

## Food Powder



# The unbeatable team for metal powder characterization



## PRACTICAL IMPACT

The final product quality depends strongly on the properties of the raw materials as well as the processing parameters. You can measure the cohesion strength with an MCR Evolution rheometer for powder rheology to find out the flowability of the powder. Employing this methodology, you will know whether excess metal powder from past production is still viable or requires the adaption of processing parameters. In this way you can calculate how much new powder you have to add to make the powder usable for high-quality end products.

### MCR powder rheology

Measure **powder flow properties**

#### What does that mean for your process?

Knowing and controlling the powder properties that count is essential for smooth processing at maximum efficiency along with high-quality output. The powder cells from Anton Paar give you the necessary tools to understand your powder during all application stages.

#### Main features

##### MCR Evolution rheometer with a powder flow cell and a powder shear cell

- The highest sensitivity and absolute results in the shortest amount of time
- Easy, safe, and clean sample handling and preparation
- Precise temperature and humidity control
- Modular rheometer concept for fluidized and consolidated powders as well as suspensions and solids (with other MCR accessories)



## PRACTICAL IMPACT

Many powders used in food products can appear with multiple polymorphs (crystal structures) which can affect properties such as the texture, flavor, mouthfeel, and stability of the final food products. If a food powder contains impurities or the desired polymorph is unstable, this can lead to problems during processing or to low-quality products. Characterizing the crystalline phases present in a sample via XRD allows optimization of these properties to ensure the highest quality can be obtained in terms of texture, taste, and stability.

### XRDynamic 500 powder X-ray diffractometer

Measure **crystal structure, phase purity, and particle size**

In-depth understanding of the crystalline phases and crystallite size in food powders is crucial to be able to control the quality, flavor, and texture of final food products. With XRD measurements using XRDynamic 500, you can optimize each step of the process, from raw ingredients all the way to the finished products, to ensure the highest quality.

##### XRDynamic 500

- Right out of the box: Best-in-class resolution / signal-to-noise ratio
- TruBeam™ concept: Larger goniometer radius and evacuated beam path
- Full automation: X-ray optics and beam geometry change
- Self-alignment: Instrument and sample, for maximum convenience

# The unbeatable team for metal powder characterization



## PRACTICAL IMPACT

Laser diffraction is used to characterize the particle size (typically micron size or above) of larger food powders such as flour, coffee, or milk powders. It is an easy, quick, and highly reproducible method for checking the quality and processing behavior. Dynamic light scattering enables the optimization of formulation instructions and nutrient content for smaller particles (typically nanometer size) in emulsions. For example, the fat droplets' size strongly influences the texture, mouthfeel, and flow behavior of milk. Additionally, a suspension's stability is triggered by the zeta potential (determined with electrophoretic light scattering).

### The PSA and Litesizer series

Measure **particle size and zeta potential**

#### What does that mean for your process?

Knowing and controlling the particle size of powders and dispersions is key to understanding the important characteristics – such as stability – of raw materials as well as final food products. The wide size range covered by Anton Paar instruments enables you to investigate these properties for many common food products and to improve, produce, and deliver your food products with consistently high quality.

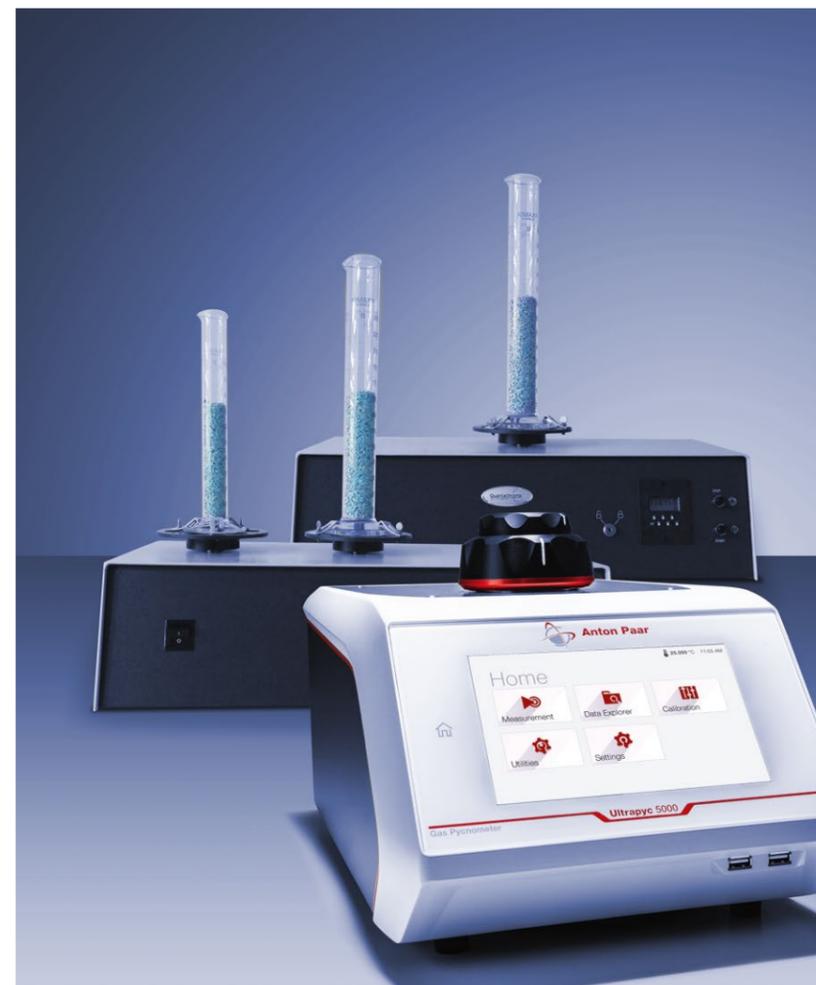
#### Main features

##### PSA series

- Multiple-laser technology for a wide range of particle sizes
- Measures powders in dry form or dispersed in any suitable liquid – both with just one setup
- Accurate and repeatable size distribution of powder particles
- Stability for a lifetime – permanent alignment and no glass elements in dry dispersion

##### Litesizer series

- Accurate and highly reproducible measurements of particle size and zeta potential of food suspensions
- Customized reports, data security, audit trails, and user management functions
- Measurement series shows how particles change with time, temperature, pH, or concentration



## PRACTICAL IMPACT

Food formulation, manufacturing, and packaging processes involving both powder and fragmentary forms require batch-to-batch consistency to ensure excellent expected texture and taste in the final product.

### Autotap and Ultrapyc 5000

Measure **solid density**

The Autotap solid density analyzer provides a definitive measure of compressibility to help inform intelligent packaging decisions such as container size and shape, as well as the amount of food product shipped.

Measuring the true density with the Ultrapyc 5000 indicates textural properties and give confidence that you are delivering food products with the exact mouthfeel customers have come to know and enjoy.

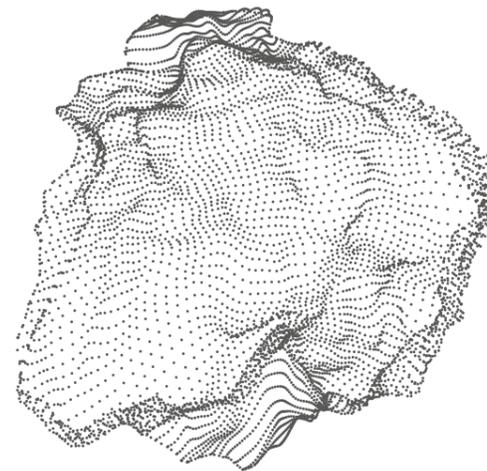
##### Autotap

- Easy to use, incorporating a high degree of automation
- Compliant with most internationally recognized standard methods
- User-selectable, lockable number of taps provides reproducible test method parameters

##### Ultrapyc 5000

- TruPyc technology for accurate results over the widest available sample range
- TruLock lid delivers unmatched repeatability
- Peltier temperature control provides stability of better than  $\pm 0.05$  °C
- PowderProtect mode for safely measuring fine powders

# The portfolio for food powder characterization



- **PARTICLE SIZE**
- **ZETA POTENTIAL**
- **DENSITY CRYSTAL**
- **POWDER FLOW PROPERTIES**
- **CRYSTAL STRUCTURE**
- **PHASE PURITY**

	TECHNOLOGY	MEASUREMENT RANGE
<span style="color: peachpuff;">●</span> <b>MCR POWDER FLOW CELL</b>	MULTIPLE POWDER FLOW MEASUREMENT METHODS RHEOLOGY	5 nm to 5 mm
<span style="color: peachpuff;">●</span> <b>MCR POWDER SHEAR CELL</b>	SHEAR TESTING	
<span style="color: teal;">●</span> <b>PSA 1090</b>	LASER DIFFRACTION	0.1 µm to 500 µm (dry) 0.04 µm to 500 µm (wet)
<span style="color: teal;">●</span> <b>PSA 1190</b>	LASER DIFFRACTION	0.1 µm to 2500 µm (dry) 0.04 µm to 2500 µm (wet)
<span style="color: teal;">●</span> <b>PSA 990</b>	LASER DIFFRACTION	0.3 µm to 500 µm (dry) 0.2 µm to 500 µm (wet)
<span style="color: teal;">●</span> <b>LITESIZER 100</b>	DYNAMIC LIGHT SCATTERING	0.3 nm to 10 µm
<span style="color: teal;">●</span> <span style="color: lightteal;">●</span> <b>LITESIZER 500</b>	DYNAMIC LIGHT SCATTERING (DLS) ELECTROPHORETIC LIGHT SCATTERING (ELS) STATIC LIGHT SCATTERING (SLS)	0.3 nm to 10 µm (DLS) 3.8 nm to 100 µm (ELS)
<span style="color: orange;">●</span> <b>AUTOTAP AND DUAL AUTOTAP</b>	BULK DENSITY	1 cc
<span style="color: orange;">●</span> <b>ULTRAPYC 5000</b>	GAS PYCNOMETRY	1 cc
<span style="color: gold;">●</span> <span style="color: teal;">●</span> <span style="color: blue;">●</span> <b>XRDynamic 500</b>	X-RAY DIFFRACTION (XRD)	Crystallite size 5 nm to 500 nm Phase fractions > 0.1%

PARTICLE SIZE RANGE

VOLUME RANGE

We're confident in the high quality of our instruments. That's why we provide **a full warranty for three years.**

All new instruments\* include repair for three years. You avoid unforeseen costs and can always rely on your instrument. Alongside the warranty, we offer a wide range of additional services and maintenance options.

\*Due to the technology they use, some instruments require maintenance according to a maintenance schedule. Complying with the maintenance schedule is a prerequisite for the three-year warranty.

### Service and support directly from the manufacturer

Our comprehensive service provides you with the best individual coverage for your investment so that maximum uptime is ensured.



#### Safeguarding your investment

Regardless of how intensively you use your instrument, we help you keep your device in good shape and safeguard your investment – including a three-year warranty.



#### The shortest response time

We know that sometimes it's urgent. That's why we provide a response to your inquiry within 24 hours. We give you straightforward help from real people, not from bots.



#### Certified service engineers

The seamless and thorough training of our technical experts is the foundation of our excellent service provision. Training and certification are carried out at our own facilities.



#### Our service is global

Our large service network for customers spans 86 locations with a total of 350 certified service engineers. Wherever you're located, there's always an Anton Paar service engineer nearby.

