



SML

EXTRUSION LINES – ENGINEERED TO PERFORM ►

► **Stretch wrap
film**

Cast film lines

www.sml.at



Expressive design,
impressive technology

Stretch wrap film lines

Outstanding technology, modern design and high performance

Given SML's solid reputation as a market and technological leader, you can be certain that you're working with a proven success strategy. In the highly competitive stretch film industry, it is particularly comforting to know that SML's stretch film lines reliably produce films of outstanding quality.

Expert guidance

We offer a range of standard stretch film lines available in widths from 1,500 mm to 6,000 mm (3-up to 12-up). Alternatively, we can develop customised lines based on our standard concepts.

We take great care to ensure that your needs are met. Our team will analyse your individual situation and provide expert advice throughout the decision-making process.

Varied winding systems

The following winding systems are available to you: inline winding on 2-inch cores for hand stretch film, coreless or shaftless winding systems, as well as thin core technology. An optional device is available to customers for edge modification. This upgrade allows for the use of lightweight handrolls with reinforced, indestructible edges.



High output, high efficiency

In stretch wrap film production, raw materials account for over 80% of costs. To address this, SML has developed high-performance stretch wrap film lines with exceptional output capacities. In combination with cost-saving formulations, rigorous safety standards and minimised waste rates, SML achieves maximum line efficiency and significantly reduces production costs.

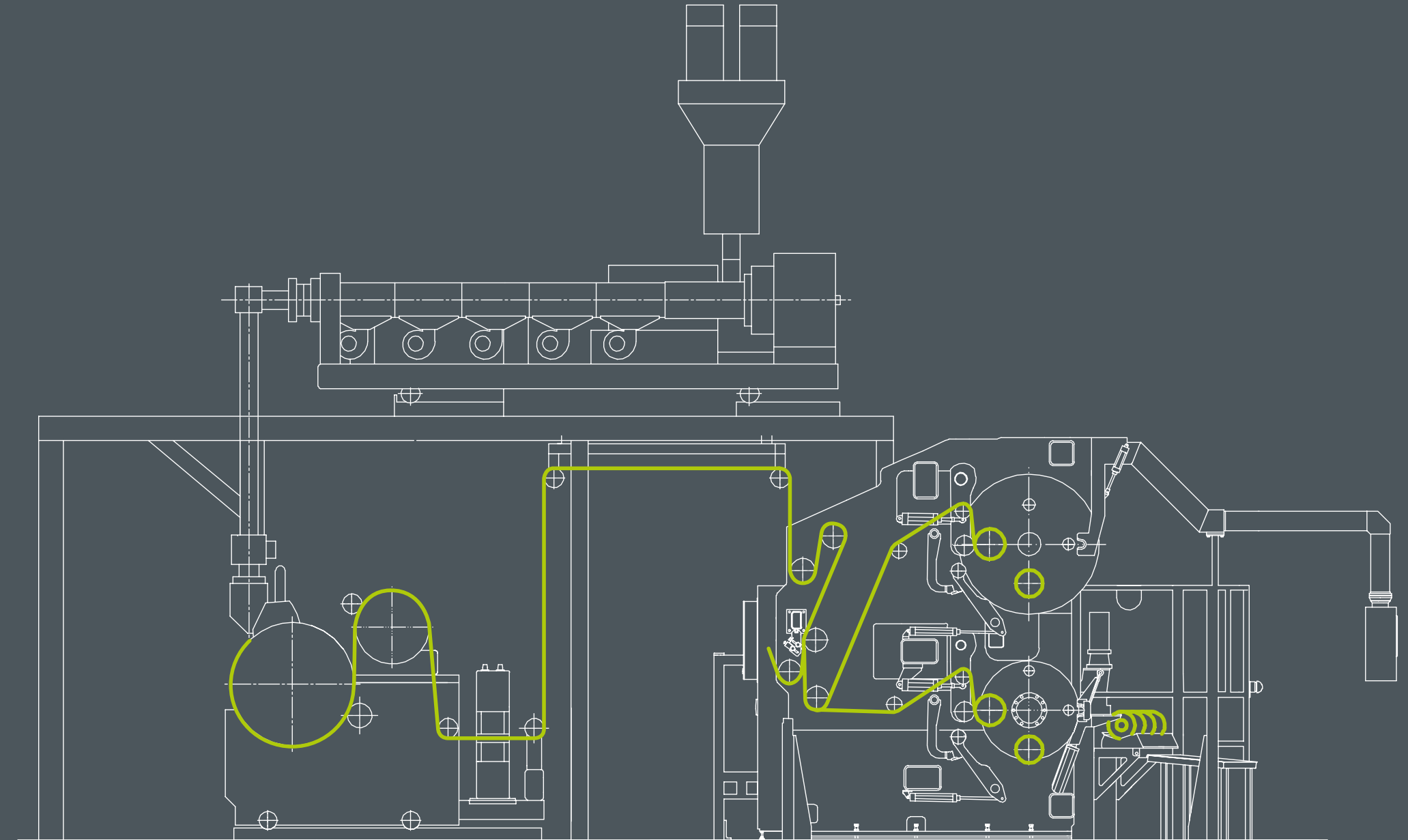
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Stretch wrap film lines

The path the film follows





MiniCast

Small space, big performance.

The MiniCast stands out as the ideal solution for **best production output/floorspace ratio.**

Despite its compact size, this stretch film line is surprisingly well equipped. Up to four extruders can be fit on a minimum floor area of less than 100 sqm which facilitate a combined extrusion throughput of 1,200–1,400 kg/h. Pre-manufacturing of standard configurations ensures that MiniCast lines are available within short delivery times.



1.5 m line concept, 3-up

Single roll casting station

The machine incorporates a single roll casting station with a chill roll diameter of 1,200 or 1,600 mm and an optical thickness measuring system for translucent films, or an X-ray version for opaque films.

Chill roll unit

- ▶ Chill roll Ø 1,200 mm or 1,600 mm, width 2,100 mm
- ▶ IR thickness measurement
- ▶ Alternative: X-ray or beta sensor
- ▶ Oscillating frame

Edge trim re-feeding system

The system is equipped with a vertical scraptruder (fluff re-feeding system). Alternative: recycling unit with reel feeder for the pelletising of edge trim and start-up rolls.

Winding of hand, machine and jumbo rolls

We can always provide the ideal winder type to suit your unique needs. In the case of the MiniCast, the winder W4000-2S or W4000-4S can be integrated. With the single-turrent version of the W4000-4S winder, for example, the MiniCast guarantees top quality winding of hand rolls on 2-inch cores as well as machine and jumbo rolls on 3-inch cores.



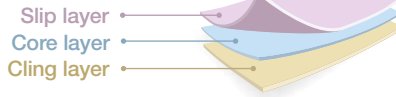
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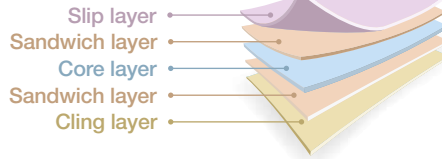
PRODUCT SPECIFICATION

Products	Super power, machine, hand, cling and agricultural film	
Film thickness range	8–50 µm	
Film final width	3 x 500 mm	
Film structure	3 or 5 layers	
Production speed	Up to 650 m/min	
Film thickness / net output value	12 µm	600 kg/h
	17 µm	845 kg/h
	23 µm / MiniCast3L	900 kg/h
	23 µm / MiniCast5L	1,050 kg/h

MiniCast 3L



MiniCast 5L



Select your line configuration

MiniCast3L		MiniCast5L	
3 extruders:		4 extruders:	
1 x 90/33	800 kg/h	1 x 90/33	800 kg/h
2 x 60/28	2 x 190 kg/h	3 x 60/28	3 x 190 kg/h
SML advanced heaters for the extruder barrels		SML advanced heaters for the extruder barrels	
3-layer feedblock		5-layer feedblock	
Automatic flat die: 2,050 mm		Automatic flat die: 2,050 mm	



EcoCompact II

Compact outside, flexible inside.

The EcoCompact line is your proven solution for **top quality stretch film production.**

Unexpectedly flexible for its size, the EcoCompact enables stretch film production with a width of 2 m (4-up) with extruder outputs of up to 1,600 kg/h. Three different winders can be integrated to get the best and most cost-efficient solution.

A pre-stretch unit for the inline production of pre-stretch rolls can also be installed on the EcoCompact, further increasing the application possibilities.



2 m line concept, 4-up

Product changes made easy

For many customers, the EcoCompact stretch film line is simply the most flexible line. Product changes are easy in comparison with larger production lines. SML usually delivers the EcoCompact in a three, five or seven layer version. Another benefit is the ability to make quick changes to the core diameter.

Chill roll unit

- First chill roll Ø 1,200 mm or 1,600 mm, width 2,700 mm
- Optional second chill roll Ø 400 mm, width 2,700 mm
- IR thickness measurement
- Alternative: X-ray or beta sensor
- Oscillating frame
- Cut-resistant guiding rolls

Edge trim re-feeding system

The EcoCompact is a true space-saver requiring only 140 sqm, including an inline recycling system. A reel feeder is integrated in the recycling unit for the pelletising of edge trims and start-up rolls. The alternative is a vertical scraptruder (fluff re-feeding system).

Winder

Depending on the customer's requirements, winders W4000-2S, W4000-4S as well as winder W3000-4S can be integrated in the EcoCompact. Various final widths of 400, 450, 500 and 1000 mm are possible.



PRODUCT SPECIFICATION

Products	Super power, machine, hand, cling and agricultural film	
Film thickness range	8–50 µm	
Film final width	4 x 500 mm	
Film structure	3, 5 or 7 layers	
Production speed	Up to 750 m/min	
Film thickness / net output value	12 µm	800 kg/h
	17 µm	1,125 kg/h
	23 µm	1,200 kg/h

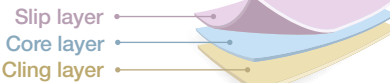
Select your line configuration

EcoCompact II S	EcoCompact II M	EcoCompact II L	EcoCompact II XL
Gravimetric batch dosing system with 2 components. Option: 3 or 4 components			
4 extruders: 1 x HSE 90/33 900 kg/h 1 x 75/33 300 kg/h 2 x 60/28 190 kg/h	5 extruders: 1 x HSE 90/33 900 kg/h 4 x 60/28 190 kg/h	6 extruders: 2 x 90/33 600 kg/h 4 x 60/28 190 kg/h	7 extruders: 2 x 90/33 600 kg/h 5 x 60/28 190 kg/h
SML advanced heaters for the extruder barrels			
5-layer feedblock	5-layer feedblock	7-layer feedblock	7-layer feedblock
Automatic flat die: 2,600 mm			

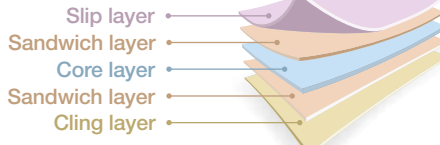
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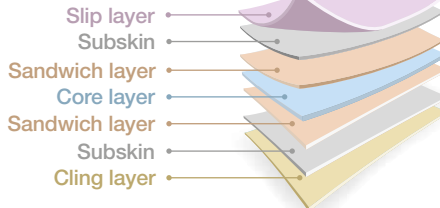
EcoCompact 3L



EcoCompact 5L



EcoCompact 7L





SmartCast

Modular, flexible, powerful.

The SmartCast brand stands for a 3 m wide (6-up) machine which produces stretch film at a top performance level and with the **greatest variety of equipment options.**

This line’s exceptional popularity can be attributed to its numerous features. One key aspect is its modular concept, which allows customers to choose from four pre-configured extrusion units. This flexibility enables them to determine the number of layers according to their specific needs. The line’s impressive output capacity, ranging from 1,900 to 3,000 kg/h, is also a significant factor in its popularity.

The ability to integrate a pre-stretch unit to produce inline pre-stretch rolls is another key attribute that underlines the high level of customisation.



3 m line concept, 6-up

Vibration-free chill roll unit

In addition to the latest standard and high-speed extruders, SML has improved the chill roll unit, incorporating new functions to prevent vibrations. This contributes to a 100 % reproducible casting position; all process parameters can be repeated.

Chill roll unit

- ▶ First chill roll Ø 1,200 mm or 1,600 mm, width 3,800 mm
- ▶ Optional second chill roll Ø 400 mm, width 3,800 mm
- ▶ Automatic positioning
- ▶ IR thickness measurement
- ▶ Alternative: X-ray or beta sensor
- ▶ Oscillating frame
- ▶ Cut-resistant guiding rolls

Edge trim re-feeding system

The system is equipped with a vertical scraptruder (fluff re-feeding system). Alternative: recycling unit with reel feeder for the pelletising of edge trim and start-up rolls.

Winders of your choice

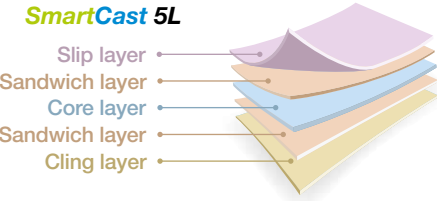
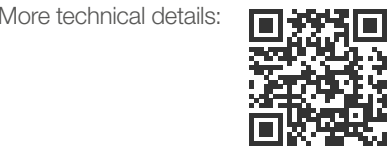
Our film winders are a key component in each of our stretch wrap film lines. For the SmartCast, there are three different winder models to choose from depending on your requirements: the W4000-2S, W4000-4S and W3000-4S winders.

PRODUCT SPECIFICATION

Products	Super power, machine, hand, cling and agricultural film	
Film thickness range	8–50 µm	
Film final width	6 x 500 mm	
Film structure	5–67 layers	
Production speed	Up to 800 m/min	
Film thickness / net output value	12 µm	1,400 kg/h
	17 µm	2,000 kg/h
	23 µm	2,400 kg/h

Select your line configuration

SmartCast S	SmartCast M	SmartCast L	SmartCast XL
Gravimetric batch dosing system with 2 components. Option: 3 or 4 components			
5 extruders: 2 x 90/33 each 600 kg/h 1 x 75/33 480 kg/h 2 x 60/28 240 kg/h	6 extruders: 2 x 90/33 each 750 kg/h 4 x 60/28 each 240 kg/h	5 extruders: 2 x HSE 90/33 each 950 kg/h 1 x 90/33 600 kg/h 2 x 75/33 each 300 kg/h	6 extruders: 2 x HSE 90/33 each 950 kg/h 4 x 75/33 each 300 kg/h
SML advanced heaters for the extruder barrels			
Edge encapsulation extruder 45/28 (optional)			
5-layer feedblock	7-layer feedblock	5-layer feedblock	7-layer feedblock
Automatic flat die: 3,800 mm			





PowerCast XL

Film production at unparalleled levels.

Designed in a width of 4 (8-up) or 4.5 m (9-up), the PowerCast offers **unparalleled versatility**. It can handle all roll sizes, including 3-inch hand, machine and jumbo rolls at **exceptionally high production speeds** - a capability that is currently unmatched.



4.5 m line concept, 9-up

Flexible configuration

The latest generation of SML's high-performance extruders sets this machine apart. For easy customisation, the PowerCast is fitted with three pre-configured extrusion units at throughputs ranging from 2,400 kg/h to 4,200 kg/h and the choice between 7 to 67 layers.

In addition, the lines chill roll unit is equipped with a 1,600 mm diameter chill roll, which ensures smooth and vibration-free operations.

Chill roll unit

- First chill roll Ø 1,600 mm, width 5,000 mm
- Optional second chill roll Ø 400 mm, width 5,000 mm
- Automatic positioning
- IR thickness measurement
- Alternative: X-ray or beta sensor
- Oscillating frame
- Cut-resistant guiding rolls

Edge trim re-feeding system

The recycling unit is equipped with a vertical scraptruder (fluff re-feeding system). The alternative is a recycling unit with a reel feeder for the pelletising of edge trims and start-up rolls.

Winder

The winder W4000-4S makes quick changeovers for different roll widths effortless. With the PowerCast XL-version, it is possible to easily handle rolls of various widths, including 400 mm, 450 mm, 500 mm, and 750 mm, all without the need for a deckling or wider edge trim.

Both the W4000-4S and W4000-2S winders can be integrated into a PowerCast stretch film line.

More technical details:



PRODUCT SPECIFICATION

Products	Super power, machine, hand, cling and agricultural film	
Film thickness range	8–50 µm	
Film final width double turret	9 x 500 mm, 10 x 450 mm, 11 x 400 mm	
Film final width triple turret	9 x 500 mm, 6 x 750 mm	
Film structure	7–67 layers	
Production speed	Up to 800 m/min	
Film thickness / net output value	12 µm	> 2,000 kg/h
	23 µm	3,400 kg/h

Select your line configuration

PowerCast S	PowerCast L	PowerCast XL
Gravimetric batch dosing system with 2 components. Option: 3 or 4 components		
7 extruders: 2 x 90/33 each 600 kg/h 5 x 60/28 each 240 kg/h	7 extruders: 2 x 90/33 each 950 kg/h 5 x 75/33 each 380 kg/h	7 extruders: 2 x 90/33 each 950 kg/h 4 x 75/33 each 450 kg/h 1 x 90/33 600 kg/h
SML advanced heaters for the extruder barrels		
Edge encapsulation extruder 45/28D (optional)		
7-layer feedblock (optional 9, 11, 13, 55, 67 layers)		
Automatic flat die: 4,800 mm		5,450 mm



MasterCast

Stepping up the game with unrivalled output.

The production of machine rolls in **high volumes with maximum efficiency** requires production lines with an **exceptional output range** – the MasterCast.

The numbers speak for themselves: the MasterCast enables production in a width of 6 meters (12-up) and an installed extrusion capacity of up to 5,000 kg/h. These values are unique – worldwide.



6 m line concept, 12-up

Efficiency in excellence

A production line of this scale provides an unparalleled return on investment, with a superior ratio of costs to output per kilogram. Additionally, it minimises labour costs and optimises energy consumption, making it the most efficient system conceivable.

Five or seven layer version

Equipped with proven SML components, the MasterCast is available in a five and a seven layer version. In combination with the fully automatic triple turret winder W4000, the MasterCast sets standards for the mass production of stretch wrap films.

Chill roll unit

- First chill roll Ø 1,200 mm or 1,500 mm, width 7,000 mm
- Optional second chill roll Ø 600 mm, width 7,000 mm
- IR thickness measurement
- Alternative: X-ray or beta sensor
- Oscillating frame
- Cut-resistant guiding rolls

Edge trim re-feeding system

The recycling unit is equipped with a vertical scraptruder (fluff re-feeding system). The alternative is a recycling unit with a reel feeder for the pelletising of edge trims and start-up rolls.

Winder

Our film winders are a key component in each of our stretch wrap film lines. SML's W4000-2S and W4000-4S winders are used in the MasterCast. Both winder versions are capable of handling 2-inch and 3-inch cores, as well as thin wall thicknesses (thin core technology).



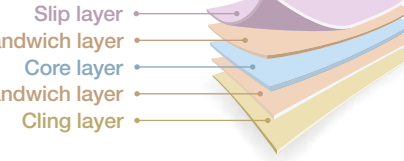
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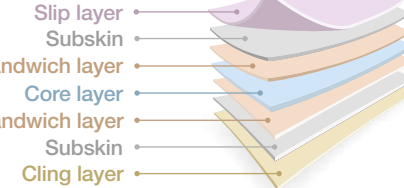
PRODUCT SPECIFICATION

Products	Super power, machine, hand, cling and agricultural film	
Film thickness range	8–50 µm	
Film final width	12 x 500 mm	
Film structure	5 or 7 layers	
Production speed	Up to 650 m/min	
Film thickness / net output value	12 µm	2,400 kg/h
	17 µm	3,300 kg/h
	23 µm	4,000 kg/h

MasterCast 5L



MasterCast 7L



Select your line configuration

MasterCast5L	MasterCast7L
Gravimetric batch dosing system with 2 components. Option: 3 or 4 components	
5 extruders: 2 x 150/33 each 1,250 kg/h 1 x 135/33 1,050 kg/h 2 x 90/33 each 600 kg/h	6 extruders: 2 x 150/33 each 1,250 kg/h 4 x 90/33 each 600 kg/h
SML advanced heaters for extruder barrels	
5-layer feedblock	7-layer feedblock (edge encapsulation optional)
Automatic flat die: 6,950 mm	

► Inline pre-stretch unit

A revolutionary advancement in efficient stretch film production.

SML's inline pre-stretch unit sets a new benchmark for efficiency in stretch film production. Inline pre-stretching streamlines the manufacturing process, resulting in significantly reduced production efforts.

The primary objective of pre-stretching is to decrease the thickness of stretch wrap film while achieving a stiff and rigid product. In combination with SML's advanced winding technology, the inline pre-stretch unit enables the stable production of high-quality pre-stretch film in a single, continuous process at considerable high speeds.



Enhanced efficiency and cost savings

The inline production of pre-stretch film offers substantial advantages, in particular reduced labour and logistics costs. As the product is ready for sale immediately after winding, the entire production process becomes significantly more efficient. This streamlined approach eliminates the need for secondary processing, which results in cost savings and increased productivity.

Versatile application

The inline pre-stretch unit is designed to produce "typical" pre-stretch products, such as hand rolls with folded edges and oscillated winding, and is compatible with 2-inch, 2 ½-inch, and 3-inch cores. Additionally, core separation at the winder for different standard core lengths is available as an optional feature.

KEY FACTS AT A GLANCE

- Single-stage, high-speed production
- Ready-to-sell product
- Compatibility with various cores sizes
- Reduced labour and logistics costs

► Products

Pallet stretch wrap film represents the **biggest share of the cast film** market. Notably, it has the lowest unit wrap weight compared to other films used for palletising solutions.

For that reason, it is the most cost-effective way for the safe packaging of items on pallets. Additionally, pallet stretch wrap film is also an eco-friendly choice, as it can be manufactured almost 100% from recycled materials.



Wide range of different film types

In response to the various requirements for different transportation methods and distances, a wide range of stretch film types is established in the market. Today, stretch wrap products range from simple 3-layer hand films to machine film grades with very high pre-stretch rates and dart-drop values.

SML also makes extensive use of its in-house testing facilities and demonstration lines to continuously develop new stretch film products in close cooperation with its partners.



► **Component description**



Raw material handling

SML's gravimetric batch blenders and continuous gravimetric feeders guarantee material blending accuracy at the highest level. Up to six components per extruder can be processed, providing maximum flexibility.

Extrusion unit

All extruders used in SML's stretch film lines are designed to handle a wide range of polymers used in this market. A choice of standard versions with 45 – 180 mm screw diameters and a 90 mm high-speed version are available. The extruders with an L/D ratio of 28 or 33 and bimetallic barrels are driven by energy-efficient, water-cooled AC motors as a standard feature.

Highly advanced screw design

Although stretch wrap film is a commodity product, the screw design is highly sophisticated. For example, hardened flanks, barrier, shearing and mixing zones are all employed inline with the layer characteristics, such as slip, cling or functional layers and the polymers utilised in the extruder. Today, apart from standard LLDPEs in C4, C6, or C8 quality, an increasing number of mLLDPEs with widely spread MFIs and even other polymers, such as PP, are used in today's stretch film production.

Heating system with gravity-closing flap

The extruder barrel of all extruder types is heated by the SML advanced heating system. A gravity-closing flap prevents the escape of hot air from the system, thus retaining the heat in the barrel.

Melt filtration

Effective melt filtration for the removal of impurities, un-melted or cross-linked particles, is extremely important. SML installs manual or hydraulic piston filters in its stretch film lines.



Extrusion tool unit

Extruder characteristics

	45/28	60/28	75/33	90/33	HSE90	120/33	135/33	150/33	180/33
Screw rpm	289	272	294	226	350	146	139	139	114
No. of zones	3	4	5	5	5	6	7	8	9
Output in [kg/h]*	95	240	480	600	950	950	1,050	1,250	1,600

* For reference only. Depending on the drive power installed, actual output may differ.

Feedblock and flat die

As a leading supplier of stretch film lines, SML partners with trusted industry experts to source its feedblocks and flat dies.

Ready for multiple layers

The trend in the production of stretch films is towards more complex film structures with a higher number of layers. Nowadays, 5, 7 or even 13 layers are standard. Co-extrusion flat dies with T-channels are capable of incorporating fixed or variable internal decking systems.

This feature provides an efficient means of varying the net film width. Depending on the manufacturer, dies are either chrome or nickel plated, but in both cases, automatic die-control via thermally heated bolts is standard.

SML nano 67: refined stretch film production at its best

On request, SML builds lines with even more layers, utilising MicroLayer or NanoLayer™ technology. The specific design boosts film performance in terms of elongation, puncture and tear propagation. A unique layer sequence and extruder combination make it possible to get the best out of every material used and delivers unsurpassed film quality. SML nano 67 is available on SmartCast, PowerCast and PowerCast XL.

Anything but ordinary: the Reflex die

SML relies on the advantages of the fully automatic Reflex die - the benchmark for ultra-fast and hands-free die lip control.

Faster and more efficient product changeovers are just a few of the advantages over conventional die design. Using the Reflex die in combination with SML's Booster technology, cross-profile adjustments can be done fully automatically; time-consuming manual settings by the operator are no longer necessary.



Feedblock and flat die

Automatic die mapping

For precise film thickness control, our stretch film lines can be equipped with an automatic die mapping system. This innovative technology measures the actual film profile, marks the film using air jets, and then measures these marks to automatically correct even the smallest deviations in the film thickness profile. The system updates the mapping completely automatically, obviating the need for manual intervention. Compared to manual mapping methods, our automatic die mapping system enables faster responses to variations in film thickness, eliminates human error, and significantly reduces waste during product changes.

Edge encapsulation system

SML recommends edge encapsulation, particularly for manufacturing thin films using PCR/PIR materials at high line speeds. An additional extruder feeds a divided melt stream of LLDPE to the edges of the die. Edge encapsulation stabilises the melt curtain and thus reduces the danger of trim loss during production. A return on the additional investment required for the edge encapsulation system is obtained very quickly, as the downtimes caused by edge breaks during conventional production can be avoided and higher production speeds are possible.

Die splitting system

SML's die splitting system enables quick and safe die opening for cleaning purposes. Meanwhile, the die remains in its original position in the machine and continues to be heated.

Edge pinning

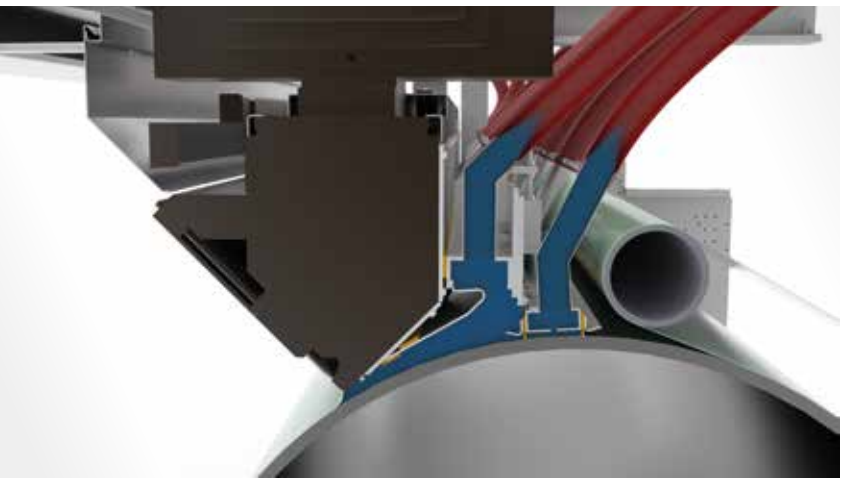
A combined electrostatic and pneumatic pinning system fixes the film to the chill roll surface. The adjustable electrostatic power and air pressure, as well as easy positioning, allow precise pinning with an excellent film edge contact on the chill roll.

Vacuum box

The vacuum box, mounted directly on the die body, consists of two or three chambers. The prechamber extracts the air stream caused by the rotating chill roll, while the main chamber maintains a low air pressure between the extruded film and the chill roll. The third chamber is at the left and right end of the box. It takes special care of the edges of the film. In addition, the length of the melt curtain can be adjusted before it touches the chill roll. All the chambers are equipped with separate speed-controlled suction fans.



Double chamber vacuum box



Double chamber vacuum box



Chill roll unit

Apart from the extrusion section, the characteristics of the chill roll unit in combination with the vacuum box have a significant influence on the final product quality. Parameters such as the position relative to the flat die, the chill roll temperatures and its surface have a direct effect on the film. In this connection, SML's extensive experience in manufacturing stretch film lines enables us to quickly determine the ideal parameters for meeting specific customer needs.

Chill rolls with specified surface properties

The chill roll unit consists of one or two cooling rolls, for which careful surface selection is vital. The electro-chemically matted surface of the first chill roll provides an extremely homogeneous surface and a very high cooling capacity. This surface also allows the straightforward removal of the film from the chill roll due to a well-positioned guide roller. The second chill roll has a polished surface for highly effective stretch film post-cooling. Both rolls are chromium-plated and equipped with separate water tempering systems and drives.

Economic film thickness regulation

SML places the thickness gauging unit directly on the chill roll frame behind the chill roll. The shortest achievable distance from the die lip to the measuring point ensures minimum reaction times for extremely economic film thickness regulation. In response to local regulations in customer countries and specific product needs, SML supplies automatic gauging systems either with infrared, X-ray or beta-ray sensors.

After leaving the chill roll, the film is transported to the winder via cut-resistant guiding rolls. These have a specially hardened surface for a high film grip and a long service life.



Fluff re-feeding unit

Trim handling system

For economical stretch film production, complete trim recycling is essential. With SML's stretch wrap film lines, the edges are cut off directly at the winder entrance and, depending on the winding system, bleed trims are also removed. Fluff or pellet re-feeding are the two possibilities for integrating edge and bleed trims back into the process. In both cases, a blower system transports the trims, either to the grinder in the fluff re-feeding system, or directly to the recycling unit.

Fluff re-feeding

In the fluff re-feeding system, the trims are drawn through a grinder and then transported to a vertical scraptruder. This feeds the fluff together with virgin material directly to an extruder to the core layer. Fluff re-feeding is the more energy-efficient and material-friendly method, as no additional melting is involved.

Pellet re-feeding

In the case of the pellet re-feeding, the trim is melted and re-pelletised in a separate recycling unit and then drawn to the dosing system of an extruder. This process offers greater flexibility regarding the use of recycled pellets in different extrusion lines. It is a convenient solution when frequent colour changes are required and for the recovery of waste and off-spec rolls.



Recycling unit

► **Winder**

The winder is the central component in a stretch film line and plays a crucial role in determining the overall line performance. Before entering the winder, the film is oscillated in an overhead positioned frame in order to ensure a perfect film roll surface. Both the oscillation distance and the speed are adjustable.

Constant upgrades

SML is proud of its peak-performance winders, which are the result of many years of intensive, in-house development. Every new product, idea or requirement spotted in the market, or that is the subject of a customer inquiry, is passed on to the R&D department. Following a detailed assessment, SML then upgrades its winders with corresponding new features.

Different winding solutions

SML has created three different winding systems for the production of stretch wrap film. All of these have a solid, vibration-free steel frame construction which can resist the dynamic forces generated at high production speeds.

Winding systems



Choose the ideal winder for your application

	Winder W3000-4S	Winder W4000-2S	Winder W4000-4S
Thickness range	8–35 µm	8–50 µm	8–50 µm
Max. mechanical speed	650 m/min	850 m/min	850 m/min
Winding width	4–6 x 500 mm	3–12 x 500 mm	3–12 x 500 mm
Part roll width	400, 450, 500 mm	variable	variable
Winding on 2-inches	yes	no	yes
Winding on 3-inches	yes	yes	yes
Coreless winding	no	yes	yes
Max. mechanical diameter 2-inches	180 mm	no	180 mm
Max. mechanical diameter 3-inches	400 mm	425 mm	425 mm
No. of winding stations per turret	4	2	4
No. of winding turrets	single	single / double / triple	single / double / triple
No. of winding shafts	shaftless	2 / 4 / 6	4 / 8 / 12
Minimum cycle time	20 s	60 s	20 s
Film tail	very short	standard	ultra short
Bleed trim	bleed trim-free	yes	yes
Winding tension	0–100 N/m	0–100 N/m	0–100 N/m
Contact roll pressure	50–500 N/m	50–500 N/m	50–500 N/m
Core and roll handling manual	no	optional	optional
Core and roll handling automatic	yes	yes	yes

Coreless winding

Coreless winding

Less paper cores – less carbon footprint

SML has been working on coreless winding technologies for more than 10 years and has established this technology successfully on the market. For SML, continuous further development and refinements are a matter of course.

Today, coreless winding offers a significant step towards sustainability in stretch film production. By eliminating the need for cardboard or plastic cores, manufacturers can realise a multitude of benefits, including reduced costs, easier handling and environmental impact through the prevention of waste.

Cost-efficiency

Coreless winding offers cost benefits threefold: firstly, coreless winding eliminates the initial purchase cost of cardboard cores; secondly, it saves on transportation costs associated with shipping and storing, and thirdly, it negates the costs and logistical efforts of disposing used cores.

Waste reduction

Coreless stretch film does not require cardboard cores; thus, waste can be considerably reduced. Additionally, coreless stretch film enables users to utilise the full length of the film, eliminating unnecessary waste. To get the most out of coreless stretch film, it is essential to use a suitable dispenser or holder.

An example calculation

Based on an annual stretch film production of 16,000 tons: a standard machine roll contains 16 kg of stretch film and a 1.2 kg paper core, resulting in approximately 1 million cardboard cores per year. By utilising SML ThinCore Technology, manufacturers can already reduce core weight to 0.7 kg, decreasing their carbon footprint by 500,000 kg CO2 eq per year. However, coreless winding technology eliminates the need for cores altogether. This minimises the carbon footprint by 1.2 million kg CO2 eq annually!

Lightweight handling

Coreless winding makes a difference for the user. As coreless film rolls do not include the weight of cardboard core, they are easier to handle and benefit from an ergonomic, user-friendly application.



Special winder design

In coreless winding, tension is crucial to ensure a stable product and an efficient production process. To address this, SML has developed innovative methods to precisely control and regulate the tension of the film during winding. The winding itself takes place on special winding shafts which have been designed especially for SML's W4000 turret winders - whether single, double or triple turret version.

Quick change-over and flexibility in production

SML's turret winder W4000 is designed for both coreless winding and winding on cardboard cores. Quick and seamless switches between coreless winding and winding on rigid cores is achieved at the touch of a button. A change of winding shafts is not necessary, thereby maximises production efficiency and minimises downtimes.

Coreless stretch film production can be realised on SML's MiniCast with a single turret version of winder W4000, on a EcoCompact or SmartCast with a double turret version (W4000-4S-2T) and on a PowerCast XL with triple turrets (W4000-4S-3T). All work with 4 winding shafts per turret.

Coreless machine and handrolls

Coreless handrolls can be manufactured in various sizes: in 2, 2.5 and 3-inch inner diameters weighing 2 – 5 kg, and coreless machine rolls in 3-inch diameters typically weighing approximately 17 kg.

KEY FACTS AT A GLANCE

- ▶ Quick change-over between winding modes (coreless or rigid cores)
- ▶ Coreless winding realisable in different inner diameters
- ▶ Cost-efficient and environmentally friendly solution

Shaftless winder W3000-4S

This highly sophisticated winder does not produce bleed trimes, and therefore uses the extruded film in a very effective way.

The incoming film is cut by single blades to the final film width, e.g. 6 x 500 mm, and then passes an equal number of separation frames.

Unique winding system

Directly after the satellite roll, the film is wound onto the winding core via a driven contact roll. This core is only clamped by special chucks and does not require a winding shaft. This makes the winder unique, as it is shaftless and thus offers the major advantage of no critical revolution speeds due to dynamic deflections. Nevertheless, the winder still has a turret with four winding stations for very short cycle times and a perfect winding quality up to the end of the roll with an ultimate short tail.

Thin core technology

These features are supported by an additional contact roll which follows the roll along the cutting index.

KEY FACTS AT A GLANCE

- ▶ Bleed trim-free, highly effective material usage
- ▶ For 2-inch and 3-inch cores
- ▶ Extremely short cycle times



Workhorse winder W4000-2S

This is our most popular stretch film winder. It is available in single, double and, triple-turret versions with net film widths ranging from 1,500 to 6,000 mm.

Simplicity, flexibility in width, and high speeds for machine and jumbo rolls are the keys to achieving high performance.

3-inch winding core

The film passes a satellite roll and is then wound onto a 3-inch winding core via a driven contact roll. Each turret is equipped with only two winding shafts and offers sufficient cycle time for typical machine rolls.

Production speeds up to 800 m/min

This winder has several significant benefits. One key advantage is its ability to produce jumbo rolls with a maximum diameter of 425 mm and a weight of 60 kg. It can also handle production speeds of up to 800 m/min. The W4000-2S winder also features thin core technology, allowing it to accommodate 2-inch and 3-inch cores with both standard and thin wall thicknesses.

KEY FACTS AT A GLANCE

- ▶ Single, double, and triple-turret versions
- ▶ Flexibility in width from 1,500 – 6,000 mm
- ▶ Production of machine and jumbo rolls at high speeds



Multitalented winder W4000-4S

This winder is a true all-rounder, meeting current market demands and anticipating future needs.

The most versatile winder W4000-4S draws on SML's extensive expertise in engineering stretch film lines and valuable customer feedback to deliver exceptional performance.

The winder W4000-4S combines features such as:

- ▶ **4 winding shafts in each turret:** single, double or triple-turret design, depending on the width
- ▶ **A separate contact roll for the ultimate, short film tail:** suitability for 2-inch hand rolls, 3-inch machine rolls and jumbo rolls
- ▶ **Thin core technology:** coreless operation available, Modified edges available, K-AP technology



We look closely at film quality

SML is going one step further than many other companies by offering in-house quality tests to customers in conjunction with sample production.

We are aware that a technically flawless extrusion line is not enough: the parameters of the final product should also be perfectly balanced by choice of choosing adequate raw material formulations and optimised machine settings.



Laboratory for finetuning during processes

SML offers customers an optional batch test with the FPT (film performance tester) for every stretch film. Thanks to the state-of-the-art laboratory at SML's Technology Centre, quality adjustments can be made at any point during trial runs. This batch test includes different procedures which can be performed on product samples several times.

Ultimate measurement

Both the elongation at break and the force required are determined using a dynamic measurement method. The unwind volume and unwind force can also be analysed.

Puncture measurement

Another important measure is the puncture resistance, i.e. how much force it takes to puncture the film with a rotating cone.

Tear propagation

To measure the tear propagation resistance, a V-knife is used to pierce a hole in the tensioned film. The timer stops until the hole becomes a film tear.

Cling measurement

With the cling force test it is possible to measure adhesion. The film is first wound up onto a roller (as if it were on a pallet) and then pulled off again. The force required for this is the adhesive force.

Dart drop with ASTM 1709

The dart drop test is a method of measuring the puncture resistance of a film. A dart with different weights is dropped from a tower onto the film. This determines the maximum weight that the film can withstand before it is punctured.



SMILE control system

The standard in machine control

SMILE is a comprehensive solution for machine control and operation. It simplifies machine handling and provides a clear overview and monitoring of the entire production process.

SMILE's user-friendly interface and customisable software ensure full integration of third-party systems and maximise line efficiency. Its advanced software structure offers superior data monitoring.

Developed in-house, SMILE combines with SML's extrusion lines for the precise, centralised control and synchronisation of all components. This technology enables innovative manufacturing, delivering unparalleled product quality, efficiency and output.

Intuitive machine control concept

SMILE is an integral part of SML's coherent and user-friendly overall line concept. The machine control and operation are highly intuitive and self-explanatory.

- ▶ Central control station for highest operating comfort and visualisation of all processes
- ▶ Reduced training requirements and error rates at operator level, less personnel required
- ▶ Remote control, remote update and remote service for minimised maintenance costs
- ▶ Multi-client / multi-user capability



E-container

Optimised production efficiency

One key purpose of SMILE is the enhancement of the Overall Equipment Effectiveness (OEE) through optimised production processes.

- ▶ Higher line speeds for higher output volumes
- ▶ Optimised use of raw materials, preventing production waste
- ▶ Greatest level of production reliability
- ▶ Minimised times for product change-overs – customisable assistant for product changes
- ▶ Customised machine functions such as innovative and state of the art controller systems lead to best machine performances

Systematised quality control

In close interaction with SML's data collection and analysis system bitWise, SMILE is an efficient tool to keep the output quality stable and to optimise output properties.

- ▶ Formula recipe system to copy production parameters
- ▶ Documentation and in-detail reporting of production processes
- ▶ Automatised alarm functions via e-mail or text message for quick debugging

Interconnectivity and third-party integration

Entirely web-based, SMILE has open interfaces that allow for straightforward data exchange with third-party machines and systems.

- ▶ Open to interconnect with systems like ERP, QA, cloud-based service or SML's data analysis tool bitWise
- ▶ Based on open standards like HTML5 and OPC-UA
- ▶ Complete end-to-end process control beyond SML extrusion lines

Integrated all-in-one concept

SMILE's all-in-one concept helps develop completely new types of solutions that turn even the most complex production processes into a single, user-friendly extrusion system. The temperature control and drive systems of all the SML extrusion lines are highly centralised. All line modules and motors are perfectly interconnected and synchronised with each other.

Central control station

SMILE's central control station allows the management of all production processes from wide touch screens attached to the line. A single SMILE control unit can control several extrusion lines. As SMILE is entirely web-based, all production and maintenance processes can be entirely remote controlled, i.e. from a PC or even a smartphone. The system is fully multi-client and multi-user capable: different types of users can log-in simultaneously.

Open for customisation

Developed in close consistency with the hardware components of SML's extrusion lines, SMILE is highly customisable. With 100% in-house development, it offers maximum flexibility to provide numerous possibilities and advantages to meet specific customer requirements.

In-house expertise for top performance

SML's comprehensive in-house expertise in automation and machine control enables us to offer a wide range of innovative functions. Our software solutions are developed entirely by SML engineers, and we have all the necessary knowledge to ensure the high flexibility of SMILE. As a result, our extrusion lines deliver top performance and offer both economic efficiency and environmental benefits.

KEY FACTS AT A GLANCE

- ▶ Central control station for all production processes
- ▶ Full interconnectivity – global OPC-UA, programmed on HTML5, open interface to other machines and systems
- ▶ Best production performance and reliability through long-term in-house know-how
- ▶ Remote access for operators and service teams – worldwide via internet, from any PC, laptop or most smartphones
- ▶ Multi-client / multi-user capability – simultaneous access for different type of users, simple assignment of permissions
- ▶ Highest comfortability – visualisation of all production processes on a big 24" screen
- ▶ Remote update for customisation and technical support on a global level

bitWise data analytics

Stop guessing, start knowing

With bitWise, SML’s customers can analyse the entire process history of their SML extrusion line with a single click, rather than relying on current snapshots.

bitWise incorporates decades of experience in automation with the latest technologies in data analytics and provides a wide range of completely new opportunities for data-driven decisions.



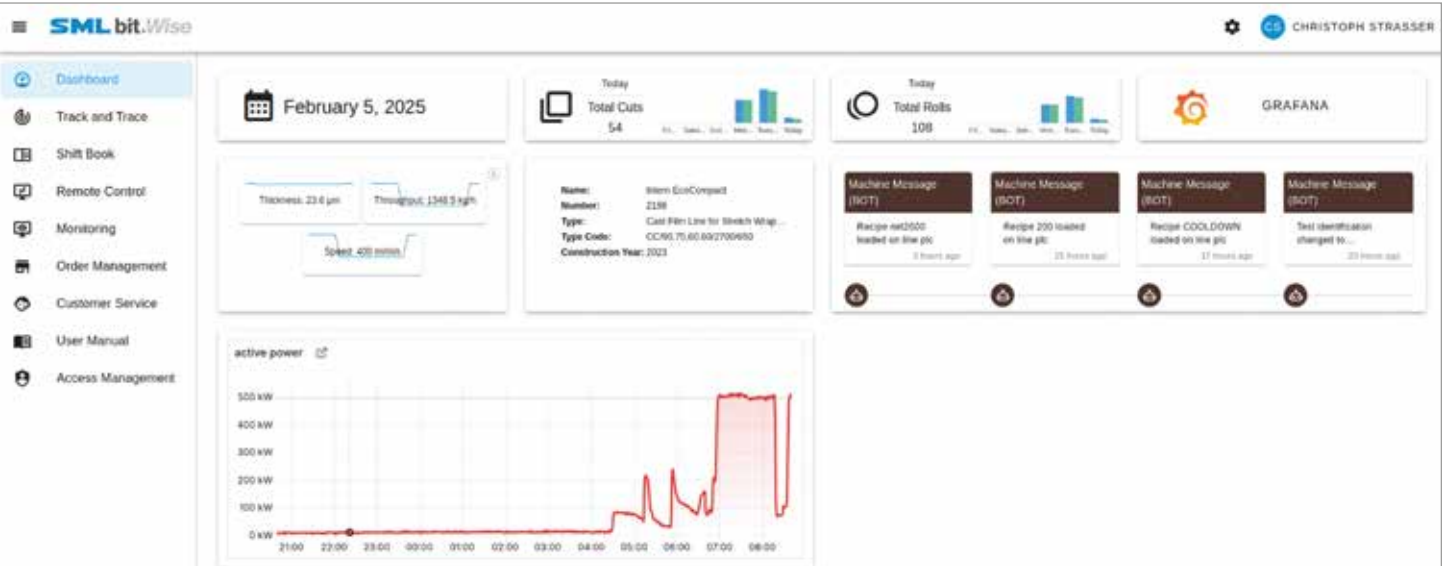
In-depth view of all details

SML’s extrusion lines are equipped with hundreds of data-generating sensors. bitWise records and visualises this data up to 10 times per second. In addition, each manufactured roll is provided with a QR code, which serves for identification. Putting everything together, manufacturers get an in-depth view of all the details involved in a production process – both in the present and in the past.

With bitWise, customers can look back at pressures within the system components and check whether there is a correlation with other measured values, such as temperature or laboratory results of a finished product.

KEY FACTS AT A GLANCE

- ▶ Highly customisable
- ▶ Easy integration
- ▶ Multi-machine capability
- ▶ Web-App



The bitWise dashboard provides an overview of the machine status; each user can configure it according to their needs.

Optimising quality

bitWise is a powerful tool for precisely optimising any aspect of the production process with a direct effect on product quality.

- ▶ Monitoring of all quality-related process parameters, allowing quick corrective action
- ▶ Comprehensive tracking and documenting of product quality
- ▶ Making quality reproducible

Minimising production costs

bitWise is the central tool for measuring and visualising all production-related costs. It forms a strong and reliable basis for continuous cost optimisation and contributes to a faster return on investment (ROI).

- ▶ Detailed monitoring and reporting of energy and raw material consumption
- ▶ In-depth optimising, tracking and reporting of Overall Equipment Effectiveness (OEE)
- ▶ Full end-to-end cost transparency through third-party integration

Maximising output

Recorded, aggregated and visualised data by bitWise help to raise overall line utilisation.

- ▶ Discovering hidden or unused output capacities
- ▶ Preventing downtime by detecting potential problems at an early stage
- ▶ Minimising maintenance times through optimised scheduling and structured access to documentation and service support

Open for vertical integration

At SML, we understand that extrusion lines represent a key part in a wider production chain. For end-to-end optimisation, bitWise therefore supports data exchange and vertical integration with third-party systems, such as Manufacturing Execution Systems (MES), Enterprise Resource Planning (ERP) or Quality Assurance (QA). Customers can simply retrieve the data from the system.

Choose your perfect interface

bitWise comes with a range of powerful functions that can be individually adapted. Customisable calendars, shift books and automated notifications provide a quick and user-friendly overview of all manual activities in production.

Always connected, even on the go

bitWise is a 100 % on-premises solution. This means that the data remains in-house on dedicated hardware; no cloud services are required. Nevertheless, customers can access bitWise in their company network via their VPN or a remote desktop solution.



Electrical retrofitting

For extended line productivity

Retrofitting pays off

Retrofitting can be a highly economical method for securing line availability and productivity for the years to come.

With its electrical retrofit programme, SML offers customers a personalised service to bring their lines up to the latest technical standard.

Securing future line availability

The electronics industry is fast-paced, with new developments constantly replacing existing systems. This can be a challenge for long-lasting extrusion lines.

Electrical retrofitting a solution to ensure line availability and production stability. SML guarantees the availability of the retrofitted components for 10 years after installation.

Extended service life – extended profitability

Electrical retrofitting from SML significantly extends the time in operation and overall productivity of an extrusion line, while total cost of ownership (TCO) is reduced. Compared to an investment in a new line, bringing an older extrusion line electrically up to date requires roughly 80% less capital, depending on the technical state of the line and the respective retrofitting measures. As with new extrusion lines, SML only installs first-class, state-of-the-art components for retrofits.



Operating panel (HMI)

KEY FACTS AT A GLANCE

- ▶ Securing future line availability and productivity at a moderate cost
- ▶ 10 years' guaranteed availability of spare parts
- ▶ Convenient and easy operation with state-of-the-art user interface
- ▶ A single-source solution from experienced SML technicians
- ▶ Greater sustainability compared to investment in a new line
- ▶ OPC-UA interface

Revised software set-up

Functional machine control and electronic systems guarantee the optimum interaction of different machine parts. The installation of state-of-the-art software means state-of-the-art functions for the better monitoring, analysis and maintenance of your machines. With the latest version of the modem installed, a remote service can be offered, and the best possible service support can be realised.

Up-to-date usability

In most cases, an electrical retrofit means changing the control system of an extrusion line. This also involves replacing the user interface with easy-to-operate 15" or 19" touch screens including RFID user handling.

Minimising downtime – one planned stoppage

The longer an extrusion line is in operation, the higher the risk of unplanned downtime. With a planned schedule for the retrofit, downtime can be calculated and the machine reliability can be improved again.



Frequency inverter

Which SML lines can be retrofitted?

Basically, all SML lines with a control system can be retrofitted. A retrofit makes sense for lines that lack one or more of these elements:

- ▶ B&R X20 control system
- ▶ ABB drives for extruders
- ▶ Lenze I550/ABB drives

The technical condition of an extrusion line is a key factor in determining whether retrofitting is feasible and, if so, which areas would benefit from it.

Customised solutions – examples

Based on a detailed inspection of the extrusion line, SML offers its customers highly customised retrofitting solutions:

- ▶ Exchange of PLC systems
- ▶ Replacing the PLC system and the drives
- ▶ Replacing all the electrical equipment
- ▶ All possible options in between

In addition to these more frequent solutions, the following upgrades have also been realised in response to customers' requests:

- ▶ Partial retrofit of specific units – e.g. only the winder and not the rest of the extrusion line, or vice versa
- ▶ Additional replacement of actuators (motors)
- ▶ Replacement of the PLC and HMI only, not of the IO nodes
- ▶ Replacement of the IO nodes only, not of the PLC
- ▶ Modification from DC motors to state-of-the-art AC motors

Experience and expertise for customer satisfaction

SML's electrical retrofit team consists of experienced engineers who have learned everything there is to know about SML's machinery over the course of their careers. In recent years, SML has carried out more than 30 retrofitting projects worldwide to the complete satisfaction of its customers.

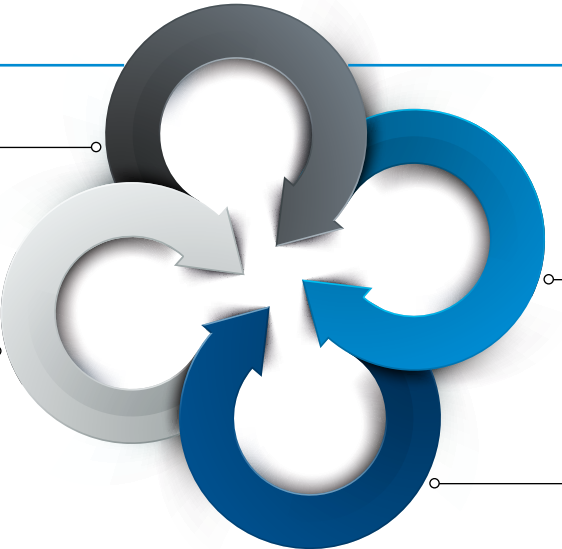
Benefits of a retrofit

State-of-the-art technical equipment

One planned stop with scheduled time

Guaranteed spare parts availability as for a new line

Higher line availability



Reliable assistance – around the globe, at all times

Outstanding end-to-end service support

Our highly-skilled technicians are at your service within 24 hours throughout Europe and within 48 hours in the rest of the world.



Always at your service

Our dedicated customer service team offers reliable assistance to ensure the continuous operation of any SML extrusion line at all times. Regardless of how long a system has been in operation, we assist every customer.

- ▶ Experienced SML service technicians
- ▶ Support via telephone, video call, chat, email and in person
- ▶ On-call service from 7 am to 10 pm CET
- ▶ Remote maintenance system
- ▶ Visual assistance via smart glasses as an option
- ▶ SML service technicians on call worldwide
- ▶ Quick on-site service

Service is our success

This slogan emphasises the importance of SML's outstanding service offering. In an industry where precision, reliability and continuous optimisation are essential, it is not only the quality of the machines themselves that matters, but also the service that accompanies them. We support our customers in all matters with a fast, efficient and solution-oriented approach. From maintenance and repairs to tailor-made solutions, excellent service ensures that machines remain efficient and companies can maintain their production efficiently. Ultimately, the success of a company is not only reflected in its technology, but also in the way it responds to the needs of its customers and supports them in the long term.

Up-to-date knowledge and experience

Our service team consists of technicians who know SML's extrusion lines inside out, having installed them themselves for many years. To keep their know-how up to date, all service employees continue to work regularly in everyday production. Their competence is reflected in the short response times to our customers' enquiries.

Immediate assistance

The remote maintenance system, which is available for every SML extrusion line, makes it easier to identify potential problems and provide a quick diagnosis. To find solutions, our service team works closely together with other departments at SML. This way, nearly all malfunctions can be solved remotely.

Time-saving solutions

A ticket system helps us manage enquiries and problems in a targeted and structured way, so that service requests can be processed faster and solutions found more quickly. This minimises downtime and maximises efficiency. Which in turn is reflected in customer satisfaction.

Visual assistance in real time

Through the use of smart glasses, our service team can provide real-time assistance worldwide. Whether our customers have technical problems, need help with product changes or maintenance work - they are guided step by step. This service is available for every extrusion line from SML.



Technology centre

Creating solutions together

SML helps you realise your ideas and test them sufficiently.

Our engineers and technicians relentlessly strive to craft the best solution for our customers. No matter the task or challenge you have in store for us, we will work with you at the Redham pilot plant to develop ideal solutions that go above and beyond the latest industry standards.

The production of customer samples and the joint development of new products and joint test series play a key role in SML's partnership with its customers. Joint R&D activities support mutual understanding, and through it, the anticipative fulfilment of customer wishes. And the findings generated together have a direct impact on the further development of new machinery and technology at SML.

Sustainability

A holistic approach to sustainability

“A **holistic understanding of sustainability** – from an ecological, social and business perspective – is firmly anchored in **SML’s company culture**. The concept of sustainability is integrated into all company processes and shapes our everyday actions. We implement the European Sustainability Reporting Standards (**ESRS**) consistently across the board as a clear commitment to transparency and responsibility.”

Karl Stöger CEO

In our sustainability targets, we focus on the following **key areas**:



With this clear focus, we contribute to forward-thinking development – economically successful, ecologically compatible and socially just.

Responsibility along the value chain

SML sees itself as an active part of the plastics value chain. We take responsibility within our own organisation as well as in upstream and downstream processes. Our Supplier Code of Conduct ensures that our social and ecological standards are also adhered to in upstream stages of the value chain.



► ENVIRONMENTAL Reducing our climate impact – step by step

Today, all the electricity needs at our headquarters are met solely by green energy and our own photovoltaics system – this represents an important step towards reducing our direct emissions.

Other measures are targeting energy use in production, the mobility of staff and transportation. To reduce emissions even further, air freight and business trips are to be reduced by ten per cent by 2030 through measures including optimised planning and transport pooling. In addition, the company’s vehicle fleet is gradually being converted to electric-powered systems.

Focusing on systems efficiency

Machines from SML have always been highly efficient in terms of energy and resources. The continuous development of our technologies reduces the carbon footprint of plastics production and lowers emissions for our customers.

Circular economy through technology

Innovative systems and process technology are essential for a functioning circular economy. Our systems enable the processing of up to 100% post-consumer recycled material. SML takes a leading role in producing machines for manufacturing easily recyclable mono-material films.

Sustainability that reaches our customers

SML’s sustainability approach is reflected in the high quality of our systems, their retrofitting capability and our extensive service offering. Some SML systems have been in regular use for more than 30 years – a clear advantage for the environment and cost effectiveness.

► SOCIAL Reliability and safety for people

SML is committed to a safe, stable and respectful working environment. Health and safety at work have the utmost priority – both in our own operations as well as in the development of machinery that is easy to use. Our sustainability targets include strengthening our operational training and development, increasing diversity and internationalisation of the workforce. This allows us to promote long-term development and social responsibility within the company.

► GOVERNANCE Sustainability: our path to the future

Sustainability is an integral component of SML’s company strategy and values. We have already achieved some of our sustainability targets – others can still be improved upon.

By including sustainability in our company policies, we are able to track and measure our progress on an ongoing basis. Environmentally, our aim is to be climate-neutral by 2050. As regards our social impact, we aim to be seen as a model company for our employees.



► For more information
follow the link



Engineered to perform.

SML – the leading manufacturer of high-end extrusion lines

- Cast film lines
- Sheet lines
- Coating and laminating lines
- Spinning lines
- Winding technology

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