

Knowing paper better!
emco

Since 1992 Partner of Paper Industry
Since 1996 Partner of Printing Industry

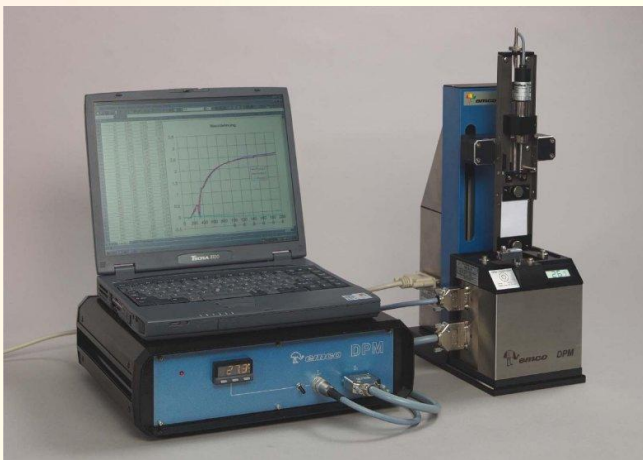
Innovation and Competence
Development, Manufacturing and Sales

emco DPM

Ultrasonic Transmission Measurement Measuring systems and methods for the paper test

An innovative method for studying the composition of paper and other materials, liquids and the dynamics of their interaction

Measuring systems and methods



emco DPM - Dynamic Penetration Measurement

Methods for the process relevant evaluation of paper characteristics for the paper and printing industry:

- dynamics of the behaviour in comparison with water
- dynamics of the capillary absorption
- dynamics of expansion and shrinking
- evaluation of the sizing of a paper

Areas of applications:

- research, development and training
- quality assurance and control
- objective examination of complaints
- evaluation of reference quotations at purchase

Technical data

Measuring frequency:	1 and 2 MHz - standard
Measuring area - circle:	10, 20 and 35 mm
Measuring area - ring:	10-20 mm / 20-35 mm
Measuring range:	0 till -60 dB
Measuring duration:	up to 24 h
Measuring beginning:	approx. 8 ms
Test liquid:	distilled water *)
Power supply:	230 V AC $\pm 10\%$, 50 Hz 110 V AC $\pm 10\%$, 60 Hz
Software:	emco DPM33 and emco DPR Viewer
PC-interface:	serial / RS232

Automatic measuring process with 2 frequencies and up to 4 tasks simultaneous.

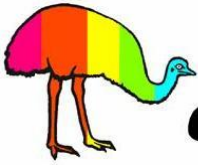
Accessories for special applications:

- heatable measuring cell up to 90 °C
- cell insert for special test liquids
- sample holder for different applications
- special cell insert for coating colours
- measuring of the side (edge) penetration

Extended accessories:

- dynamic expansion module **emco DDPM** for the simultaneous determination of the wet expansion
- **emco DPM** Interpreter - Sizing for the determination of the sizing of a paper

*) standard test liquid, with the cell insert are applicable other liquids, solvents, printing inks, coating colours etc



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technology connects

emco DPM

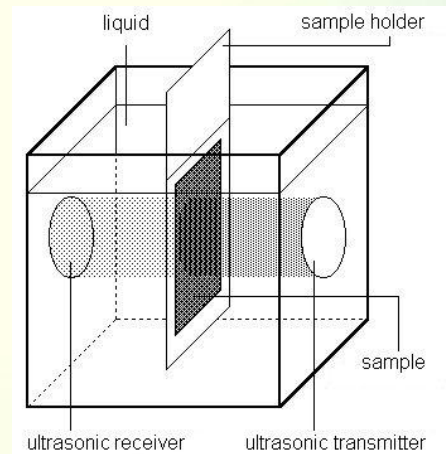
Measuring principle

Ultrasonic – Transmission Measurement: The ultrasonic transmitter and the ultrasonic receiver are arranged so in a measuring cell that the sample to be checked is penetrated of the sound wave on a direct way.

During the measurement at the transmitter an ultrasonic wave is generated with constant frequency and intensity. In the result of the measurement the ultrasonic intensity, which is measured in a millisecond clock, is represented at the receiver as a transmission-time-diagram.

Physical basics: An ultrasonic wave needs for the transmission a medium. During the transmission over this medium this sound wave sustains a constant damping. If the medium is changing, then the sound intensity is also changing.

Technical basics: During the measuring operation the material sample is fixed on a sample holder and contacted with the examining liquid. The dynamics of the interaction between the examining liquid and the test sample characterizes whose fibre absorption and capillary absorption. Sample holders for different applications are available. The properties of the front and the back side of the sample can be measured independently of each other. At the same time the changing of the dimension (dynamic of the wet expansion) can be measured.



Methods – applications

emco DPMprint - for the assessment of the printing process relevant characteristics and its sidedness (front side and back side) of a printing substrate:

- determination of the dynamics of the behaviour in comparison to water, dampener additives and solvents
- assessment of the capillary absorption regarding to colour absorption and colour drying
- determination of the dynamics of expansion and shrinking at changing of climate and moisture

emco DPM Sizing - for the assessment of the sizing degree of a paper and characterization of the surface sizing and internal sizing based on the *emco* DPM - basis curve:

- characterization of the dynamics of the wetting phase of the paper surface
- characterization of the capillary absorption
- characterization of the dynamics of the fibre absorption

Coating papers / coating base papers

- examination of coating base papers, coating papers and various liquids
- examination of water absorption of base papers consisting of coating colour

Decor papers and laminating papers

- examinations at decor papers and laminating papers, impregnating resin absorption and testing

Label papers

- label papers (all preliminary and intermediate stages), analysis of printed labels, verification of embossing, alkaline penetration, detachment with caustic soda lye up to 90 °C.

And further examinations of special papers, felts, cigarette papers, filter papers etc.