SML

EXTRUSION LINES – ENGINEERED TO PERFORM

PET sheet

Sheet lines

www.sml.at

Proven technology, easy operation.

SML's PET sheet lines are the ideal solution, when applications with exceptional visual appearance are required.

At SML, we're dedicated to helping our customers optimise their production setup. Whether you're working with trays, blister packaging, cups, and lids for the food industry, or striving to set new standards in pharmaceuticals, medicine, or other sectors, we are here to provide expert guidance and support.

Whatever you require, an SML PET sheet line is an investment that quickly pays for itself thanks to its performance and efficiency.

First-class options

For SML, only supplying an extrusion line is not enough – we accompany our customers for as long as they need us. Our repertoire covers a huge array of customisable options with a maximum of flexibility – including three different extrusion concepts with thickness ranges from 150 µm to 1,800 µm and net widths up to 2,700 mm as field-tested standards. But SML is also well-known for pushing the limits further. All lines include highly advanced roll stack technologies, various winding systems as well as several options for co-extrusion and lamination.

In this context, we make sure that the best line concept for the raw material source is always the one used. This has proven to be an overwhelming success, with our customers enjoying decisive production advantages as a result. After all, SML is one of the leading suppliers of sheet extrusion lines for high-grade PET sheet.

Making the best use of material loops

In the near future, achieving up to 100% recycling and closing the material loop will become increasingly important. PET stands out as a prime candidate for this task, as it is one of the few raw materials available worldwide with a consistent quality, even as a recycled material.

Comfortable to control

SML offers winding concepts with different grades of automation in terms of roll and core handling. Together with the SMILE control system, this enables customers to operate SML sheet lines with a minimum of manpower. The analysing tool bit*Wise* supports the constant optimisation of production processes.

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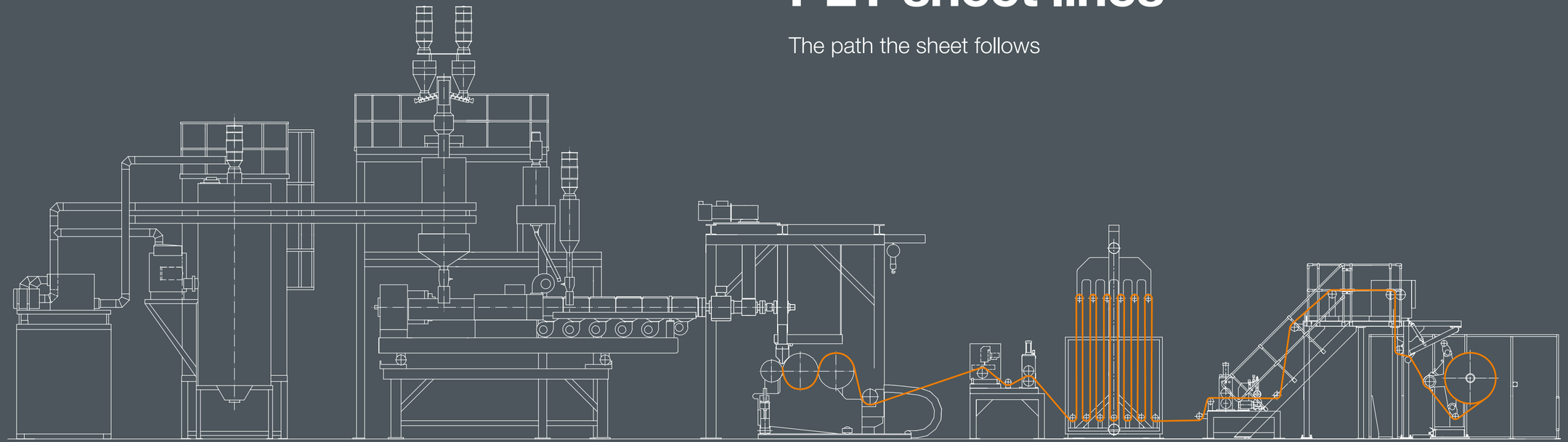
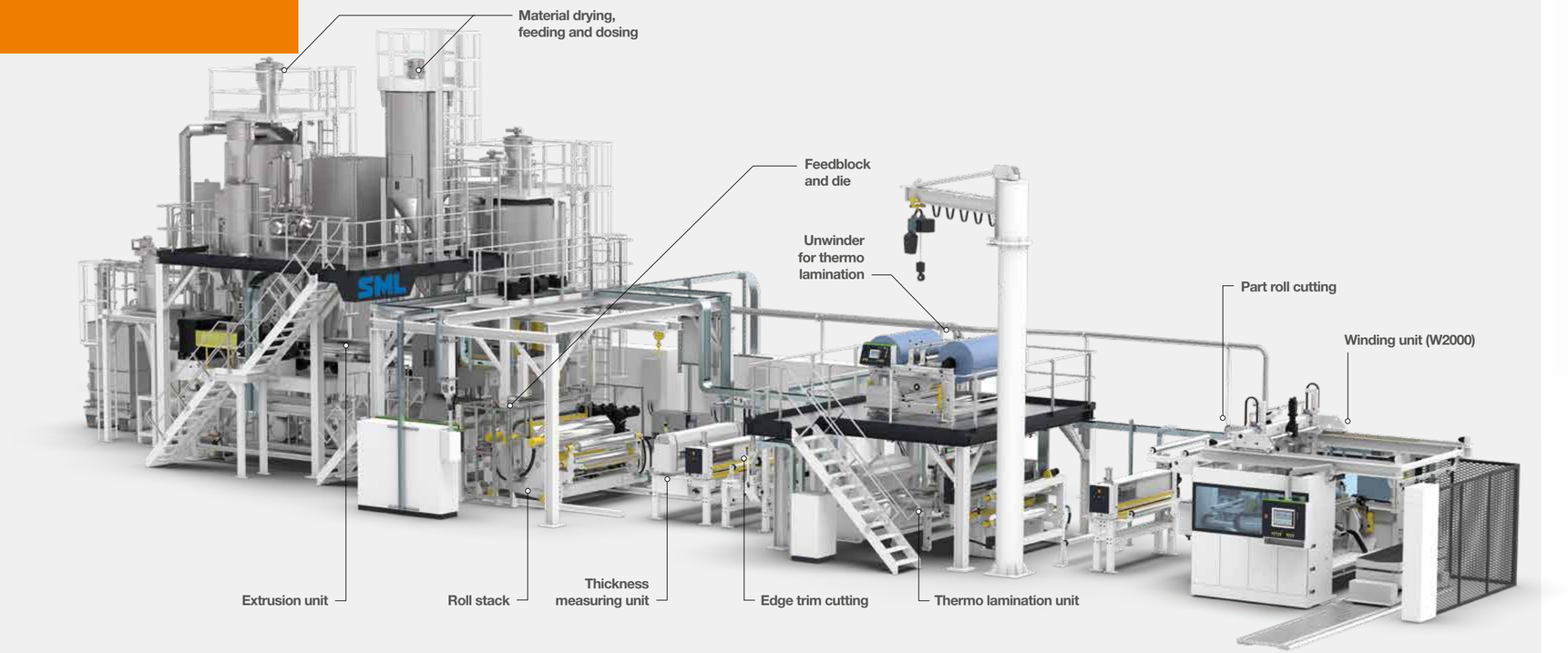
PET sheet lines

The path the sheet follows



ClassicPET



Typical ClassicPET products

ClassicPET – Single screw extrusion

Our long-proven classic with pre-drying

The ClassicPET line from SML is the ideal choice for those seeking a **straightforward production process** without the need for complex material mixtures, while achieving high-quality sheet.

This well-established line configuration is known for its **robust design and user-friendly operation**.

Single-screw extruders combined with drying equipment make the ClassicPET a typical co-extrusion line for the production of standard structures. It is especially suitable for high-quality sheet and can be upgraded in order to comply with the regulations of European (EFSA) and US authorities (FDA). Another advantage: It is also suitable for the production of foamed sheet in various configurations.

Drying systems

According to the single-screw extrusion concept, the raw materials are pre-dried through a desiccant dryer (in combination with infrared (IR) dryers). In the dry air process, the individual components are dried separately, which provides maximum flexibility regarding mixture changes. When drying A-PET regrind, the amorphous flakes have to be pre-crystallised in the IR dryer or agglomerated in a separate unit. The conventional SML desiccant dryers are suitable for processing PET-G as well.

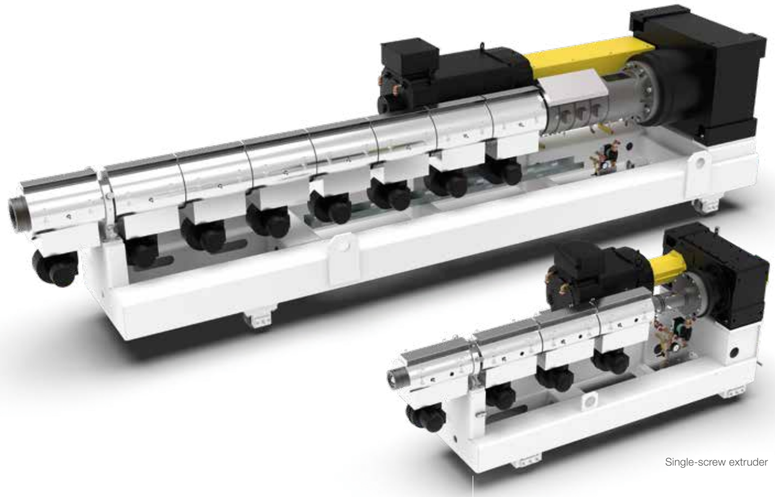
In combination with IR-drying, the main components such as flakes and different types of regrind materials can be pre-mixed. After that, they are pre-dried in an IR-dryer before being further dehumidified in a conventional desiccant dryer. Another advantage is gained from the ability of the IR-dryer to crystallise the regrind material in the same process.

To add additives to the main material, small blenders are mounted just above the inlet of the extruder. The ClassicPET sheet line cannot be overfed and requires very little maintenance.

KEY FACTS AT A GLANCE

- Robust, technically mature
- Easy to operate, low maintenance
- Minimised reduction of intrinsic viscosity
- EFSA, FDA approved

efsa EUROPEAN FOOD SAFETY AUTHORITY



Single-screw extruder

OUTPUT TABLE *ClassicPET*

	PET 1	PET 2	PET 3	PET 4	PET 5	PET 6	PET 7	PET 8
Main extruder Co-extruder	1 x ES120 1 x ES60	1 x ES135 1 x ES60	1 x ES135 1 x ES60	1 x ES150 1 x ES75	1 x ES150 1 x ES75	1 x ES150 1 x ES90	1 x ES150 1 x ES90	1 x ES180 1 x ES90
Output at full width [kg/h]	850	1,200	1,200	1,500	1,500	1,750	1,750	2,250
Roller width [mm]	1,050	1,050	1,200	1,400	1,650	1,800	2,000	2,200
Sheet thickness range [µm]	150–1,800 µm (PET films above 1,200 micron with slanted roll stack)							
Sheet net width [mm]	600–800	600–800	700–950	850–1,150	1,000–1,400	1,150–1,550	1,300–1,750	1,500–1,950
Number of webs	1	1	1	1	1–2	1–2	2–3	2–3

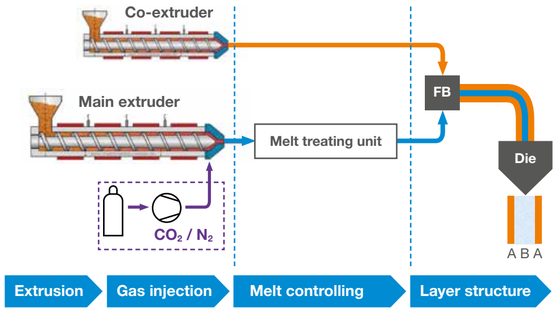
More technical details:

Production of foamed PET sheet

PET foam technology is an add-on solution that can replace PS or coated paper in many hot-fill applications. The technology fully complies with the European Packaging and Packaging Waste Regulation (PPWR).

By opting for foamed PET sheets, manufacturers can **create high-quality, sustainable, and cost-effective products for hot-fill applications**, such as trays or cups.

Foaming process



Roll stack

Cross-section 3-layer sheet with a foamed middle layer

Foamed sheet roll

Material savings

Using SML's foaming technology, foamed PET sheet offers a significant advantage: density reduction up to 50% compared to conventional PET sheets, resulting in substantial raw material savings. This lightweight property makes it an ideal choice for the economic production of low-weight cups with exceptional insulation properties.

Unparalleled results in hot-fill applications

The production of the 3-layer A/B/A sheet, where the middle layer is foamed, is done physically with the injection of nitrogen or carbon dioxide. The foamed PET sheet can be used especially for hot-fill applications such as cups and trays, offering excellent dimensional stability and heat insulation.

Operator-friendly technology

SML applies different foaming methods, depending on the type of extruder. Post-consumer PET bottle flakes can be used as a raw material for the foamed core layer together with virgin and regrind PET. Regardless of the foaming method applied – SML only delivers comprehensive, field-tested and operator-friendly foaming solutions with unparalleled sheet qualities.

KEY FACTS AT A GLANCE

- **50% densitiy reduction compared to conventional PET sheet**
- **Perfectly useable for hot-fill applications up to 100°C**
- **Exceptional heat insulation, rigidity and surface feel**

Typical foamed PET sheet products

RecyPET

Typical RecyPET products

RecyPET – Recycling extrusion

Combined expertise for top-quality rPET sheet (VACUREMA® System)

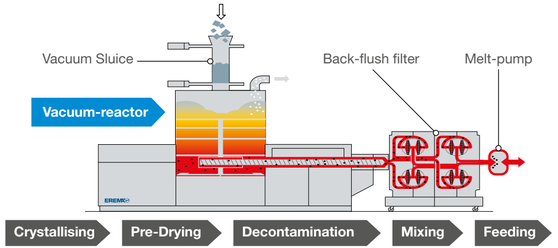
With RecyPET, a joint development of SML and EREMA, you leverage the expertise of two leading Austrian engineering companies in one innovative solution. RecyPET is the ideal line configuration for processing **large quantities of recycled material**.

One of the most significant advancements of our time is the ability to transform recycled materials into food-safe, monolayer packaging. SML's RecyPET technology makes this possible. When paired with the compact VACUREMA system, it provides an ideal solution for processing PET bottle flakes and regrind. The advantages: No conventional pre-drying of the input material and a low energy consumption.

EFSA & FDA approval

The process complies with the regulations of European (EFSA) and US authorities (FDA). It is especially suitable for the decontamination of post-consumer bottle flakes and therefore appropriate for producing single (mono) layer PET sheet for direct food contact purposes in high output ranges.

Vacuum Reactor + Single-Screw Extruder – RecySHEET



KEY FACTS AT A GLANCE

- EFSA/FDA approved process
- Patented vacuum reactor
- Field-approved recycling technology
- No pre-drying
- Low energy consumption

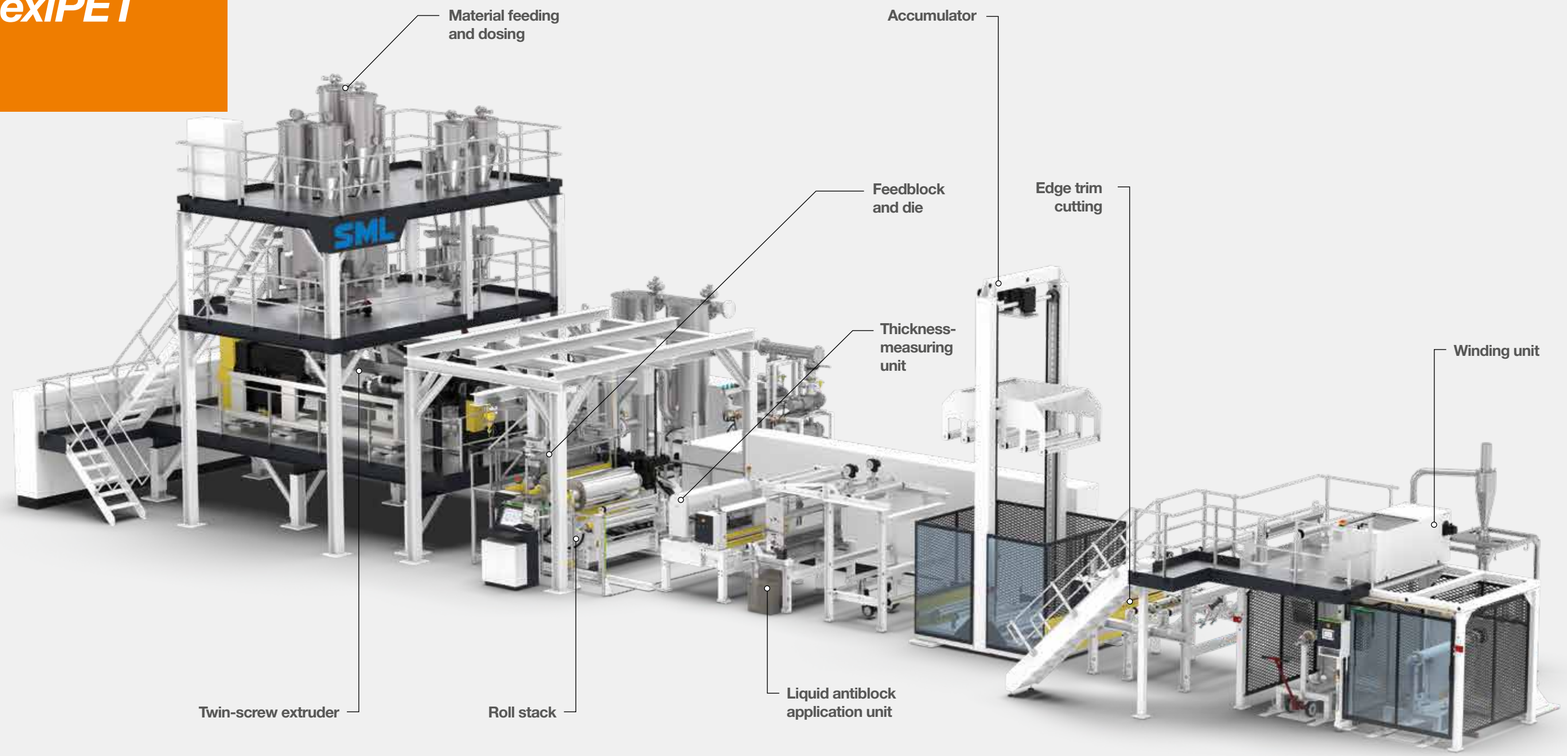
VACUREMA® Extruder

OUTPUT TABLE *RecyPET*

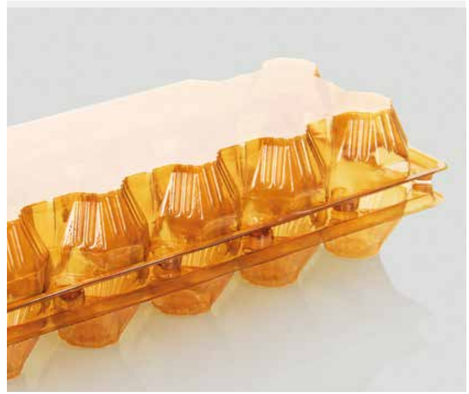
	RecyPET 1	RecyPET 2	RecyPET 3	RecyPET 4	RecyPET 5	RecyPET 6	RecyPET 7	RecyPET 8
Main extruder Co-extruder	1 x VAC1512 1 x ES60	1 x VAC1714 1 x ES 60	1 x VAC1716 1 x ES60	1 x VAC1716 1 x ES75	1 x VAC2018 1 x ES75	1 x VAC2018 1 x ES90	1 x VAC2318 1 x ES90	1 x VAC2321 1 x ES90
Output at full width [kg/h]	850	1,100	1,300	1,450	1,750	1,900	2,200	2,450
Roller width [mm]	1,050	1,050	1,200	1,400	1,650	1,800	2,000	2,200
Sheet thickness range [µm]	150–1,200 µm							
Sheet net width [mm]	600–800	600–800	700–950	850–1,150	1,000–1,400	1,150–1,550	1,300–1,750	1,500–1,950
Number of webs	1	1	1	1	1–2	1–2	2–3	2–3

More technical details:

FlexiPET



Typical FlexiPET products



FlexiPET – Twin-screw extrusion

Flexible polymer processing

With FlexiPET, you have access to a vast range of polymers. The sheet line's clever design allows for **swift and easy polymer changeovers**.

Conical twin-screw extruders imply a highly advanced technology for a maximum of flexibility in the case of polymer changes. Unlike other systems, the FlexiPET boasts rapid changeover times. Furthermore, it is able to process a wide range of different polymers such as virgin and regrind PET granules or PP.

PET production with or without pre-drying

Depending on the moisture content of the raw material and the required sheet quality, PET can be processed without pre-drying, which has a positive effect on total energy consumption. In case material is additionally pre-dried before processing, the IV loss is lower and the values for AA-content and yellowing are exceptionally good, which results in a superior sheet quality from the same material.

100% food grade sheet from bottle flakes

By combining the conventional pre-drying of washed bottle flakes with the medium vacuum on the conical twin screw extruder, this system complies with the regulations of European (EFSA) and US authorities (FDA). Thus, washed PCR bottle flakes can be directly converted into "excellent quality – 100% food grade sheet".

Optimised feeding through conical design

Gravimetric loss-in-weight dosing units are typically used with twin-screw extruders, as they allow for precise control over the filling rate.
The conically shaped twin-screw extruder is larger at the inlet than the screw diameter at the outlet, which provides advantages relating to the material's feeding ability. Hence, the pressure build-up is significantly higher than that of a parallel twin-screw extruder. This effect opens the way to operations using a backflush filter without the need for an additional melt pump in front of it.

KEY FACTS AT A GLANCE

- **Multifunctional extrusion system**
- **Optimised energy consumption**
- **Easy operation**
- **Quick changeovers**

ACURECYA® Extruder

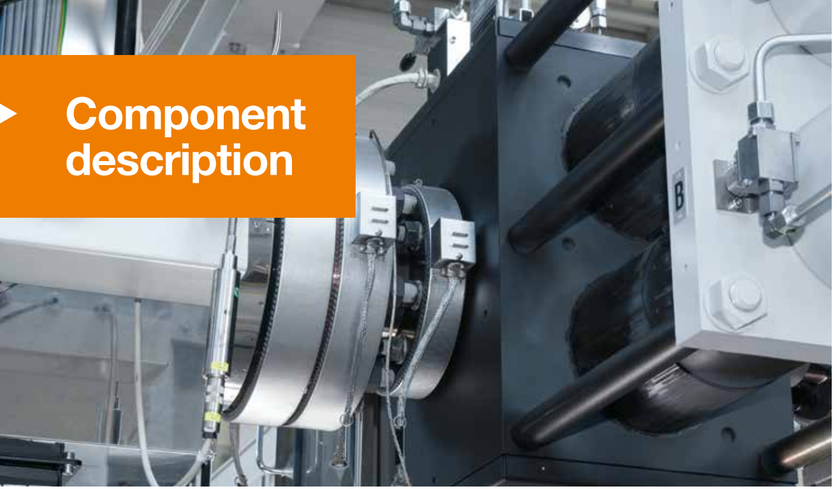
Twin-screw extruder

OUTPUT TABLE *FlexiPET*

	FlexiPET 1	FlexiPET 2	FlexiPET 3	FlexiPET 4	FlexiPET 5	FlexiPET 6	FlexiPET 7	FlexiPET 8
Main extruder Co-extruder	1 x TSE75 1 x ES60	1 x TSE75 1 x ES75	1 x TSE75 1 x ES60	1 x TSE90 1 x ES75	1 x TSE90 1 x ES75	1 x TSE90 1 x ES90	1 x TSE93 1 x ES90	1 x TSE93 1 x ES90
Output at full width [kg/h]	850	1,100	1,300	1,500	1,500	1,650	1,850	1,850
Roller width [mm]	1,050	1,050	1,200	1,400	1,650	1,800	2,000	2,200
Sheet thickness range [µm]	150–1,000 µm							
Sheet net width [mm]	600–800	600–800	700–950	850–1,150	1,000–1,400	1,150–1,550	1,300–1,750	1,500–1,950
Number of webs	1	1	1	1	1–2	1–2	2–3	2–3

More technical details:

Component description



Twin-screw extruder

Back-flush filter

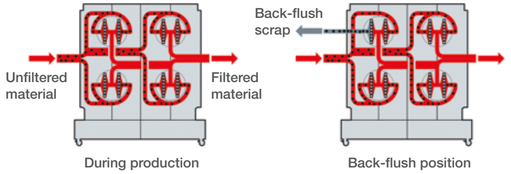
Filtration system

SML provides different types of filters, in line with the specific extruder design and the level of impurities expected in the raw material.

- Single-piston, hydraulically actuated discontinuous filters
- Double-piston (2 or 4 cavities), hydraulically actuated continuous filters
- Backflush filters with up to 12 cavities
- Laser filters

All of SML's PET sheet lines are equipped with melt pumps and static mixers in order to guarantee a stable pressure and a good melt homogenisation in front of the die.

Schematic drawing: 8-cavity back-flush filter



Feedblocks and flat dies

As a leading supplier of high-quality PET sheet lines, SML partners with trusted industry experts to source its feedblocks and flat dies. All of our systems are basically configured for the production of a 3-layer A/B/A sheet structure with thin outside layers.

- Only virgin material is used to process the two outside layers, while recycled material is employed in the middle layer. This avoids contact between the packaged goods and the recycled material – complying with the food contact regulations of most countries.
- Application of anti-block additives only in the thin outside layers, helping to keep production costs low.
- Production possible with various additives like Master-batch or foaming agent, just in the core layer.
- Manufacturing GAG sheet (PETG/APET/PETG).

Tool unit with a melt pump, static mixer, feedblock and flat die

Die-splitting system

Details that matter

Feedblocks integrated into PET sheet lines can process up to nine layers as standard. They are ready for special applications, i.e. for functional layers such as barrier and peel or seal layers.

SML provides manual and automatic flat dies with special features such as lip heaters or compound angles, for a minimum distance between the die and the roll stack.
Dies are usually deckled with external or internal deckles or a combination of both. The SML die splitting system guarantees the quick and safe opening of the flat die for cleaning purposes.

KEY FACTS AT A GLANCE

- **Configurable for the manufacturing of various sheet structures**
- **Die-splitting system for fast and easy cleaning**

PET / PE co-extrusion

Another method for producing a PET or PE sealing layer inlcuding barrier properties is the co-extrusion process. By utilising a multi-layer feedblock equipped with various selector plugs, manufacturers can create a range of layer combinations. This flexibility allows for the production of both symmetric and asymmetric structures.

Example of a 7-layer structure:

Layer / Extruder size	Material
B 150/33	PET
B 150/33	PET
C 35/34	Adhesive
D 35/34	EVOH
C 35/34	Adhesive
A 75/33	PET or PE
A 75/33	PET or PE

Roll stack

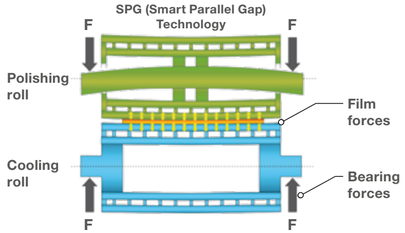
SML's roll stacks are operator-friendly and very easy to adjust; the process stability is reached swiftly. All of the roll stacks for PET sheet are equipped with the specially designed SPG (Smart-Parallel-Gap) polishing roll for superior thickness tolerances.

Superior heat transfer

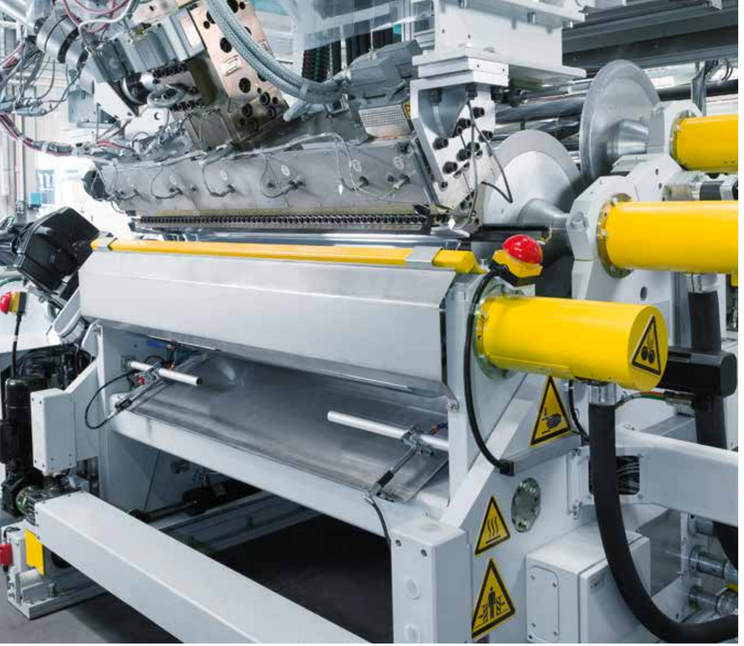
The main cooling roller and the secondary cooling roll have very thin outer shells. Thanks to an optimal heat transfer, they enable a highly specific output. All of the rollers at the roll stack are hardened, chromium plated and polished to a high-gloss mirror finish. Each roller is equipped with a separate water temperature control system and an individual, highly accurate drive system.

The maximum mechanical speed depends on the line configuration: the extrusion capacity, width and thickness range. SML's PET sheet lines are available for mechanical line speeds up to 100 m/min. Depending on the sheet thickness and output, additional post cooling rolls can be mounted on the roll stack for optimised outputs.

SPG Roller with counter bending



Horizontal roll stack



Slanted roll stack

Manual vs. motorised gap adjustment

In its standard designs, SML offers gap adjustment using manually adjustable spindles with scales and readings. The motorised gap adjustment system helps production staff to stick to the production plan, making it quick and easy to make changes. The adjustment parameters are displayed on a touch screen of the control panel. These parameters are then stored in the SMILE control system. Another useful optional feature is the nip load measurement system, providing real-time line load (in N/cm) in the calendering gap.

Horizontal roll stacks for thermoformable PET

For the typical thermoformable PET sheet thickness range, we recommend a horizontal roll stack which offers significant advantages:

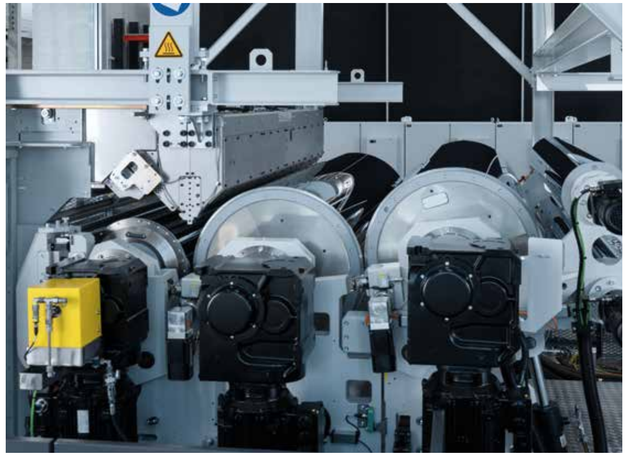
- Superior sheet surface quality thanks to the optimised positioning of the melt bank
- Vertical melt exit – the melt is not pulled over the edge of the die lip
- No sagging of the melt before roll contact, as can happen with vertical roll stacks
- Minimised internal stress in the sheet as the melt is not cooled by roll contact before it enters the gap

Slanted roll arrangement for thick sheet

For very thick sheet, SML supplies roll stacks with a slanted roll arrangement – which is the optimal design for these products. In combination with an elaborated temperature control, the slanted roll arrangement developed by SML guarantees the smooth production of PET sheet up to 1,800 µm.

KEY FACTS AT A GLANCE

- **Smart Parallel Gap – SPG polishing rolls**
- **Outstanding thickness profile**
- **Smooth processing of PET sheet up to 1,800 µm**



Roll stack XL

The design of SML's XL roll stack enables a roller width of up to 3,000 mm, a throughput of up to 5,000 kg/h, and a maximum thickness of 1,200 µm. Thanks to its modular design, the calender (C0/C1/C2) can be split between C1 and C2 allowing for easy and convenient start-up.

Fully automated

The roll stack XL features fully automated operation, enabling the base unit to separate from and re-dock with the C2 unit automatically. The calender can also automatically move to different operating positions to facilitate work and reduce downtime.

Hydraulic roller

By applying pressure up to 300 bar, the crowning of the hydraulic C0 roller can be adjusted continuously to achieve a constant roller gap across the entire width. Combining this feature with Ax-crossing provides a high degree of flexibility and enables the production of high-quality films.

KEY FACTS AT A GLANCE

- **High volume production capability (up to 5,000 kg/h)**
- **2,700 mm net film width**
- **Easy and convenient start-up**
- **Automatic positioning and docking for improved productivity**

Inline thickness-measuring unit with an inductive / capacitive sensor

Thickness-measuring system

In answer to local regulations and to specific product needs, SML supplies different gauging systems:

- Inductive / capacitive sensors
- Radioactive beta-ray sensors (Krypton 85 or Sr 90)
- X-ray sensors
- Laser shadow sensors

All these systems are available for dies with manual adjustment or automatic profile control. To maintain the average value of the thickness setting, they are linked to the speed of the main cooling roller.

Edge trim cutting

Edge trim cutting

Edge trims are cut off using static blades or motor-driven circular knives. A precise cut is required for an excellent winding quality. The edge trim is usually pulled into an inline grinder. The regrind is then either filled into big bags for interim storage or re-fed directly to the main extruder via a conveying screw mounted above the extruder inlet opening.

PE inline
thermolamination unit

PE inline thermolamination unit

A separate PE thermolamination unit can be integrated into SML's PET sheet lines to combine PET with PE, with or without barrier layer, in order to create sealable applications in food packaging.

The PE is unwound from an overhead unwinder with precise tension control. Next, both PET and PE are preheated using infrared fields to prepare them for bonding. The two polymers are then joined together in the lamination duo, achieving a maximum bonding strength of 4-6 N/cm for standard PE lamination films. Additionally, an optional corona treatment can be applied to further enhance film properties.

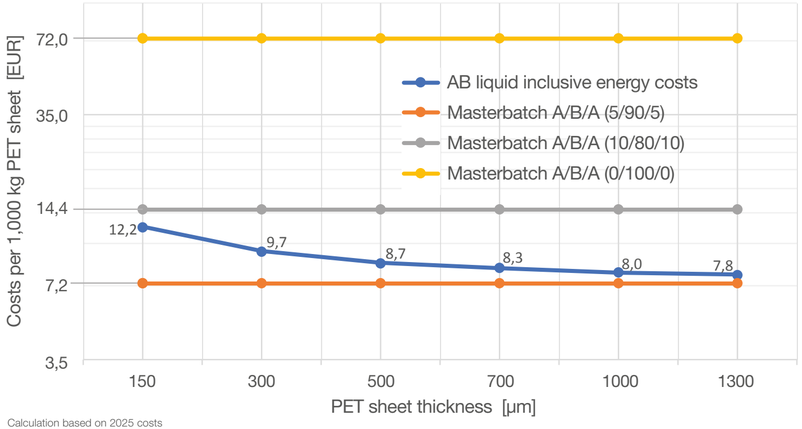
Anti-block application unit

SML's applicator unit for anti-block liquid offers ease of operation and maximum flexibility.

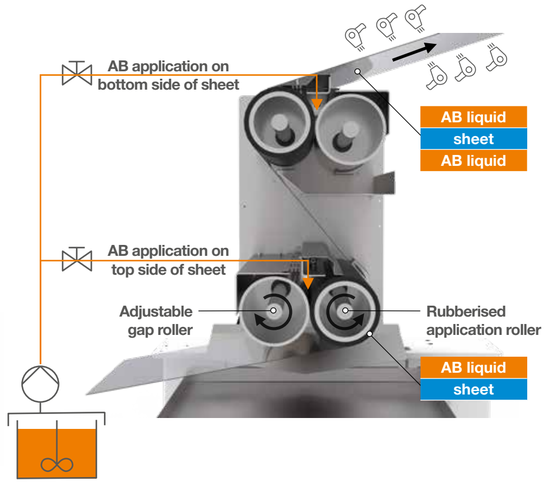
Applying anti-block liquid to PET sheets can be a cost-effective alternative to masterbatch.

Compared with masterbatch, the application of anti-block liquid provides significant cost-advantages at the production of mono-layer PET sheet and PET sheet with thicker outer layers.

Cost analysis AB liquid vs. Masterbatch



Calculation based on 2025 costs



Straightforward process

The anti-block liquid is constantly mixed in a movable tank container and dosed to a gap between an adjustable aluminium gap roller and a rubberised application roller. After passing the roller gap, the anti-block liquid is applied via the rubberised application roller onto the sheet. Depending on the production requirements, application is possible on one or on both sides of the sheet. Afterwards, the treated sheet is dried in a hot-air drying station.

Fast product and recipe changeovers

The movable tank container gives SML's applicator unit a high level of flexibility, since it can be easily uncoupled. In interaction with a second prepared container, it allows very fast product and recipe changeovers.

Different functionalities

SML's application unit offers a flexible solution for applying liquids with various functionalities. For example, anti-block and anti-static agents can be combined into a single liquid mixture and applied in just one step. Additionally, the unit also enables the application of antifog agents.

KEY FACTS AT A GLANCE

- Smart Parallel Gap – SPG polishing rolls
- Outstanding thickness profile
- Smooth processing of PET sheet up to 1,800 µm

Winder

Winding systems

SML's customers can select from a wide range of different semi- and fully automatic sheet winding systems for PET.

All winders for PET sheet are designed and manufactured in-house by SML. They have a proven track record for longevity and outstanding properties in terms of technical precision, reliability and operability.

Semi-automatic winding in combination with an accumulator

Semi-automatic sheet winders are known for their excellent production reliability at an attractive price. They are used in combination with an accumulator, which works from a bottom to top position, while a torque-driven servo motor generates storage movement and precise web tension. The accumulator picks up the sheet during the manual change of the roll in the winder, making roll changes by the operators very easy and safe.

KEY FACTS AT A GLANCE

- **Standard film capacity of the accumulator: 38 m and 50 m**
- **Access doors on the operating side of the accumlator for effortless sheet feeding**
- **Compact solutions for a limited floor space**

Find the ideal winder for your application

Winder type	W500	W600	W550	W900	W2000 XL
Line width	1,050–2,200 mm	1,050–1,800 mm	1,050–1,800 (2,200) mm	1,050–2,200 mm	1,650–2,200 mm
Number of webs	up to 4	up to 4	up to 4	up to 4	up to 4
Core ID (inch)	3, 6, 8	3, 6, 8	3, 6, 8	3, 6, 8	3, 6
Thickness range	150–1,800 µm	150–1,800 µm	150–1,800 µm	150–1,200 µm	150–1,800 µm
Max. mech. speed	70 m/min	70 m/min	70 m/min	70 m/min	100 m/min
Accumulator	yes	yes	yes	yes	no / yes
Max. roll diameter up to*	1,200 mm	1,200 mm	1,200 mm	1,200 mm	1,200 mm
	2,000 mm	1,400 mm			

* Depending on the shaft diameter, roll width and number of webs

Winder W500 A-frame

W500 A-frame winder is a **comfortable** and **cost-saving** solution **for large roll diameters**.

This single or multi-web winder is equipped with an electric drive and with two A-frame winding trolleys for each web.

The winder's operation is simple and straightforward. After completing the roll change procedure, the operator removes the A-frame trolley, which holds the finished roll, from the winder. Next, the roll is lifted off the trolley using a crane or forklift.

KEY FACTS AT A GLANCE

- **Large roll diameters**
- **Single or multi-web winder**
- **Electrical movement of winding trolley, optional**

Winder W600 cantilever

The cantilever winder W600 ensures **maximum operator convenience**, especially in the case of **small diameter rolls** and **frequent roll changes**.

This model is a single- or multi-web winder, which has two winding stations with winding shafts for each web, supported on just one side.

After the roll change procedure, a lifting trolley is used to remove the finished roll from the cantilever shaft, which remains in the winder.

KEY FACTS AT A GLANCE

- **Suitable for smaller roll diameters and frequent roll changes**
- **Single or multi-web winder**
- **Winding shafts for each web, supported on just one side**

Winder W550

combined A-frame / cantilever

W550 combines the advantages of the A-frame winder W500 and the cantilever winder W600.

The W550 stands for greater flexibility and production reliability in changing roll diameters from small to big. The A-frame winding trolley is typically used for production processes requiring jumbo rolls, while the cantilever winding shaft is best suited to making frequent roll changes when producing small rolls.

The winder W550 can be easily converted from an A-frame winder into a cantilever winder. The A-frame trolley only has to be moved out, and the cantilever shaft is quickly fixed to the drive disk.

KEY FACTS AT A GLANCE

- **Highly flexible system**
- **Efficiently useable for a wide range of roll diameters**
- **Easy and operator-friendly modification from A-frame to cantilever winder**

Winder W900

turret

The semi-automatic turret winder W900 is easy to operate and requires **less floor and handling space**.

The turret winder is ideal for medium-sized roll diameters and thin sheet production, thanks to its short, internal film guideways.

Additionally, the winder W900 is available with optional friction winding shafts. This allows for the winding of two or more webs on a single shaft.

KEY FACTS AT A GLANCE

- **Especially suited to medium roll diameters and the production of thin sheet**
- **Space saving**
- **Friction winding shafts optionally**

Winder W2000 XL fully automatic

SML's fully automatic sheet winder, W2000 XL, enables **roll changes at full line speed**, eliminating the need for an accumulator.

The short web path in the winder and the automatic attachment of the film to the new winding core represent advantageous features of the W2000 XL. This applies especially to thin films. Generally, this winder is specifically designed to wind PET sheets across a wide range of thicknesses.

Horizontal shaft movement

The winder has a web tension measuring roll in the winder entrance, which separates the winding tension from the upstream web. Owing to the horizontal shaft movement principle, the roll remains in an optimum winding position until the very last moment before cross-cutting, thus guaranteeing a perfect winding quality up to the last layer on the roll.

Powerful guillotine cutting unit

The W2000 XL is equipped with a powerful guillotine cutting unit. After cutting, the leading edge of the film enters a guide system and is pressed onto the newly prepared winding core. The winder is also designed for precise gap winding.
The upper side of the sheet is wound on the inside.

Friction winding for inline split rolls

The winder W2000 XL can be fitted with optional friction winding shafts for the production of inline slit rolls. In this case, two adjustable banana rolls are positioned behind the slitting unit in order to separate the webs with a small clearance between them. In the friction-winding mode, the pneumatic pressure in the winding shaft controls the winding tension in line with the start tension and the selected taper curve.

Fully integrated roll and shaft handling

At the end of the winding process, the finished roll and the winding shaft are transported onto a moveable lifting table by an overhead robot, which then pulls the rolls off the clamped shaft. The complete roll and shaft-handling process is fully integrated into the winder's automatic mode.

KEY FACTS AT A GLANCE

- Automatic roll changes at full speed
- Horizontal shaft movement for an equally high product quality up to the last layer on the roll
- Powerful guillotine cutting unit
- Fully automatic control of winding quality

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.

E-container

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

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 his 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

bit.*Wise* data analytics

Stop guessing, start knowing

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

bit*Wise* 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.

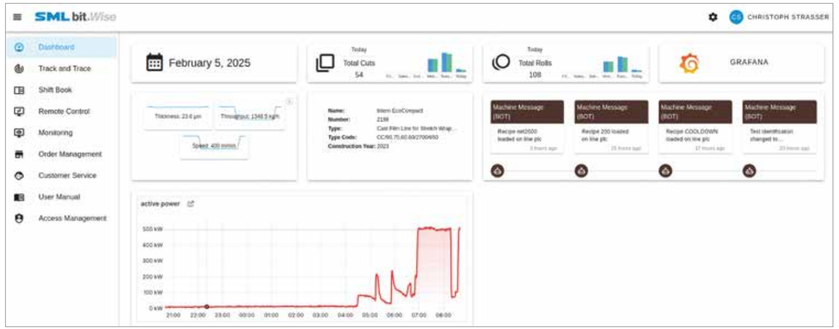
In-depth view of all details

SML's extrusion lines are equipped with hundreds of data-generating sensors. bit*Wise* 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 bit*Wise*, 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

bit*Wise* 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

bit*Wise* 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 bit*Wise* 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, bit*Wise* 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

bit*Wise* 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.

bit.*Wise*
data analytics

Always connected, even on the go

bit*Wise* 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 bit*Wise* 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

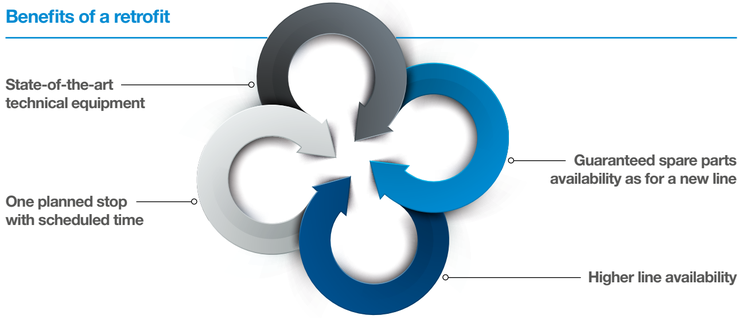
In addition to these more frequent solutions, the following upgrades have also been realised in response to customers' requests:

- 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



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 Redlham 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

SML

EXTRUSION LINES – ENGINEERED TO PERFORM

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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