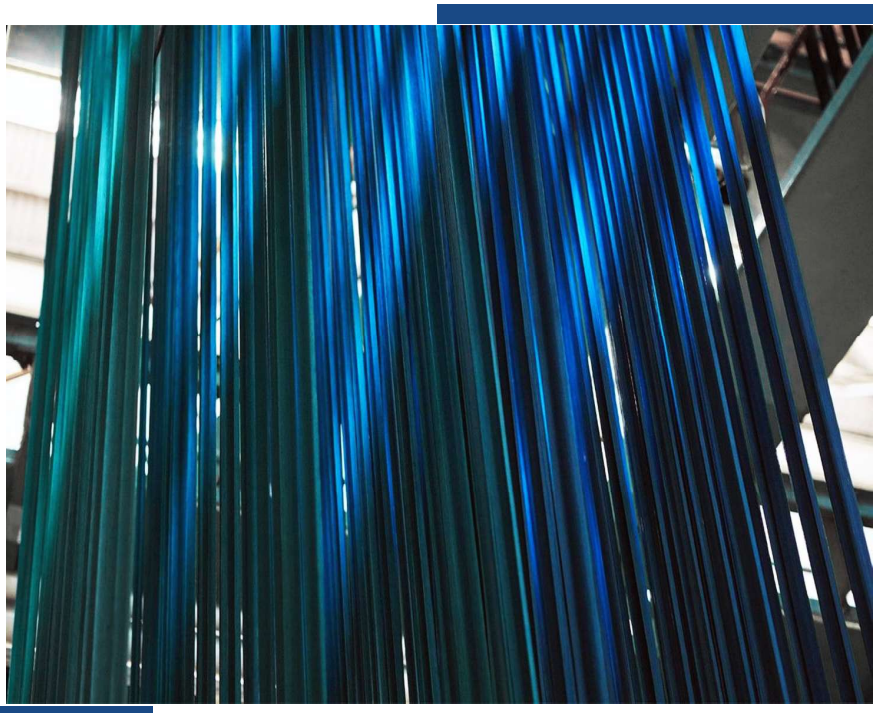
PRO-SMH

GERMAN TECHNOLOGY
designed & developed in Germany



ROPE DYEING-RANGE

PRO-ROPE®

rope dyeing-range

gamma di tintura a fun

Strangfarbeanl

halat boyama

gamme de teinture mûr

ROPE DYEING PROCESS

In general, the rope dyeing process consits of the steps

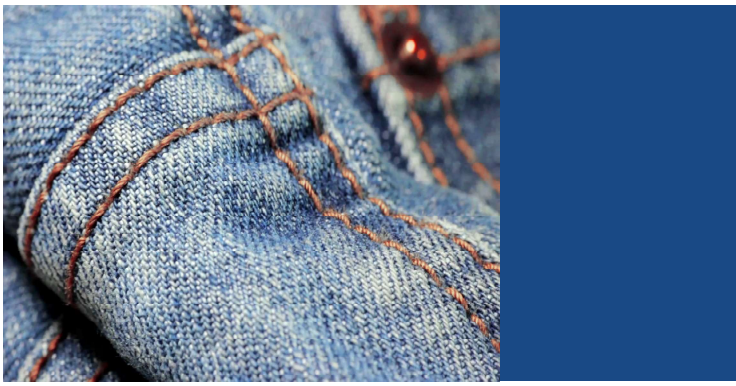
- Ball warping
- Rope dyeing
- Re-beaming
- Sizing

The rope dyeing-range PRO-ROPE can be roughly divided into the following steps:

- Ball warping
- Creel section at inlet
- Rope dyeing:
  - pre-scouring
  - hot washing
  - cold washing
  - dye baths
  - hot washing
  - cold washing
  - application of softener
- Outlet with coiler

Main advantages of the rope dyeing process are:

- Opportunity at re-beaming to repair broken ends
- High efficiency production
- Possibility to mix yarns of different colors - just one can get denim stripes during re-beaming
- No need to start & stop the range at each set, so shade matches perfectly
- No extra ends



BALL WARPER

In ball warping, 250–400 yarn ends are pulled from the creel. The yarns then pass through a comb like device (also known as hack or reed), which keeps each warp yarn separate and parallel to its neighbouring ends.

At intervals of every 1000 or 2000 m, a lease string is placed across the sheet of warp yarns to aid yarn separation for the re-beaming operation, which will occur later.

The yarns then go through a funnel shaped device called a trumpet or condenser, which collapses and condenses the sheet of yarn into rope form. This device is located at the base of the warper head and traverses back and forth, guiding the newly formed rope of yarn onto a log. The rope must be wrapped at a constant tension to keep the yarns from tangling.

BALL WARPER

PRO-BW6-48®

BALL WARPER

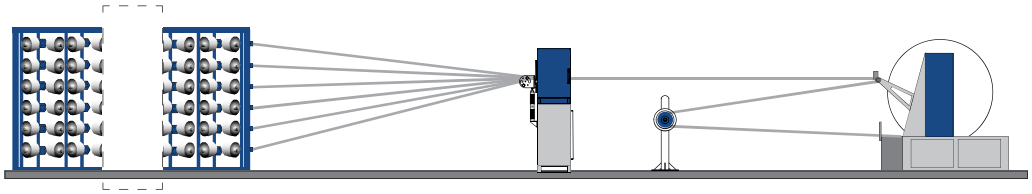
TECHNICAL DATA

working width	1.220mm
max. spped	500m/min
max. traverse speed	150m/min
max. temsile force	1.100N
max. ball diameter	1.524mm (60")

BALL WARPER

benefits at a glance

- absolute even ball warps with homogenuous tension in the rope and edge/center/edge in balls
- the computer controlled system ensures smooth & consistent winding performance for superior results
- up to 25 % greater efficiency in warping process
- best ball quality for fine and course yarns
- up to 20 % better yarn opening performance in beaming process

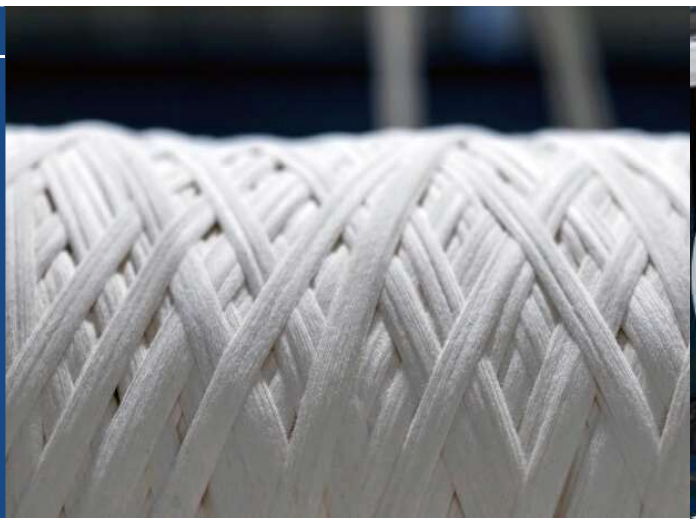


BALL WARPER

WORK FLOW

BALL WARPER

WINDED BALLS



BALL LOG CREEL STAND

During rope dyeing, ball warps are continuously fed into the rope or chain-dyeing range for application of the indigo dyeing. Typically, 12-36 individual ropes of yarn are fed side-by-side simultaneously into the range. The ropes are kept separate from each other throughout the various parts of the dye range.
For example, if the total number of ends on the loom beam is 3,456, and each ball would have 288 ends, then the dye set would have a total of 12 ball warps.

benefits at a glance

- Creel stand design with assistant carrier roll to reduce the formation of rope twist
- The ball log creel stand is designed as a modular system from structural steel with UHMW nylon log holdern. Capacity varies between 6, 12, 24, 36 and 48 ball logs
- Each rolling car is equipped with one gear unit, which applies frequency-changing speed adjustment. The tension is adjusted automatically.
- Additional support bars on the top of the frame to prevent that the loose yarn is going into the nip

BALL LOG CREEL

PRO-CL6-48®

number of ball warps	6, 12, 24, 36, 48
ball logs max. width	1.200mm
ball logs max. dia.	1.500mm
mechanical speed	0-40m/min
working width	1600, 1800, 2000, 2200, 2400mm

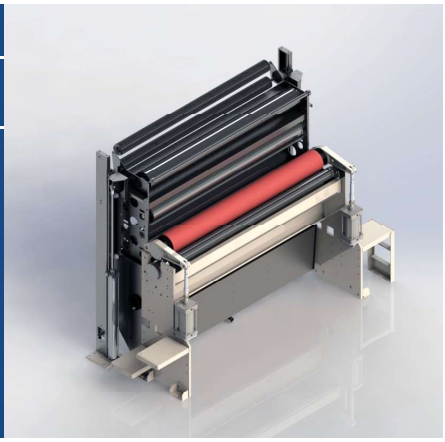
BALL LOG CREEL

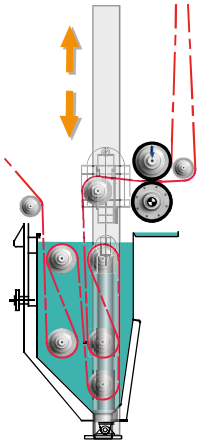
TECHNICAL DATA

DYE APPLICATION SYSTEMS

DYEING UNIT

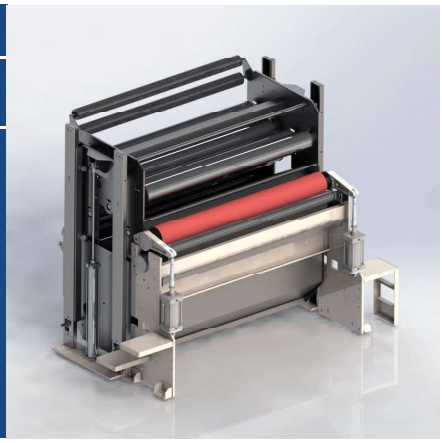
PRO-DYE®

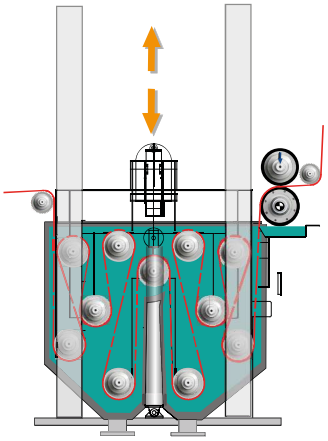




DYEING UNIT

PRO-POWERDYE®



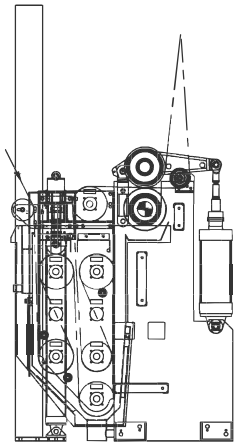


DYEING UNIT

PRO-POWERDYE®

DYEING UNIT

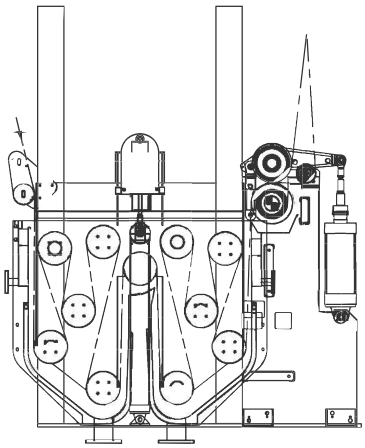
TYPE **PRO-DYE**



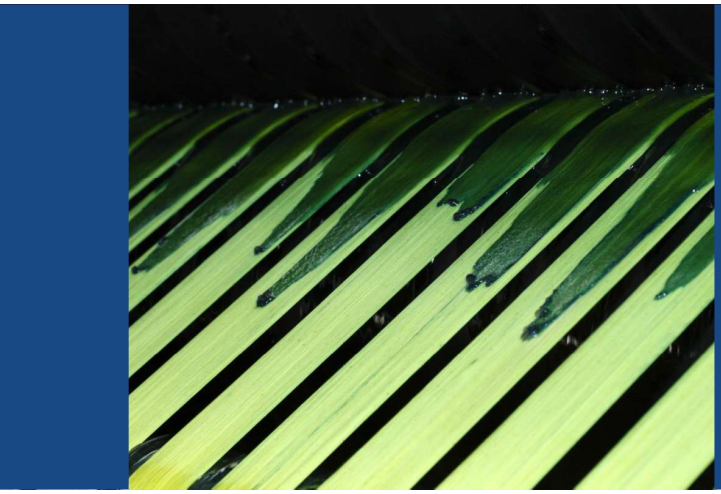
working width	1.800-2.200mm
number of bathes	1
fabric content	5,7m
liquor content	150.900l at ww2000mm
circulation	12m^/h
pressure main squeezer	10t

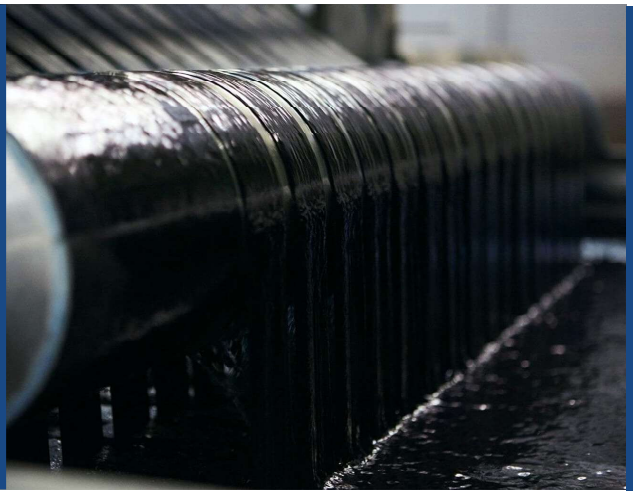
DYEING UNIT

TYPE **PRO-POWERDYE**



working width	1.800-2.200mm
number of bathes	1
fabric content	11ö6m
liquor content	150.1.950l at ww2000m
circulation	12m^/h
pressure main squeezer	10t



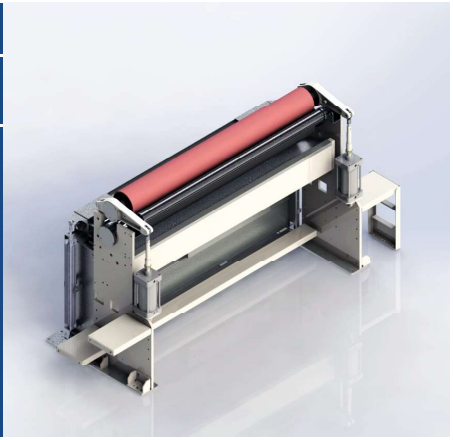


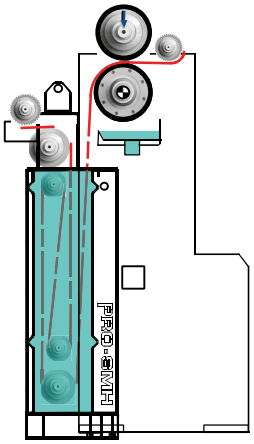
PRO-SONIC

- superior washing effect by means of ultrasonic
- space saving construction
- available with 1 or 3 bathes

WASHING UNIT

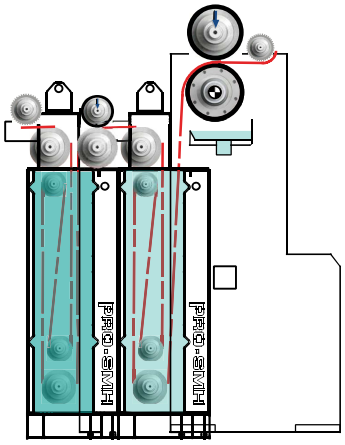
TYPE **PRO-SONIC-1®**





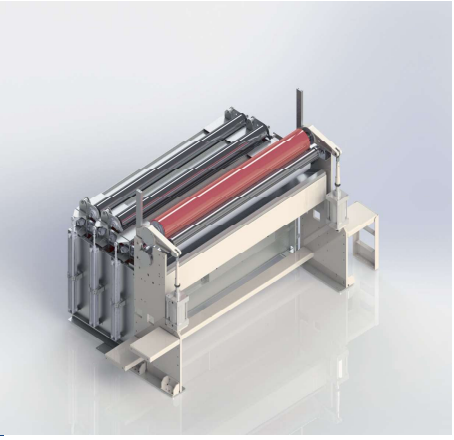
WASHING UNIT

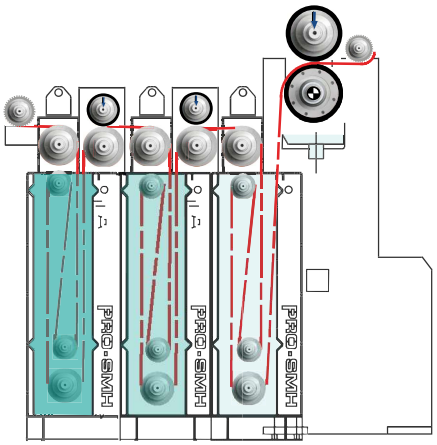
TYPE **PRO-SONIC-2®**



WASHING UNIT

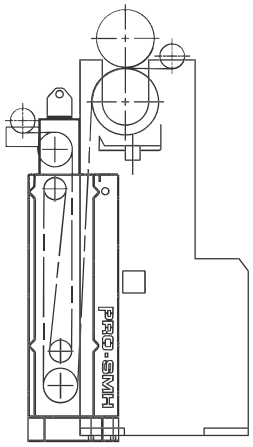
TYPE **PRO-SONIC-3®**





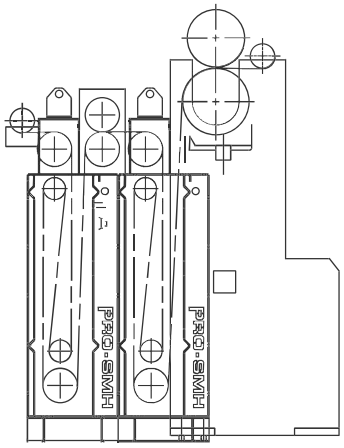
PRO-SONIC

WASHING UNIT
TYPE PRO-SONIC-1®



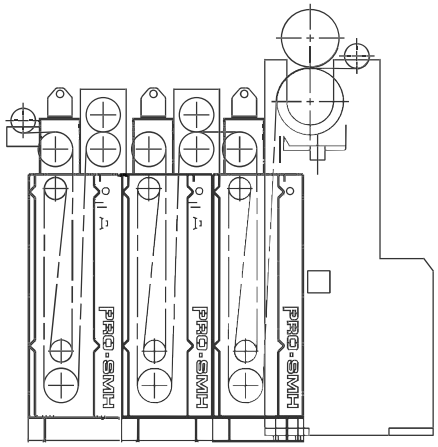
working width	1.800-3.600mm
number of bathes	1
fabric content	4,7m
liquor content	480l at ww2000mm
pressure main squeezer	10t

WASHING UNIT
TYPE PRO-SONIC-2®



working width	1.800-3.600mm
number of bathes	2
fabric content	9,6m
liquor content	960l at ww2000mm
pressure main squeezer	10t

WASHING UNIT
TYPE PRO-SONIC-3®

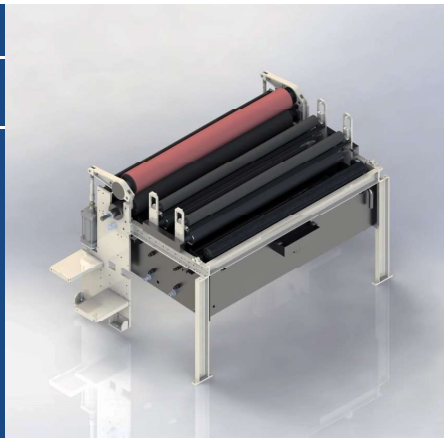


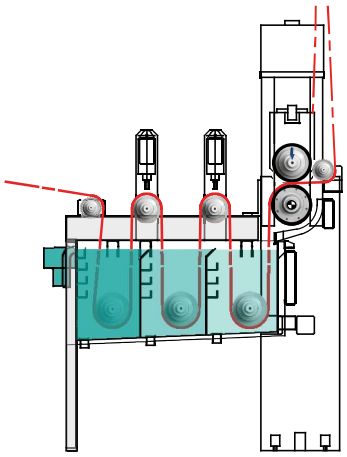
working width	1.800-3.600mm
number of bathes	3
fabric content	13,4m
liquor content	1.440l at ww2000mm
pressure main squeezer	10t

PRO-OPTIWASH

WASHING UNIT

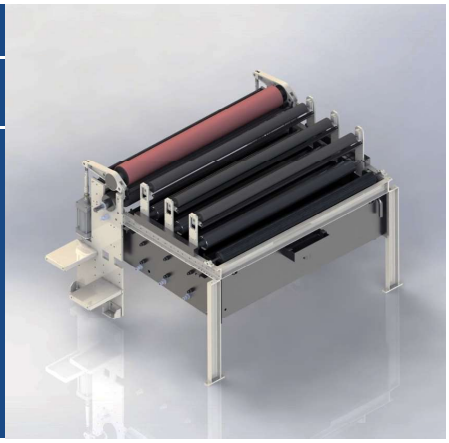
TYPE **PRO-OPTIWASH-3®**

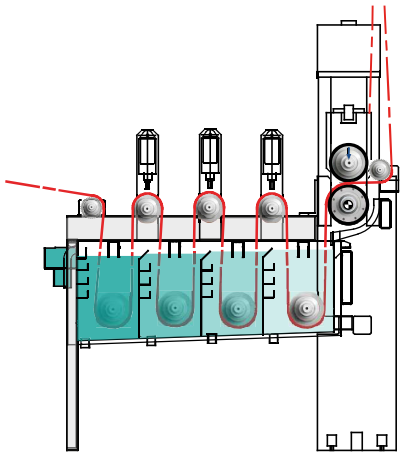




WASHING UNIT

TYPE **PRO-OPTIWASH-4®**





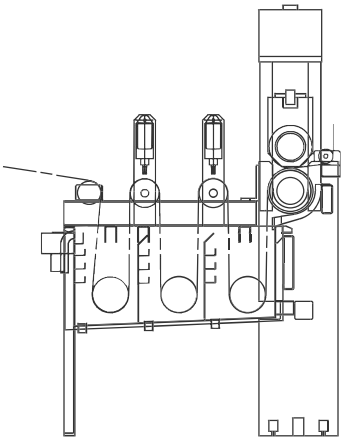
PRO-OPTIWASH

- superior washing performance with counter-flow
- circulation system for chemical treatment
- up to 35% reduction in water consumption
- available with 3 or 4 bathes

PRO-OPTIWASH

WASHING UNIT

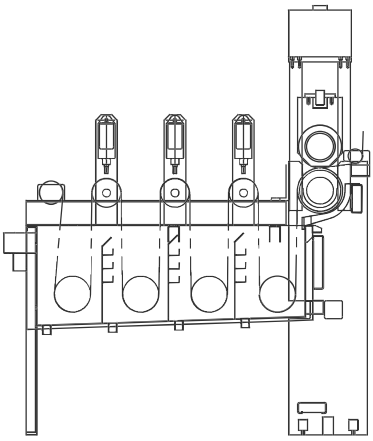
TYPE PRO-OPTIWASH-3®



working width	1.800-2.200mm
number of bathes	3
fabric content	6,3m
liquor content	800l at ww2000mm
circulation	12m³/h
pressure main squeezer	10t

WASHING UNIT

TYPE PRO-OPTIWASH-4®

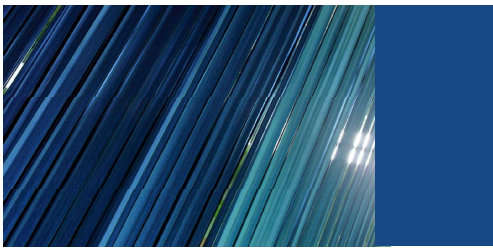


working width	1.800-2.200mm
number of bathes	4
fabric content	8,4m
liquor content	1.200l at ww2000mm
circulation	12m³/h
pressure main squeezer	10t

OXIDATION CONCEPTS

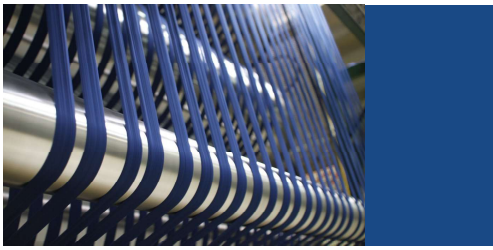
OXIDATION TYPE PS-AIR-31®

- conventional oxidation via air passage
- total length of 31m
- warp guiding via corrugated roller
- smooth warp guiding



OXIDATION TYPE PS-FO®

- fast oxidation with hot airflow
- increased dyestuff pick-up
- total length of 24m
- less yarn waste and better tone uniformity of the warp sheet



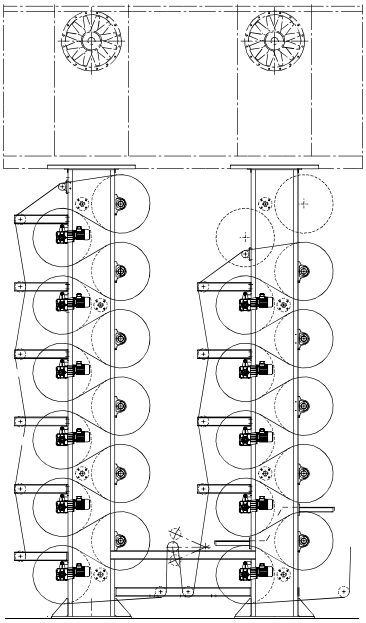
OXIDATION TYPE PS-STEAM®

- steam chamber for reactive dye process
- also usable as air passage
- total length of 20m or 35m

PRO-DRY

CYLINDER DRYER

TYPE PRO-DRY®



working width	1.800-2.400mm
number of stacks	1-3
dia. drum	600-800mm
max. steam pressure	5bar (up to 155°C
teflon coated	on demand
temperature control	by 3-way valve
tension control	by dancer
suction hood iwth fan	on demand
drives	on each 2. drum

CYLINDER DRYER

TYPE PRO-DRY-24®

ROPE LAYER SYSTEM

COILER SYSTEM

TYPE PRO-COIL®

The dyed ropes coming from the rope dyeing machine are converted into pre-beams.

The ropes are withdrawn from the cans by means of drawing rollers, passing a guide and through a trumpet to enter the nip of drawing rollers.

After entering the tension stand, warping around falling rollers and passing a number of guides, the ropes finally are guided into the accumulator. passes with in a number of guides and around roller to enter the accumulator.

Depending on the yarn count the tension at the tension stand is kept between 20-40psi. The accumulator, where the tension generally is set at 60-80psi, is used for caching the length of rope needed to repair any broken end.

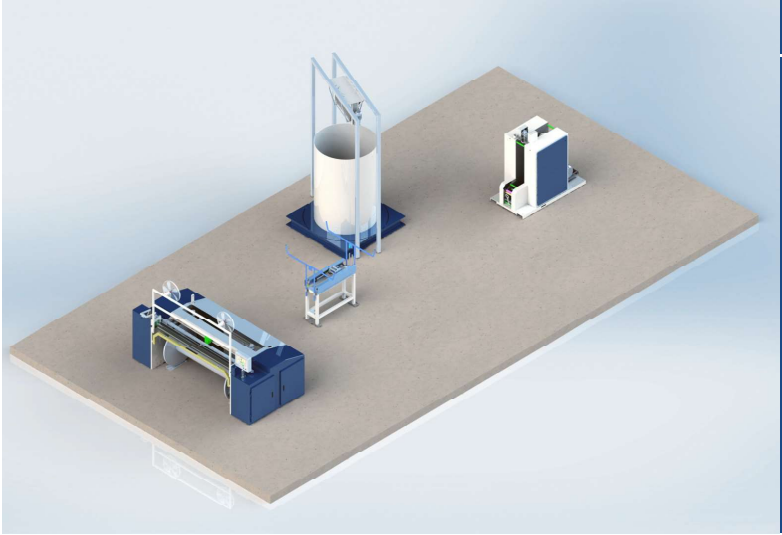
After leaving the accumulator the rope passes around the beater bar on the tension stand, where the pressure roller presses the package, i.e the pre-beam, with 7-15 psi.

RE-BEAMER

working width	1.800mm
max. spped	500m/min
max. yarn tension	450N
max. beam flange dia.	1.000mm

REBEAMER

TECHNICAL DATA



REBEAMING SYSTEM

TYPE **PRO-RB-500®**

After rope dyeing of the warp yarn the next operation is re-beaming. After dyeing and drying the rope is taken into large cans in the coiler section. The cans then will be transferred to the Re-Beaming section. The basic purpose of re-beaming is to open the rope into sheet form of yarn and to wind it onto a warp beam to be forwarded to the sizing machine.

The Re-Beamer PRO-LCB untangles the ends from rope to a sheet form. The ropes are pulled from the can by moving them upward to a guiding device, which is mounted above the can, probably in the ceiling. The upward movement of the rope allows the yarn to untangle before nearing the beamer head.

LONG CHAIN BEAMER

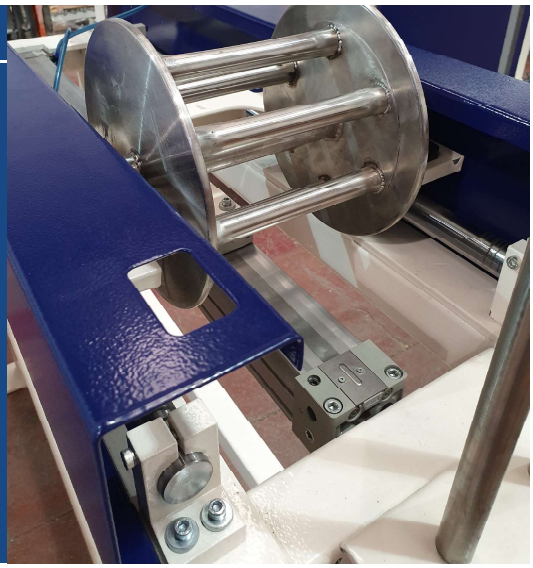
Tension Stand

When the ropes are coming down from the guiding device, they are passing the tension stand rollers where tension will built up. This tension is necessary to help separating the ends before going through a comb, as without tension the rope would have a tendency to resist the opening process into sheet form.

The tension stand consists of two tensi-on drums. These rolls are fitted one over the other.

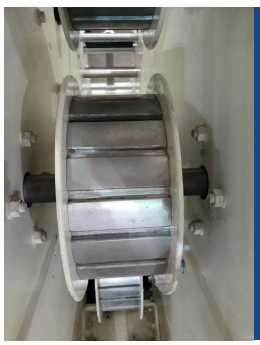
TENSION STAND

TYPE **PRO-TS-50®**



Before passing the tension stand the ropes have been guided through a simple pre-tension device which is located at the base of the device.

The pre-tension device applies slight resistance to the ropes before being wrapped onto the tension rolls.



REBEAMER

TYPE **PRO-RB-500®**

LONG CHAIN BEAMER

benefits at a glance

- automatic machine stop in case of yarn breaks, crosses, knuckels or knots
- automatic tension control system & online tension measuring with loadcell
- comb travers system
- unlimited reverse run
- dust removal by air on comb
- 12" touchpanel ensures intuitive operation of the machine
- yarn break detection system compatible
- beam stretching mode, rope preparation mode
- bucket stripping mode: rope in the bucket can be taken out
- machine can be remotely accessed
- suitable for adding yarn splizer system
- blowing device on combs, activation peri adjustable
- motorised displacement V-type comb system
- equipment with position controler
- forward, reverse & stop tensions individually adjustable
- Energy feedback at the tension stand
- up to 20% greater efficiency during beaming
- industry 4.0 ready

DYEING & CHEMICAL DOSING SYSTEM

The computer-controlled dyestuff & chemical dosing system for dyestuffs and chemicals is the heart of the Rope-Dyeing-Range. Indigo vat, hydrosulphite and caustic soda are continuously added according to the calculated quantity indications and depending on the machine speed. Colour unlevelness owing to fluctuations in the bath concentration does no longer occur. Due to the high circulation rate of the dye liquor in 2 circuits, differences in bath concentration can be avoided. The lodging system stores the required parameters and guarantees a high level of process reliability and reproducibility.

The dye liquor is metered continuously by means of a special frequency controlled pump with precise intermediated batching. The intervals depend on the desired indigo concentration which is determined by the rope pass and liquor loss in the dyeing machine.

DYEING DOSING SYSTEM

TYPE **PRO-DDS**

DYEING DOSING SYSTEM

TYPE **PRO-DDS®**

CHEMICAL DOSING SYSTEM

TYPE **PRO-HDS®**

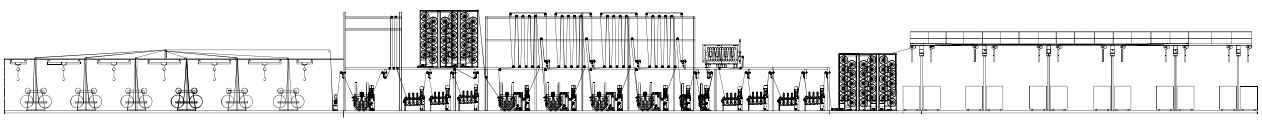
DRIVE AND CONTROL SYSTEM

The drive & control system is one of the most important key factors in rope dyeing-ranges. PRO-SMH therefore uses all motors and inverters from LENZE company/GER, PLC from SIEMENS/GER.

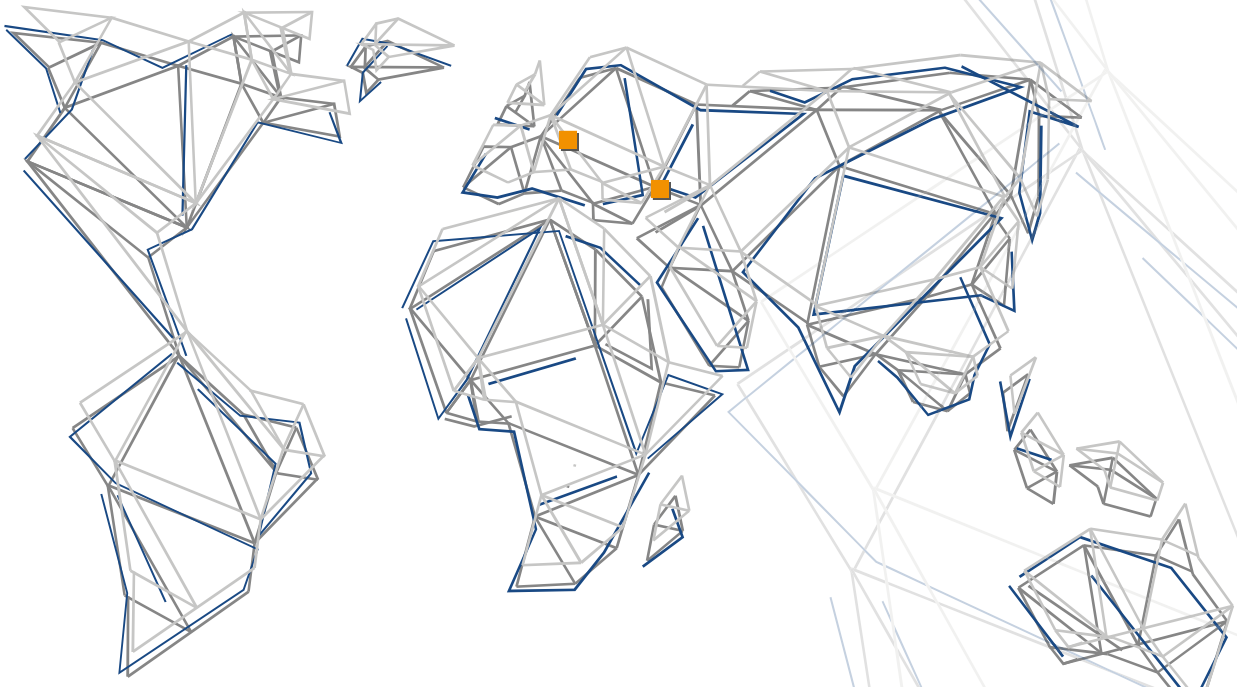
All important parameters like temperatures, production speed, tension, etc. are shown on the 19" SIEMENS Touchscreen.

DRIVE & CONTROL SYSTEM

TYPE **PRO-DC®**



PRO-SMH



PRO-SMH MAKİNA PAZ. SAN. LTD. STİ. | YAZLIK YENİ MAH. D 130 | KARAYOLU CAD. NO 87 | 41650 GÖLCÜK/KOCAELİ-TR | T 0090.262.343.30.90 | F 0090.262.343.30.90 | INFO@PROSMH.COM | WWW.PROSMH.COM