mahlo

trendsetting technology. worldwide.

since 1945

PRODUCT OVERVIEW

Solutions from Mahlo

PRODUCT OVERVIEW

Quality made in Germany

TEXTILE NONWOVEN COATING & CONVERTING PAPER EXTRUSION

Dear Customer,

Mahlo® provides measuring, control and automation systems for the industry sectors textile, nonwovens and refining, coating & converting, films and extrusion as well as pulp and paper.

Mahlo stands for international cutting edge technology from Bavaria in the tradition of a progressive, medium-sized family enterprise,

- ✓ researches and develops innovative products
- ✓ in conception and execution
- ✓ present on the world market with technically sophisticated and industrially tailored problem solving solutions,
- ✓ close to the customer with efficient after-sales service.

We are your partner for the future!
We are there for you 365 days a year, 24 hours a day.

Just get in touch with us!

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Standard systems and customised special solutions

Precision and reliability – Highest quality product through automation and tracking! This results in cost reduction and efficiency in production.

Mahlo® enjoys over 70 years of experience in the processes and procedures of the industries supplied. Not only the Mahlo standard systems are deployed here.

The modular design of the systems allows their flexible adaptation to all applications. Both, standard requirements and highly customised demands are thus met.

Customers are partners for Mahlo, and we individually adapt our systems to their requirements to achieve the best possible cost-benefit factor.

Philosophy

The company's success is the result of the perfect interaction between our customers, **the** products **from Mahlo and our** workforce realising the demands of our customers together. Implementing solutions for your problems is one of our strong competitive hallmarks.

Your success is our philosophy – simple as that!

Mahlo® International:
With 5 branch offices, over 70 agencies and 40 service stations we operate in more than 100 countries worldwide.

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ORTHOPAC AUTOMATIC STRAIGHTENING AND PROCESS CONTROL SYSTEM

DISTORTION DETECTION AND DISTORTION CORRECTION

Better product quality, straight-thread goods and saving resources in a single step: With the Orthopac® straightening and process control system from Mahlo®.

Corrects web distortion: The Orthopac automatic straightening system

The straightening systems of the Orthopac family from Mahlo normally represent automatic roller straightening systems where scanning system and straightening rollers are combined. However, the scanning bridge is also available as stand-alone device and a manual straightening system without scanning bridge.

Numerous variants and options are available to meet the requirements of the textile industry. From the pure distortion detection system to large, reinforced straightening machines for wide and heavy products such as carpet or combination system.

Straightening machine and process control combined

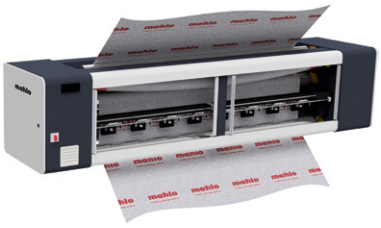
All systems of the Orthopac family can be fitted with a modular process control system thus combining the functionality of the Orthopac straightening systems and the Optipac VMC process control system in a single device.

+ Orthopac FMC-15 – Distortion detection
The Orthopac FMC automatic straightener is the heart and core of the Orthopac. The device consists of an optical scanning system and electronic control for distortion correction.

It is used primarily to detect and log residual distortions in the exit end of a system, e.g. with the stenter. Thread density can be determined at the same time. It can also be connected to external straightening machines then serving them as control unit.

Variants:
Orthopac FMC T: Standard bridge with optical scanning system and two guide rollers
Orthopac FMC EP: Compact bridge only with optical scanning system

+ Orthopac MFRC-15 – Fine straightener
This model represents a compact fine-straightening system for the correction of residual distortions. The special strength of the Orthopac MFRC is the extremely high straightening accuracy at relatively small distortions. The compact straightening unit is equipped with a skew and bow roller as standard. This arrangement allows for very fine adjustment of the straightening effect while permitting small device dimensions. Available with hydraulic or electrical straightening roller adjustment.



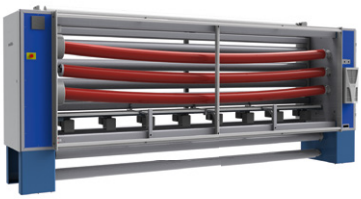
Variants:
MMR Straightener: Manual straightening machine without optical scanning system and control

+ Orthopac RVMC-15 – Classical straightening machine
The Orthopac RVMC is the universally employable straightening system from Mahlo for the correction of web distortions for nearly all applications. Available with hydraulic or electrical straightening roller adjustment. The modular construction allows the system to be configured to meet the demands of changing conditions and requirements.

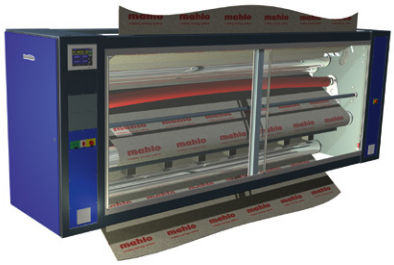
Variants:
RMM Straightener: Manual straightening machine without optical scanning system and control

+ Orthopac XRVMC-12 – Precision straightening machine
Control and regulate at the same time: The Orthopac XRVMC is the first straightening system worldwide to offer this unique combination. This completely new concept was developed for processing high-value textiles with the greatest distortion dynamics. The independently controllable straightening rollers guarantee the greatest possible control of the straightening process and easily hold even the tightest residual skew tolerances.

+ Orthopac GRVMC-12 – Reinforced straightening machine
The heavy duty version. High demands due to large product widths (e.g. carpet) or dimensionally stable textiles with defined skew settings (e.g. denim) require a more solid configuration. The frame, bearings and rollers are designed for high loads. Available with up to 5500 mm working width.



Variants:
GRMM Straightener: Manual straightening machine without optical scanning system and control



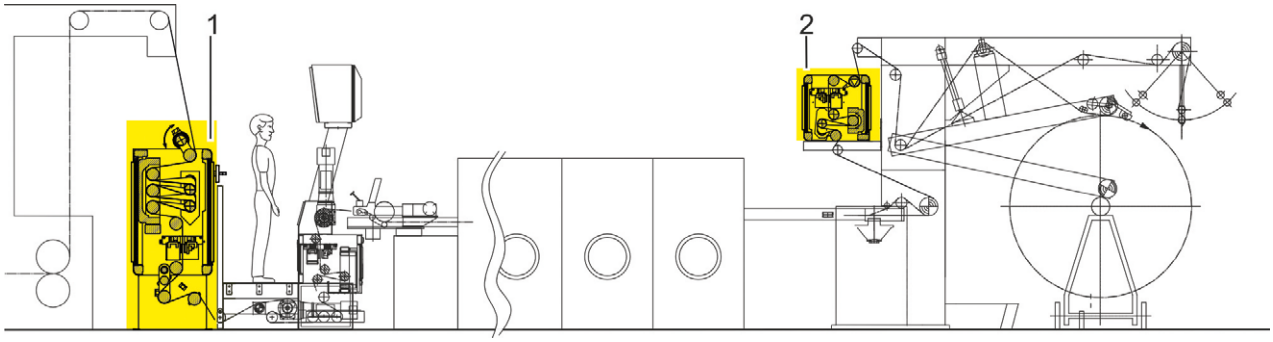
+ Orthopac CRVMC-12 – Specialist for carpets and technical textiles
The Orthopac CRVMC is especially designed for high mechanical load. Thanks to reinforced components, it is ideal for processing very heavyweight and wide materials. The arc of contact of the straightening rollers thereby depends on the desired straightening effect. With products without skews and bows, the straightening rollers are not enveloped unnecessarily. When the straightening rollers engage with the product they always contact the product across the entire width of the web, thanks to the innovative roller positioning drive.

Variants:

CRMM Straightener: Manual straightening machine without optical scanning system and control

Combination systems

+ Straightening combinations – Linking of straightening systems
Confronted with the most stringent demands with respect to any residual distortion, in many cases it is also necessary to develop very special straightening concepts. Mahlo has responded to this trend and developed individual solutions. This becomes necessary since in many cases straightening before the stenter is not sufficient. Distortion, especially bow, can still occur in the stenter itself. This is why the weft configuration is sensed by scanning after the stenter pull-off roller. Distortion is actively controlled by means of the speed controller of the pull-off roller and/or with the combined skew/bow roller of the Orthopac MFRC straightener.



Example: Combination system for knits: Orthopac RVMC (1) straightening and process control system with product tension control and spreading roller combined with an Orthopac MFRC (2) straightener on the stenter delivery side.

Pin wheel straightening systems

+ Orthomax RFMB-12 – Fusion of pin wheel and roller straightening system

Reliable, quick distortion correction also for asymmetric web distortion. The fusion of pin wheel and roller straightening technology perfectly combines the advantages of both technologies and provides amazing straightening results. An infinitely variable unclipping roller minimises residual bow and edge distortions. The intelligent drive station with special voltage control for smallest product distortion activates or deactivates automatically (e.g. in case of blockages). A bypass function is available at the push of a button for products that cannot be straightened with the pin wheel.

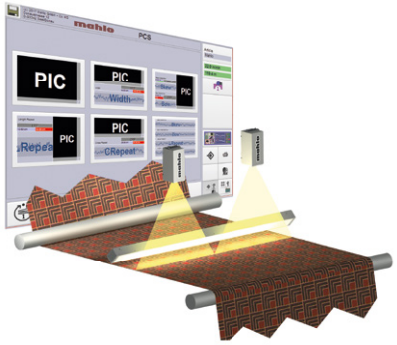
+ Orthofact RMB-12 – Classic pin wheel straightening machine

Asymmetrical distortions (wavy, S-shaped, etc.) in textiles have always represented a huge challenge in the textile industry. A special straightening approach is needed particularly when the straightening process does not take place in combination with a stenter (e.g. before decatizers, digital printing systems, etc.). To restore the warp and weft threads to their original state, the Orthofact RMB generates a defined lateral tension using freewheeling, inclined pin wheels. This cross-tension stretches the warp threads. The resultant force controls the freewheeling pin wheels, since the weft threads will always seek out the shortest path from selvedge to selvedge. Distortion, no matter whether wavy or S-shaped, will be corrected.

Pattern detection

+ Patcontrol PCS-15 – Pattern detection, Distortion correction, Repeat control

The leading pattern detection system using camera technology. Repetition of printed, woven or tufted patterns are evaluated according to certain algorithms and used for measuring, correcting and evaluating distortions and repeats. Depending on the application area of the Patcontrol PCS, Mahlo configures the system individually. The system uses one or two cameras – depending on the width of the product to be processed – to automatically detect the position of the pattern and continuously determine the pattern repeat, measures the product width, and – together with a weft straightener – aligns the product distortion based on the print pattern.



Variants:

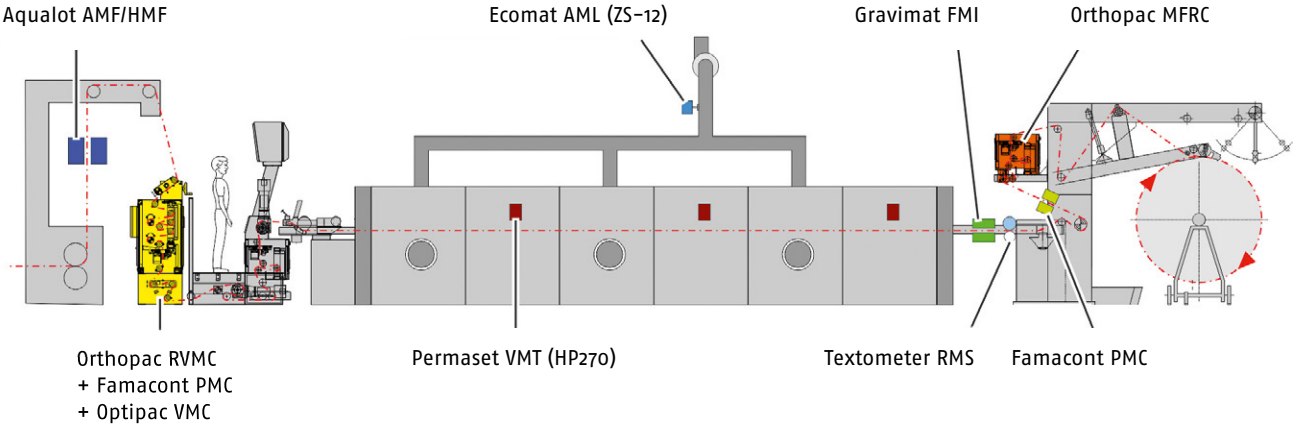
Patcontrol PCS/PDS: (Pattern Distortion System)
pattern distortion detection and control

Patcontrol PCS/PRS: (Pattern Repeat System)
pattern repeat detection and control

TEXTILE NONWOVEN COATING & CONVERTING PAPER EXTRUSION

PROCESS CONTROL AND PROCESS MONITORING

Textile manufacturers and textile outfitters are fighting with increasing production and energy costs, declining profit margins, shorter production times as well as greater requirements on quality and flexibility. Cost-efficient and quality-focused textile outfitting thus becomes increasingly important. Sustained production and the trend to higher-quality, technically sophisticated textiles also play a major role. The efficiency of the production plants can be drastically increased through suitable measuring and control technology from Mahlo. This means, at the same time, increased productivity with usually improved reproducible quality, optimised raw materials usage and work effort accompanied by clearly improved plant utilisation.



Mahlo® straightening and process control system for stenters

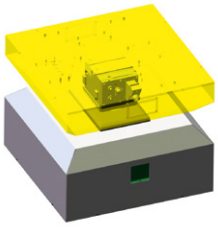
Optipac VMC-15 – Modular process control system

The Orthopac VMC is a modular process control system for textile refinement. It optimises drying or fixing processes as well as the processes all about the stenter. The system measures, logs and controls critical process parameters such as dwell time, thread density, residual moisture, basis weight, exhaust air moisture, etc. across the entire working width. This increases quality while saving resources and energy. The modular design of the system allows its flexible adaptation to all applications. Both, standard requirements and highly customised demands are thus met.

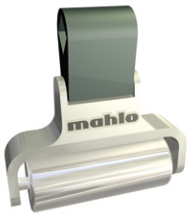
The system can also be integrated into an Orthopac straightening system. It thereby combines the functionality of a weft straightener with that of a process control system in one compact device.

+ Dwell time / Fixing time – Permaset VMT
Infrared pyrometer. To determine the dwell time or fixing time for a desired product temperature, the surface temperature of the product is measured without contact at several locations in the dryer using high-temperature resistant infrared pyrometers. Up 64 sensors are possible. The dryer speed is automatically adapted.

+ Thread density / Course density – Famacont PMC
Optoelectronic sensor / camera sensor. The Famacont PMC determines the thread density by means of a non-contacting, optoelectronic or imaging process. With the optoelectronic process individual threads or courses pass the sensor and are projected onto the photocell using a precision optical lens. The resulting frequency is proportional to the thread count. A high-resolution camera is used with the imaging process. The image is analysed with using suitable software. Both, the thread count in weft and warp direction can be determined here with maximum precision.

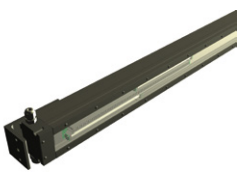


+ Basis weight – Gravimat FMI
Transmission of beta rays. The weight monitoring and control system measures the weight continuously, without contact, destruction-free and on moving product. The measurement is based on the attenuation of rays from a radioactive isotope through the substrate located in the measuring gap. This attenuation in intensity is an indication of the weight of the product.



+ Residual moisture – Textometer RMS
Measuring electrical conductivity. Moisture retention (residual moisture) is an important criterion in terms of later finishing, finished product scrap and energy optimizing. Electrodes determine the residual moisture at the outlet of the dryer utilising electrical conductivity measurement. The dryer speed is automatically adjusted until the desired degree of drying has been reached. Many different electrodes are available for a wide variety of applications.

+ Exhaust air moisture – Ecomat AML
Measurement of steam. Much unused energy is wasted through the exhaust air during drying processes without appropriate control. The Ecomat AML optimises the heating energy required by monitoring charging of the exhaust air with water steam and controls this factor through the fan speed or the exhaust air vent control.



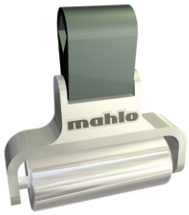
+ Product width – Wilot WMR
Reflexion of infrared light. Automatic width measurement on a running product web. IR LEDs used in reflective mode continuously and precisely determine the product width. The sensor module only needs to be attached on one side of the product. The compact design allows it to be installed even in the tightest mounting spaces. Retrofitting is possible virtually anywhere.

Ecopac EMC-15 – Process control system for drying processes

The Ecopac EMC uses the state of the art microprocessor technology to ensure product quality and optimise the energy balance for drying processes. The modular system for monitoring and controlling residual moisture, product temperature, dwell time and exhaust air humidity can be flexibly adapted to current production. Up to three of the same or different modules may be used as needed.

+ Product temperature – Thermoset OMT
Infrared pyrometer. The product temperature at the dryer delivery depends on the residual moisture. To determine the residual moisture the surface temperature of the product is measured at the outlet of the dryer using a high-temperature resistant infrared pyrometer without contact. The dryer speed is automatically adapted.

+ Dwell time / Fixing time – Permaset VMT
Infrared pyrometer. To determine the dwell time or fixing time for a desired product temperature, the surface temperature of the product is measured without contact at several locations in the dryer using high-temperature resistant infrared pyrometers. Up 64 sensors are possible. The dryer speed is automatically adapted.



+ Residual moisture – Textometer RMS
Measuring electrical conductivity. Moisture retention (residual moisture) is an important criterion in terms of later finishing, finished product scrap and energy optimizing. Electrodes determine the residual moisture at the outlet of the dryer utilising electrical conductivity measurement. The dryer speed is automatically adjusted until the desired degree of drying has been reached. Many different electrodes are available for a wide variety of applications.

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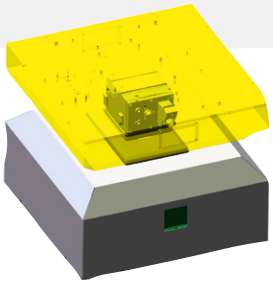
Thread density / Course density

+ Famacont PMC-15 (Stand-alone)
Optoelectronic sensor / camera sensor. The Famacont PMC determines the thread density by means of a non-contacting, optoelectronic or imaging process. With the optoelectronic process individual threads or courses pass the sensor and are projected onto the photocell using a precision optical lens. The resulting frequency is proportional to the thread count. A high-resolution camera is used with the imaging process. The image is analysed with using suitable software. Both, the thread count in weft and warp direction can be determined here with maximum precision.

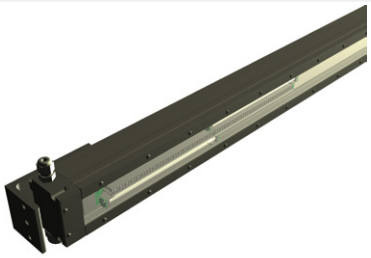
Basis weight

+ Gravimat FMI-15 (Stand-alone)
Transmission of beta rays. The weight monitoring and control system measures the weight continuously, without contact, destruction-free and on moving product. The measurement is based on the attenuation of rays from a radioactive isotope through the substrate located in the measuring gap. This attenuation in intensity is an indication of the weight of the product.



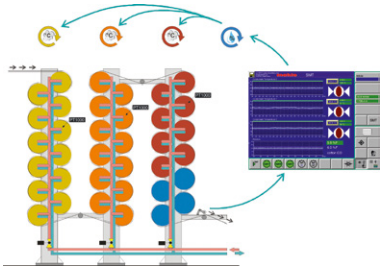
Product width

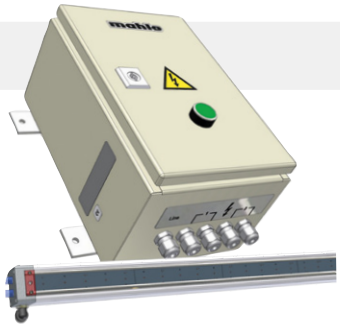
+ Wilot WMR-15 (Stand-alone)
Reflexion of infrared light. Automatic width measurement on a running product web. IR LEDs used in reflective mode continuously and precisely determine the product width. The sensor module only needs to be attached on one side of the product. The compact design allows it to be installed even in the tightest mounting spaces. Retrofitting is possible virtually anywhere.



Control of cylinder dryers

+ Atmoset SMT-15 (Stand-alone)
The Atmoset SMT regulates the residual moisture of the tissue with steam-heated cylinder dryers. The deviation of the condensate temperature from a preset setpoint is used to directly calculate the amount of energy required for drying. The heating output is optimised according to the product. The Atmoset SMT enables a stable and effective drying process. The optimal degree of drying is always reached, regardless of the weight of the product or the web speed.





Antistat AMW-12 – Ioniser - effective against static charge

Ionisation of the air

The Antistat AMW ioniser for trouble-free processing of synthetic materials and of textiles with high charge separation. By ionising the ambient air, the electrostatic charge is diverted from the product sheet. Antistat AMW can be used at high or low speeds.

Qualiscan QMS-12 – Traversing quality control system

Modular quality assurance and process optimisation

The Qualiscan QMS can be used in virtually every area of industry in which products are produced as a web, or where they are finished (e.g. coated). The versatile sensors and measuring devices of the Qualiscan QMS series can sense, log and continuously control (in-process) such parameters as weight per m², coating weight, moisture or thickness in a variety of web-type products.
The already proven areas of application range from coating paper, films, non-woven, textiles, rubber and metal foils to paper and cardboard manufacture, film extrusion and extrusion coating and non-woven production. The Qualiscan QMS is a modular system consisting of multiple measuring sensors (modules) and traversing frames (measuring frames) with one or more computers at the core.

Accessories:

DieControl APC Pro: Module for cross-profile control for common extrusion nozzles with thermal bolts for film extrusion (flat film – cast film) and extrusion coating.

sensors: see page 16

Measuring frame:

+ WebPro L – For large width

The WebPro L model traversing frames represent the pinnacle of the Mahlo measuring frame family. They are available for traversing widths of up to 6.6 meters, and can move up to five Mahlo sensors in uninterrupted continuous use at high speed and with great precision perpendicular to the web. A stainless steel version is also available for the paper industry or for hazardous atmospheres.

+ WebPro M – For normal widths

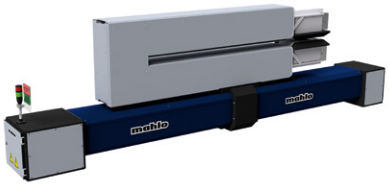
The traversing frames of the WebPro M type are used for a variety of applications in different industries and are marked in particular by the rugged and reliable design. Traversing frames of this type can be used for product widths up to max. 4 meters and can accommodate 3 Mahlo sensors.

+ WebPro S – Where space is at a premium

The traversing frames of the WebPro S type were designed with the objective of providing an extremely compact but still rugged and reliable traversing platform for applications in which space conditions do not permit use of a conventional O-frame.

+ WebPro XS – For normal widths

The traversing frames of the WebPro XS type are used for a variety of applications in different industries and are marked in particular by the rugged, reliable and compact design. Traversing frames of this type can be used for product widths from 0.2 to max. 2 meters and can accommodate one Mahlo sensor.



+ WebPro C – For challenging conditions

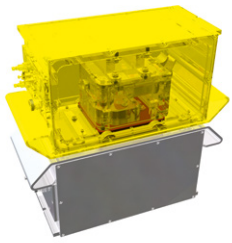
The traversing frames of the type WebPro C are used for applications where much dirt is generated or the measuring head must be moved completely out of the product web. This type is available for horizontal or vertical product guidance and distinguishes itself by the robust, reliable and dirt-resistant design. It can be vertically employed to a product width of 1.2 metres and one sensor or horizontally of 2 metres and 2 sensors.

+ UniScan M / UniScan S – For one-sided measuring tasks

The UniScan M and UniScan S traversing frames are the singlesided counterpart to the double-sized O-frames in the WebPro series, and have been specially designed for single-sided operating measuring devices in the Mahlo Qualiscan QMS family.

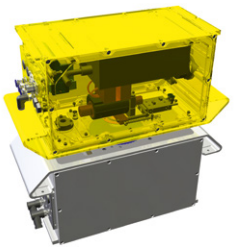
Qualiscan QMS-12 – Traversing quality control system

Sensors:

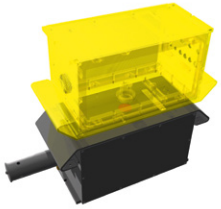


+ Gravimat DFI – Basis weight / Thickness
Transmission of beta rays. The weight monitoring and control system measures the weight continuously, without contact, destruction-free and on moving product. The measurement is based on the attenuation of rays from a radioactive isotope through the substrate located in the measuring gap. This attenuation in intensity is an indication of the weight of the product.
The Gravimat uses a target weight to reduce the range of different m^2 weights and thereby ensure a more consistent product.

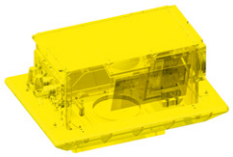
+ Gravimat FMX – Basis weight / Thickness
Backscattering of X-rays. The weight monitoring and control system measures the weight continuously, without contact, destruction-free and on moving product. The X-ray radiation from an X-ray tube is directed towards the product, from which it is partially scattered back. The greatest part of the radiation passes through the product and is absorbed by a beam dump or steel facing roller installed there. This backscattered portion is an indication of the weight of the product.



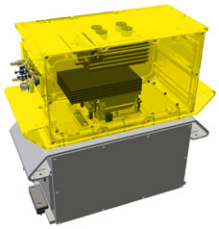
+ Gravimat FMX-T – Basis weight / Thickness
Transmission of X-rays <5 kV. The Gravimat FMX-T permits the contactless and traversing measurement of basis weight / thickness of the running product webs over the entire product width. It measures thin film, nonwovens and other fabric with high resolution, measuring accuracy and absence of flaws.



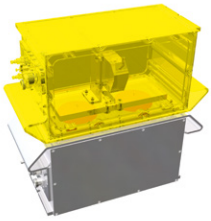
+ Infrascope NIR – Basis weight / Moisture
Absorption of infrared light. The Infrascope NIR monitors the absorption of infrared energy of all components on or in the web in the near infrared range. Measuring over the entire spectrum range and applying multivariate data analysis tools produces highly accurate calibration results from information in redundant spectra. The Infrascope NIR is available in transmission mode.



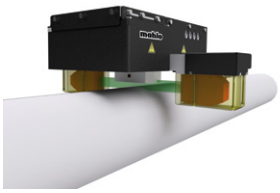
+ Infralot IMF – Moisture / Basis weight / Thickness
Reflexion of near infrared light. Infralot IMF uses optical evaluation of the reflected light energy in the near-infrared range to continuously measure and control material moisture on-line.



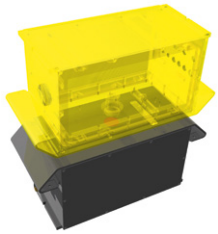
+ Aqualot HMF / AMF – Humidity
Absorption of microwaves. The Aqualot AMF and HMF use microwave technology to measure moisture without contact. The system measures regardless of the composition of the water, pH value changes in the material, material fillers or colour pigments.



+ Calipro DML – Thickness
Laser triangulation. The Calipro DML optical system uses laser triangulation online to measure the thickness or coating thickness of various materials with the highest accuracy.



+ Calipro DMS – Thickness
LED micrometer Calipro DMS measures the material thickness of the product using a light curtain. It is insensitive to colour, transparency and opacity as well as largely independent of the material surface.



+ Optoscope WLI – Thickness / Layer thickness
White light interference. White light from the upper and lower boundary surfaces of thin films is reflected differently. Interference measurement allows for the precise measuring of transparent coatings on films and mono-films. Both, the layer thickness and film thickness can be determined with a special measuring process.

+ Airpro APM – Air permeability / Permeability
Measurement of pressure drops. Airpro APM allows for a highly dynamic and traversing measurement of air permeability and pressure drops on the running product web across the entire product width. Applications range from all types of surface structures, felts, dense paper and airbag fabric to extremely open nonwovens and paper sieves.

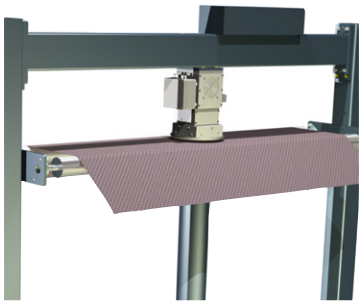
TEXTILE NONWOVEN COATING & CONVERTING PAPER EXTRUSION

PRODUCT INSPECTION

Online colour metrics measurement

+ Colorscan CIS-12 – Spectral photometer
The traversing colour scanning system for product inspection.
The measuring system used in the Colorscan CIS is based on a spectro-photometer with a 0° / 45° geometry. Traverse speeds of up to 1.2 m/sec can be reached. The measuring spot created in dynamic mode is approx. 18 mm wide and 60 mm long. Repeatability of the measured values is outstanding.

Automatic sample cutter



+ SampleCut FSC-12 – Compressed air blade
To monitor the progress of certain processes, there is no alternative but to take frequent samples at the machine itself. This is normally possible only while the product is either moving slowly or stopped, and often results in complicated work-arounds to enable continual production (continuously running winders, etc.). The Samplecut FSC is the solution to the problem. The tried and tested sample cutter Samplecut FSC takes samples from fast running product.

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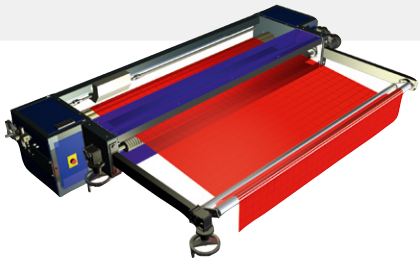
WEB GUIDING

Guiding and stentering roller



+ Ceremat MMZ-12
Drifting of the product web lateral to the running direction of product is unavoidable in some stages of textile finishing. The Ceremat system brings the product back on the right path. Applicationspecific variants are available.

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Moisture meter

+ Textometer DMB-15
The Textometer DMB is a mobile handy device for measuring moisture on textile webs and bobbins on a wide variety of versions. It determines the moisture content of raw materials, semi-finished products and finished products precisely and quickly. With an addon the Textometer DMB can also be used as a conductivity gauge for electrostatic flock coating.

Moisture tester

+ Aquarius AMZ-1
The pocket-sized moisture tester. The practical moisture tester for quickly checking actual moisture distribution, especially in yarn packages.

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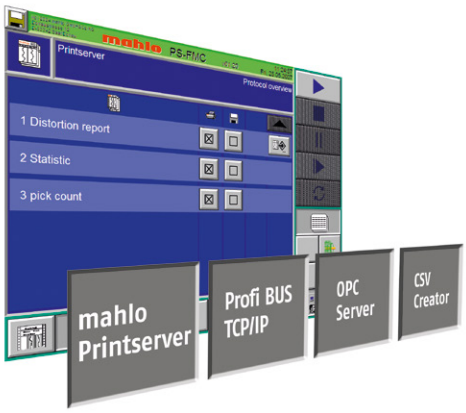
DATA MANAGEMENT



Logging, archiving, interface definition. Saving and archiving all the important production data is gaining increasing importance in modern production operations. Mahlo can provide a variety of aids for your data management needs. The flexibility of these tools enables individual solutions for customer problems.

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