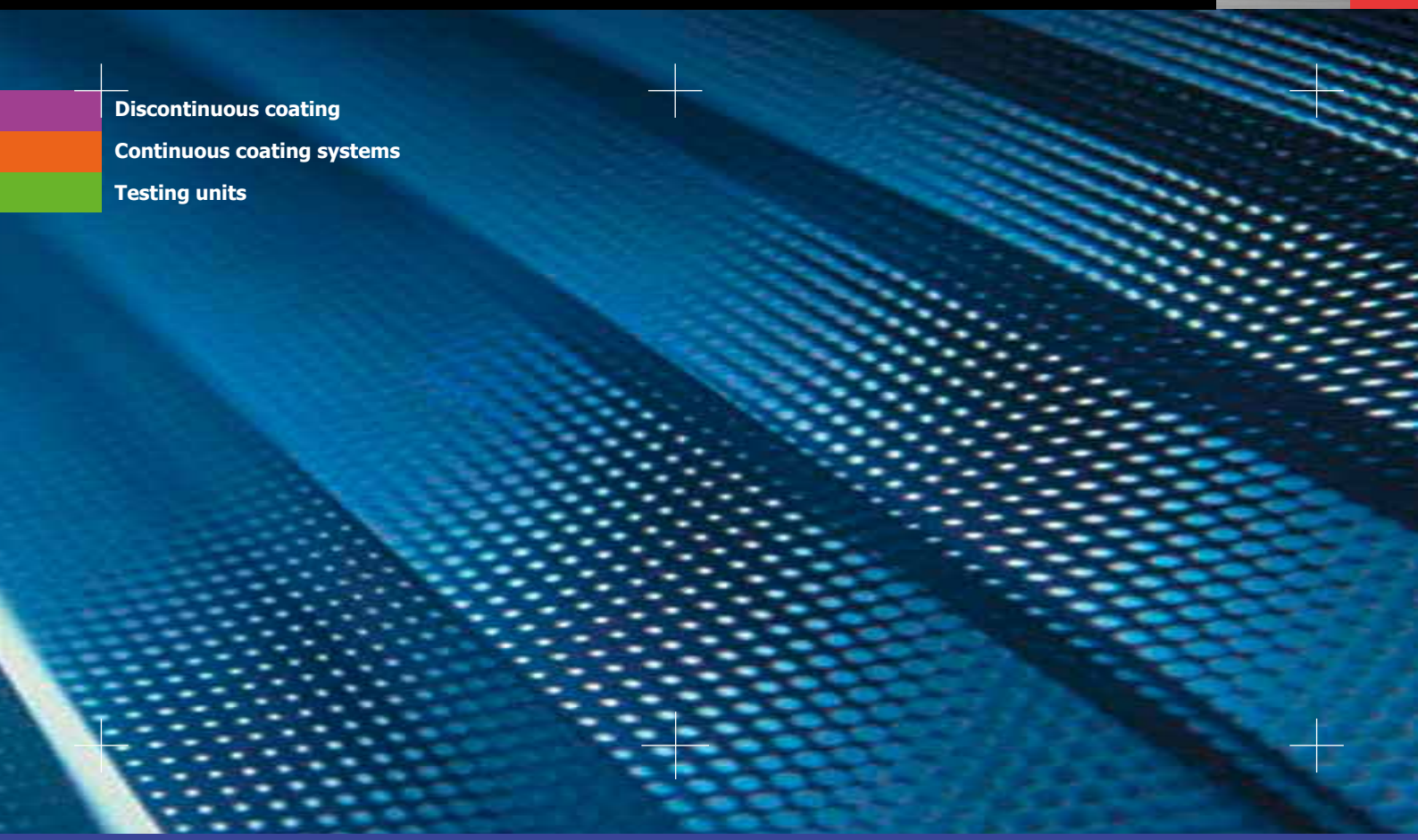
english

COATING OF A WIDE RANGE OF MATERIALS – OUR SOLUTIONS

Devices and systems for laboratories and production plants



Discontinuous coating

Continuous coating systems

Testing units

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Mathis

Sample Swiss Perfection

Mathis AG – your competent partner for coating solutions in laboratories and production

MATHIS AG has been manufacturing coating machines for laboratory and production applications for more than 35 years.
Laboratory machines are mainly discontinuous machines for sample sizes of approximately DIN A4. This sample size is already often sufficient to make a conclusive statement about the appearance, surface structure and stability of the sample. These samples are available within a very short time.
Pilot or production systems are developed, built and taken into operation in accordance with customer specifications. A wide range of components with a web width of up to 900 mm are used.

Innovative and practical

Our engineers and technicians work closely with research institutes and the R&D departments of a wide range of companies. As a result they are in touch with the latest innovations in the various industries and include these in the design of laboratory, pilot and production machines. Together with our customers we look for the best solution for optimum utilization of our machines in each company.

Cosmopolitan and truly Swiss

The machines of MATHIS AG, headquartered in the Swiss town of Oberhasli near Zurich, have been in use in dyeing laboratories since 1968. Since 1974 we have been developing machines and systems for coating a wide range of materials.
In addition to a production facility and sales office in São Paulo, Brazil as well as sales and service facilities in the United States, India and China, MATHIS AG has a global network of representatives.

MATHIS AG in Oberhasli, Switzerland

Mathis U.S.A. INC in Concord N.C.

Mathis Ltda in São Paulo, Brazil

Competent coating solutions

Wide range of application methods

Application of a wide range of application materials onto various substrates requires specifically adapted application processes. MATHIS AG develops and builds machines for many different application processes.

- Doctor knife coating
- Caster / Slot die
- Engraved rolls
- Reverse roll coater with 3 – 5 rolls
- Hot melt
- Coater with Meyer bar

All processes are customized to suit your specific requirements. They can also be optimized together with you in our test center.

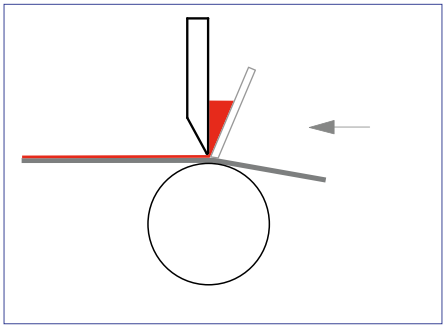
Application materials and substrates

Solutions and dispersions, both aqueous and solvent based, can be processed on our machines and systems. These materials are applied, for example on:

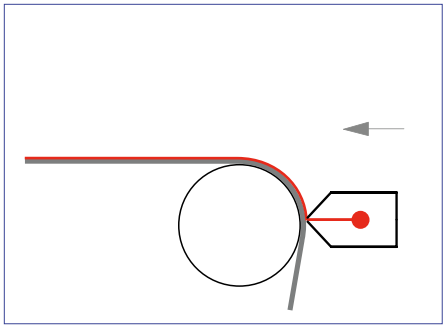
- Textiles, both woven and non-woven and also knitted fabrics
- Metal coils of steel or aluminum
- Paper, PET and PP foils etc.

Customers from various sectors

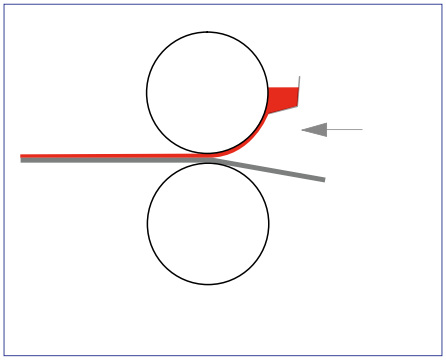
Mathis supplies the coating machines and systems to renowned companies in the textile, pharmaceutical, packaging and paper industries, and also surface treatment, membrane technology, fuel cell and solar technology companies.



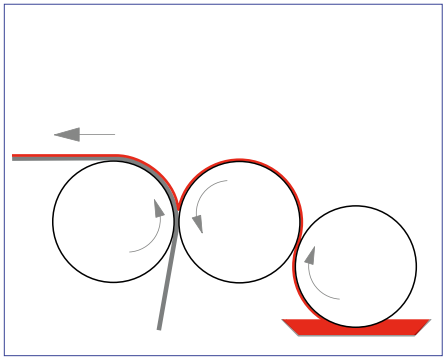
Doctor knife coating



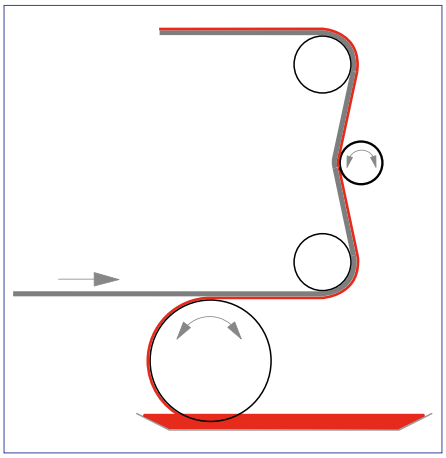
Caster / Slot die or hot melt



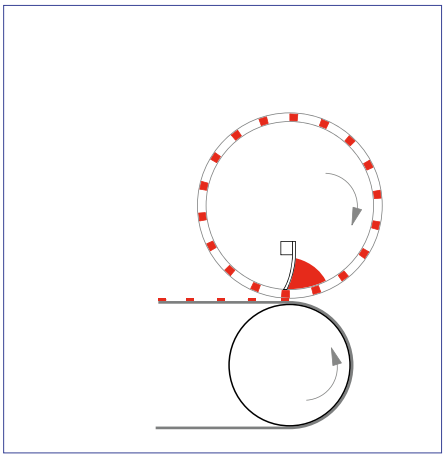
Engraved roll



Reverse roll coater 3 – 5 rollers



Coater with Meyer bar



Rotary screen

Complete coating systems from one source

Upwinding and unwinding systems

Upwinding and unwinding systems with bearings on one or both sides ensure continuous web feed and discharge. Contactless diameter scanning, adjustable winding parameters and freely selectable direction of rotation are additional advantages of the Mathis upwinding and unwinding systems.

Web storage

As web storage is provided downstream from the unwinding device or upstream before the upwinding device, the material batch can be changed without stopping the web feed.

Optimum drying

The highest coating quality specifications as well as different application materials also require an optimum drying process.
Continuous dryers with slot or venturi nozzles in module sizes of 1.5 m, 2 m and 2.5 m can be combined according to your specifications and optimally modified to your requirements.
Different temperature zones in the same dryer or one-sided nozzle arrangements are only two of the many options in the Mathis AG range.

Infrared pre-dryer

Horizontal or vertical infrared pre-dryers with infrared radiators for specific materials round off the optimum drying process.

Customer benefits

The intelligent designs as well as the modular functionality of the Mathis machines and systems provide a sound basis for optimum customer benefits.

Unwinding device with bearing on one side

Dryer with different temperature zones

Vertical web storage

«UNIVISION» – The process controller of the MATHIS machines

The programmable «UNIVISION» process controller is optimally designed to meet the requirements of its users and the functions of the Mathis machines.

Its operation is very simple due to the following features:

- Clearly structured graphic process visualization
- Simple, easy-to-remember function pictograms
- Menu-driven parameter entry
- Updating and visualization of all process data during operation
- Information displays (error and fault displays) in plain text
- Comprehensive help file
- Updatable software
- Import and export of process data to other «UNIVISION» process controllers or on PC

With the «UNIVISION» process controller your business is ready for processes both today and in the future.

Options

Process programmer

Up to 99 recurring processes can be saved and retrieved when necessary.

Auto start

A starting time can be preselected if required. The process is started automatically.

Daily and weekly programmer

Not only recurring, individual processes but also complete daily and weekly programs can be predefined and started.

Process control with PC

It is possible to connect the «UNIVISION» to a LAN network with an RS232C or Ethernet interface TCP/IP connection. Process data and complete programs are then created centrally and forwarded to the «UNIVISION». Even an ongoing process can be changed in this manner. With a connected PC, for example, process reports for ISO 9001 compliance can be created.

Technical data

«UNIVISION Touch S»

Operating system:	Windows CE
Memory capacity:	Dynamic >64 MB RAM
Touchscreen:	15” TFT
Interfaces:	TCP/IP connection (Ethernet interface), USB

Paste evacuating unit type «LPE»

The paste evacuating unit type «LPE» is used when air and bubble-free pastes and lacquers etc. are required.

The table model «LPE» unit creates a vacuum in the treating chamber. The integrated stirrer breaks up air bubbles in the paste and the discharged air is evacuated. Constant stirring also prevents overflowing of the paste in the vacuum.

Accessories

- Polypropylene beaker, 1 liter, disposable
- Centering ring for 1 liter polypropylene beaker
- Stainless steel beaker, 1.5 liters
- Centering ring for 1.5 liter stainless steel beaker

Technical data

Mixing quantity:	~1 liter / ~5 liters
Stirrer speed:	50 – 1500 rpm, infinitely variable
Vacuum:	99.5 %
Dimensions W x D x H:	300 x 520 x 600 mm / 400 x 700 x 800 mm
Weight:	~45 kg / ~55 kg

Laboratory coating device type «SV»

The laboratory coating device type «SV» is used to coat single material samples. Coating is performed with a floating, roller or rubber blanket knife.

Options

- Coating device with motor drive
- Laminating device type «SV-K»
- Fast laminating device type «K-SK»
- Various material holders

Technical data

Coating sample:	280 x 300 mm max.
Dimensions W x D:	600 x 700 mm
Weight:	~45 kg

Infrared dryer type «IR-K»

The infrared dryer type «IR-K» is installed to dry material samples which have been previously coated on a laboratory coating device type «SV».
The material holders are placed into the infrared dryer without re-loading the material samples.

The material holder is drawn through the infrared radiator automatically and at a variable speed, and the material sample is dried accordingly.

Options

- Infrared radiation pyrometer for contactless measurement of the surface temperature of the material sample

Technical data

IR heating capacity:	2.4 kW (top and bottom)
Sample size:	430 x 330 mm max.
Speed of material holder:	0.2 – 2.0 m/min
Dwell time:	12 s – 2 min
Dimensions W x D x H:	900 x 570 x 540 mm
Weight:	~45 kg

Roller application device type «DWE»

The roller application device type «DWE» is used for controlled application of various media onto material samples. The media are applied by means of a screen, stippling roller and a doctor knife device. The use of engraved rollers ensures regular, controlled application. The application materials are, for example, mono-colors, lacquers, glue and adhesive primers, coatings and moistening liquids. Aqueous, solvent-based and 100 % systems such as UV lacquers etc. can be applied to samples of artificial leather, foils, paper, textiles and non-woven fabrics.

Options

- Additional applicator rollers, with or without engraving

Technical data

Roller width:	290 mm
Roller diameter:	80 mm
Roller speed:	0 – 10 m/min
Air connection:	4 – 6 bar
Dimensions W x D x H:	~480 x 650 x 570 mm
Weight:	~55 kg

Sizepress type «SP»

The sizepress type «SP» is used for coating, finishing and applying optical whitener to paper samples.
The paper samples are supplied from the top and after treatment placed in the collecting tray below the rollers.

Technical data

Roller width:	350 mm
Roller diameter:	110 mm
Roller speed:	5 – 250 m/min
Dimensions W x D x H:	930 x 830 x 730 mm
Weight:	~200 kg

Thermotester type «LTE-T»

The thermotester type «LTE-T» is an almost fully automated oven for determining the thermal (static) stability of plastics.
In combination with the coating device the «LTE-T» can be used as both a gelling oven and also as a universal testing oven for plastics applications.

Accessories

- Material holder with 14 U-shaped inserts
- Material holder with sieve insert
- Cover raiser with lifting motor

Options

- Infrared radiation pyrometer for contactless measurement of the surface temperature of the material sample
- Exhaust air fan
- Automatic cover raiser
- Motorized air flap control
- Smartview for data recording

Technical data

Temperature range:	Up to 250°C / 300°C
Interval time/dwell time:	5 s to 999 min
Circulation air control:	Infinitely variable
Infeed and discharge:	automatic
Interval distance:	1 – 420 mm
Sample sizes:	14 strips 22 x 420 mm (Thermotest)
Operation:	Univision
Dimensions W x D x H:	870 x 1135 x 950 mm (D = 1460 mm, transport frame extended)
Weight:	~240 kg

LABCOATER type «LTE-S»

The LABCOATER type «LTE-S» is the optimum combination of dryer and laboratory coating table. Various kinds of material samples are coated in the same run by the coating device and heat-treated in the dryer. The coating is applied either by a floating, roller or rubber blanket knife. Multiple coatings which do not require reloading are also possible.

Accessories

- Pin frame adjustable in length
- Pin frame with adjustable length and width, both to stretch textiles
- Reversing pin frame
- Paper and foil frame
- Sieve frame for holding loose material

Options

- Infrared radiation pyrometer for contactless measurement of the surface temperature of the material sample
- Exhaust air fan
- Automatic cover raiser
- Motorized air flap control
- Laminating device type «SV-K», e.g. for laminating PVC with the reversing method
- Fast laminating device type «K-SK», e.g. for laminating PU directly after coating
- Coating device with motor drive
- Smartview for data recording

Technical data

Temperature range:	Up to 250°C / 300°C
Dwell time:	5 s to 999 min
Circulation air control:	Infinitely variable
Infeed and discharge:	automatic
Sample sizes:	
– only drying	330 x 430 mm max.
– coating and drying	280 x 300 mm max.
Coating speed:	0.2 – 4 m/min (coating device with motor drive)
Setting accuracy of the coat thickness:	0.01 mm
Operation:	Univision
Dimensions W x D x H:	945 x 1135 x 950 mm (D = 1460 mm, transport frame extended)
Weight:	~280 kg

2-roll laboratory calender type «KAL»

Technical data

	Type «350»	Type «500»
Roller width:	350 mm	500 mm
Web width:	300 mm	450 mm
Linear pressure:	400 daN/cm max.	
Web speed:	0.3 – 3 m/min, infinitely variable	
Roller temperature:	30°C – 180°C	
Setting the gap:	0 – 5 mm	
Dimensions W x D x H:	1520 x 1000 x 1570 mm	
Weight:	~570 kg	~630 kg

The 2-roll laboratory calender type «KAL» is used for treating the surface of material samples.
Material surfaces are calendered in various ways under pressure and with the use of heated rollers.

Options

- Steel roller with engraving
- Heater for heating the steel roller

Reverse roll coater type «RRC»

Technical data

Unit sizes/ sample widths:	Type 250 / up to 180 mm Type 350 / up to 280 mm Type 500 / up to 430 mm Type 650 / up to 580 mm
Sample length:	400 mm
Sample thickness:	0.2 – 5 mm
Type 650 Required space W x D x H:	1800 x 1500 x 2000 mm
Working height:	1100 mm
Weight:	~650 kg

The reverse roll coater type «RRC» is used for the application of aqueous and solvent based primers and lacquers and also 100 % systems such as UV lacquers. Pre-treatment of aluminum, steel sheets and other materials is also possible.
Production conditions can be reproduced on small samples with the reverse roll coater type «RRC». Various parameters such as the roller speeds, roller gap or direction of rotation of the rollers are precisely set to this purpose.

Options

- Transport of the material samples either by a transport roller or belt
- Variable lengths of in feed and discharge tables
- Variable number of rollers
- Different roller materials

Laboratory hot air oven type «LTH»

The laboratory hot air oven type «LTH» is used for drying, hardening and baking primers, paints, lacquers or similar surface coatings. Substrates of sheet steel, aluminum etc. are coated in the reverse roll coater type «RRC» in accordance with the «coil coating method». After coating the sample is placed in the holder of the «LTH» and transported into the dryer for subsequent heat treatment.

Options

- Infrared radiation pyrometer for contactless measurement of the surface temperature of the material sample
- Exhaust fan 30 m3/h max.
- Automatic cover raiser
- Holder for sieve frame, tilting, with water trough
- Smartview for data recording

Technical data

Temperature range:	Up to 400 °C / 450 °C
Dwell time:	5 s to 999 min
Circulation air control:	Infinitely variable
Circulation air volume:	up to 1000 m³/h
Infeed and discharge:	automatic
Sample sizes:	300 x 388 mm max.
Operation:	Univision
Dimensions W x D x H:	935 x 1070 x 1020 mm (D = 1560 mm, transport frame extended)
Weight:	~400 kg

Crockmeter type «CRO-B-P»

Crockmeter type «CRO-B-P», for determining the abrasion resistance of coil-coated metals, lacquers and coatings.

Technical data

Abrasion surface:	15 x 80 – 104 mm (adjustable)
Abrasion pressure:	0.05 MPa
Abrasion speed:	1 cycle / second
Abrasion cycles:	1 – 9999
Dimensions W x D x H:	150 x 435 x 280 mm
Weight:	~12 kg

Coating systems type «BA»

Mathis coating systems are installed as either laboratory or pilot systems and also as production machines. They are optimally adapted to suit individual requirements with their customizable configuration. Various components are used to this purpose.
These are:

- Application modules for caster, slot die, doctor knife and roller application
- Infrared pre-dryer
- Hot air dryers combined as modular systems
- Cooling rollers and laminating modules
- Upwinding and unwinding systems

Plant control with «Univision»

On coating machines in particular the «Univision» operating unit is mounted on a fully movable console. As a result the operating unit can be moved to almost any conceivable position. The large display and the clearly structured graphic visualization of all processes and functions also enhance operating convenience.

Technical data

Roller widths:	350, 500, 650 mm
Working widths:	300, 450, 600 mm
Web speed:	0.5 – 10 m/min

Ergonomic design of the «Univision» operating unit

Continuous production line 1100 mm roller width

Continuous coating system type «KTF-S»

Continuous doctor knife coating with subsequent drying are the basic functions of the «KTF-S».

The continuous coating system type «KTF-S» is used where the required sample length makes economic use of a large machine impossible.

Options

Various options enable customized configuration of the «KTF-S».

- Infrared pre-dryer
- Double field dryer for different treatment temperatures
- Infrared radiation pyrometer for contactless measurement of the surface temperature of the material sample
- Exhaust air fan
- Laminating device
- Hot melt coating
- Special material holder for use as a hot-air dryer in a discontinuous process without doctor knife coating

Technical data

Working width:	Up to 450 mm	
Material speed:	0.1 – 2 m/min	
Dwell times:	Roller – Roller Pin frame	20 – 420 s 15 – 280 s
Circulation air speed:	Up to 6 m/s	
Temperature range:	Up to 250 °C	
Sample size width x length:	330 x 500 mm min. 480 x 500 mm max.	
Dimensions:	Depending on the respective configuration	

Production of battery components

The application material is applied to a metal or plastic foil or paper in a reverse roll coating process or as a doctor knife coating. The coated web feed runs through various drying stages and is subsequently wound up.

Technical data

Roller widths:	500 mm
Working widths:	450 mm max.
Web speed:	1 – 4 m/min
Temperature range:	200 °C max.

Doctor knife with mounted trough for continuous coating

«Reverse coating» roller coating

Multifunctional textile coating system

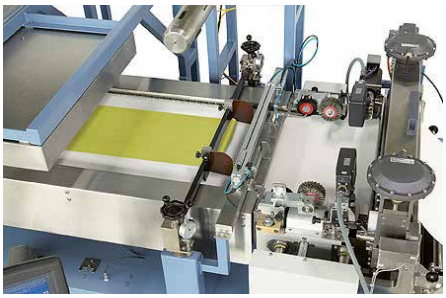
Both woven and knitted fabrics are coated. Various coating methods are employed.

- Doctor knife coating
- Doctor knife coating with subsequent wet lamination
- Coating with rotary screen

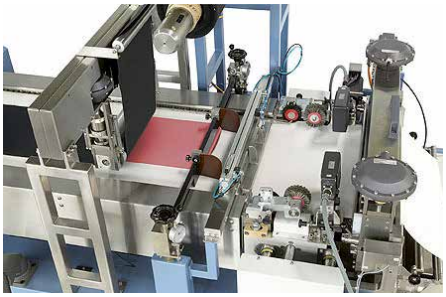
After coating the textiles are thermally treated in a stenter frame dryer.
Infrared pre-dryer, cooling rollers and upwinding devices round off this multi-functional coating system.

Technical data

Roller widths:	500 mm
Working widths:	250 – 500 mm
Fabric speed:	2 – 20 m/min
Temperature range:	235 °C max.

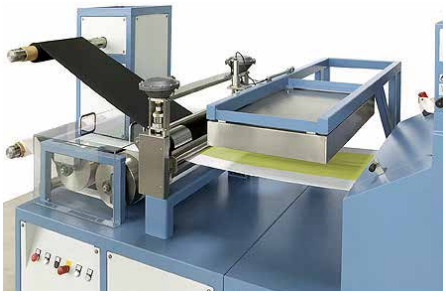


Doctor knife coating



Doctor knife coating with subsequent wet lamination

Coating with rotary screen



Infrared dryer, cooling rollers, upwinding devices

Coating system for production of transdermal systems – TTS PATCHES

The application material, a homogenous solution of active substance and adhesive, is continuously applied to a substrate foil with a slot die. The coated foil runs though a four-zone dryer in which the solvent is thermally removed from the active substance and adhesive solution. The finished laminate is wound up after application of a laminating foil.

Technical data

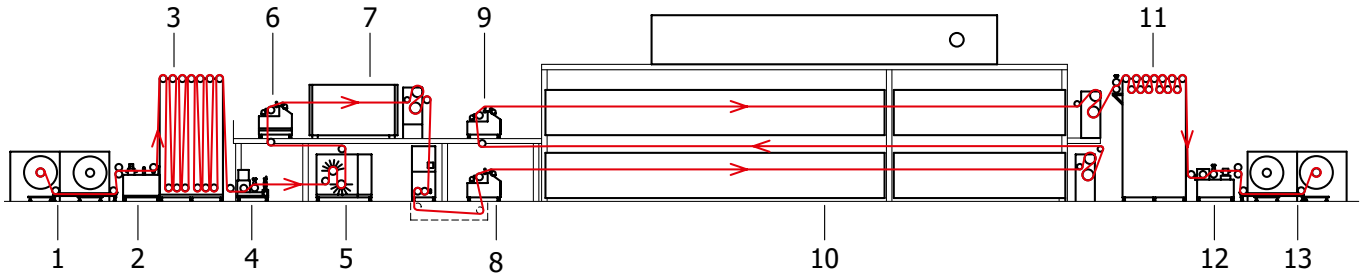
Roller width:	450 mm
Working width:	400 mm max.
Web speed:	0.1 – 10 m/min
Temperature range:	60 °C – 140 °C
Dimensions:	Length: 9 m Width: 1.5 m

Clearly structured operation on the «Univision» operating unit

Main drive with downstream caster application unit

Compact four-zone dryer

Coil coating system for coating and drying steel and aluminum coils



The application material, in this case lacquers of different colors, is applied to one or both sides of an aluminum coil with the «reverse roll coating» process.
In two-shift operation, up to 38000 meters of aluminum coil is coated daily.

Technical data

Roller width:	275 mm
Working width:	69 – 150 mm
Web speed:	4 – 40 m/min
Coil weight:	Up to 500 kg
Coil diameter:	Up to 1000 mm
Dimensions:	Length: 49 m Width: 9 m

1 Double unwinding device
2 Cutting and welding unit
3 Vertical web storage
4 Edge rolling mill
5 Plasma pre-treatment
6 Chem-coater
7 Dryer
8 Shuttle reverse roll coater
9 Reverse roll coater
10 Dryer and cooling section
11 Vertical web storage
12 Cutting unit
13 Double unwinding device

Partial view of the coating system

Shuttle reverse roll coater. A «new color» is prepared during production.

The coated aluminum coil is wound up.

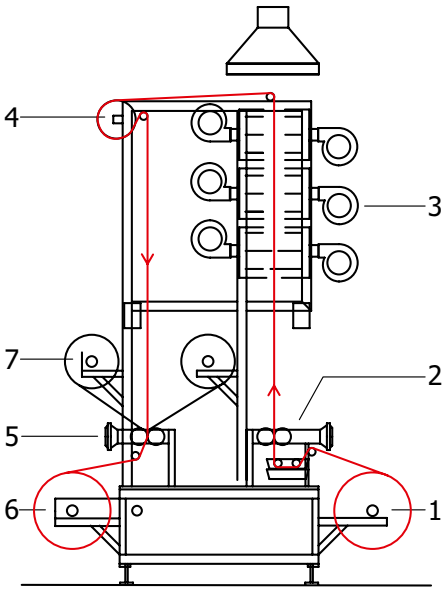
Impregnation system for woven glass fiber fabric

The «PREPREG» system is used for impregnating woven glass fiber fabric with resin. After drying with the infrared radiators and subsequent cooling, the fabric can be laminated on both sides.

Technical data

Roller widths:	650 mm
Fabric widths:	600 mm
Fabric speed:	0.1 – 5 m/min
Cloth batch weight:	Up to 150 kg
Cloth batch diameter:	Up to 500 mm
Dimensions W x D x H:	2375 x 3750 x 1500 mm

1 Unwinding device
2 Impregnation squeezing device
3 Infrared predryer
4 Cooling deflecting roller
5 Drawing out squeezing device
6 Upwinding device
7 Unwinding device lamination



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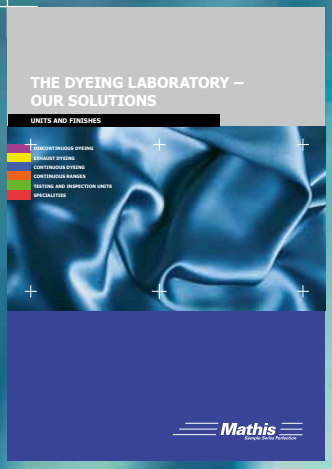
Further documentations



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