



100%
eXtrusion
SPINNING LINES

AUSTROFIL -
BCF MULTIFILAMENT

LINES FOR BCF YARNS



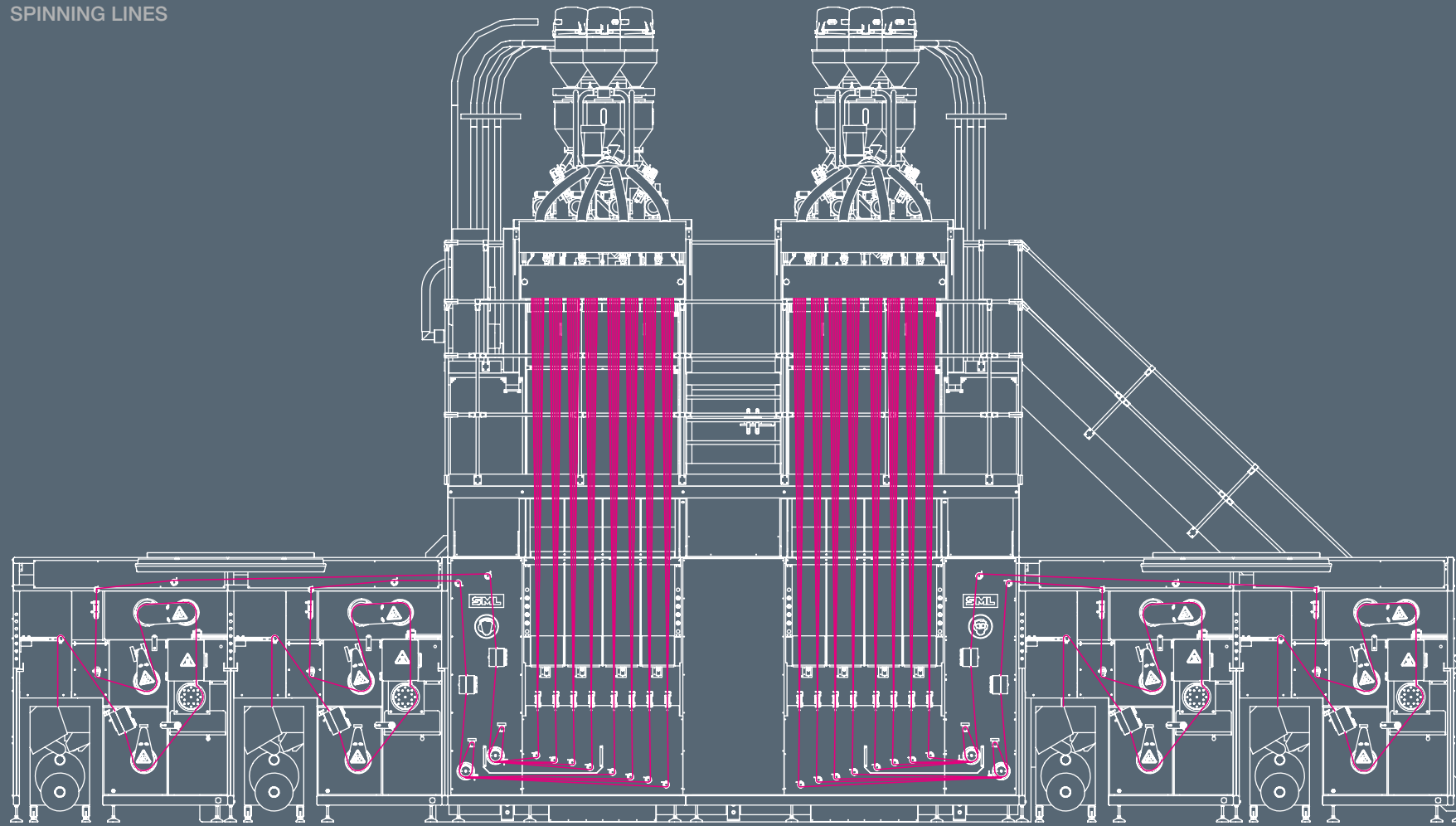
The Bulked Continuous Filament process is the most efficient method of producing yarn for the carpet industry.

SML's brand-name AUSTROFIL® stands for Austrian quality, the best service and turn-key solutions.

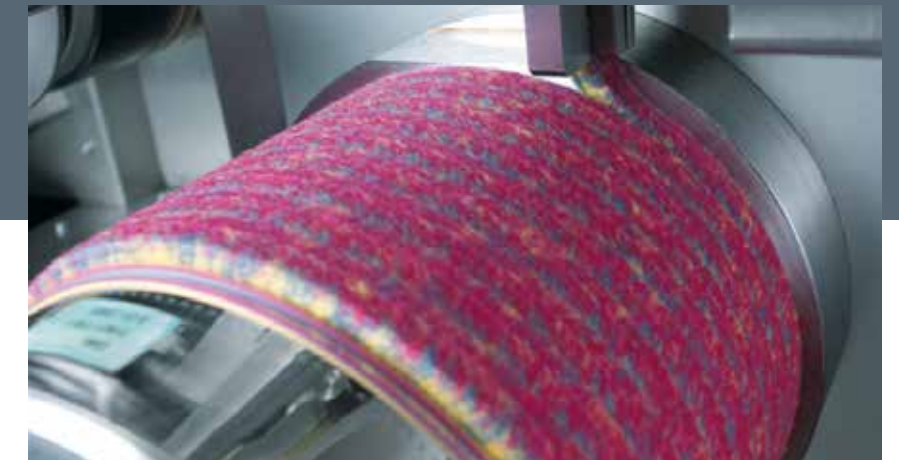
The outstanding characteristics of BCF spinning lines developed and manufactured by SML are technical precision, reliability and flexibility in production – resulting in an **endless variety of high-quality yarns that meet all kinds of requirements and trends for carpet design.**

SML's patented BCF texturing units are setting worldwide standards for high yarn crimp, longevity and the efficient use of raw materials. They are one of the clearest examples of SML's innovative detail engineering with the continuous further development of core components. SML integrates high performance single screw extruders with a 75mm screw diameter in all of its BCF spinning lines. They guarantee, above all, top melt quality, the highest reliability and substantial productivity.

The horizontal line concept of the BCF spinning lines, in combination with the integrated state-of-the-art control system, SMILE ensures comfortable operation, easy maintenance, troubleshooting and remote control. bitWise, SML's digital transformation solution, provides a wide range of entirely new opportunities for data driven decisions with a clear focus on optimisation of production processes and the final products.



SPINNING LINES FOR BCF YARNS



CONTENTS

BCF PP Monocolour Compact	6
BCF PP Monocolour TWIN	8
BCF PET / PA6 / PP Monocolour TWIN	10
BCF PP Tricolour 4 x 2	12
BCF PP Tricolour 6 x 2	14
Line Description BCF PP Tricolour 6 x 2	16
Line Description BCF PET / PA6 / PP Monocolour TWIN	18
Component Description	20



Austrofil®

BCF PP Monocolour „COMPACT“

The BCF PP Monocolour “COMPACT” spinning line is SML’s entry level model, offering the highest yarn quality at a favourable price-performance ratio.

With an output of 160 kg/h or 3.8 t/d, this monocolour line is custom designed for the production of small yarn lots, providing a maximum efficiency and flexibility.

PERFECT COOLING FOR THE HIGHEST YARN QUALITIES

The horizontal line concept of the BCF PP Monocolour “COMPACT” makes the operation and maintenance very simple and straightforward – with considerably low personnel costs. The line is equipped with only one extruder and two stretching sections. Two spinnerets per yarn provide for perfect cooling conditions, which result in an excellent yarn quality even at high titer ranges. Top product standards also derive from the patented SML texturing unit for top crimp contraction – reducing the consumption of raw material in carpet production to an absolute minimum.

OPERATOR-FRIENDLY IN EVERY SENSE

A wide titer range can be produced without any changes of the texturing system components. Thanks to its ingenious design, the crimper is completely maintenance-free and frequent changes of the lamellas are not necessary. As with all new SML spinning lines, the machine control system, SMILE, is absolutely operator-friendly and allows remote operation and servicing.



Your Advantages

- ✓ Affordable market entry level model with output of 160 kg/h
- ✓ Wide titer range production without changes of components in the texturing system
- ✓ Simple and straightforward operation and maintenance

PERFORMANCE LEVEL

BCF PP 2x2C / 75 Compact 4 ends, monocolour	
Polymer	Polypropylene, MFR 23 - 27
Titer range	1,000 - 5,000dtex
Output capacity	160 kg/h, 3.8 t/d

LINE CONFIGURATION

Material feeding and dosing system	1 continuous gravimetric loss-in-weight dosing unit with 2 additives
Extruder	1 unit
Inverter controlled	75 / 28D
AC motor	Melt and colour uniformer device
Spinning system	Electrically heated spinning head 4 spinning pumps each 2 outlets 8 spinnerets each provided separately
Quenching system	1 quenching unit, airflow and temperature controlled down to 14°C cooling air
Take-up system	Spinfinish applicator and pre-intermingling for each yarn thread separately Feeding rolls for constant yarn take-up
Stretching unit	2 independent stretching units Inductively heated godet roller Texturing unit with SML's patented AUSTROJET Multi-wrap cooling drum Top air intermingling jets

WINDING

Winder	Automatic turret winder
Mechanical winding speed	1,000 - 3,500 m/min
Bobbin diameter	Max. 320mm

SPACE REQUIREMENT

Length	7,600mm
Width	6,500mm
Height	Approx. 6,900mm (depending on the dosing unit)



Austrofil®

BCF PP Monocolour „TWIN“

With an output of 320 kg/h, SML's BCF PP Monocolour "TWIN" line stands for the efficient production of high-quality yarn.

Equipped with two extruders and two independent spinning sections, SML's Monocolour TWIN line is ideally suited for the simultaneous BCF PP monocolour production of either 8 absolutely identical yarns or two times 4 yarns with different specifications such as the titer, colour and the number of filaments.

HIGHEST YARN CRIMP – LOW MATERIAL CONSUMPTION

The consumption of raw material for carpet production is very low as the patented texturing system generates yarns with an extraordinary high crimp. In addition, it is possible to run the line with two separate granules. Every adjustment, from dosing to the winder, can be carried out using individual parameters.

MINIMUM MANPOWER

The line can be operated with less manpower, waste production is lower than 1 percent and maintenance is very simple as all the major components are easily accessible.

A high yarn quality is fully preserved across every output capacity, thanks to the use of two extruders.

Your Advantages

- ✓ Ideal for small and large batches alike
- ✓ Different products can be simultaneously produced with ease

PERFORMANCE LEVEL

BCF PP 4x2 / 2x75 TWIN, 8 ends, monocolour	
Polymer	Polypropylene, MFR 23 - 27
Titer range	1,000 - 5,000dtex
Output capacity	320 kg/h, 7.6 t/d

LINE CONFIGURATION

Material feeding and dosing system	2 continuous gravimetric loss-in-weight dosing units with 2 additives
Extruder	2 units
Inverter controlled	75 / 28D
AC motor	Melt and colour uniformer device
Spinning system	2 independent electrically heated spinning heads
	8 spinning pumps each 2 outlets
	16 spinnerets each provided separately
Quenching system	2 independent quenching units, airflow and temperature controlled down to 14°C cooling air
Take-up system	Spinfinish applicator and pre-intermingling for each yarn thread separately
	Feeding rolls for constant yarn take-up
Stretching unit	4 independent stretching units
	Inductively heated godet roller
	Texturing unit with SML's patented AUSTROJET
	Multi-wrap cooling drum
	Top air intermingling jets

WINDING

Winder	Automatic turret winder
Mechanical winding speed	1,000 - 3,500 m/min
Bobbin diameter	Max. 320mm

SPACE REQUIREMENT

Length	12,500mm
Width	6,000mm
Height	Approx. 6,900mm (depending on the dosing unit)



Austrofil®

BCF PET / PA6 / PP Monocolour „TWIN“

The BCF PET / PA6 / PP Monocolour “TWIN” spinning line is the ideal solution for anyone looking for top quality BCF yarn production with a wide choice of raw materials.

With an output capacity up to 9.6 t/d and the ability to process PET, PA6 and PP, this spinning line combines performance with flexibility in any aspect of the production process.

TWO YARNS WITH DIFFERENT SPECIFICATIONS

The BCF PET / PA6 / PP Monocolour “TWIN” is equipped with two independent spinning sections and it is therefore able to produce two types of yarns with different specifications simultaneously, i.e. in terms of diverse titer ranges or diverse numbers of filaments, etc.

OPTIMAL THERMAL TREATMENT

A cooling process with two spinnerets per yarn ensures perfect cooling conditions, contributing substantially to the high output and the excellent yarn quality of this line. Controlled humidity in the quenching air ensures an identical yarn quality, regardless of the production environment. 4-zones godets even guarantee thermal treatment for each yarn thread.

ADVANCED EXTRUDER TECHNOLOGY FOR FLEXIBILITY IN PRODUCTION

Due to the advanced extruder technology, changes of raw materials or colours take place fast and without frictions. SML's user-friendly control system SMILE allows remote operation, supervision and service as well as extended data analysis and quality documentation.



Your Advantages

- ✓ Ready for batches of any size
- ✓ Highest flexibility in any aspect of the production process – different raw materials, two types of yarn simultaneously
- ✓ Reduction of up to 15 % in raw material consumption thanks to the patented texturing system

PERFORMANCE LEVEL

BCF PET/PA6/PP 4x2 TWIN 8 ends, monocolour	
Polymer	Polypropylen with MFR 23 - 27 Polyester with IV 0.76 - 0.84 Polyamide with RV 2.67 - 2.73
Titer range	1,000 - 5,000dtex
Output capacity	320 kg/h, 7.6 t/d

LINE CONFIGURATION

Dry air drying system	Dry air quantity 800 m³/h Main drying bin 3000l
Additional drying bins	Above dosing unit, 6 units, each 50l
Material feeding and dosing system	2 continuous gravimetric loss-in-weight dosing units with 2 additives
Extruder	2 units
Inverter controlled	75 / 28D
AC motor	Melt and colour uniformer device
Spinning system	2 independent electrically heated spinning heads 8 spinning pumps each 2 outlets 16 spinning pumps each provided separately
Quenching system	2 independent quenching units, airflow, temperature and humidity controlled down to 14 °C cooling air
Take-up system	Heated feeding rolls for constant yarn take-up
Stretching unit	4 independent stretching units Inductively heated multizone godet rollers Texturing unit with SML's patented AUSTROJET Multi-wrap cooling drum Top air intermingling jets

WINDING

Winder	Automatic turret winder
Mechanical winding speed	1,000 - 3,500 m/min
Bobbin diameter	Max. 320mm

SPACE REQUIREMENT

Length	13,500mm
Width	11,000mm
Height	Approx. 12,500mm (depending on the dosing unit)



Austrofil®

BCF PP Tricolour 4x2

The central asset of the BCF PP Tricolour line is its vast variety of unique yarns with nearly endless colour combinations that can meet the fanciest trends in carpet design.

Like all BCF spinning lines made by SML, the BCF PP Tricolour line offers the highest yarn quality in combination with an extraordinary efficiency.

PATENTED TEXTURING FOR OUTSTANDING CRIMP

The patented texturing unit of the BCF PP Tricolour guarantees an outstanding uniform crimp structure. Additionally, it allows the production of an extensive titer range without changing any components.

SUPERIOR COOLING EFFICIENCY

The yarn quality even at high titer ranges comes substantially from the sophisticated cooling system featuring several vertical and horizontal adjustable zones.

WIDE RANGE OF COLOUR VARIATIONS

Two pre-intermingling positions allow for a wide range of colour variations – from melange to sprinkle. Additionally, optional cam rolls enable the creation of carpet yarns with a very special design appearance.

All of the production processes are managed with the integrated control system, SMILE, that provides very user-friendly operation, supervision and remote service, as well as data trend analysis and quality documentation.



Your Advantages

- ✓ High crimp tri and monocolour yarns for cost efficient carpet production
- ✓ Production of unique yarns to set new trends and suit the latest style developments
- ✓ Top-grade colour constancy, meaning colours can always be reproduced

PERFORMANCE LEVEL

BCF PP 4x2 T / 3x75 8 ends, mono and tricolour	
Polymer	Polypropylene, MFR 23 - 27
Titer range	1,000 - 5,000dtex
Output capacity	320 kg/h, 7.6 t/d

LINE CONFIGURATION

Material feeding and dosing system	3 continuous gravimetric loss-in-weight dosing units with 2 additives
Extruder	3 units
Inverter controlled	75 / 28D
AC motor	Melt and colour uniformer device
Spinning system	1 electrically oil heated spinning head
	12 spinning pumps each 2 outlets
	24 spinnerets each provided separately
Quenching system	2 independent quenching units, airflow and temperature controlled down to 14°C cooling air
Take-up system	Spinfinish applicator for each yarn thread separately
	Sprinkle and melange pre-intermingling
	Feeding rolls for constant yarn take-up
Stretching unit	4 independent stretching units
	Inductively heated godet roller
	Texturing unit with SML's patented AUSTROJET
	Multi-wrap cooling drum
	Top air intermingling jets

WINDING

Winder	Automatic turret winder
Mechanical winding speed	1,000 - 3,500 m/min
Bobbin diameter	Max. 320mm

SPACE REQUIREMENT

Length	14,000mm
Width	8,500mm
Height	Approx. 7,100mm (depending on the dosing unit)



Austrofil®

BCF PP Tricolour 6x2

SML's BCF Tricolour 6x2 spinning line stands out with its remarkable output capacity in combination with the highest production flexibility in production.

The line is providing two different processing modes: either one big tri or monocolour lot with 12 ends and an output of 480 kg/h, or the simultaneous production of three different monocolour lots with 4 ends and an output of 160 kg/h each.

PATENTED TECHNOLOGY FOR SUPERIOR YARN QUALITIES

It is SML's superior extrusion technology in interaction with a convenient gravimetric dosing system that ensures top melt quality with an optimised colour distribution. In both modes, SML's elaborated spinpack design allows the processing of up to 700 filaments per yarn. The high yarn crimp and the outstanding product qualities of the BCF Tricolour 6x2 line are largely due to SML's patented texturing technology in combination with multi-wrap cooling drums.

OPERATOR-FRIENDLY AND COMPACT LINE SET-UP

SML's BCF Tricolour 6x2 spinning line is controlled by an intuitive Human Machine Interface (HMI) that guarantees comfortable operation. Additionally, the line is ready for SML's data logging and analysing tool, bitWise. Due to the horizontal line design, string-ups and maintenance are swift and easy. Despite the line's horizontal set-up, the footprint is considerably small, with an unmatched low line height.



Your Advantages

- ✓ Highest volumes with outstanding yarn qualities – 480 kg/h of tricolour or monocolour BCF yarn
- ✓ Simultaneous production of three independent monocolour lots – each 160 kg/h
- ✓ Superior spinpack design for up to 700 filaments per yarn for extraordinary yarn properties

PERFORMANCE LEVEL

BCF PP 6x2T / 3x75 12 ends, mono- and tricolour	
Polymer	Polypropylene, MFR 23 - 27
Titer range	1,000 - 5,000dtex
Output capacity	480 kg/h, 11.5 t/d

LINE CONFIGURATION

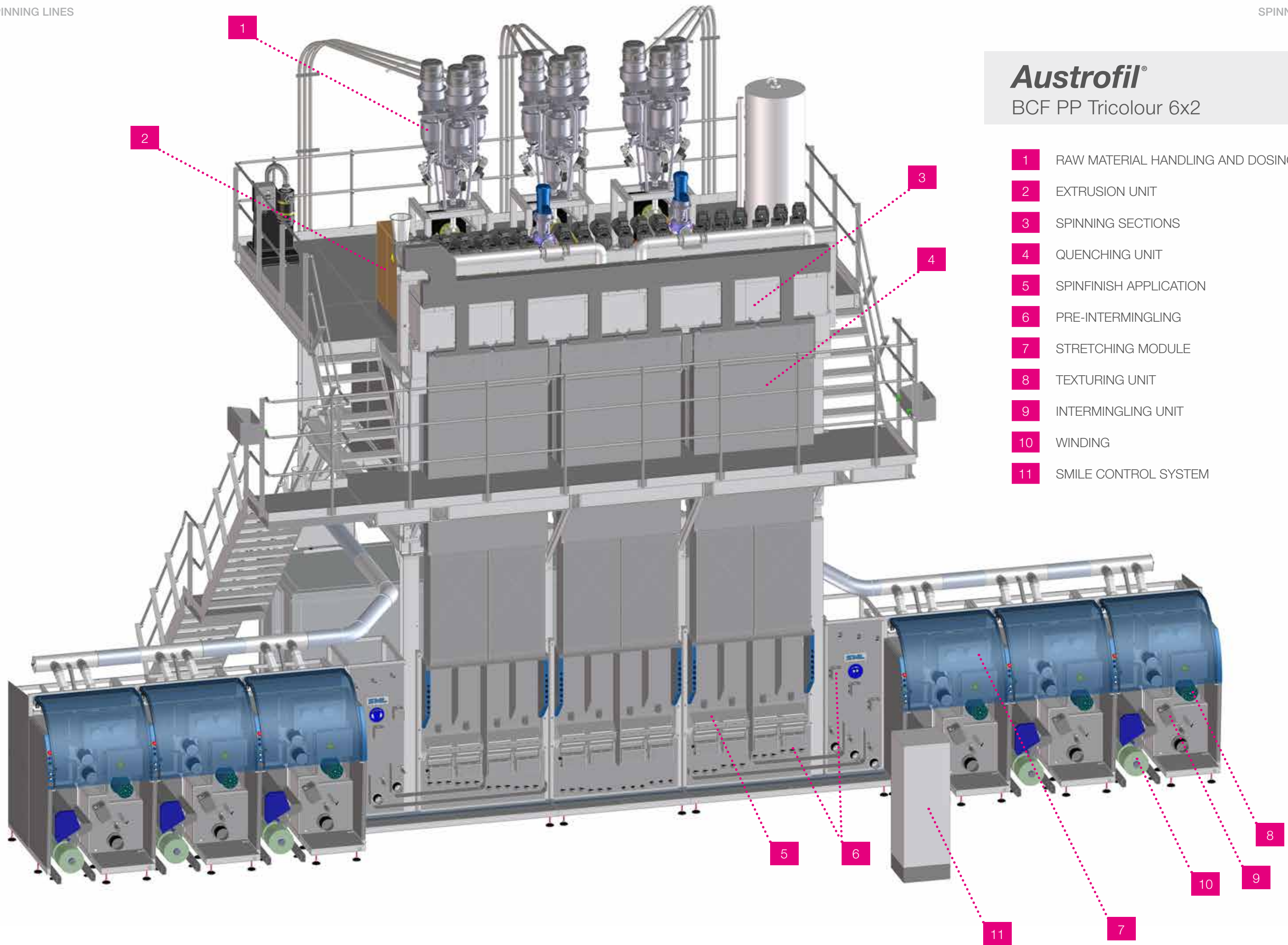
Material feeding and dosing system	3 continuous gravimetric loss-in-weight dosing units with 2 additives
Extruder	3 units
Inverter controlled	75 / 28D
AC motor	Melt and colour uniformer device
Spinning system	1 electrically oil heated spinning head
	18 spinning pumps each 2 outlets 36 spinnerets each provided separately
Quenching system	3 independent quenching units, airflow and temperature controlled down to 14°C cooling air
Take-up system	Spinfinish applicator for each yarn thread separately
	Sprinkle and melange pre-intermingling
	Feeding rolls for constant yarn take-up
Stretching unit	6 independent stretching units
	Inductively heated godet roller
	Texturing unit with SML's patented AUSTROJET
	Multi-wrap cooling drum Top air intermingling jets

WINDING

Winder	Automatic turret winder
Mechanical winding speed	1,000 - 3,500 m/min
Bobbin diameter	Max. 320mm

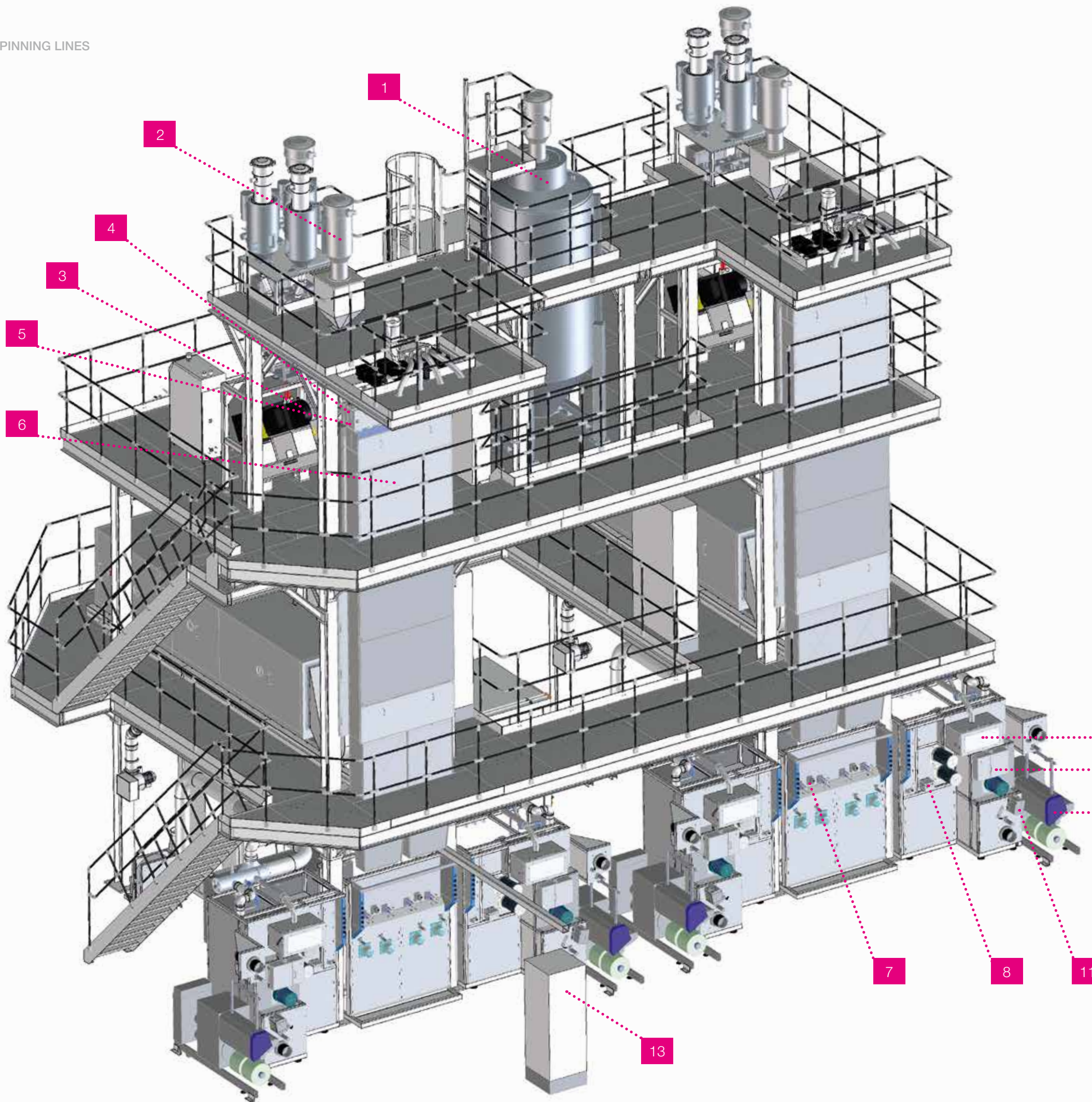
SPACE REQUIREMENT

Length	15,500mm
Width	6,600mm
Height	Approx. 9,100mm (depending on the dosing unit)



Austrofil®
BCF PP Tricolour 6x2

- 1** RAW MATERIAL HANDLING AND DOSING
- 2** EXTRUSION UNIT
- 3** SPINNING SECTIONS
- 4** QUENCHING UNIT
- 5** SPINFINISH APPLICATION
- 6** PRE-INTERMINGLING
- 7** STRETCHING MODULE
- 8** TEXTURING UNIT
- 9** INTERMINGLING UNIT
- 10** WINDING
- 11** SMILE CONTROL SYSTEM



Austrofil®

BCF PET / PA6 / PP Monocolour „Twin“

- 1 DRYING EQUIPMENT
- 2 RAW MATERIAL HANDLING, DRYING AND DOSING
- 3 EXTRUSION EQUIPMENT
- 4 SPINNING SECTION
- 5 SPINPACKS
- 6 QUENCHING UNIT
- 7 SPINFINISH APPLICATION
- 8 PRE-INTERMINGLING
- 9 STRETCHING MODULE
- 10 TEXTURING UNIT
- 11 INTERMINGLING UNIT
- 12 WINDING UNIT
- 13 SMILE CONTROL SYSTEM

- 9
- 10
- 12

- 7
- 8
- 11

- 13



EXTRUSION UNIT ▲

Drying equipment

For processing PET or PA6, a drying equipment is necessary which guarantees optimal material conditions at the extruder inlet.

Top quality drying systems ensure a lower residual moisture content of the granules and additives. Closed air circuits are employed to prevent humidity absorption in the material feeding system.

Raw material handling and dosing

BCF spinning lines from SML are equipped with highly accurate gravimetric loss-in-weight dosing systems for exact and reproducible colour effects. These systems consist of one main component and two ancillary components for additives like colour master-batch or UV stabilisers. For easy operation, the main functions of the raw material handling and dosing unit are actuated using the SMILE control panel at ground level. For processing PET or PA6, additional drying equipment is required.

Your Advantages

- ✓ World-class extrusion technology for top melt quality and colour uniformity
- ✓ Easy line operation at ground level

Extrusion unit

SML is a globally accepted technology leader in the field of extrusion systems. BCF spinning lines made by SML contain highly efficient single screw extruders with a 75mm screw diameter and an L/D ratio of 28. A high output, barrier screw design and a subsequent static melt mixer in the adapter pipe ensure a top melt quality and top colour distribution. The extrusion unit is driven by an air-cooled AC motor, coupled to a water-cooled gear-box. Continuous melt filters, like SML's screen belt filter system, are available as an option.

Your Advantages

- ✓ Gravimetric loss-in weight dosing systems for exact and reproducible colour effects



SPINNING SECTION ▲

Spinning Sections

BCF MONOCOLOUR LINES

SML's Monocolour BCF lines use spinning beams with electrical plate heaters for a stable operation and easy maintenance. All the spinning pumps have two outlets and each outlet provides a single spinpack with melt. The design ensures an equal residence time for every melt stream, resulting in a very uniform yarn quality. Technical precision and a 100 % vertical yarn path ensure an excellent spinning quality and problem-free production.

BCF TRICOLOUR LINES

On SML's Tricolour BCF lines, the heating system of the spinning beam allows a wide temperature range for the processing of various types of materials. The large spinning beam is heated electrically and the heat transfer is done by thermal oil in order to obtain a constant

Quenching unit

SML's efficient quenching units supply cooling air at a defined temperature and speed to the filaments for uniform cooling. They are designed with three individually adjustable horizontal zones for fine-tuning quenching conditions.

BCF PET / PA6 / PP MONOCOLOUR 'TWIN'

For processing PET or PA6, the quenching unit is equipped with steam generators to supply humidity-controlled quenching air.

temperature over its entire width. To avoid safety hazards, the thermal oil circulates in an open system under atmospheric pressure.

The lightweight design of the spinpacks offers easy handling and replacements, and no spinpack preheating is required. The holes in the spinnerets for BCF have a trilobal design cross-section. A monomer suction unit above the spinning beam can be applied and guarantees the efficient removal of fumes from the top of the machine.

Your Advantages

- ✓ Precise vertical yarn path
- ✓ Spinpacks with a lightweight design
- ✓ Spinning beam for a wide temperature range

Your Advantages

- ✓ Air flow and temperature control
- ✓ Air flow with an even speed profile
- ✓ Adjustable horizontal zones



SPINFINISH APPLICATION ▲

Spinline application

Spinline application reduces frictions during spinning and in the subsequent production steps. Furthermore, it helps to hold the filaments together. This improves the stability of the whole production process.

Spinline oil is supplied very accurately to the ceramic applicator nozzles by means of precision metering gear pumps. A single pump outlet for each yarn ensures that an exact and equal amount of

oil is applied to the yarn. The spinline tank is equipped with a level sensor and a filter prevents supply system blockages.

Your Advantages

- ✓ Accurate supply of spinline oil by precision metering gear pumps

Pre-intermingling

BCF MONO / TWIN

In the pre-intermingling stations of its Monocolour and Monocolour Twin lines, SML uses air jets to compact the single yarns and to distribute the applied spinline more uniformly. Precise pre-intermingling provides an enhanced processing performance throughout the entire line.

BCF TRICOLOUR

At SML's BCF Tricolour lines, two different pre-intermingling systems are installed for diverse design effects. The first system is used for strong colour separation, which creates a 'sprinkle effect' in the yarn through the compacting of each single colour thread.

The second pre-intermingling system allows all of the filaments to be mixed. This results in a 'melange effect', which involves the mingling of three single colours of each yarn with no extreme colour separation. Both pre-intermingling systems can be combined.

Your Advantages

- ✓ Pre-intermingling via air jets
- ✓ Diverse design effects



PLUG ON COOLING DRUM ▲

Stretching module

The processing of only two yarns per stretching and texturing unit ensures excellent yarn treatment. Inductively heated godets prepare the yarn for the desired stretching ratio and guide it into the texturing unit. Energy-saving motors drive the godets, which have surfaces coated with a wear-resistant ceramic layer for a long service life.

In case of a yarn break, a cutting and suction unit removes the yarn, thus enabling the operator to thread up the line again beginning from the suction.

Your Advantages

- ✓ Inductively heated godets for the best stretching and texturing results
- ✓ Cutting and suction unit for a fast and easy re-start in the case of yarn breaks

Texturing unit

SML's patented texturing system is setting a market benchmark for high yarn crimp. Its central technical property is its sophisticated design that reduces service-times to an absolute minimum. As there are no wear-parts integrated, the texturing unit in SML's BCF spinning lines is largely maintenance-free. The texturing jets can handle yarns in the complete titer range without the need to change parts such as lamellas.

The excellent crimp provided by the SML system results in maximum carpet pile coverage, which allows producers to employ finer yarns for an equal or superior product quality. This advantage adds up to raw material savings and therefore lower costs.

Your Advantages

- ✓ Well accepted quality benchmark for a high yarn crimp
- ✓ Material savings
- ✓ Free from wear parts



INTERMINGLING UNIT ▲

Intermingling unit

In its BCF spinning lines SML exclusively uses first-class ceramic intermingling jets. To cover the whole titer range, only two different sets of intermingling jets are required. The jets are mounted in a sound-insulated box made of stainless steel. Air pressure is employed to control the number of intermingling knots.

Your Advantages

- ✓ First class ceramic intermingling jets
- ✓ Only two different sets to cover the whole titer range
- ✓ Adjustable number of knots

Winding

All of the spinning lines from SML are available with fully automatic turret winders. First class winding quality at top speeds delivers perfect yarn bobbins.

STANDARD WINDER DATA FOR BCF LINES

No. of yarns	2
Core diameter	73mm
Traverse length	250mm
Bobbin diameter	Max. 320mm
Mechanical winding speed	Max. 3,500 m/min





E-CONTAINER ▲

SMILE® control system

SMILE is SML's generic machine control and operation concept. It stands for all-encompassing automation, providing machine control systems with the highest usability in combination with outstanding capacities for profound process management and monitoring.

The end-to-end integration of third-party systems, overall line effectiveness, operator-friendliness as well as tailor-made and flexible software solutions are the key elements of SMILE.

SMILE is developed as a whole in-house and is integrated one hundred percent in SML's extrusion lines. It is the highly precise, centralised control and synchronisation of all components in an extrusion system, which is blazing the way to new manufacturing concepts as well as delivering product properties, line efficiency and output volumes.

INTUITIVE MACHINE CONTROL CONCEPT

SMILE is an integral part of SML's coherent and user-friendly over-all line concept; machine control and operation is highly intuitive and self-explanatory:

- A central control station system for the highest operating comfort and the visualisation of all processes
- Reduced training efforts 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 increase in the Overall Equipment Effectiveness (OEE) through optimised production processes.

- Optimised use of raw materials, preventing waste
- Faster start-up of production
- Minimised times for product change-overs – customisable assistant for product changes



Control panel



SYSTEMATISED QUALITY CONTROL

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

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

INTERCONNECTIVITY AND THIRD-PARTY INTEGRATION

SMILE has open interfaces that allow the web-based data exchange with third-party machines and systems.

- Open to interconnecting with systems like Enterprise Resource Planning (ERP), Quality Assurance (QA) or SML's data analysis tool bitWise
- Based on open standards like HTML5 and UPC-UA
- Complete end-to-end process control beyond SML extrusion lines

INTEGRATED ALL-IN-ONE CONCEPT

It is SMILE's all-in-one concept that helps to create completely new types of extrusion solutions, making one single operator-friendly step out of the most complex production processes. The control of temperatures, speeds and pressures on SML extrusion lines is highly centralised. All of the line modules and motors are perfectly interconnected and synchronised with each other.

CENTRAL CONTROL STATION SYSTEM

SMILE's central control station system allows the management of all of the production processes from the wide touch screen attached to the line. As SMILE is web-based, all of the 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. It is SML's flexibility that offers a wide range of opportunities if customer-specific solutions are required.

SOFTWARE 100 % DEVELOPED IN-HOUSE

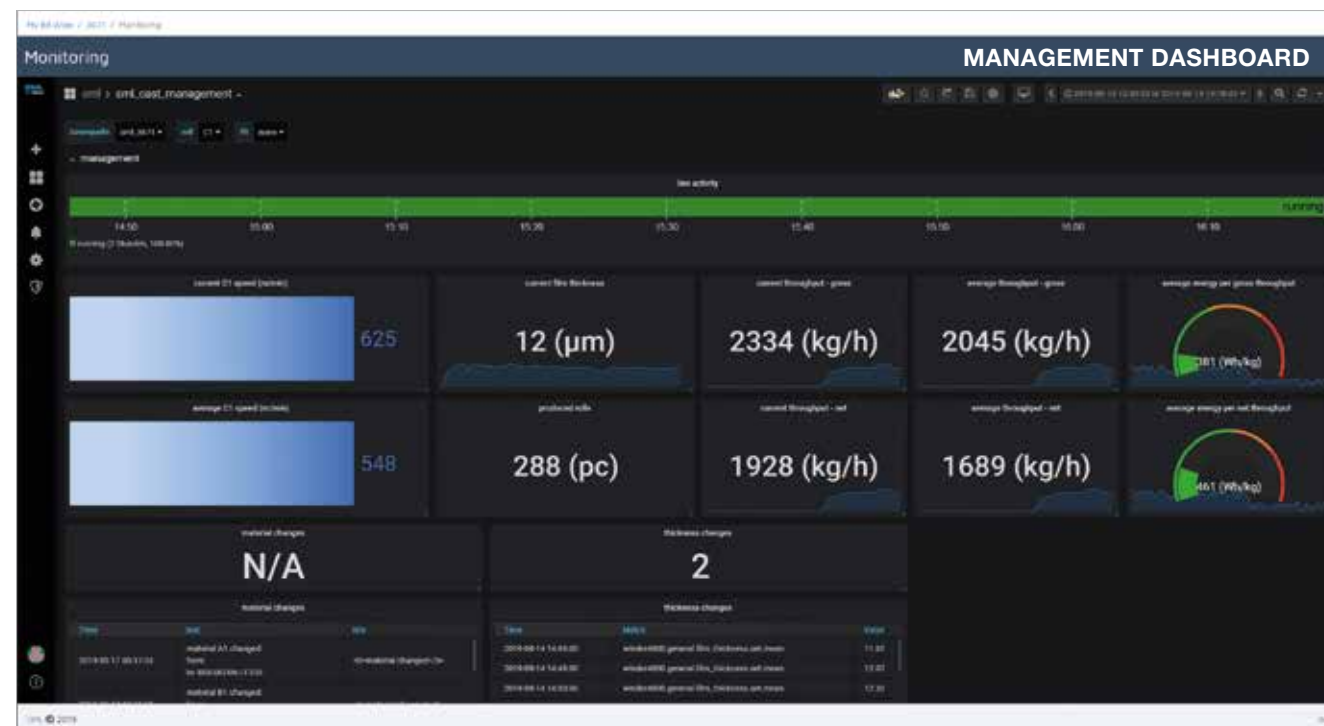
Above all, it is SML's long-standing in-house competence in the field of automation and machine control that provides loads of innovative functions tailored to specific customer requirements. In-house developed, state-of-the-art and dynamic controller systems always allow running the machines at their very best performance-level – considering both economic and environmental aspects. All of SMILE's software solutions are developed by SML technicians. Last but not least, it is SML's concentrated know-how in any aspect of automation, that helps to create the extrusion solutions of tomorrow.

SMILE SOFTWARE FEATURES

- ▶ Central control station system for all production processes
- ▶ Full interconnectivity – global UPC-UA, programmed on HTML5, open interface to other machines and systems
- ▶ Remote access for operators and service teams – worldwide via the 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 wide screen
- ▶ Worldwide possibility of remote update for customisation and technical support

SMILE HARDWARE FEATURES

- ▶ The hardware components of SMILE are supplied by B&R Industrial Automation GmbH, a member of the ABB group, a global leader in automation.



bitWise data analytics

bitWise is SML's digital transformation solution for extrusion lines. It breathes life into the buzzword **"Industry 4.0"**. bitWise provides for a wide range of entirely new opportunities for data driven decisions with a clear focus on the optimisation of production processes and the final product. Completely developed in-house, it incorporates SML's decades of experience in automation with the latest technologies in data analytics and visualisation.

IN-DEPTH PROCESS INSIGHTS

SML extrusion lines are equipped with hundreds of data-generating sensors. Following the principle of **"stop guessing – start knowing"**, bitWise collects, records and visualises this data up to 10 times per second. This gives manufacturers a 360 degree in-depth view of all of the details involved in a production process, both in the present and in the past.

OPTIMISING QUALITY

bitWise is a powerful tool to optimise any aspect of the production process with a direct effect on product quality.

- In-depth monitoring of all quality-related process parameters, allowing quick corrective action
- Comprehensive tracking and documenting of product quality
- Making quality reproducible

3871
qhObwH

Position:	B4_1
Width:	500
Weight:	17.6
Diameter:	234
Endtime:	10.9.2019, 15:55
Length:	2665
Length difference:	0
Rolls:	4
Order Nr.:	bitWise
Quality:	excess length
Recipe:	12mic_K-Show
Shaft:	4
Shift:	KW37
Starttime:	10.9.2019, 15:51
Station:	B
Tags:	show, lab
Thickness:	12.6
Trial:	K-SHOW_12mic
Trigger:	meter

SHOW METRICS

GENERATE A REPORT

MAXIMISING OUTPUT

Data recorded, aggregated and visualised by bitWise helps to raise overall line utilisation and deliver a faster return on investment (ROI).

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

MINIMISING PRODUCTION COSTS

bitWise is the central tool to measure and visualise all production-related costs. It forms a strong and reliable basis for the continuous cost-optimisation of production processes.

- 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

ON-PREMISE SOLUTION

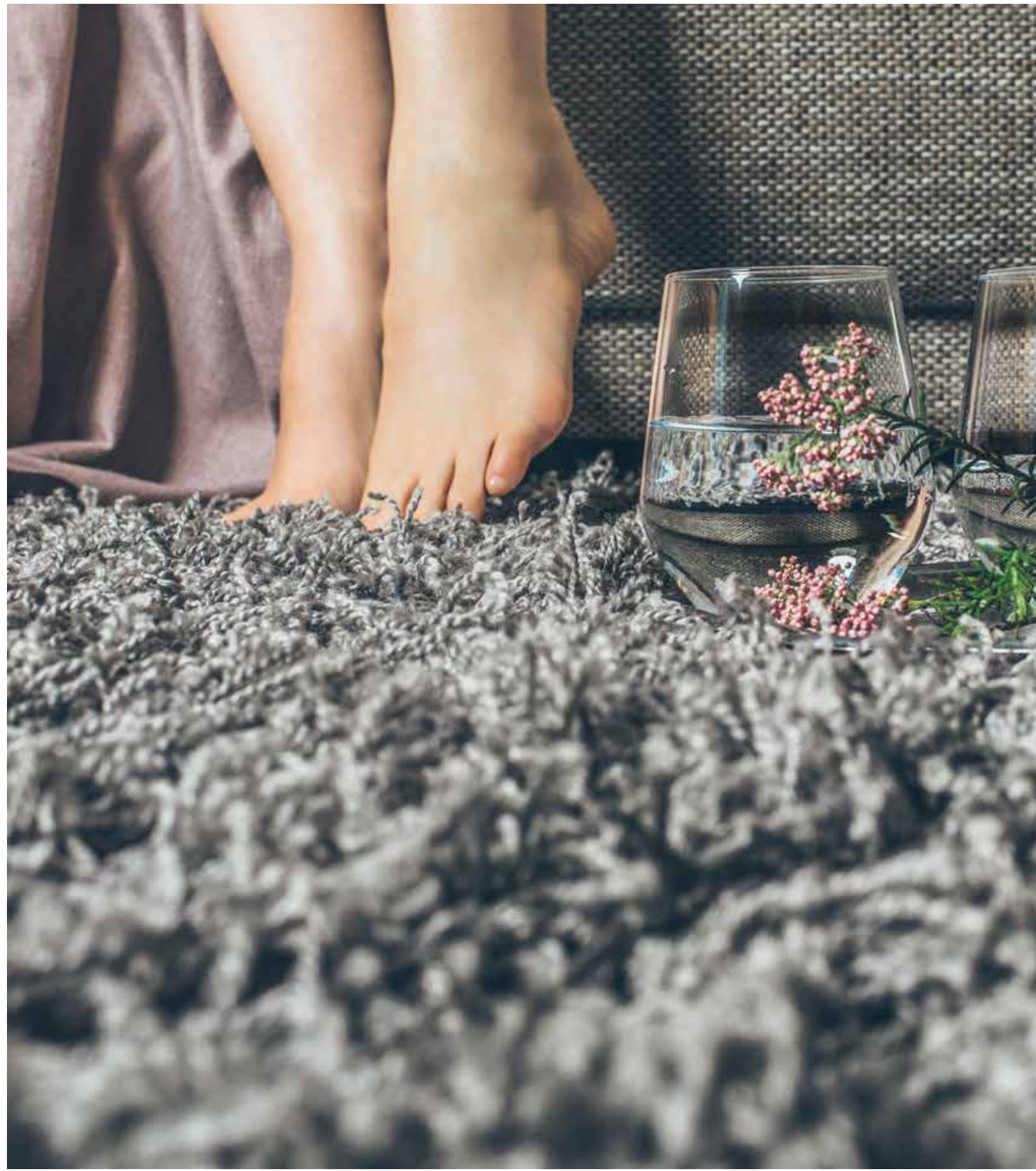
bitWise is a 100 % on-premise solution. Your data stays in your company, on dedicated and secured hardware, no cloud services required.

CUSTOMISATION AND RETRO-FIT

As with most technologies developed by SML, bitWise is highly customisable. bitWise can be retro-fitted to many existing SML extrusion lines optimising production processes, cutting costs, raising the OEE and ROI of existing investments.

OPEN FOR VERTICAL INTEGRATION

Extrusion lines are a key part in a wider production chain. For end-to-end optimisation, bitWise supports data exchange and vertical integration with third-party systems, e.g. Manufacturing Execution Systems (MES), Enterprise Resource Planning (ERP) or Quality Assurance (QA).



	BCF PP 2x2 C / 75 4 ends monocolour	BCF PP 4x2 / 2x75 TWIN 8 ends monocolour	BCF PET/PA6/PP 4x2 / 2x75 TWIN 8 ends monocolour
GENERAL TECHNICAL DATA			
Polymer	Polypropylene, MFR 23 - 27	Polypropylene, MFR 23 - 27	Polypropylene, MFR 23 - 27 PET IV 0.76 - 0.84 PA6 RV 2.67 - 2.73
Titer range	1,000 – 5,000dtex	1,000 – 5,000dtex	PET 1,000 - 4,400dtex
Output capacity	160 kg/h (> 2,400dtex) 3.8 t/d	320 kg/h (> 2,400dtex) 7.6 t/d	PET 400 kg/h (> 3,000dtex) 9.6 t/d
Drying system	–	–	Airflow 910 m ³ /h
Dosing unit	Continuous gravimetric loss-in-weight dosing with 3 components		
Extruder [mm] L/D	1 unit, 75/28	2 units, 75/28	2 units, 75/28
Spinning beam	Electrically heated with plate heaters	Electrically heated with plate heaters	Electrically heated with plate heaters
Spinning pumps	4 pcs. each 2 outlets	8 pcs. each 2 outlets	8 pcs. each 2 outlets
Spinnerets	8 pcs., Ø 110mm	16 pcs., Ø 110mm	16 pcs., Ø 110mm
Pre-intermingling	Heberlein, Migra-Jet	Heberlein, Migra-Jet	Heberlein, Migra-Jet
Godets	Ø 160mm, induction heated, lifetime lubricated bearings		Ø 190mm, inductive, multi zone heating
Texturing system	Patented jets, operation without lamellas		
Cooling process	One cooling drum, multi-wrap, cooling time > 15s		
Winder	Automatic turret winder	Automatic turret winder	Automatic turret winder
Winding speed	1,000 – 3,500 m/min	1,000 – 3,500 m/min	1,000 – 3,500 m/min
Bobbin diameter	320mm	320mm	320mm

MAIN DIMENSIONS			
Length	7,600mm	12,500mm	13,500mm
Width	6,500mm	6,000mm	11,000mm
Height with standard dosing unit	6,900mm	6,900mm	12,500mm

Machine type	AUSTROFIL BCF monocolour	AUSTROFIL BCF monocolour TWIN	AUSTROFIL BCF PET/NYLON
Applications	Carpets, rugs, door and window seals		Carpets and rugs

	BCF PP 4x2 T / 3x75 8 ends tricolour	BCF PP 6x2 T / 3x75 12 ends tricolour
GENERAL TECHNICAL DATA		
Polymer	Polypropylene, MFR 23 - 27	Polypropylene, MFR 23 - 27
Titer range	1,000 – 5,000dtex	1,000 - 5,000dtex
Output capacity	320 kg/h (> 2,400dtex) 7.6 t/d	480 kg/h (> 2,400dtex) 11.5 t/d
Drying system	–	–
Dosing unit	Continuous gravimetric loss-in-weight dosing with 3 components	
Extruder [mm] L/D	3 units, 75/28	3 units, 75/28
Spinning beam	Electrically heated, thermal oil for heat transfer	Electrically heated, thermal oil for heat transfer
Spinning pumps	12 pcs. each 2 outlets	18 pcs. each 2 outlets
Spinnerets	24 pcs., Ø 110mm	36 pcs., rectangular
Pre-intermingling	Heberlein, Migra-Jet, 2 positions	Heberlein, Migra-Jet, 2 positions
Godets	Ø 160mm, induction heated, lifetime lubricated bearings	
Texturing system	Patented jets, operation without lamellas	
Cooling process	One cooling drum, multi-wrap, cooling time > 15s	
Winder	Automatic turret winder	Automatic turret winder
Winding speed	1,000 – 3,500 m/min	1,000 – 3,500 m/min
Bobbin diameter	320mm	320mm

MAIN DIMENSIONS		
Length	14,000mm	15,500mm
Width	8,500mm	6,600mm
Height with standard dosing unit	7,100mm	9,100mm

Machine type	AUSTROFIL BCF tricolour	AUSTROFIL BCF tricolour
Applications	Multi-coloured carpets and rugs	Multi-coloured carpets and rugs

NOTES:



EXTRUSION LINES – ENGINEERED TO PERFORM ▶

SML - Head Office

SML Maschinengesellschaft mbH
Gewerbepark Ost 32
4846 Redlham, Austria
Phone: +43 7673 90999 0
E-mail: sml@sml.at
www.sml.at

SML - Machinery Far East Sdn Bhd

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

SML - Moscow Office

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

SML - Beijing Office

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

SML - North America Service Inc.

Suite 204
85 Eastern Avenue
Gloucester MA 01930
USA
Phone: + 1 978 281 0560
E-mail: jom@sml.at

100%
eXtrusion
SPINNING LINES

ANALYSES | DEVELOPMENT

PRE-TESTED PERFORMANCE | DELIVERY ON TIME

SERVICE SUPPORT | CUSTOMER SATISFACTION

www.sml.at