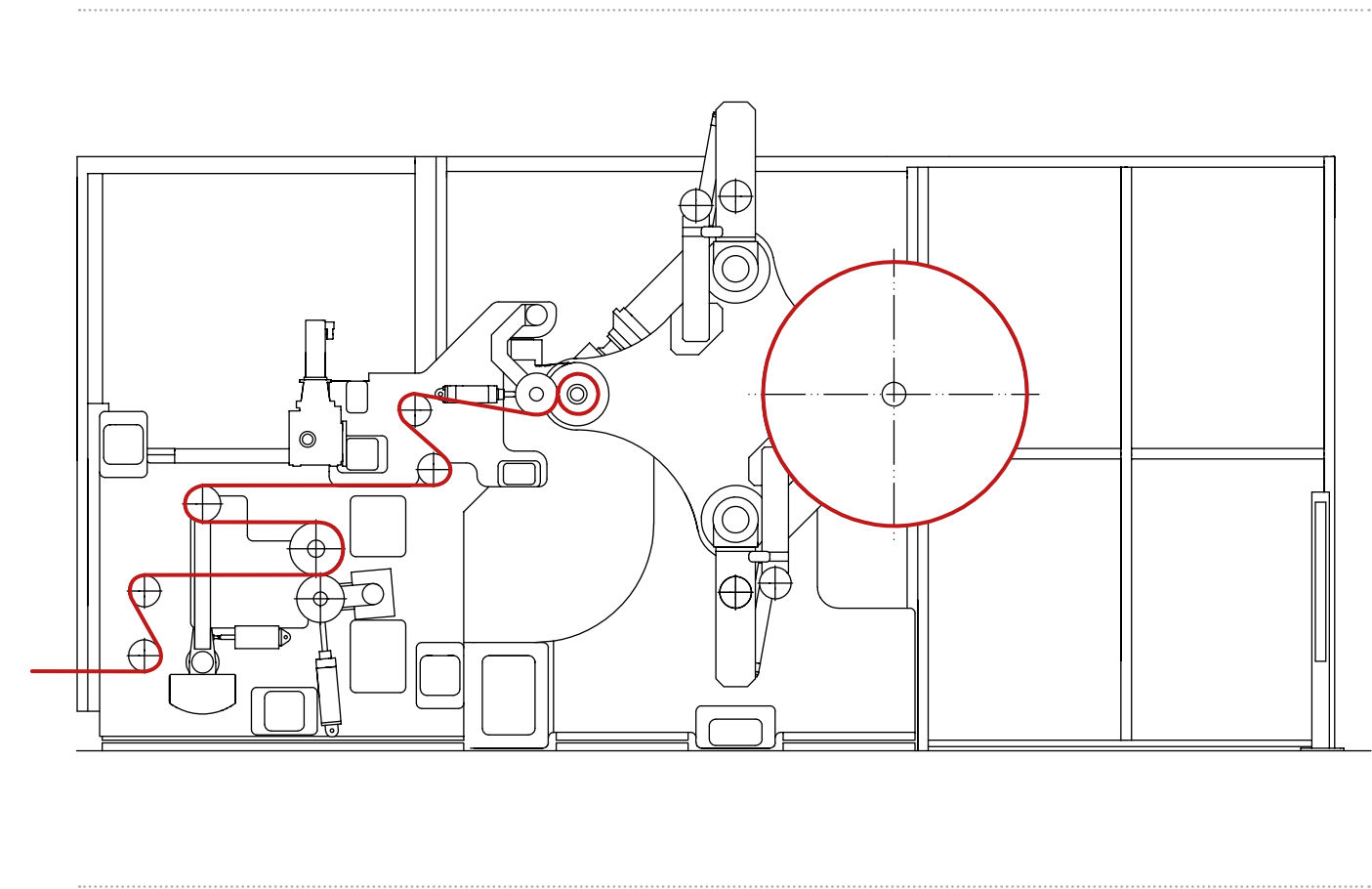
After cutting, the trims are sucked off and cut into small pieces, so as to minimize the volume required for storing and transportation.



11 WINDING SYSTEMS

Over the years, SML has invested enormous amounts of effort in building its own peak performance winders, and has created different winding systems for various applications. All these winders have a solid, vibration-dampening steel frame construction, which is able to resist the dynamic forces generated at high production speeds.

Each winder is equipped with a separate control cabinet and its own PLC system, and therefore can also easily be retrofitted on existing lines. The system is synchronized with the main line control system and has a large 17" touch screen for operator convenience.

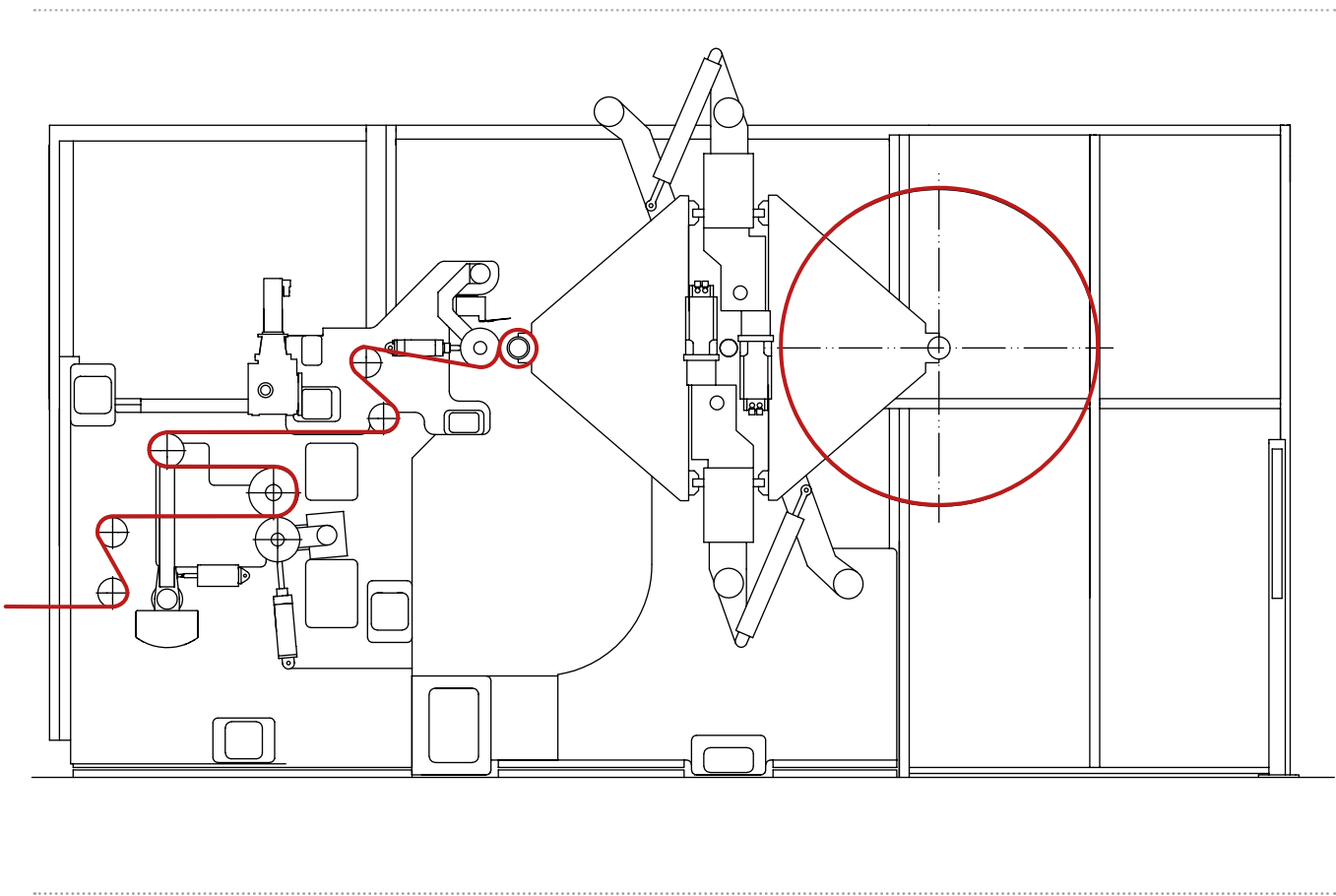


WINDER W1500 WS

The turret winder W1500 WS is capable of production speeds of up to 350 m/min and can be used for products with a maximum roll diameter of 1,200mm. Winding shafts with a special circular adapter are used in combination with sliding safety chucks for core fixation.

A fix point unit at the winder inlet separates web and winding tension. An ultra-lightweight carbon fibre dancer roll controls the winding tension, while the roll is centre driven by an AC servo-motor. Winding can be done in gap or contact mode.

Cross-cutting systems with flying or guillotine knives are available for smooth roll changes. In order to satisfy individual requirements, rolls can be wound in both directions by means of an optional second cutting unit. This design facilitates easy roll handling with standard electric forklifts.

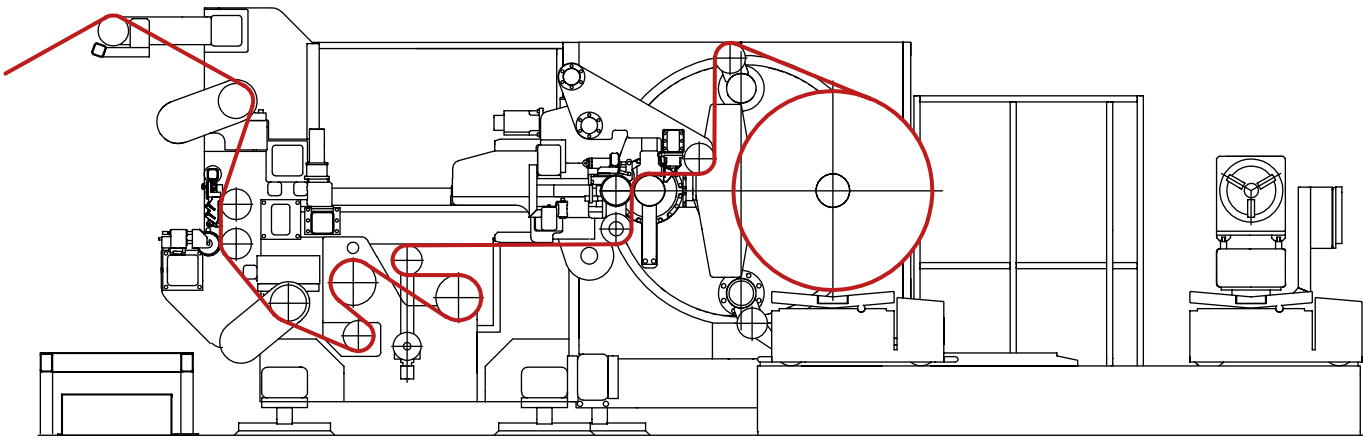


WINDER W1500 SL

The turret winder W1500 SL is capable of production speeds of up to 450 m/min and maximum roll diameters of 1,270mm.

Core clamping is done shaftless and uses mechanically actuated chucking heads, which can be equipped with adapters for all standard core diameters.

The winder can be equipped for single or dual directional winding. With 2 different available cutting systems it can be adapted to the respective customers needs.



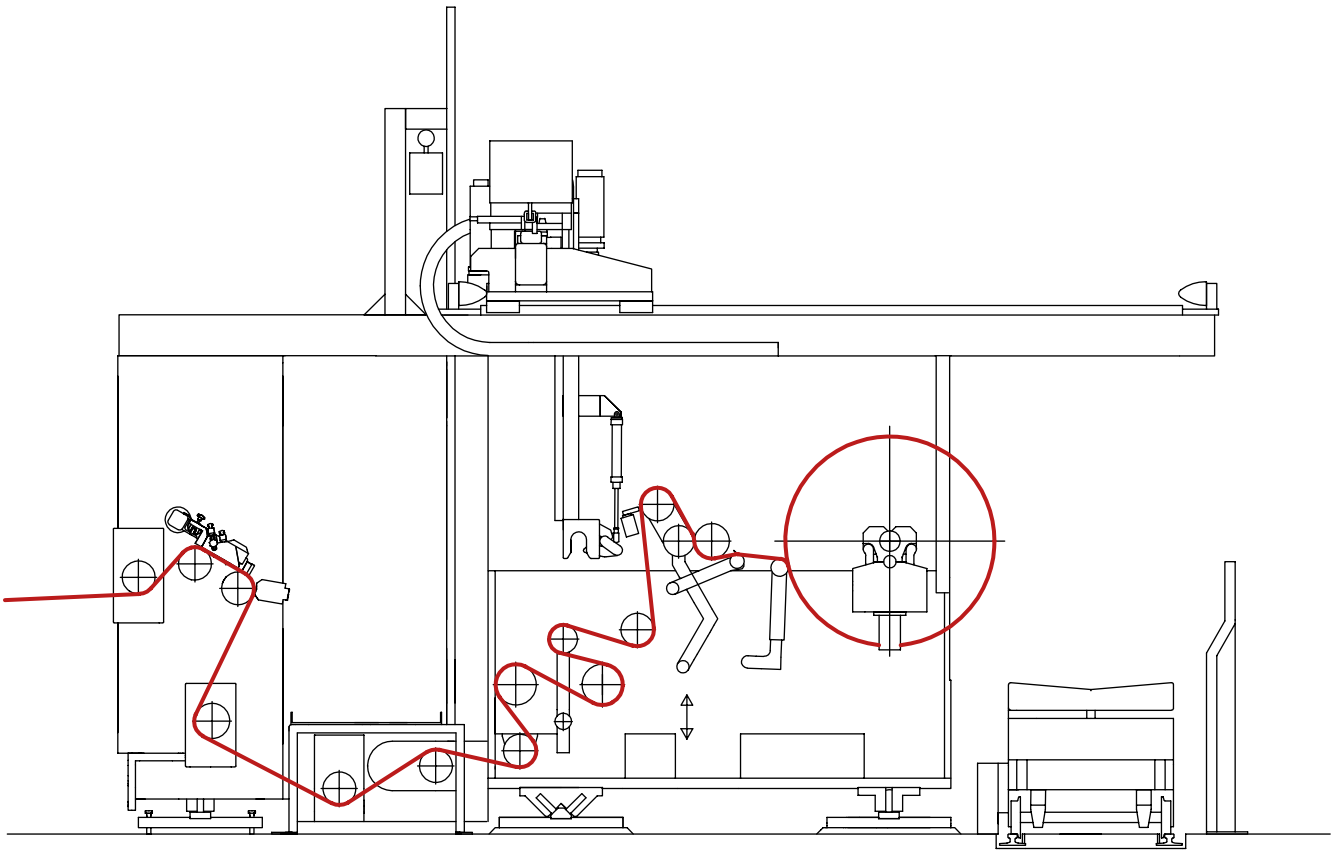
WINDER W1200

The turret winder W1200 is for large widths of up to 5.2m and maximum roll diameters of 1,300mm.

A fix point unit at the winder inlet separates web and winding tension. A dancer roll controls laminate tension, while the product roll is centre driven. The winder can be operated in gap or contact mode.

Laminate cross-cutting is performed by a flying knife, which enables the cutting of reinforced products.

This winder can either be operated with winding shafts or shaftless. A semi-automatic trolley with a shaft pulling device is available as an option to ease handling of heavy rolls and shafts.



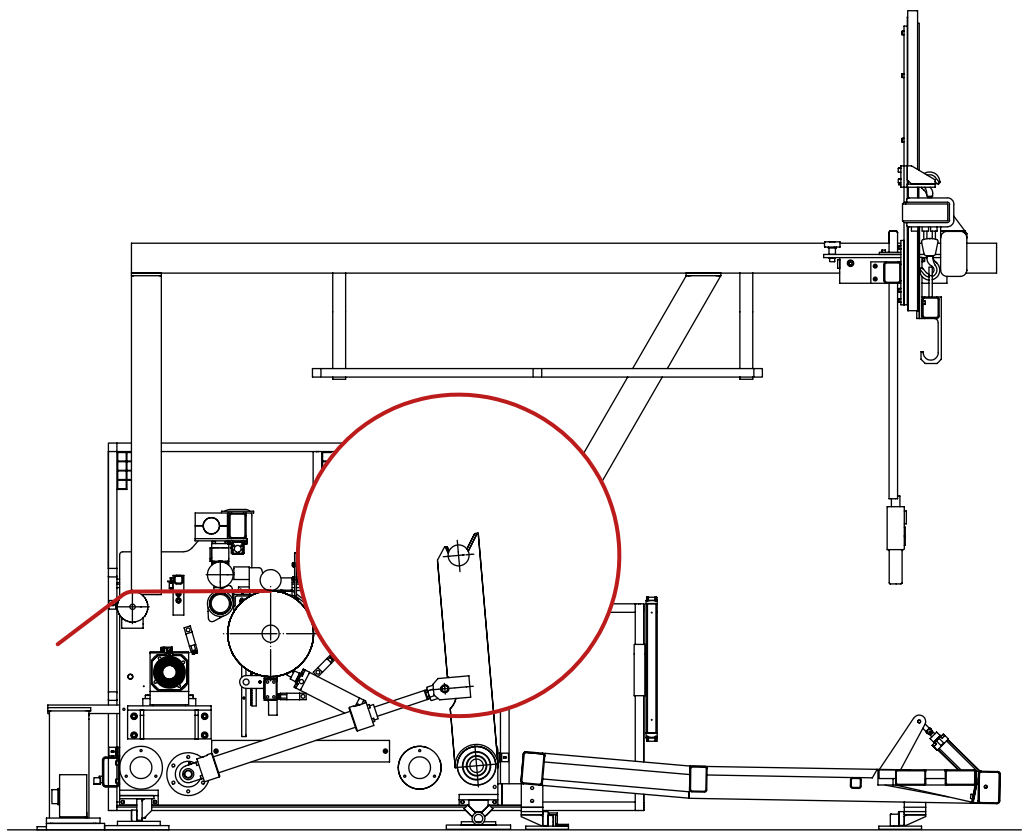
WINDER W2000 ROBOTIC

The winder W2000 is the standard horizontal sliding winder for the inline-slitting of rolls. Owing to the principle of horizontal winding position movement, the roll remains in an optimum winding position until the very last moment before cross-cutting, thus guaranteeing perfect winding quality up to the last layer of the roll.

This winder is designed for the winding of laminates in a wide thickness range, is equipped with an ultra-lightweight dancer roll for sensitive tension control and can be operated in gap or contact mode. A satellite roll optimizes the entrance angle of the film to the roll, which minimizes air entrapment. A strong guillotine knife is used for cross-cutting on the W2000 robotic winder. The film is fixed onto the new winding core with a belt cage and compressed air nozzles. As a result, core preparation is unnecessary.

The inline-slitting process can be carried out either with or without bleed trims. Depending on the product, slitting stations with razor blades or with circular knives are integrated at the winder entrance.

The finished roll and the winding shaft are transported onto a moveable lifting table by an overhead robot, which pulls the slit rolls from the clamped shaft. The complete roll and shaft handling process is fully integrated into the automatic mode of the winder.



WINDER W100

The W100 is a surface winder and is ideal for winding of big diameter mother rolls.

Compared to all other winding systems this type of winder requires the lowest floor space and installed motor power. Nevertheless, it can wind up to 1,500mm diameter rolls with perfect hardness from the inner core till to the outer layer.

The strong cross-cutting unit cuts even very thick and reinforced products, such as container bag or reinforced fabrics. The complete winder can be oscillated, which enables the winding of products that tend to create rings or edge build up of folded, tubular or reinforced products.

Unloading of finished rolls is done with a hydraulic lifting system. After preparation of the new winding core with double sided adhesive tape the feeding of the new winding shaft into the winder can be done with the simple, but very effective loading system without physical stress.

Winder type	W1500 WS	W1500 SL	W1200	W2000	W100
Maximal mechanical speed	350 m/min	450 m/min	350 m/min	600 m/min	150 m/min
Maximal winding width	1,800mm	1,800mm	5,200mm	2,900mm	2,400mm
Inline slitting	No	No	Yes	Yes	No
Maximal mechanical diameter	1,200mm	1,270mm	1,300mm	980 or 1,500mm	1,500mm
Maximal roll weight	1,500kg	2,000kg	4,500kg	2,500kg	2,500kg
Winding direction	both	both	both	top inside	top inside
Winding tension	50 - 750N	50 - 750N	50 – 3,500N	30 – 300N	50 – 1,200N
Contact roll pressure	100 – 1,800N	100 – 1,800N	50 – 3,500N	50 – 500N	100 – 3,000N
Roll handling	manual	manual	semi-automatic	fully automatic	semi-automatic



12 SMILE CONTROL SYSTEM

An innovative, intuitive and operator-friendly human-machine interface (HMI) with two 17-inch touch screens provides all the functions needed by operators and maintenance personnel to handle the complete line. Everything, from the input of the ratio of each raw material to the parameters of the winder can be dealt with from the main terminal, which is located in the casting section. A second touch screen at the winder that is linked to the main terminal allows winding parameter adjustment directly in the field of vision for the process.

Different access levels and features such as alarm management, recipe administration and remote service via ethernet/internet are standard. For extended trend analysis and quality documentation, data can be transferred to a data logging system via a separate PC, or existing data collection systems. The electrical equipment is either installed in an e-container or, depending upon the space requirement, in e-cabinets. Both customised solutions are supplied complete with electrical engineering, wiring and air-conditioning equipment. Only first choice and proven components are used for each device.

.....
e-container
.....

ADVANTAGES
■ Centrally operated touch-screen monitor, displaying all relevant data
■ Central control of all production parameters
■ Industrial Ethernet Powerlink connection to decentralised I/O points
■ Process data analyses
■ Integrated OEE (Overall Equipment Effectiveness)



control panel



FlexPack®

EXTRUSION COATING AND LAMINATING LINE

The name **FlexPack** stands for SML's new extrusion coating and laminating line concept, which is intended specifically for the flexible packaging market.

During the design phase, special attention was paid to the creation of a compact modular line with all the features required for safe, cost-efficient and user friendly production. The result is a system with an excellent price/performance ratio, which provides this special market segment with an outstanding product quality. Due to its modular design, the line can also be adapted to fulfil individual requirements.

Two automatic turret unwinds and a turret rewind facilitate the processing of various products that contain substrates such as paper, film, aluminium foil and nonwoven, etc.

The moveable extruder carriage is designed for co-extrusion and is equipped with the latest feedblock and die technology for precise product structures.

The complete line is fully synchronized by the SMILE control system, which enables quick product changeovers while reducing waste. Thus, the **FlexPack** sets new benchmarks in terms of ease of operation, productivity and profitability in this market sector.

Substrates	BOPP, BOPET, paper, aluminium foil, metallized film, barrier film, nonwoven, etc.	
Products	flexible packaging, tooth paste tubes, technical applications	
Product width	FlexPack 1500	700 – 1,350mm
	FlexPack 1800	800 – 1,650mm
Extrusion materials	LDPE, PP, EAA, EMA, EVA, ionomers....	
Coating weight	9 - 50 g/sqm (depending on product)	
Coating layers	3-layer (optional 5-layer)	
Maximal operating speed	350 m/min winding shafts 450 m/min shaftless	

UNWINDING EQUIPMENT:

Fully automatic turret unwinds offer automatic splicing at full operating speed, for constant production conditions. An optional, constant gap device is provided for highly sensitive substrates, such as aluminium foils, to allow smooth peel-off from the roll.

Maximal substrate diameter	1,200mm
Web tension	30 - 600N
Core fixation	winding shafts (shaftless optional)
Core diameter	3-inch, 6-inch (other dimensions on request)
Unwinding direction	both directions possible

CORONA TREATMENT:

A driven, ceramic treatment roll is equipped with a rubberized pressing roll for web tension control. Ceramic electrodes are available for the treatment of conductive and non-conductive substrates.

PRIMER COATING:

A gravure roll system with chamber doctor blade for anchor coating, is provided for bonding, when co-extrusion is not sufficient. The vertical dryer has movable hoods for a minimum space requirement. A driven post-cooling roll with a rubberized pressing roll offers exact web tension control.

DOUBLECOAT:

This technology has been integrated into the proven **FlexPack** extrusion coating line and combines extrusion coating with hot melt lamination, thus facilitating coating thickness minimisation. For example, a minimum coating layer thickness of 7µm can be achieved using TPE on a PP nonwoven. This corresponds with roughly a mere quarter of the current average for such coatings and results in enormous material savings. Excellent product quality is guaranteed and even with thin coating layers adhesion to the substrate is perfect and no pinholes occur.

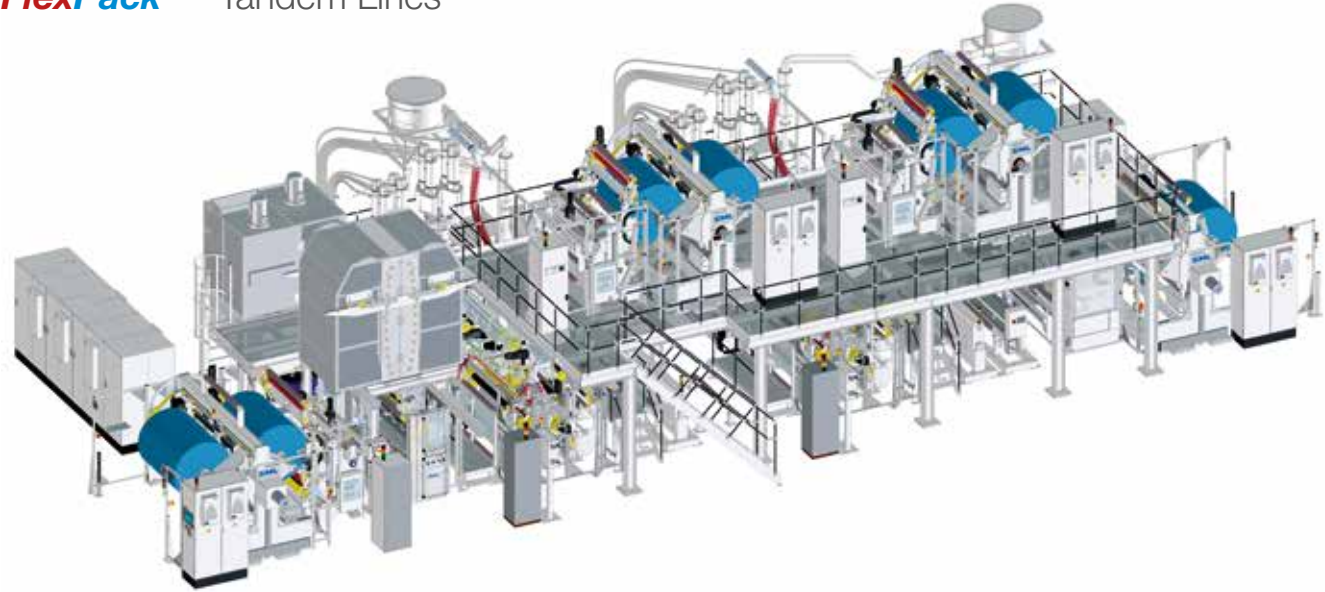


Another exciting feature of the process is enhanced product breathability. The coating thickness has a significant effect on the water vapour transmission rate (WVTR), as a thinner layer results in a reduction in water vapour flow resistance. Consequently, standard product breathability can be increased several times over. A further advantage offered by the new process is a reduction in the melt temperature to a minimum. This has a very positive effect on the mechanical characteristics of the coating because the material is subject to less stress during extrusion.

The advantages of the “DoubleCoat” process at a glance:

- Reduced coating layer thickness
- Material savings and hence lower costs
- Strong adhesion
- Improved breathability
- High water column
- Enhanced mechanical properties

FlexPack® – Tandem Lines



EXTRUSION:

Extruder carriage with a floor level track-system, motorized 3-axis movement and an adjustable die oscillation function.

- Gravimetric batch dosing system with 4 components (optional 6 components)
- Main extruder: Ø 90/33 L/D
- Side extruder: Ø 60/33 L/D
- Specially designed screws are installed for the polymers used in coating applications
- An advanced heating system on the barrel reduces energy consumption

TOOL UNIT, FEEDBLOCK AND FLAT DIE:

Compact housing with a piston-type manual filter and integrated manual melt pressure regulation valve.

- 3-layer feedblock with variable geometry
- T-die with manual or automatic die bolt adjustment
- EBR-deckling system (adjustable internal and external deckling)
- Removable die splitter for easy die cleaning
- Fume exhaust

COATING UNIT:

- Chill roll, Ø 800mm
- Rubberized pressing roll, Ø 200mm
- Steel supporting roll, Ø 250mm
- Quick-change equipment for each roll
- Adjustable stripper roll at the chill roll outlet
- Adjustable PTFE belt attachment for overcoating

THICKNESS MEASURING SYSTEM:

Frame with beta sensor for maximum product flexibility. Additional frames for differential thickness measuring as an option.

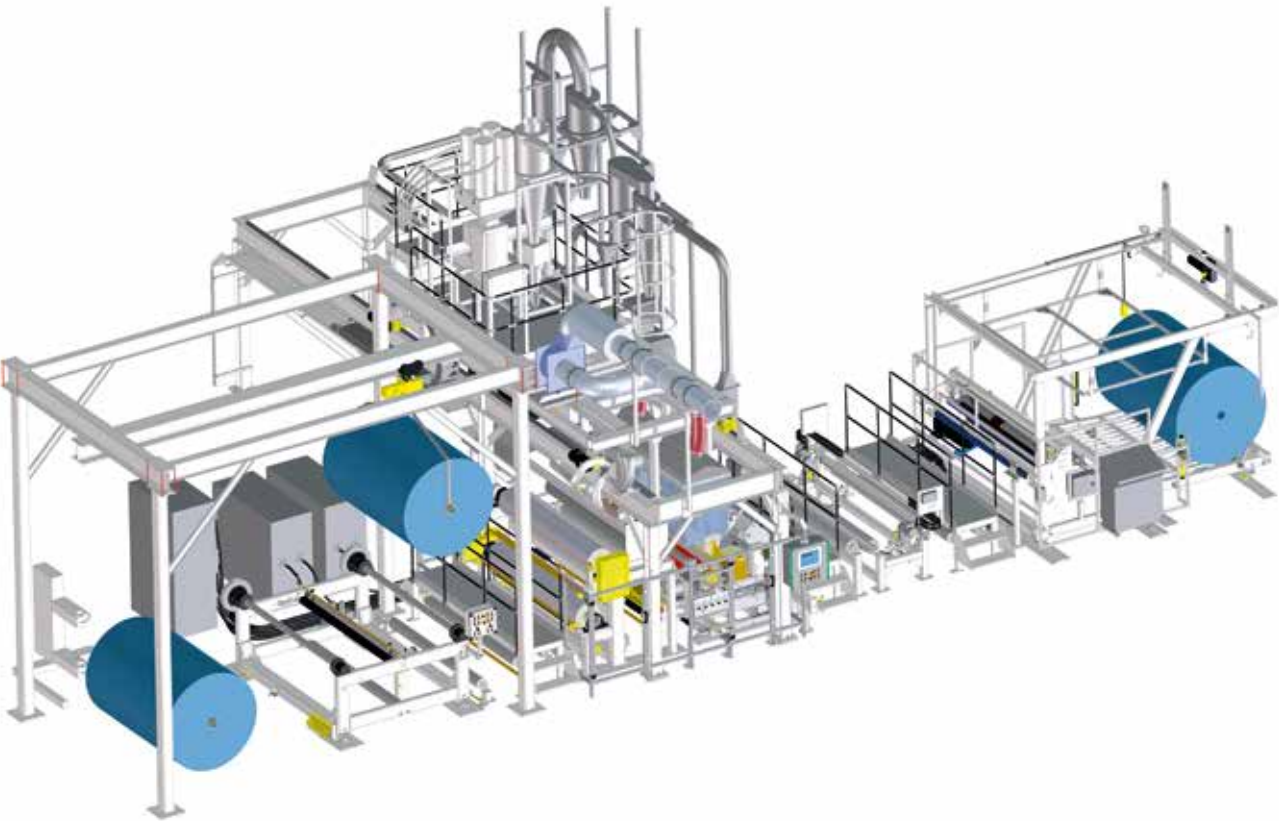
EDGE TRIM HANDLING:

- Shear cut system with circular knives and driven counter-knife, mounted at the exit of the coating unit.
- Edge trim suction system with blower, Venturi system, pre-cutter and sound absorber.
- Edge trim can either be collected in a big bag or container, or passed to a compactor.

WINDER W1500 WS OR SL:

Fully automatic turret winder with roll change at full operating speed for constant production conditions.

Maximal winding diameter	1,200mm WS (1,270mm SL)
Winding tension	50 - 750N
Core fixation	winding shafts (shaftless optional)
Core diameter	3-inch, 6-inch (other dimensions on request)
Winding direction	both directions possible
Cutting device	flying knife or chopping knife
Winding mode	contact or gap



WOVEN FABRIC EXTRUSION COATING LINES

SML has gained vast experience in manufacturing coating lines for fabrics. These lines are genuine workhorses for a tough environment and have been specifically designed for ease of operation. The end applications include tarpaulins, container liners, big bags, sacks, tents and woven bags laminated with printed BOPP film.

TECHNICAL DATA:

Substrates	woven fabric
Maximal flat product width	2,200mm
Maximal tubular product width	2,200mm, single-sided coating 750mm, double-sided coating
Extrusion materials	LDPE, PP
Coating weight	15 - 80g/sqm
Maximal operating speed	150 m/min

UNWINDING:

Double unwinding units with semi-automatic splice function

Maximal substrate diameter	1,500mm
Web tension	700N
Core fixation	winding shafts
Core diameter	4-inch, 6-inch, 8-inch (other dimensions on request)

SUBSTRATE TREATMENT:

The lines are equipped with a corona treatment station with silicone treatment roll and stainless steel electrodes. An optional cleaning system is available for contaminated substrates.

A preheating system with two heating rolls increases bonding strength during the coating process and flattens out the substrate.



EXTRUSION:

A hanging extruder arrangement with edge trim re-feeding system ensures minimum waste and optimum efficiency. With a continuous melt filter system downtimes for cleaning are reduced.



COATING UNIT:

An integrated reversing triangle facilitates the coating of tubular fabrics on both sides, in a single production step.



PERFORATION UNIT:

Residual air can be exhausted by means of a micro-perforation system, which makes subsequent bag filling easier and raises the attainable production speed.

EDGE TRIM:

The entire cutting system is mounted on linear guides. An optical sensor detects the edge of the product and tracks the complete cutting process, with the result that just the overcoat is trimmed off. This is then fed back directly to the extruder.



WINDER:

The recommended winding system for this application is the surface winder W100. Tubular substrates have thicker edges. Moreover, small tubular fabric for bags, which are coated on both sides in a single pass are not arriving in the centre line of the winder. These factors result in difficult winding conditions. To avoid bullhorns the complete winder can oscillate and be moved off centre.





EXTRA WIDE EXTRUSION COATING AND LAMINATING LINES

Coating of wide products has been one of the core competencies of SML for decades.

Because the applications for this type of line are usually very special, extra wide coating and laminating lines are custom built. SML has produced and successfully installed such wide lines for a variety of applications. Thus, we can advise and supply our customers also in case they have very special applications in mind.



Substrates	woven fabric, paper, nonwovens, grids, etc.
Products	tarpaulins, steel wrap, wood wrap, roofing membranes, tents, landfill liner, geo membranes, carpets, truck cover, scaffold sheeting, technical laminates,...
Product width	up to 5,300mm
Extrusion materials	LDPE, PP, EAA, EMA, EVA, TPE
Coating weight	15 - 80 or 80 - 600g/sqm, others on request
Extrusion layer	mono or co-extrusion
Maximal operating speed	250 m/min

Lines which need to handle wide substrates are special. The complete machine frame needs to be very massive to withstand the high web tensions and to avoid vibrations.

UNWINDING:

Either fully automatic turret unwinds with automatic splice for full operating speed for constant production conditions or double unwinding units with semi-automatic splice can be offered.

Maximal substrate diameter	1,200mm (optional 1,500mm)
Web tension	up to 1,600N
Core fixation	shaftless or winding shafts
Core diameter	6-inch, 8-inch (other dimensions on request)



SUBSTRATE TREATMENT:

Possible treatment methods are corona treatment or flame treatment. Since substrates such as woven fabrics are often contaminated with dust, they need to be cleaned before in-line treatment.

EXTRUSION:

Wide dies have a bigger cross section and to accommodate wide dies, hanging extruder arrangements ensure much better stability, compared to a floor carriage with cantilever design. Wide lines also require high output extruders to run at the optimum production speed. For special applications, twin screw extruders are selected.

COATING UNIT:

The wider a line gets, the more effort needs to be invested to avoid bending of the rollers. Big diameter rollers in combination with calculated bending compensation are required to achieve a constant pressing nip over the whole product width.

WINDER:

Winders for this application need to be able to handle rolls with big diameters and several tons of weight. SML offers a turret winder as well as a drum winder for these applications. Out of one wide web several smaller webs can be cut. To avoid the additional operating step of slitting, it is possible to do inline slitting on the coating line.



PROCESS COMBINATIONS AND INTEGRATIONS

SML offers machinery for all major flat die extrusion processes, such as cast film, sheet calendering and extrusion coating. It is obvious to combine the know-how derived from this different operations to build-up integrated production lines.

Individual substrates, which are required in a laminated structure are often produced using the cast or calendering method. In order to optimize production costs this processes can be merged into the extrusion laminating system to form a single line that handles both substrate fabrication and lamination in one single machine.



integrated laminator for spunbond line

Examples of this type of combination include production lines for asymmetric PA/PE barrier films and inline PET/PE lamination for sealable PET-trays.

In addition, SML has already integrated extrusion-coating stations into both spunbond and foamed film lines. The TDO stretching of extrusion-coated products has also been implemented.



HIGHEST QUALITY PRODUCTS





EXTRUSION LINES – ENGINEERED TO PERFORM ►

SML - Head Office

Bundesstrasse 1a
A-4860 Lenzing, Austria
Phone: +43-7672-912-0
Fax: +43-7672-912-9
E-mail: sml@sml.at
www.sml.at

SML - Machinery Far East Sdn Bhd

(1029958-P)
1201 Block B, Menara Amcorp
No.18 Jalan Persiaran Barat
46050 Petaling Jaya
Selangor Darul Ehsan,
Selangor, Malaysia
Phone: +60-3-7955-9098
Fax: +60-3-7955-9981
E-mail: yen@sml.at

SML - Moscow Office

Ogorodny proezd, 5
Building 6, office 504
127254 Moscow
Russia
Phone: +7 495 618 8007
Fax: +7 495 619 5961
E-mail: kna@sml.at

SML - Beijing Office

Unit 1410, Landmark Tower
No. 8 North Dongsanhuan Road
Chaoyang District
100004 Beijing, P.R. of China
Phone: +86-10-6590-0946
Fax: +86-10-6590-0949
E-mail: sml@sml.bj.cn

100%
eXtrusion
COATING LINES

ANALYSES | DEVELOPMENT

PRE-TESTED PERFORMANCE | DELIVERY ON TIME

SERVICE SUPPORT | CUSTOMER SATISFACTION

www.sml.at