

Product sheet

Mütek™ SZP-10

System Zeta Potential

FEATURES

- Detects the zeta potential of fibers and solid particles
- Plug formation via vacuum and automatic plug discharge
- Measures the streaming potential, conductivity and pH
- Removable touch-screen

BENEFITS

- Easy handling with intuitive user guidance
- Quick and accurate measurement
- No sample preparation
- Light and easily transportable



GENERAL / BACKGROUND

The Mütek™ SZP-10 System Zeta Potential identifies the surface charges of fibers, pigments and other solid materials. Measuring samples before and after chemical contact, it evaluates the performance of e.g. wet strength agents, sizing agents, dispersants or coatings in a manufacturing process. The SZP-10 is a well accepted standard tool for chemical suppliers of the pulp and paper industry, especially because it measures process samples without further sample preparation, as would be necessary, e.g. for electrophoresis.

The device has been successfully employed to assess chemical additives in the papermaking process as well as for evaluating filter aids for beverages, other separation technologies or to control textile finishing.

The Mütek™ SZP-10 System Zeta Potential detects the surface charge of solid materials. The surface charge is the overall charge of a solid particle in an aqueous system. This charge influences the interaction of the sample material with chemical additives

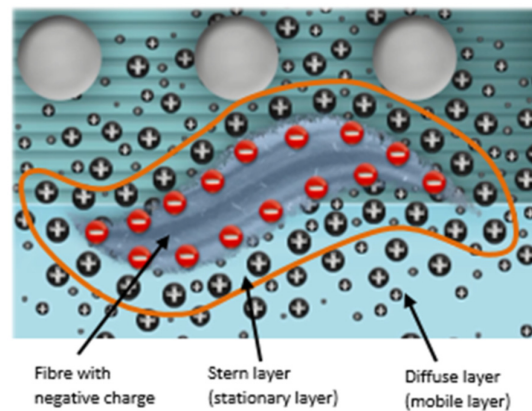


Figure 1: Surface charge of a particle



Use QR-code or link for more information
www.btg.com/mybtg/en/instruments/szp-10

MEASURING PRINCIPLE / MEASUREMENT

Practically all colloids and solid particles carry electric charges when dissolved in water. This leads to a concentration of oppositely charged ions, the so called counterions, at the particle surface. If these counterions are separated from the particle, a streaming potential can be measured. In the Müttek™ SZP-10 solid particles are fixed at a screen while their surrounding counterions are separated by a liquid flow.

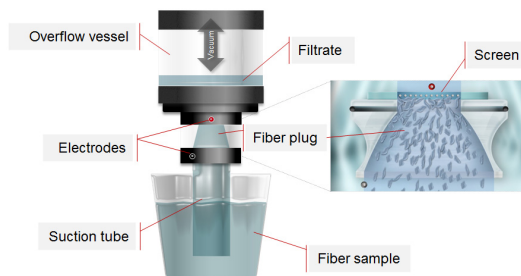


Figure 2: Measuring cell SZP-10 with sample

This principle will not take colloiddally dissolved substances into account as colloids can pass the screen.

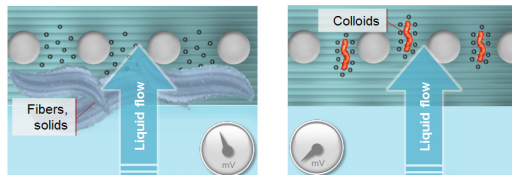


Figure 3: Separation of counterions in the SZP-10 cell

The so induced streaming potential is measured, as well as the conductivity and the vacuum difference.

After several vacuum cycles, the zeta potential is calculated out of these measured values. The measurement sequence ends with blowing-out the fiber plug back into the beaker.

APPLICATION EXAMPLES

The Müttek™ SZP-10 is suitable for a wide range of industrial applications as well as R&D as for example in:

PAPERMAKING

Optimization of fiber active chemicals like sizing agents, optical brighteners, wet strength agents and fillers.

SEPARATION TECHNOLOGY

Characterization of filter aids and filtration materials for waste water treatment, mining applications and selective adsorption of interfering substances in the food and beverage industry or for pharmaceutical applications.

PIGMENTS

Characterization of pigment (e.g. TiO_2) dispersions in view of pH dependency, stability and process ability.

TEXTILE FINISHING

Control of refinement process (finish) of textiles in regard to coatings (water-repellent, heat resistant etc.) and colors.

FIBER TECHNOLOGY

Quality control and optimization of fiber treatments like sizing of glass fibers.

2CHARGE STRATEGY

Combining the Müttek™ PCD with a Müttek™ SZP will allow the user a comprehensive knowledge of the charge reactions taking place in a process. The measurement results of the PCD and the SZP complement each other. Whereas the PCD measures the colloidal dissolved substances, SZP results investigate the used fibers and prove whether or not chemical additives react with the fiber.

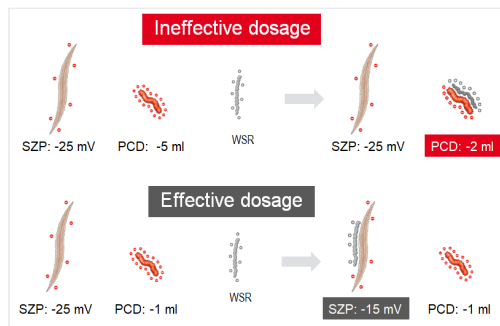


Figure 4: 2Charge Strategy

SAMPLE SPECIFICATION

Generally, a streaming potential can be measured for particles larger than the openings (308 µm or 40 µm) of the used screen. To measure samples containing particles smaller than 40 µm, a suitable filter material has to be inserted.

PULP FIBER MATERIALS

Samples with 4 % solids content can be measured directly. Higher concentrated samples might require dilution with own filtrate. Conductivity should be between 100 µS/cm and 7 mS/cm.

SOLID PARTICLE SUSPENSIONS

Suspensions of 1% up to approx. 50% depending on hydrophilic/ hydrophobic characteristics of the sample material.

PIGMENTS

Pigment slurries of up to 60% can be measured with the special electrodes for pigments.

TEXTILES, FILTER PLATES, FIBER MATS

Cut in small pieces then suspended in water (~1% suspension). Alternatively, a piece of sample material can be punched out and clamped into the measuring cell.

ACCESSORIES

ZETA TEST

Anionic ZETA Test for use as control substance for zeta potential determination.

MEASURING CELL

The measuring cell features built-in gold pin electrodes and a filtrate release valve. Depending on the sample properties it can be equipped with a standard screen or a fine screen. For pigment dispersions a special measuring cell is available.

SCREEN FOR FILTRATING FIBER SUSPENSION

Sample materials with high solids content (> 4 %) should be diluted with their own filtrate. To gain filtrate, the beaker with screen can be pressed into the thick stock.

TRANSPORTATION BOX (OPIONAL)

All Müttek™ lab devices are available with tailor-made carrying cases.

SUPPORT

ANALYTICAL SERVICES

Besides its service to measure customer's sample material, our application lab is dedicated to develop special applications for many different industries. For further information please contact us at instruments@btg.com.

TECHNICAL DATA / SPECIFICATIONS

GENERAL

Dimension W / D / H	380 / 285 / 365 mm [13,5 / 8.2 / 12.6 in]
Weight	8.5 kg [18.7 lb]
Power supply	100–240 VAC/1.5 A / 50–60 Hz
Ambient temperature	15 – 40 °C [50 – 104 °F] No condensation
Storage temperature	5 – 40°C [41 – 104 °F]
Sample temperature	5 – 40°C [41 – 104 °F]
Measuring values	Streaming potential [mV] Conductivity [mS/cm] Pressure difference [mbar] pH (optional)
Results	Zeta potential [mV] pH (optional)
Sample volume	Fiber sample: 500ml Pigment slurry: 200ml
Consistency	0.1% – 4% Fiber sample (depending on the sample properties, higher consistent samples can be measured) Up to 60% pigment slurry

Data Storage	Internal memory with capacity for 100 measurements
Output	Display USB interface
Reproducibility	
Standard deviation SD(x)	0.5 % – 5 % depending on sample
Detection limit	0.05 mV streaming potential

SAFETY & DIRECTIVES

Safety and protection class

Product safety	Protection class I
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EU-directives

Designed in accordance with relevant CE standards.

Quality Assurance

Quality-assured in accordance with ISO 9001.

YOUR LOCAL BTG OFFICE



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