

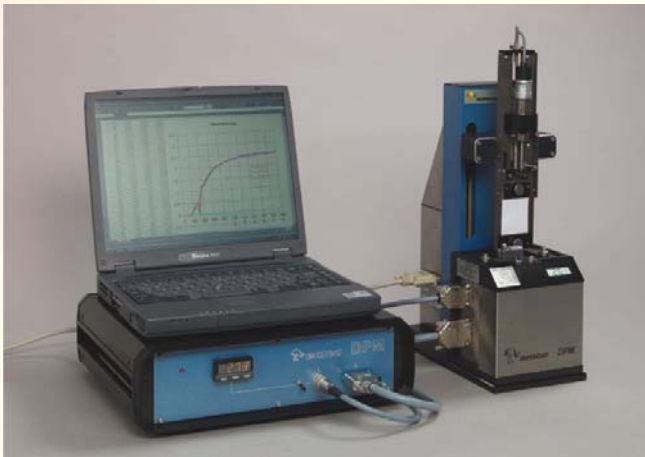
Measuring systems and methods for the paper test



## **emcoDPM** - Ultrasonic Transmission Measurement

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

### Measuring systems and methods



**emcoDPM - 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

**Application areas:**

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

### Technical data

<b>Measuring frequency:</b>	1 and 2 MHz - standard
<b>Measuring area - circle:</b>	10, 20 and 35 mm
<b>Measuring area - ring:</b>	10-20 mm/ 20-35 mm
<b>Measuring range:</b>	absolute in dB
<b>Measuring duration:</b>	unlimited
<b>Measuring beginning:</b>	approx. 8 ms
<b>Test liquid:</b>	distilled water *)
<b>Power supply:</b>	230V AC $\pm 10\%$ , 50Hz 110V AC $\pm 10\%$ , 60Hz
<b>Software:</b>	emcoDPM33 and emcoDPR Viewer
<b>PC-interface:</b>	serial/ RS232

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

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 **emcoDDPM** for the simultaneous determination of the wet expansion
- **emcoDPM** Interpreter - Sizing for the determination of the sizing of a paper

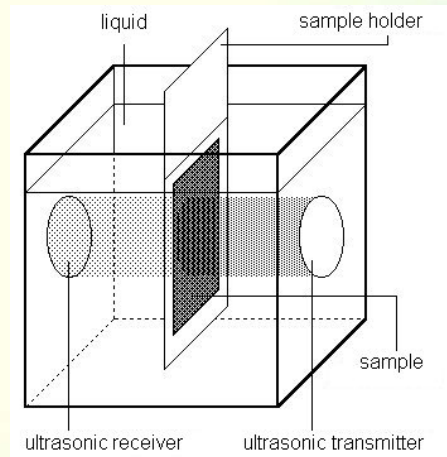
## Measuring principle

**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

**emcoDPMprint** - 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

**emcoDPM Interpreter-Sizing** - for the assessment of the sizing degree of a paper and characterization of the surface sizing and internal sizing based on the *emcoDPM* - 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.