

# Application Report Paper

Production and Processing of Paper, Tissue & Cardboard



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## 1 PRODUCTION AND PROCESSING OF PAPER, TISSUE & CARDBOARD

### Papermaking



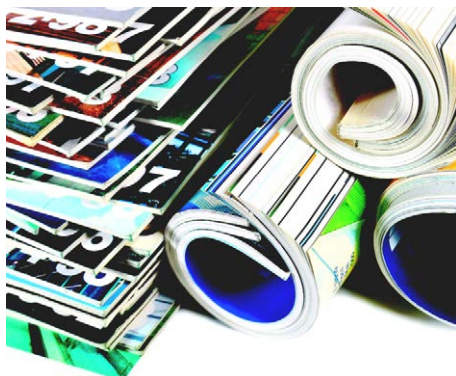
The Paper Tissue and Board market requires a Quality Control System that is both flexible and configurable. Measurements must be performed on both the wet and dry ends for fast accurate control. In addition, this industry has become increasingly more competitive resulting in tighter product specifications and more challenging profit margins.

Mahlo has responded to these market pressures by providing paper industry measurement and control solutions for over 25 years.



Mahlo's experience and understanding of the paper, tissue and board industries has allowed us to tailor web gauging systems for the following processes:

- Papermaking
- Tissue Manufacturing
- Board Manufacturing
- Sizing
- Remoisturizing
- Coating
- Impregnating
- Calendering
- Laminating



Manufacturers using Mahlo systems supply to the following paper, tissue and board industries:

- Health / Personal Care / Hygiene
- Printing
- Furniture
- Automotive
- Flooring
- Labeling
- Industrial Clothing
- Gasketing

Among the paper, tissue and board products manufactured using Mahlo systems are:

- Facial Tissue
- Paper Toweling
- Fiber Mats
- Kraft
- Book Hardcovers
- Label Backing

Durable and easy to maintain

## 1.1 Durable and easy to maintain

### Built to last



For the entire range of paper, tissue and board products, Mahlo makes a quality control system tailored to your specific application, for your specific measurement and control needs. The production, processing and coating of cellulose, paper, tissue or sanitary paper, cardboard and paperboard requires close tolerances in quality and consistency. Fixed, single-sided and dualsided scanning platforms are available.

The systems measure coatings, basis weight, moisture and thickness plus a myriad of combined calculations on both the wet and dry ends of the machine. Multiple synchronized scanners are available as standard for coating & laminating lines. Automated control integration is possible through our relationships with major process automation suppliers. Sealed, purged and stainless steel scanners and sensors are available.



With intelligent sensor and scanner technologies, quality management systems (QMS) from Mahlo measure continuously with extreme precision and sensitivity. The Windows-based data interface is open and complies with the industry standards for communication. Usability and configurability set standards. The menus and functions are designed intuitively and ensure quick success.



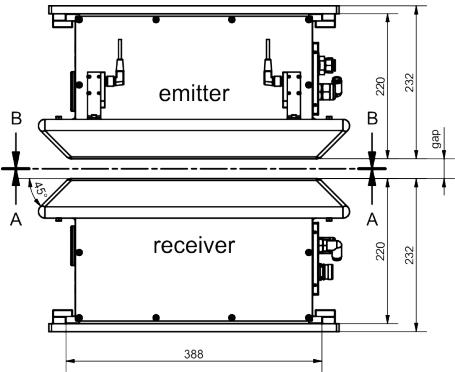
One of the outstanding features is the range of robust, traversing scanners. We know exactly that these scanners traverse reliably 24 hours a day, 365 days a year - for many for many years. The construction of robust industrial machines in German quality workmanship is one of Mahlo's strengths. The company grew out of the manufacture of large systems for the textile and carpet industry and continues this development today.

Whether scanners for single-sided infrared, laser or X-ray sensor applications, whether compact measuring frames for cramped conditions or large WebPro-L measuring frames for applications with broad wide webs and more than five sensors - all Mahlo systems are designed for long, trouble-free and uninterrupted operation. At the same time, they consist of commercially components and are therefore very easy to maintain.



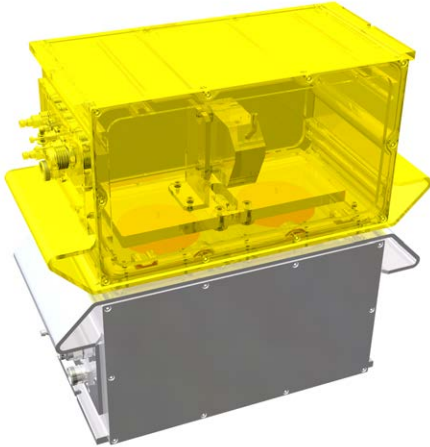
1.2 Sensors & Measurements

Measurements



Basis weight	
	Beta Transmission Sensor, Model DFI
1 – 200 g/m <sup>2</sup>	■ Promethium-147
20 – 1 300 g/m <sup>2</sup>	■ Krypton-85
150 – 6 000 g/m <sup>2</sup>	■ Strontium-90
50 – 20 000 g/m <sup>2</sup>	X-Ray Backscatter Sensor, Model FMX
5 – 1 000 g/m <sup>2</sup>	X-Ray Low Voltage Sensor, Model FMX-T
Thickness / Caliper	
<0,2 - 80 mm	Single-Sided and Dual-Sided Laser Caliper Sensor, Model DML
0,3 – 100 µm	White Light Interference Sensor, Modell WLI

## Scanners



Moisture	
0,1 – 90 %	Infrared Absorption Sensor, Model IMF or Model NIR - depending on application -
2 – 1 500 g/m <sup>2</sup>	Microwave Sensors, Model HMF and AMF
Selective Coatings, e.g. adhesive, lacquer, silicone...	
approx. 0,1 – 200 g/m <sup>2</sup>	Infrared Absorption Sensor, Model IMF or Model NIR - depending on application -

## 1.3 Scanners

### Traversing Platforms



O-Frame Scanners	
Up to 2 meters	WebPro XS
Up to 3 meters	WebPro S
Up to 4.5 meters	WebPro M
Up to 8 meters	WebPro L
Single-Beam Scanners	
Up to 3 meters	UniScan S
Up to 6 meters	UniScan L
C-Frame Scanners	
Up to 2 meters	WebPro C



## Operator stations & Options

### 1.4 Operator stations & Options

#### Operator stations



Stand-Alone	Standard Operator Station
IP Desktop	QMS Visualization IP Desktop
Line Control Station	Integrated into Line Operator Station

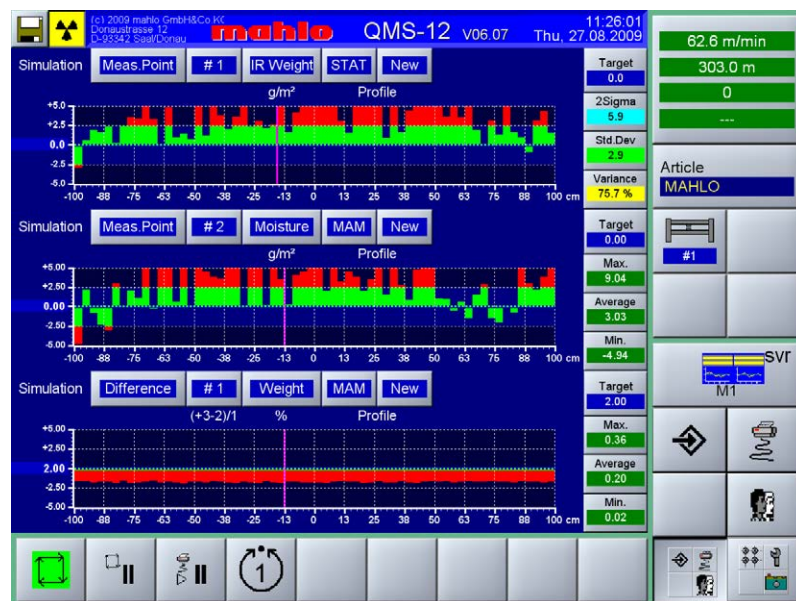
#### Options



Auto-Die-Control

SPC/QC Packages

Hazardous Ambient Applications



Operator stations & Options





## 2 MAHLO AT A GLANCE



Mahlo GmbH + Co. KG is one of the leading manufacturers worldwide of monitoring, control, and automation systems, not only for the textile and related finishing industries, but also for the paper, film and coating divisions. The long-established Bavarian company was founded in 1945 by Dr. Heinz Mahlo and has remained a family business that has maintained its position on the world market to this day. Through a worldwide network of service centers and a high quality standard combined with strong customer relationships, the special requirements of Mahlo's clientele are fully satisfied.



Due to the exorbitantly rising costs of raw materials, energy and water, and the high costs of environmental protection, it is more important than ever to keep an eye on these issues. The products from Mahlo set new standards in terms of quality assurance and process optimization. The goal is to work with the customer to determine the most competitive and cost-effective production solutions. The ultimate purpose of this strategy is to maximize profitability (ROI) by reducing the need for energy, raw materials and personnel while optimizing quality, equipment utilization and work processes.

### Mahlo products and solutions

The portfolio of products and plant-related solutions is comprehensive. For more detailed information, please direct your inquiries to Mahlo. Please call us today at +49-9441-601-0 or visit us at [www.mahlo.com](http://www.mahlo.com).

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## Monitoring and control systems, automation

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