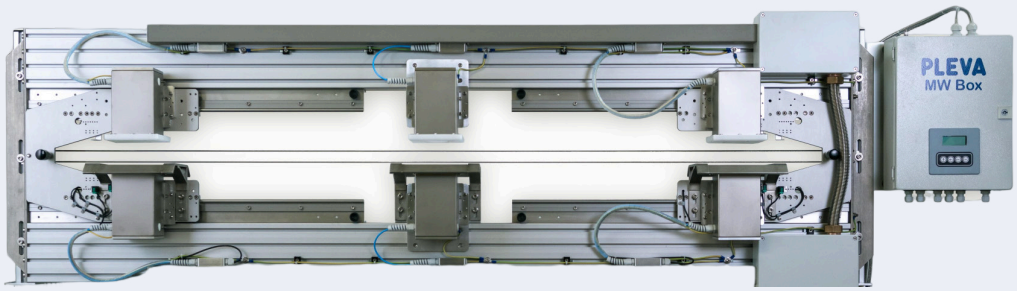
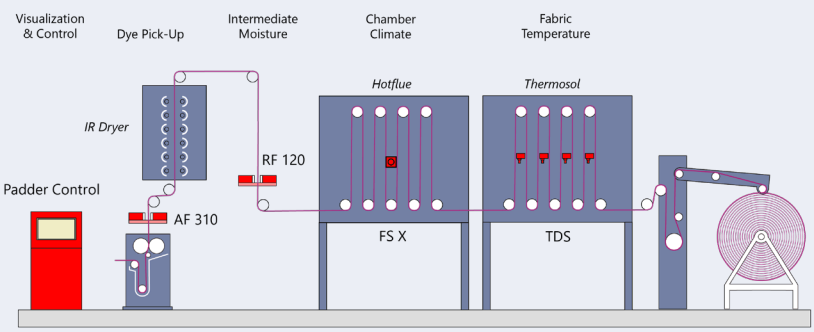
PLEVA
Sensors and Controls

Application Moisture Measurement (dye pick-up, coating)

AF 310





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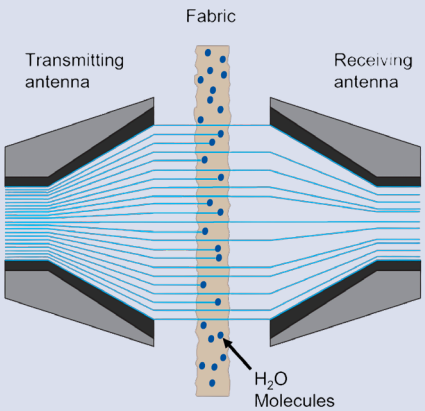
INTRODUCTION

Contactless measurement technology for optimal application processes

AREAS OF APPLICATION

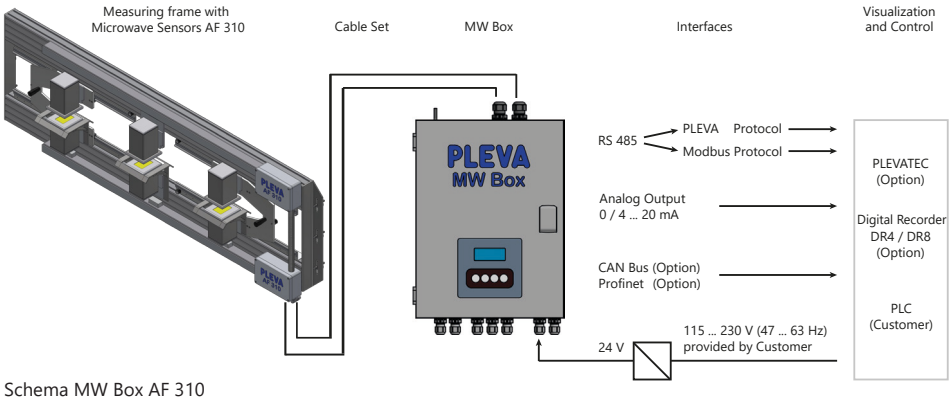
- Textile/nonwovens industry: liquor pick-up on fabric webs, dyeing, wet-in-wet applications (independent from fiber and color), latex- and foam-coating for carpets
- Paper industry: at all sorts of paper and cardboard webs, adhesives
- Woodworking industry: verneer manufacturing, chipboards, wood laminated boards
- Building industry: building boards, sandwich boards such as plaster boards etc., insulating boards, gypsum

  ... and many more possible!



Measuring principle AF 310

The application moisture measuring device AF 310 (with 3 pair of measuring heads) can measure contactless, continuous, accurately and reliably the high moisture content of textile fabric webs and other surface shaped fabrics. The application moisture content and differences over the fabric width are determined behind machines for add-on or coating of water soluble liquors, solutions, paste and foam.
By measuring these values, previously not recognizeable reasons for defects, as well often the causes, can be detected and rectified. This results in uniform liquor pick-up over the width especially in dyeing and quality improvement through evenness and minimization of chemical add-on. This optimization leads to increased productivity and savings of energy in following drying processes.



Schema MW Box AF 310

Achieving sustainable success with consistent quality

- Only required chemicals or applications are used, which saves valuable resources
- Energy consumption and thus, CO_2-emissions for subsequent drying processes can be reduced to a minimum.
- Less rejected/second choice goods are produced.
- No need for cut-outs of fabrics for checking e.g. coating.

This makes the AF 310 a hero for sustainability.

Measuring principle

Measurement of the material moisture is based on microwave absorption by water.
A semi-conductor oscillator transmits microwave energy through the web. The non-absorbed part of the energy is received on the opposite side by a microwave sensor. The amount of absorption is a measurement of the absolute moisture content. At the AF 310 the absolute moisture will be indicated from the pair of measuring heads in the middle, and from the pairs of measuring heads on the left and right side the difference to the middle will be indicated as well.

Set-up of equipment

Measuring frame with measuring heads

The fabric web can be guided in any position. The measuring frame (aluminium) with measuring heads made of stainless steel are arranged vertically to the web that the web can be guided through in the middle of measuring frame.

Evaluation electronics MWB

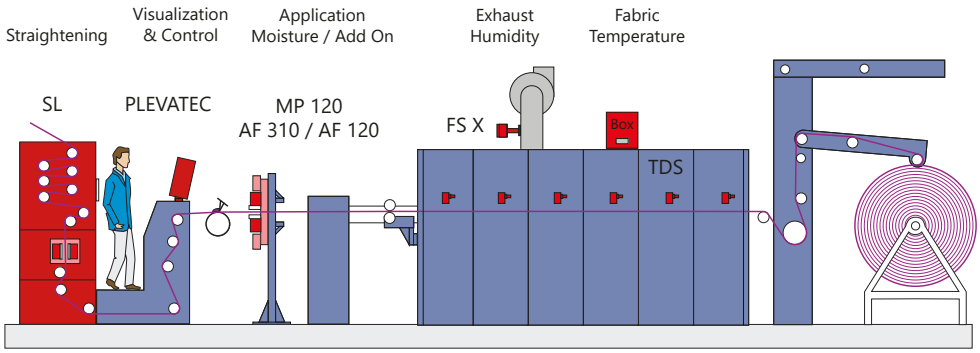
The Microwave box MWB evaluates the signals from the measuring heads. It can be equipped with interfaces such as CAN-Bus and Profinet.

Process visualization and control system

An additional process visualization and control system can be added to allow a automatic control of the respective process. On cold pad batch (CPB) and continuous dyeing the PadderControl CIMATIC gives best process results.
The modular PLEVATEC pro system is designed for versatile usage in various processes and allows a individual combination with other PLEVA sensors and control packages.

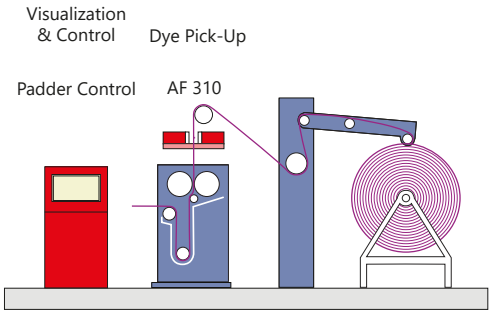
Measurement technology and areas of application

Measurement of coating application

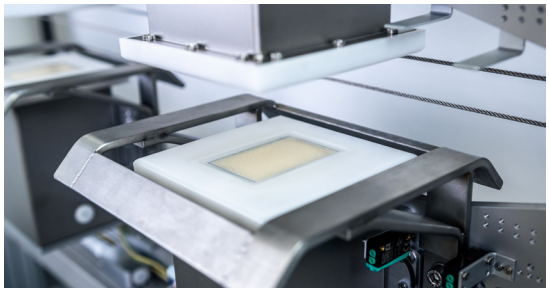


There is a plurality of processes in which a web is coated, thereby on add-on substance is applied to it. These may be pastes, foams or glues. In each case the add-on substance and the quantity are prescribed. The task is now to apply the correct quantity, constantly along the length and across the width, independent of fluctuations of the process or material parameters. In all application processes, in which the add-on substance is solved in water, the AF 310 measures the application reliably and reproducibly (measurement of selvedge - centre - selvedge). Thus the setting to the prescribed optimal values is possible. The process safety is substantially increased and the results are considerable advantageous for fabric quality, amount of material and energy consumed, production performance and, as a total, for the production costs.

Measurement and control of dye liquor



The AF 310 is successfully used at dyeing padders for the optimization of continuous dyeing processes. Most important are the processes Thermosol, Pad-steam and Cold-Pad-Batch (CPB). The main problem of these dyeing processes is that the shade often is not constant along the length of a lot as well as across the fabric width. Experts are talking from tailing (lengthwise) and listing (width wise). There are a lot of reasons resulting from pre- processing and from the padder itself. The contact-free measurement of the application moisture and thus of the dye liquor pick-up by means of the AF 310 leads to considerable improvements. The AF 310 delivers the relevant values side/center/side continuously with fast speed. With this instrument the dyeing process can be monitored and understood, supervised and controlled online. If a padder is used, at which the pressure and consequently the squeezing effect of it can be adjusted sectionally across the width, then the dye liquor pick-up can be automatically controlled.



Measuring heads with protection frame

BENEFIT FOR CUSTOMER

- Uniform pick-up over the width
- Consistant quality, reproducibility
- Evenness
- Reduction of shade variation at dyeing
- Minimizing chemical, foam or other applications
- Increasing cost-efficiency
- Neither machine running speed nor flapping of the fabric have any effect on the measured results

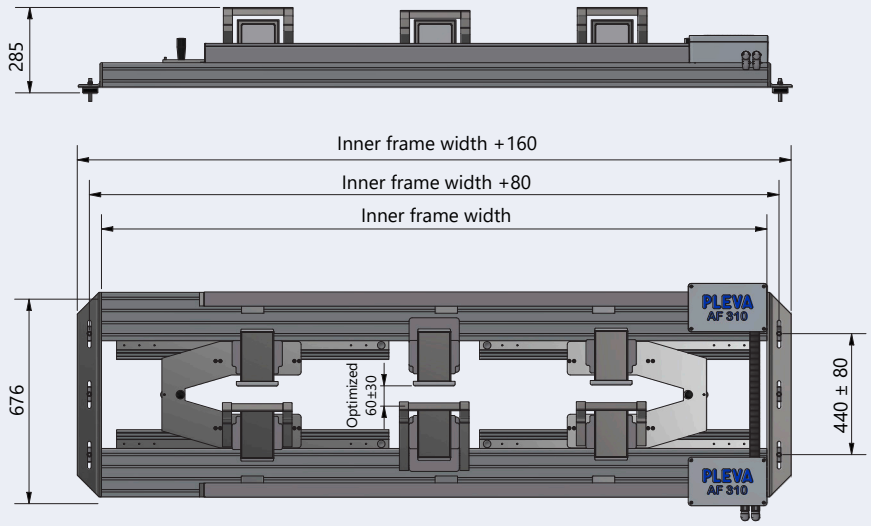
FEATURES OF AF 310

- Three point moisture measurement side/center/side
- Continuous, contactless measurement
- No special safety precautions necessary because of non-hazardous, non-destructive measurement
- Side pairs of measuring heads can be easily adjusted on different fabric widths
- Measuring heads made out of stainless steel

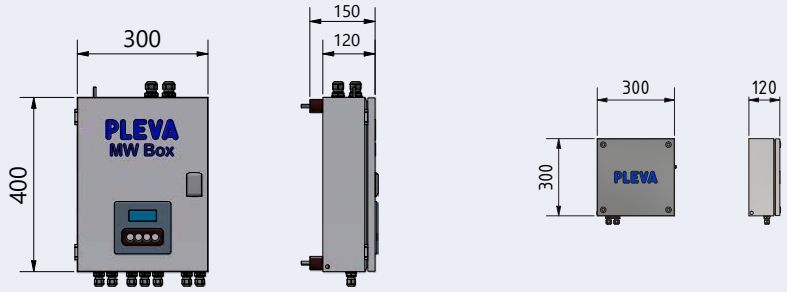
AF 310

Technical Data

Technical drawings



AF 310 measuring frame with microwave sensors



Microwave box

Power supply unit

Technical data

Frame with measuring heads	
Ambient temperature sensor:	max. 50 °C standard
Measuring range	0...2000 g H_2O/m^2
Accuracy:	better than ± 1% of measuring range but not better than ± 0,8 g H_2O/m^2 absolute
Measuring head distance:	optimized between 50 mm and 70 mm
Material:	aluminium
Inner frame width:	max. 6000 mm
Weight:	approx. 100 kg (2200 mm)
Microwave box	
Ambient temperature:	max. 50 °C
Supply voltage:	24V DC (± 10%)
Power consumption:	max. 90 W
Interface:	RS485, 0/4....20 mA, CAN (optional), Profinet (optional)
Weight:	approx. 10 kg
Power supply unit for microwave box	
Nominal voltage:	115/230 VAC 47-63 Hz
Dimension:	70 x 147,5 x 164 mm
Weight:	approx. 1.2 kg

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