

FILAMENT

Perfect Sizing is a key-passage in the weaving industry, where the accuracy of warps reflects in the efficiency of the weaving machines and in the quality of the fabrics.

PRO-SMH knows the industry and its needs: we have designed the perfect machines to fit the requirements of each specific application, where all parts are perfectly combined with our know-how, in a process to achieve top-quality results. The experience of our team in weaving preparation spans over decades and hundreds of applications, making nowadays PRO-SMH the skilled and reliable partner for man-made filament weaving mills. We offer new and innovating machines as well as prompt and competent Service for troubleshooting, modification and spare parts.



WEAVING PREPARATION

PRO-FILAMENT[®]

FILAMENT YARN-RANGES



WEAVING PREPARATION

PRO-MULTISIZE[®]

efficient & accurate for cellulosic fibers
& higher counts



WEAVING PREPARATION

PRO-SINGLESIZE[®]

smooth process for thin, microfiber yarns

PRO-FILAMENT

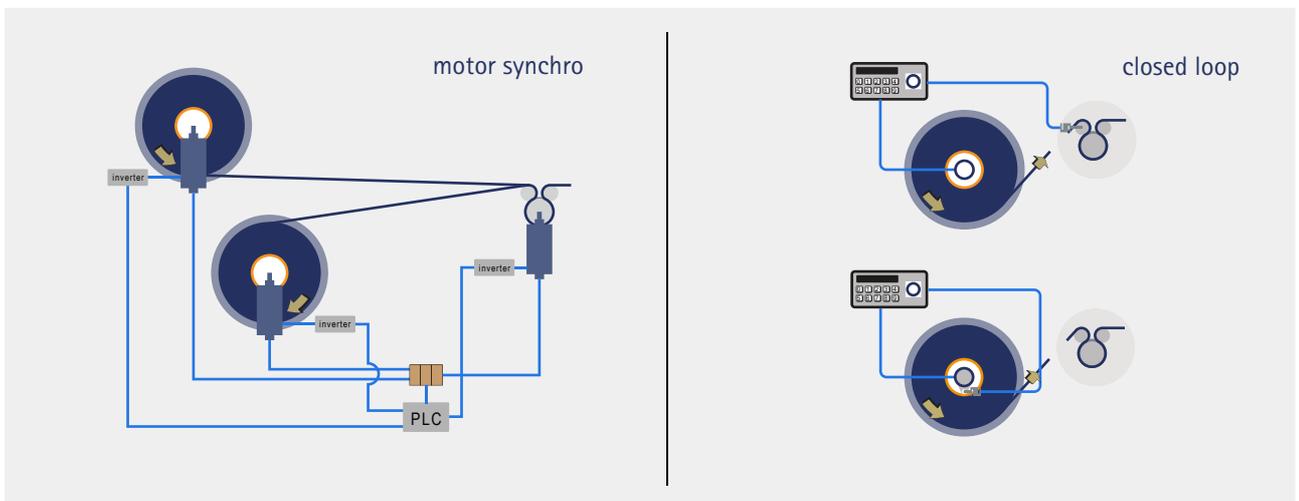
The adjustment of Yarns Tension is crucial for the quality of the warps, particularly with delicate continuous filament and cellulosic yarns.

PRO FILAMENT machines accurately regulate to obtain a smooth yet fast passage of the yarns along the process, by automatic adjustment of the brakes and synchronization of the different motors of the machines. Our advanced systems swiftly control the unwinding and rewinding in a 'closed loop', with the tension set and controlled by onboard computer.

WEAVING PREPARATION

TENSION CONTROL

- especially designed for delicate yarns for the lowest tension
- stepless control in increments, accelerations and deceleration
- complete reproducible quality due to automatic process control
- real tension adjustments by loadcell systems



The two dryers of the machine (one with hot air flow and one with driven hot-cylinders) can be designed for operation either with steam or with diathermal oil, to match customer's production needs.

WEAVING PREPARATION

HEATING FLUIDS

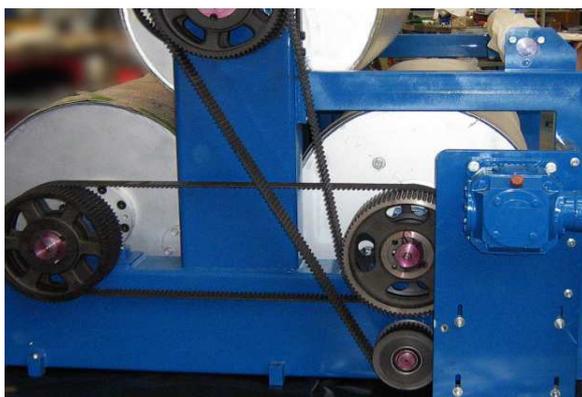
- STEAM
- OIL



WEAVING PREPARATION

SMOOTH & EFFICIENT

The size box has been fully motorized and provided with double tank with interspace for heating (steam or oil) and filter overflow; special sensors allow a smooth regulation.



PRO-SMH has taken up the challenge of the new innovating fibers and designed a machine with specific features for the ultra-fine yarns and the most efficient process.

The drying cylinders are driven by short toothed belts, for compact and reliable control.



Entry and exit rollers, with with load-cell, allow accurate adjustment of the motors as well as a measuring system to keep the yarns guided without any stress.

WEAVING PREPARATION

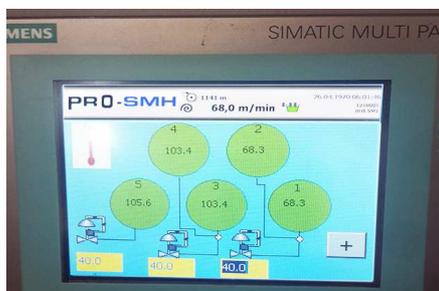
TEMPERATURE CONTROL



Size is kept at the best temperature for yarn's impregnation and reaction to the pre drying units.

The temperature of the dryers is constantly checked and kept at the required level (hot-chamber, normally 150 - 160°C for high speed operation and 120 - 130°C for low speed operation) by the onboard automatic system.

The drying cylinders can also reach a temperature exceeding 130°C with steam and 180°C with diathermal oil. Each cylinder will have its own individual adjustment.



PRO-FILAMENT FEATURES

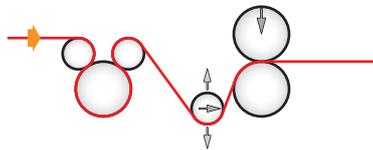
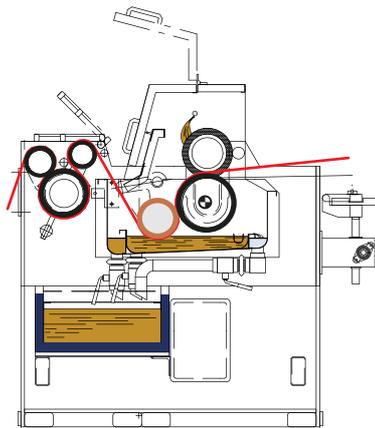
WEAVING PREPARATION

SIZE BOX

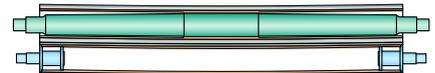
An excellent process requires a perfect size application:

Also by incorporated **spray bar** the size circulation constantly renews the size in the tank; the vat is designed for **minimum foaming** and exceeding size eliminated by squeezing and washed-out, is returned to the reserve tank are the right temperature.

Eventually, the degree of sizing is calculated by derivation from the exact measurement of **liquor consumption**.



The squeezing pressure is adjusted also with automatic stepless control depending on yarn speeds, thanks to the rapid reaction of pneumatic cylinders to changes in speed. Constant sizing left - centre - right is ensured by a **constant pressure roller with special core**.



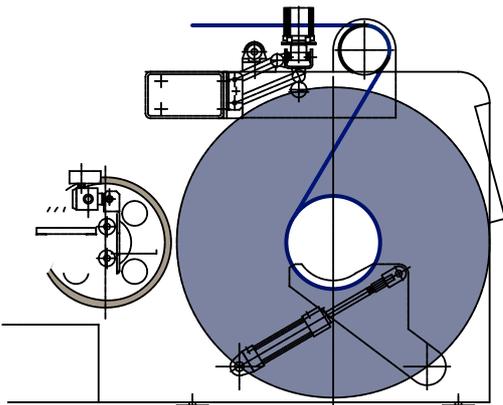
WEAVING PREPARATION

ALWAYS REGULAR WARPS

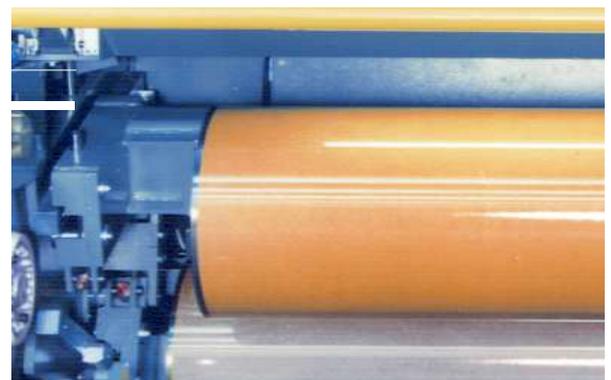


Constant warp laying on the beam is a key factor, particularly with anelastic yarns. Each individual filament passes through the machine with a clearance of 1 to 1.5 mm from the adjacent filament.

Comb traverse is accurately controlled, by the constant traverse motion over the traverse range and short dwell times at the reversing points. This creates a well-arranged winding shape that results in less tension fluctuation, which is especially efficient for fine yarns.

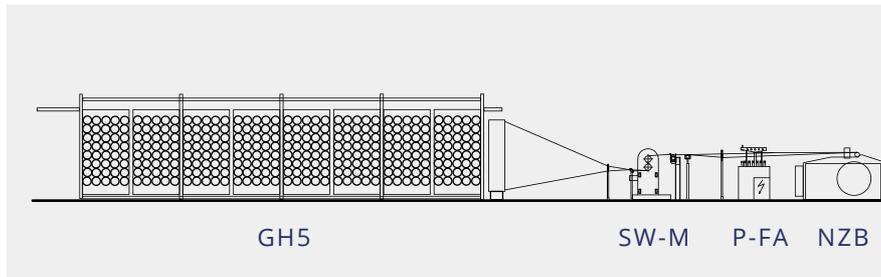


A tapping device and a pressure roller with smooth, glossy surface equip the direct warper.



PRO-FILAMENT AGGREGATES

Accurate tension control in **ONE** or **TWO** areas: in the bobbins creel, eventually in the S-Rollers (motorized) and then in the Warper (with pressure roller). The line is composed of GH5 creel, eyelets tables for precise guidance, SW-M Rollers-unit for tension management, other ancillaries for quality check and NZF warper.

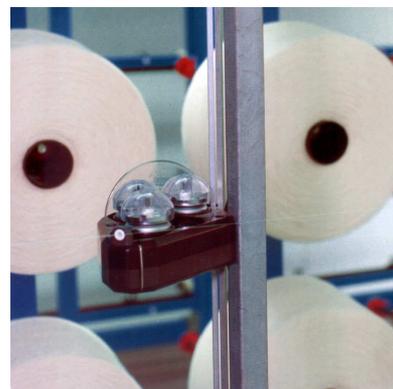


WEAVING PREPARATION

PRO-MULTISIZE[®]

warping line

A creel preferably with swivel-frames, equipped with spindles suitable for **cops and/or bobbins**. Accurate tensioning, with individual offset and centralized adjustment. Mechanical tension units with smooth surfaces, according to the yarn specifications. Other creel constructions are available, with up-to-measure design. Active antistatic devices equip the creel.



WEAVING PREPARATION

**COPS /
BOBBINS CREEL
type GH5[®]**

filament tension unit

Winding headstock with fixed working width, equipped by pressure roller (warping line). The beam has **powerful motorization** regulated by machine's computer. The computer adjusts all the devices of the line, to keep the tension constant. Accurate measurement of the winding speed and length.



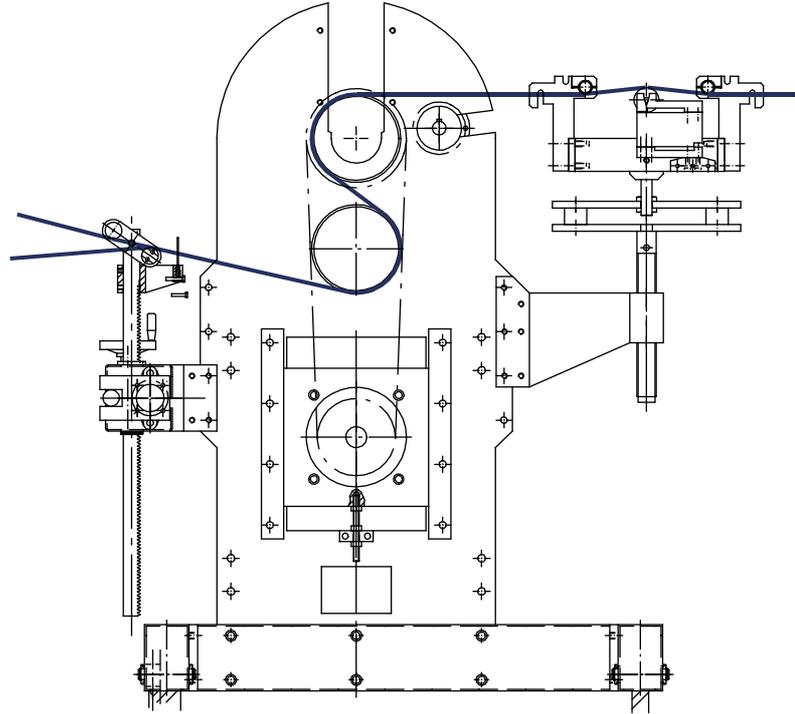
WEAVING PREPARATION

**DIRECT WARPERS NZB[®]
& HEADSTOCK NZF[®]**

headstock

PRO-FILAMENT AGGREGATES

This Tension Rollers unit responds to the need of **perfect tension adjustment** in all warps, for exact and controlled winding of the warp beams. Very efficient for yarns that require higher tension. The tension rollers are **motor driven**, then the system positively controls the tension and is perfect also for non-twisted and delicate yarns. The rollers have **adjustable, swinging structure** to change the contact angle. An additional nip roll is available, for a wider range of yarns.



WEAVING PREPARATION

TENSION ROLLERS SW-M®

Tension Controller

When any fluff, broken filament, fluff ball, or loop is detected, the machine stops at a fixed position. Defects on yarns are then easily removed.

When for any reason a recovery of lost ends in the warp is required, a Yarn accumulator is available, for rewinding up to 10 meters of warp



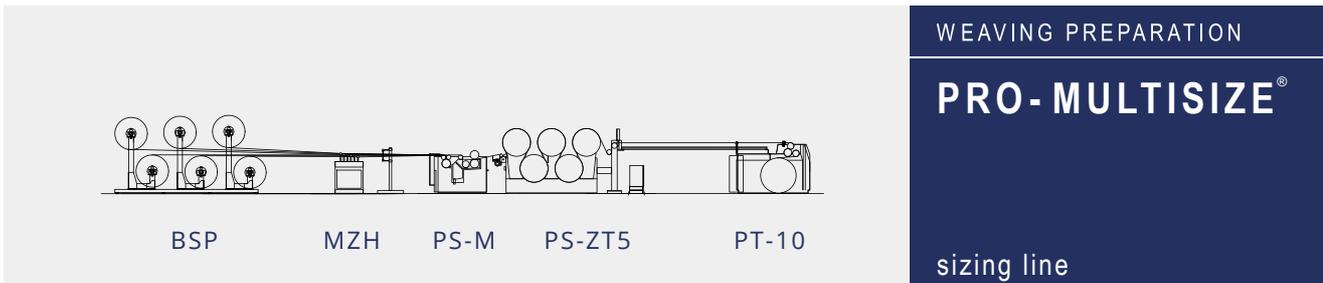
WEAVING PREPARATION

ANCILLARIES Warpstop & P-FA®

Yarn Quality

PRO-MULTISIZE AGGREGATES

Accurate tension control in **SIX** areas: from the warp beam to the size-box; inside the size-box; from the size-box to the dryers; before the beamer; inside the beamer. The line is composed of a beams-creel BSP, a leasing device MKH, size-box PS-M, contact hot-cylinders dryers PS-ZT, a beamer PT10; ancillaries for quality check complete the installation.



WEAVING PREPARATION

PRO-MULTISIZE®

sizing line

The tension is controlled by **individual pneumatic brake**, according to diameter sensor or a load cell at guide rolls. The torque (tension) between the beam stands and the take-up rollers (size-box) is adjusted constantly at target value. In case of a power failure, the **brake stops the beam** and prevents loose yarns. Single deck or double deck arrangement is available, for shorter structure and reduced space.



WEAVING PREPARATION

**BEAM CREEL
type BSP®**

with load cell

The Leasing device is placed between the beam stands and the take-up section. It accurately **separates the yarns** up and down alternately for leasing with its hook reed. As it is operated by buttons and motors, only one operator is required and the time expended is reduced. The complete stand moves on rail for more comfort of use. Suitable as well for full sizing "Multi Size" as for Assembling "Single size" lines. Optional layout for leasing operation with **ODD** number of warp-beams (5 - 7 - 9 - 11 etc).



WEAVING PREPARATION

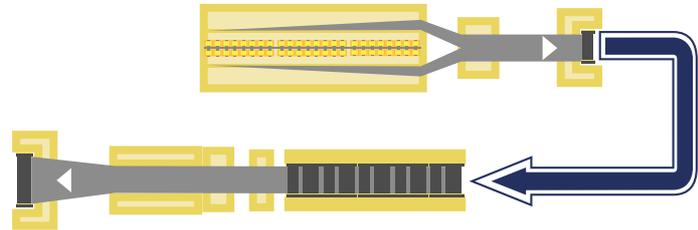
**LEASING DEVICE
MKH®**

Motor-activated

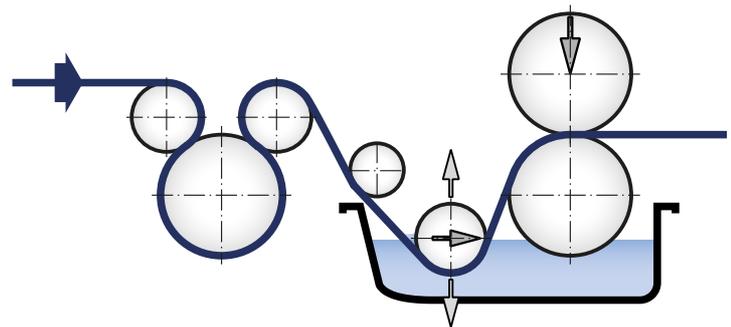
PRO FILAMENT TECHNOLOGY

FILAMENT FIBRES, Direct Warping and Full Sizing, for maximum efficiency and flexibility of production.

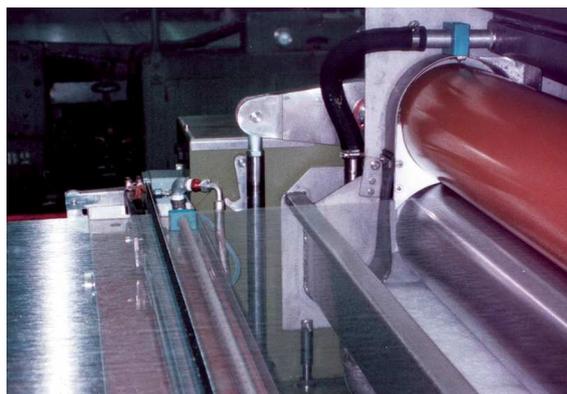
- Suitable for Cellulosic (like Viscose, Acetate, Cupro) Low Twisted yarns (80-100 twists)
- Suitable for Synthetic fibres (Polyester, Polyamide, Cordura), both Textured intermingled and Low Twisted (80-100 twists)



PRO-MULTISIZE AGGREGATES



Size box with movements and layout suitable for the best results in the full-sizing process of Filament yarns. Several finishing and layouts of rollers are available, for the most suitable threading. A special control of the tension and the elongation during dipping, allows a perfect sizing even of the most delicate and moisture sensitive cellulosic fibers.



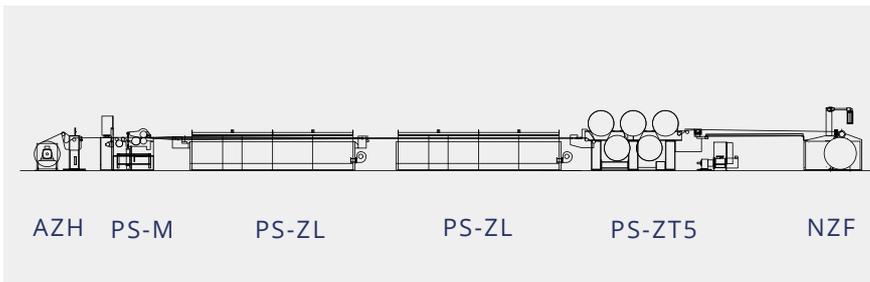
WEAVING PREPARATION

SIZE BOX
type PS-M®

Full-Size Layout

PRO-SINGLESIZE AGGREGATES

Accurate tension control in **SIX** areas: from the creel or the warp beam to the size-box; inside the size-box and to the dryers; before the headstock. The line is composed of a creel GH5 or beam unwinder AZH, a size-box PS-M, a hot air PS-ZL and a contact hot-cylinders dryers PS-ZT, a headstock NZF; ancillaries for quality check complete the installation



WEAVING PREPARATION

PRO-SINGLESIZE®

sizing line

Alternatively to the bobbin creel, a **single beam unwinder** feeds the sizing machine. The adjustment of **tension** at constant values is granted by an inverter-controlled motor. An accurate regulation by diameter control allows smooth unwinding without deviation rollers. For **extremely delicate yarns**, such as super-thin yarns and microfibers, the tension has to be set with fine tuning control. A stable rate of **elongation** is kept. Optionally, the motor-brake can be driven by a **load-cell**. At stops, to prevent yarns from over-running, a mechanical brake also works. **Double supply stand** is available, as an option, for example, to increase the number of yarns in the warp.



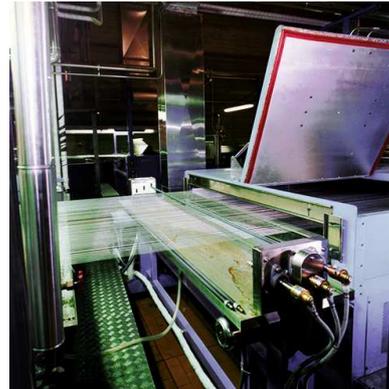
WEAVING PREPARATION

**BEAM UNWINDER
type AZH®**

with Motor-brake

Size-box is driven by **two motors**, accurately adjusted (by load cell) to obtain the required tension in the delicate operation of dipping and squeezing. During this operation, the sizing pickup is calculated from the first warp meter.

After sizing, **splitting rods** divide the warp sheet up to 4 levels, to enter the hot-air dryer. The rods are cooled and moisturized to prevent size deposits.



WEAVING PREPARATION

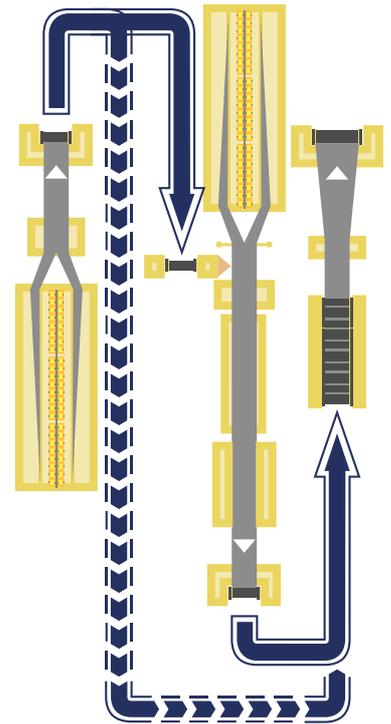
**SIZE BOX
type PS-M®**

with tension control

PRO FILAMENT TECHNOLOGY

When full warp sizing is unlikely to achieve the required benefits of sizing (such as with zero-twist yarns) to avoid capillary breaks, PRO-SMH has designed PRO-Singlesize with two or three-steps process (Warping, Sizing and Assembling). The two-steps (Creel to beam sizing) aims to maximum efficiency, the three-steps (Warping and Beam to Beam sizing) aims to flexibility and quality.

A multi-purpose layout is available, for covering all ranges of yarns, such as Cellulosic fibres (Viscose, Acetate, Cupro) and Synthetic fibres (Polyester, Polyamide, Cordura) with Parallel yarns (Flat intermingled) and Textured intermingled yarns, up to elastic fibres and micro-filaments



PRO-SINGLESIZE AGGREGATES

The Hot-air dryer works with counter-flow system controlled by inverter and flaps. Heat insulation has been accurately designed and tested, to reduce heat release as a way to cut steam consumption and save energy costs. As a further energy-saving option, a waste air moisture control system with waste air volume control can be employed.



WEAVING PREPARATION

HOT AIR CHAMBER
type PS-ZL®

with energy saving

Final drying takes place in a cylinder dryer on steam heated teflon-coated cylinders. Optionally, the cylinders can be heated by diathermal oil. The setting and adjusting of the temperature are accurately managed by PT-100 sensors and an automatic system. Inlet and outlet of the dryer is equipped with loadcells for tension control. After drying, usually the warp will cool down in the open air, but a cooling chamber is available at request.



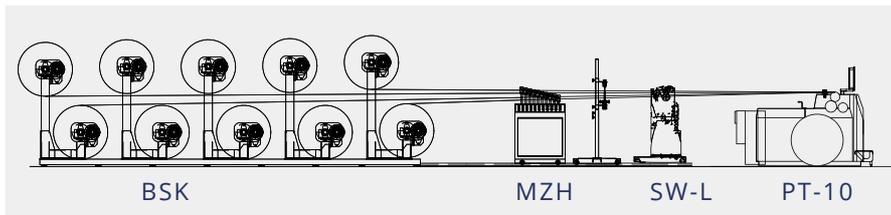
WEAVING PREPARATION

DRYING DRUMS
type PS-ZT5®

with smooth control

PRO-SINGLESIZE AGGREGATES

Accurate tension control in **TWO** areas: from the warp beam to the transport roller, from the trio to the warp-beam. The line is composed of a beams-creel, a leasing device, ancillaries for quality check and a beamer with double motorization.



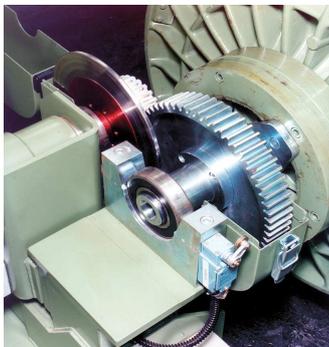
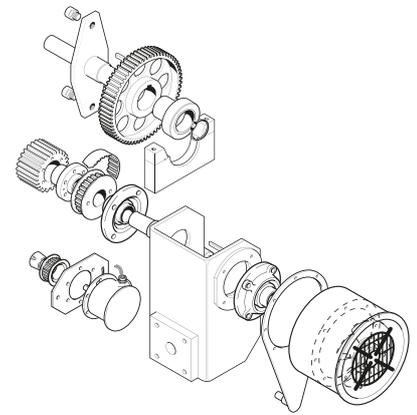
WEAVING PREPARATION

PRO-A2[®]

assembling line

A highly efficient and effective single (or double) magnetic powder brake allows smooth and perfect assembling operations. The system can be adjusted by stepless manual regulator or automatically by individual load-cell.

At stops and even power-failures, to prevent yarns from over-running due to the inertia of the beam, a disk-brake also works.



WEAVING PREPARATION

**BEAMS CREEL
type BSK[®]**

magnetic Brake

The tension is controlled by individual motor according to a load cell at guide rolls. The torque (tension) between the beam stands and the take-up rollers (size-box) is adjusted constantly at target value. In case of a power failure, a disk brake stops the beam and prevents loose yarns. Single deck or double deck arrangement is available, for shorter structure and reduced space.



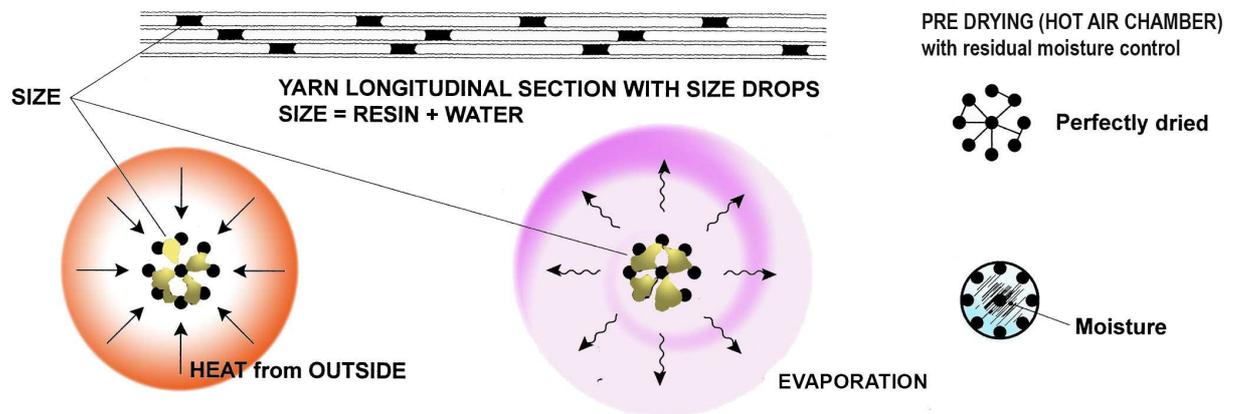
WEAVING PREPARATION

**BEAMS CREEL
type BSM-C[®]**

motor Brake

PRO FILAMENT TECHNOLOGY

Optimal size application and even, regular cohesion of threads, boost weaving efficiency both with staple and filament fibers. While in case of staple fibers, Sizing aims mainly at reducing hairiness and giving a smooth surface to the yarns, filament fibers require a deeper sizing process, where micro-links are created between thin filaments, to help them resist the stressing process of weaving at high speed.



In case of very thin and zero or low twisted filament yarns, Single Size is advisable:

- risks of sticking different yarns and breaking filaments are minimized
- before drying the warp on hot cylinders, a pre-drying section, in hot air, helps fixing the yarn's structure and improve the final visual aspect of the fabric, while avoiding exceeding residual moisture and tape-effect.

PRO-FILAMENT AGGREGATES

The design of the Beamer, suitable for Assembling lines and Multisize Full-sizing lines, is ergonomic, to allow the user greatest productivity and quality of work and the optimal outlook of the beaming warp. Tension is adjusted by motors synchronization with the possibility of degressive winding tension. A precision yarn traverse on the warp is allowed by the reed accurate movement. A taping device and a pressure rollers device are also available.

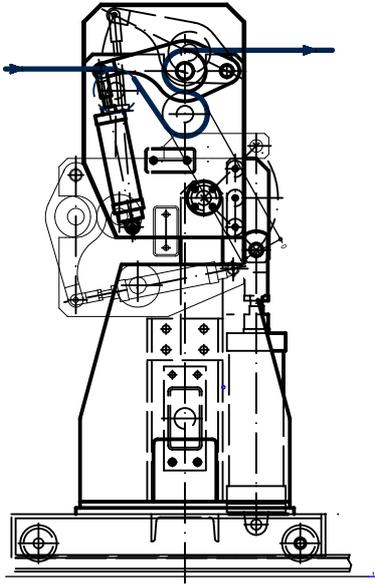


WEAVING PREPARATION

BEAMER
type PT-10®

accurate winding

PRO-FILAMENT AGGREGATES



An ergonomic and easily applied S-Roller (non-driven) device helps the beaming of wide-warps, with smooth angles and regular tension, all over the warp. The S-Rollers aggregate can be sunk for direct beaming without threading. The device moves on rails, for the best and more flexible layout.



S-ROLLERS

WIDE WARP OPENER type SW-L

convertible layout

Perfectly prepared warps are a result of know-how, process-machines and quality inspection. PRO FILAMENT machines are equipped with efficient and up-to date ancillaries, such as oiling device for antistatic finishing, Yarn counters by Camera ore Tension Scanner for continuous and individual yarn-tension check. All along, PRO-FILAMENT machinery keep the whole process under constant control, by suitable devices, such as fluff detector and end-break laser-sensor. The machinery will stop and keep memory of every fault of the warp.



YARN QUALITY

OILING DEVICE YARN COUNTER TENSION SCANNER

PRO SMH has designed own size-preparation set, with net capacity of 500, 1000 or 1500 liters. Indirect heating by introduction of steam into the tank jacket, as well as a propeller stirring device, allow constant and regular consistence size liquor. A control cabinet with temperature control and water meter complete the installation. Warp Beams suitable for PRO-FILAMENT machinery are available upon request; anyway, PRO-SMH machinery is designed to fit with any kind of beam



ANCILLARIES

SIZE PREPARATION WARP BEAMS

PRO-FILAMENT NAVIGATOR

At PRO-SMH we are very keen on electronics and software for machine management. PRO FILAMENT machinery employs the computer control system with a full-color graphic display graphic for operating conditions, warnings and any malfunctions, as well as all machine parameter settings, which can be memorized for preparation of new articles parallel to the running process and immediate, quick activation at batch changes. A production report can be prepared with the production records by beam or lot.



CAM-SYSTEM

PRO-NAVI[®]

INDUSTRY 4.0 Ready

LAN communication (Ethernet) is possible from the machine, so such as operation check, production record, and monitoring can be easily made by managers in the office. This Navigation system is Industry 4.0 ready and makes your investment even more profitable.



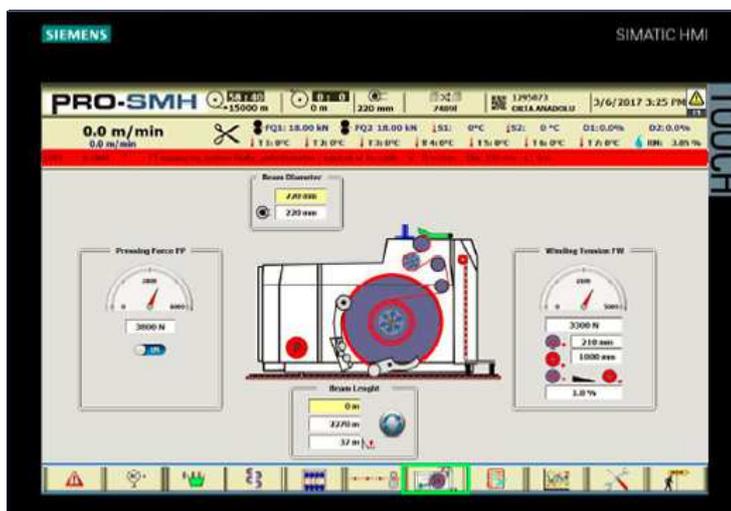
REMOTE ASSISTANCE

GO-PRO[®]

Safe-link

At any fault or problem, the machines minutely explain countermeasures to solve any warning or malfunction.

Anyway, by quick remote connection, our Service department can be asked for rapid assistance; PRO SMH will grant remote assistance by Teleservice as well as prompt shipment of spares, directly from our stock. We have a wide range of spare parts also for older machines.



A very well trained and skilled team of engineers will take care about your project from A to Z. We would be happy to help you overcome any problem: please feel free to contact us at any time.

PRO-SMH

IN COOPERATION WITH

