FRITSCH

Particle Sizer

IDEAL FOR

- ANALYSIS OF PARTICLE SHAPE AND SIZE
- POWDERS AND BULK SOLIDS – SUSPENSIONS AND EMULSIONS
- PARTICLE SIZES FROM 20 µm – 20 mm I 5 µm – 3 mm
- QUALITY CONTROL
- RESEARCH AND LABORATORY
- FAST ALTERNATIVE TO SIEVE ANALYSIS

DYNAMIC IMAGE ANALYSIS

QUALITY
MADE IN GERMANY

FRITSCH is more than just a brand: It is backed by a strong, medium-sized, family business in its fourth generation, which has been firmly embedded in the region since 1920 and globally active for decades. All FRITSCH-products are produced according to strict quality criteria, and our entire production is in-house. The innovative ideas of our development department are inspired by the close relationship with our customers and their practical work in the lab. Satisfied customers worldwide count on our quality, our experience and our service. This makes us proud and motivates us.

FRITSCH. ONE STEP AHEAD.

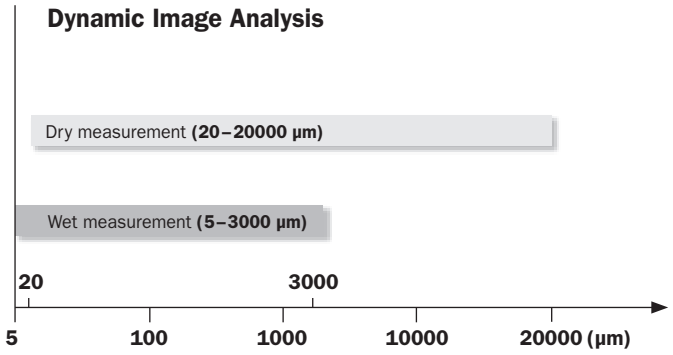
ANALYSETTE 28 ImageSizer

FAST ANALYSIS OF PARTICLE SHAPE AND SIZE

The **FRITSCH ANALYSETTE 28 ImageSizer** for **dry** and **wet measurement** is the ideal Particle Sizer for all applications that require accurate and reproducible measuring results for both particle shape and size. The optical process of Dynamic Image Analysis provides results for a wide measuring range, delivers multiple shape parameters and also offers a very easy and cost-effective alternative to sieving.

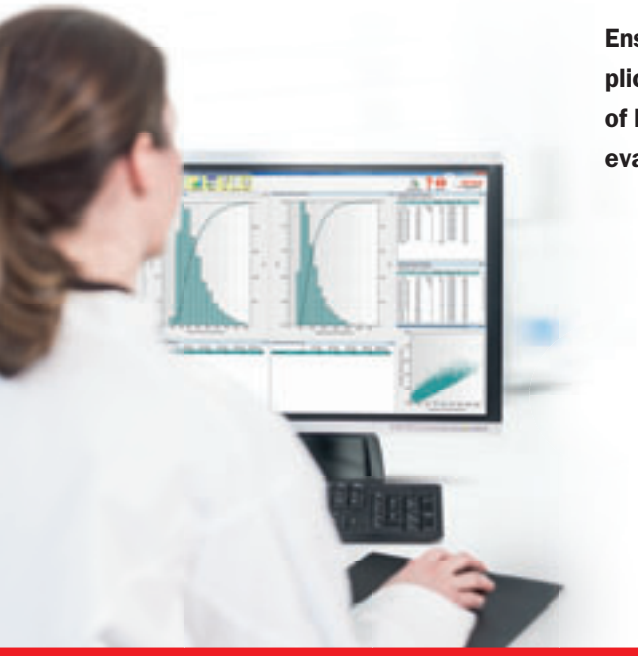
Your advantage: Great flexibility for different measurement tasks – at a perfect price-performance ratio.

- **Extra wide measuring range, individually adjustable**
- **High-performance camera with telecentric lenses**
- **Fast, simple operation via SOP control**
- **High-performance, integrated image analysis software ISS**
- **Extensive library for morphological analysis**
- **Useful tools for reliable quality monitoring**
- **Practical report generator for individual presentation of results**



Ideal for the analysis of: Fertilisers | Refractory products | Glass and ceramics | Carbon products
Catalysts | Plastics | Foodstuffs | Metals and ores | Pharmaceutical products
Carbon black and coal | Salts | Sand | Abrasives | Cements

Absolutely reliable quality control in 3 simple steps



Ensure higher quality, reduced rejects and lower costs: fast, safe and uncomplicated by measuring particle shape and size. With short measuring times of less than 5 minutes and reliable reproducibility thanks to pixel-accurate evaluation. For always consistent results.

1. ADD SAMPLE
2. START MEASUREMENT
3. READ EVALUATION

Open configuration of the measuring process via SOPs

The ANALYSETTE 28 ImageSizer software contains predefined Standard Operating Procedures (SOPs) for typical measurement tasks, making operation especially easy. In the SOP you can set for example the parameters for the feeder, the dispersion and the camera. Own SOPs can also be created according to the measurement requirements and retrieved at any time via an input mask. Your advantage: a completely free configuration of the entire measuring process – for a simple and reliable reproducibility of the measuring process.

Immediately ready to use, due to pre-installed ImageSizing-Software ISS

We make it very easy for you: each ANALYSETTE 28 ImageSizer is delivered with a computer* on which the ImageSizing-Software ISS for the control, recording and evaluation of your measuring results is already installed. Plug it in, start it and off you go!

* without computer hardware for deliveries to CIS countries

Dynamic Image Analysis instead of a microscope

With the principle of Dynamic Image Analysis, the ANALYSETTE 28 ImageSizer offers all benefits of an analysis via microscope, but records due to the fully automatic process with up to 75 images per second a considerably higher number of particles. Instead of just one image, any freely definable number of images can be recorded and evaluated. You can see the result of the analysis directly without any complicated evaluation just like with a microscope. Your advantage: Faster, representative results and higher precision in evaluation.

One-camera-system with 5 megapixels

With only one high-performance industrial camera, the ANALYSETTE 28 ImageSizer covers an extremely wide measuring range and ensures thanks to its 5 megapixels, highest resolution of even smallest particles. Your advantage: In one image, large and small particles can be directly captured, displayed, edited and deleted. And a direct USB connection to the computer ensures the fastest possible data transmission for evaluation of the results.

Heavy-duty for all applications

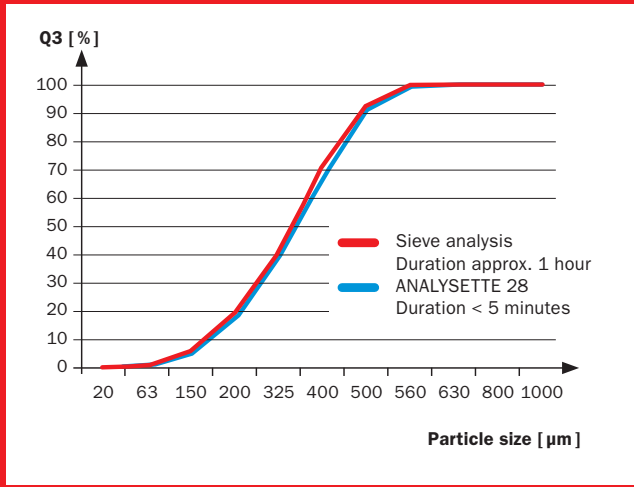
Even the lenses are optimised for industrial utilization: With a simple, heavy-duty design, and hermetically sealed against dust and moisture, a precise opto-mechanical setting and high optical performance are ensured at any time.

Homogeneous illumination

The extra strong LED lighting guarantees a homogeneous illumination of the image field for perfect measurements. The flexibly adjustable exposure time ensures optimal adaptation to the sample and can easily be saved in the SOP.

Fast alternative to sieving

If you conduct many and frequent sieve analyses, the ANALYSETTE 28 ImageSizer is the ideal, time-saving alternative completely without weighing, assembling of a sieve stack and time-consuming cleaning. And with substantially reduced follow-up costs, as there is no need to calibrate or purchase new sieves. And additionally, you receive besides the particle size distribution, also valuable information about the particle shape.



Efficient dry measurement of powders and bulk solids

YOUR ADVANTAGES

- **Extra wide measuring range of 20 µm – 20 mm, individually adjustable**
- **3 telecentric lenses are available**
- **Up to 75 images per second**
- **Agglomerates are preserved**
- **Practical Clean Design of the measuring chamber**
- **Optimal number of particles due to automatic adjustment of the feeder**
- **Easy handling**

The ANALYSETTE 28 ImageSizer is the ideal Particle Sizer for fast analysis of particle shape and size of dry, free-flowing materials.

Via the optical analysis of the particle shape and particle size, you can identify damaged particles, contaminates, agglomerates or oversized and undersized particles accurately and fast and view them completely uncomplicated in single images. The measuring time depending on the sample quantity, is under 5 minutes. And the result is available immediately.

Efficient dry measurement

For measurement, the sample material is filled into the funnel and conveyed to the falling chute via the automatically controlled feeder, which its U-shaped cross section ensures a good material feed. There, the sample falls through the measuring chamber between the camera and LED strobe light into an easy to clean sample collecting vessel. The images recorded continuously during this process offer a variety of evaluation possibilities. And the sample remains undamaged and completely intact throughout the entire analysis process.

Lens with appropriate feeder

Choose for your ANALYSETTE 28 ImageSizer between three telecentric lenses the perfect one according to your specific measurement task. We will be happy to advise you and will automatically supply you with the optimally adapted feeder with funnel. And if your measurement tasks change, all lenses can be retrofitted at any time, and are easily to replace.

MEETS THE REQUIREMENTS OF ISO 13322-2 FOR DYNAMIC IMAGE ANALYSIS!

Simple adjustment of the **funnel height** for optimal adaptation to the sample.

Funnel and feeder of the ANALYSETTE 28 ImageSizer can be removed for cleaning with just a few motions due to its quick-clamping locks.

A rubber seal around the especially smooth moving **colleting vessel** prevents leakage of sample material.

Telecentric lenses for highest shape precision

Thanks to the bi-telecentric lenses, the ANALYSETTE 28 ImageSizer guarantees always the same reproduction scale of each individual particle wherever it is located in the measurement volume. Compared to conventional lenses, there is also a greater depth of field and less image field distortion. Your advantage: a more accurate measurement through a higher magnification consistency.

Clean Design of the measuring chamber

Due to its special geometry, the measuring chamber of the ANALYSETTE 28 ImageSizer is automatically kept clean so air flushing is not necessary. And nevertheless, if soiling should occur, it is fast and easily cleaned.

Variable measuring time

The duration of the measurement can be varied depending on the desired number of images (up to 75 images/sec.) or on the number of measured particles.

Optimal number of particles due to automatic adjustment of the feeder

For exact reproducible measurements, the position of the feeder and the funnel height can be adjusted via a scale and stored as information in a SOP. The ideal feed rate, precisely adapted to the sample, can also be stored in the SOP. The particle concentration is determined and controlled by the software. Your advantage: always the optimal number of particles per image for a reliable and significant analysis.

Our tip: Ask for different coatings of the feeder when using special sample materials.

Typical sample quantity 10–100 g

Easy wet measurement of suspensions and emulsions

YOUR ADVANTAGES

- **Extra wide measuring range 5 µm – 3 mm**
- **3 telecentric lenses available**
- **Powerful, practically maintenance-free and modular wet dispersion system**
- **Variable suspension volume between 150 ml and 500 ml**
- **Many organic solvents can also be used as a standard**
- **Efficient, valveless and automatic rinsing**
- **No dead space in measuring and rinsing circulation system**
- **Separate ultrasonic box with up to 50 Watt output for deagglomeration**
- **Fast and consistent cleaning**

The ANALYSETTE 28 ImageSizer is in combination with the corresponding wet dispersion unit ideal for measurement of particle shape and size of suspensions and emulsions.

Wet dispersion is particularly suitable for fine particles, poorly flowing, fine-agglomerating or sticky materials, which do not react in water or other liquids.

Easy wet measurement

For perfect dispersion the sample material is fed into a closed liquid circulation system and is pumped with high power through the measuring cell between camera and LED strobe light. The continuously obtained images are the basis for the analysis with a variety of evaluation possibilities.

Suitable for many liquids!

All parts in the sample circulation, which come into contact with the dispersion medium are made of high-quality stainless steel 316L, PTFE, POM, FFKM, BK7 glass, ETP-S or silicone and are suitable for use with alcohol and many organic solvents as suspension liquids.

NEW: 3 lenses to select

Choose from 3 different telecentric lenses for wet measurement. By choosing the suitable lens, the measuring range can be optimally adapted to the measuring task. And if your application changes, all lenses can be retrofitted and easily replaced at any time.

Highest resolution

The bi-telecentric lenses of the integrated camera guarantee the highest precision of the image of each individual particle always at the same reproduction scale and thus the highest shape accuracy with the greatest possible depth of field.

Illuminated dispersion bath: makes it incredibly easy to feed the sample materials and to observe the dispersion process

MEETS THE REQUIREMENTS OF ISO 13322-2 FOR DYNAMIC IMAGE ANALYSIS!

For using the **wet dispersion unit**, simply insert the wet measuring cell into the measuring unit.

NEW: Wet dispersion system without dead space

The first fully automatic wet dispersion unit operating completely without valves and moveable seals in the sample circulation system and for emptying the system. That makes it significantly more robust and virtually wear-free. And no difficult to clean dead spaces occur in which soiling can get deposited permanently. A single rinse is sufficient and it is ready to be used again. Without soiling. Without wear.

Separate ultrasonic box

If you frequently measure sample material that tends to agglomerate, you can additionally connect a powerful ultrasonic box to the wet dispersion unit. It enables an even finer adjustment of the wet dispersion to the respective sample material.

Parameter: Water quality

Generally, normal tap water is perfectly adequate for wet dispersion. In rare cases, it may be necessary to use distilled water. Just ask us – we will be happy to advise you.

Perfect wet dispersion

A powerful centrifugal pump with individually adjustable speed ensures optimal transport of even heavy, high-density particles in the wet dispersion unit – enabling fast, uniform distribution of the sample material in the entire circuit. SOP's for easy operation, the completely free programmable dispersion process, the automatic cleaning ensure fast and reproducible measuring results.

Typical sample quantity 0.1–1 g

The FRITSCH Cloud

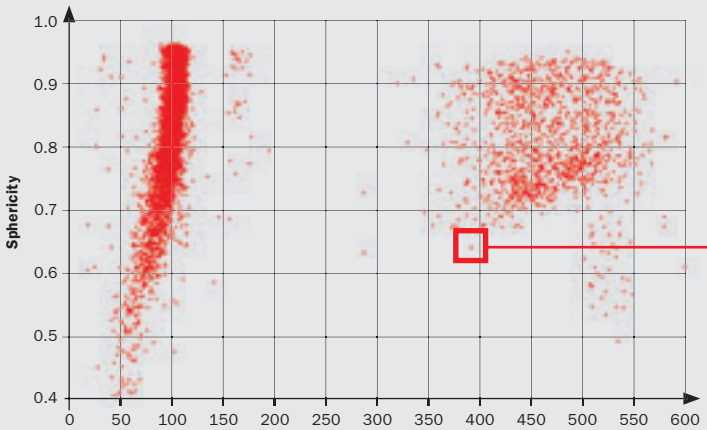
State-of-the-art evaluation with the ImageSizing-Software ISS

For all applications where besides the size also the shape affects the critical properties of a particle system, the ANALYSETTE 28 ImageSizer shows you fast and easily whether, for example, the grains of abrasives have sufficiently sharp edges, whether the particles of a plastic granulate are more spherical or oblong or whether the surface of an absorber is rather smooth or jagged. And because the complex shape of any particle cannot be described with a simple figure, the ImageSizing-Software ISS offers a comprehensive library of morphology parameters.

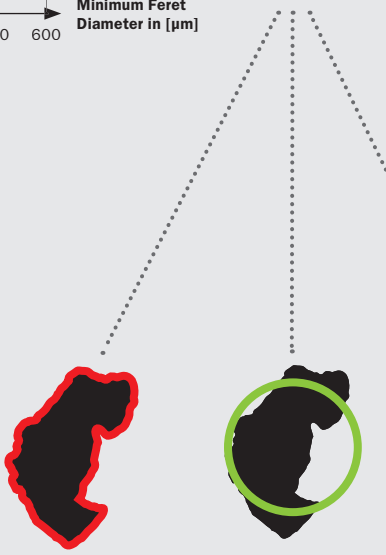
Even the evaluation of the measuring results is uniquely simple with the ANALYSETTE 28 ImageSizer. The evaluation software ISS displays each recorded particle clearly as a data point in the immediately available FRITSCH Cloud as well as in the FRITSCH Gallery. You freely choose which statement is of interest to you: for example the Sphericity in regards to the Minimum Feret Diameter, the aspect ratio, applied on the porosity, or the convexity as a function of the particle Cross Section.

The FRITSCH Cloud:
Each particle can be clicked individually

The state-of-the-art of uncomplicated evaluation: For fast single image viewing, each individual particle can be opened directly with a mouse click from the clearly arranged FRITSCH Cloud. The really important information for you about the morphology will be shown by the position of the data point in the Cloud. Without time-consuming search, you can immediately analyse, evaluate and delete individual selected particles. All available size and shape parameters are automatically displayed.



Each particle is one point in the FRITSCH Cloud: for more than 10,000 particles, the Sphericity is applied against the Minimum Feret Diameter.

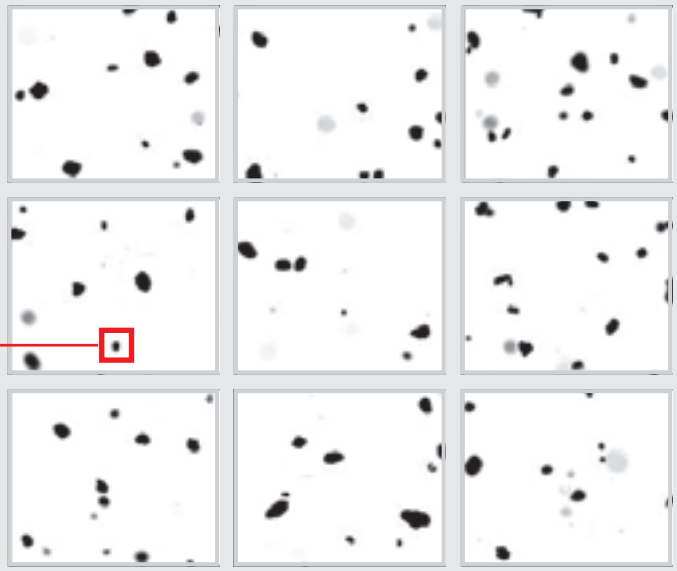


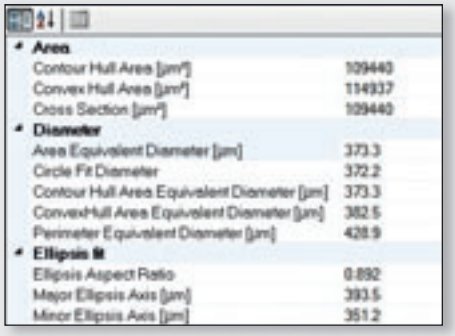
The single image analysis from the Cloud or the Gallery offers the possibility to evaluate each particle according to various shape values, such as for example: Contour (red), Circle (green) or Ellipsis (blue).

FRITSCH Advantage: Freely configurable report generator
For automatically displaying the results clearly arranged on the monitor, either as a Cloud, as a cumulative curve, as a bar chart or in a table form. Or define a layout according to your sieve analysis. The displayed results are printed out as you set it up on the monitor.

FRITSCH Advantage: Several measurements in a chart
Have several measurements displayed simultaneously in a chart and you will immediately see the differences between the respective samples. A direct visual evaluation - brilliantly simple, uniquely flexible.

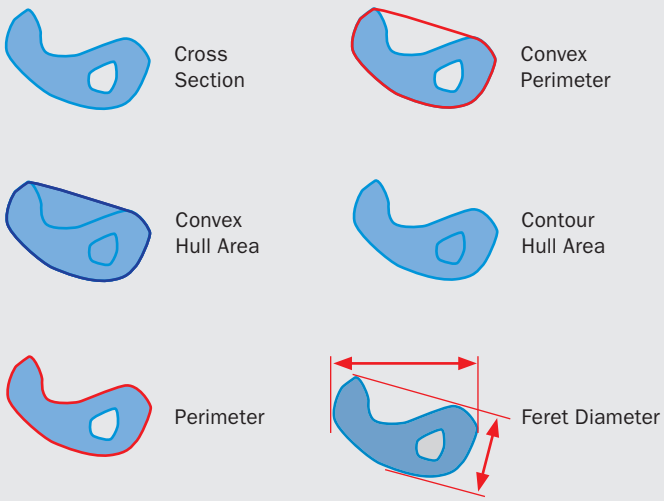
FRITSCH Advantage:
Also use ISS for your microscopic images
Simply load digital images from other imaging systems, e.g. from your microscope, into the evaluation software ISS of the ANALYSETTE 28 and access the full functionality and scope of evaluation options. Your advantage: a high-value image analysis software at no extra cost.





The FRITSCH Gallery:
Everything at a glance
To get a quick overview of the typical particle shape of the analysed sample, view and evaluate all the images in a gallery which is integrated directly into the software for easy use. Individual particle images can be directly selected for single image analysis.

Selection of possible shape parameters



TECHNICAL DATA

ANALYSETTE 28 ImageSizer

	Dry Measurement	Wet Measurement
Measuring range	20 µm – 20 mm	5 µm – 3 mm
Method of analysis	Dynamic Image Analysis	
Type of analysis	Dry measurement of free-flowing powders and bulk solids	Wet measurement of suspensions and emulsions
Measurement values	Particle shape and particle size	
Standard	ISO 13322-2	
Lenses	**3 different, easy to change telecentric lenses** **Enlargement / Measuring range** 1. 0.157x / ~ 90 µm – 20 mm 2. 0.35x / ~ 40 µm – 9 mm 3. 0.735x / ~ 20 µm – 4.5 mm	**3 different, easy to change telecentric lenses** **Enlargement / Measuring range** 1. 0.35x / ~ 20 µm – 3 mm 2. 0.735x / ~ 10 µm – 2 mm 3. 1.333x / ~ 5 µm – 1 mm
Size of the measuring field (FoV) / Depth of field (DoF)	**3 lenses** **FoV / DoF** 1. 53.8 x 45 mm / ~ 27 mm 2. 24.1 x 20.2 mm / ~ 5 mm 3. 11.5 x 9.62 mm / ~ 1.2 mm	**3 lenses** **FoV / DoF** 1. 24.1 x 20.2 mm / ~ 5 mm 2. 11.5 x 9.62 mm / ~ 1.2 mm 3. 6.34 x 5.3 mm / ~ 0.5 mm
Camera	5 megapixel CMOS camera, 2,448 x 2,050 pixel resolution, USB 3.0	
Typical measuring time	< 5 min (depending on the desired measuring statistics)	
Typical sample quantity	10 – 100 g	0.1 – 1 g
Measuring speed	Max. 75 images/s	
Evaluation	Fast image analysis for morphology description and particle size determination	
Software	ImageSizing-Software ISS for controlling, recording and evaluating the measuring results pre-installed on supplied computer, incl. monitor, keyboard and mouse (without computer hardware for deliveries to CIS countries)	
System requirements (for computers supplied by customer)	Standard Windows PC with Intel Core i7 Quad Core processor or better, at least 16 GB main memory, drives: 1 TB SSD, 1 TB HDD, USB 3.0 port, Windows 10 (64 bit), monitor with 1,920 x 1,080 pixel or better, keyboard, mouse	
Dimensions (w x d x h)	90 x 30 x 55 cm	90 x 30 x 55 cm and 29 x 27.2 x 29 cm (wet dispersion unit)
Net weight	36.8 kg	58.8 kg

ORDERING DATA

Order No.	Article

PARTICLE SIZER

ANALYSETTE 28 ImageSizer

28.2000.00 ***Particle Sizer ANALYSETTE 28 ImageSizer***
with USB-interface and ImageSizing-Software ISS already pre-installed on supplied computer, incl. monitor, keyboard, mouse*
for 100–240 V/1~, 50–60 Hz, 60 Watt

For dry measurement please order lenses according to the desired measuring range.
For wet measurement please order wet dispersion unit, lenses according to the desired measuring range and if required ultrasonic box separately.

ACCESSORIES FOR DRY MEASUREMENT OF POWDERS AND BULK SOLIDS

Lenses with holder, feeder and funnel

28.2060.00 Telecentric lens enlargement 0.157x
with feeder 50 mm and sample funnel 2000 ml
(measuring range ~ 90 µm–20 mm, depth of field ~ 27 mm)

28.2061.00 Telecentric lens enlargement 0.35x
with feeder 20 mm and sample funnel 250 ml
(measuring range ~ 40 µm–9 mm, depth of field ~ 5 mm)

28.2062.00 Telecentric lens enlargement 0.735x
with feeder 20 mm and sample funnel 250 ml
(measuring range ~ 20 µm–4.5 mm, depth of field ~ 1.2 mm)

ACCESSORIES FOR WET MEASUREMENT OF SUSPENSIONS AND EMULSIONS

28.2600.00 ***Wet dispersion unit***
incl. flow measuring cell for automatic dispersion,
volume 150–500 ml

22.9270.00 ***Ultrasonic box***
for dispersion with ultrasonic with max. 50 Watt ultrasonic output, variably adjustable
for 200–240 V/1~, 50–60 Hz, 60 Watt

22.9280.00 ***Ultrasonic box***
for dispersion with ultrasonic with max. 50 Watt ultrasonic output, variably adjustable
for 100–120 V/1~, 50–60 Hz, 60 Watt

Lenses with holder

28.2017.00 Telecentric lens enlargement 0.35x
(measuring range ~ 20 µm–3000 µm, depth of field ~ 5 mm)

28.2018.00 Telecentric lens enlargement 0.735x
(measuring range ~ 10 µm–2000 µm, depth of field ~ 1.2 mm)

28.2501.00 Telecentric lens enlargement 1.333x
(measuring range ~ 5 µm–1000 µm, depth of field ~ 0.5 mm)

Spare parts for wet dispersion unit

22.9251.26 Measuring cell glass 4 mm for flow measuring cell

Hoses and seals on request.

ACCESSORIES FOR CALIBRATION AND CERTIFICATION

28.2224.00 Calibration plate with 0.5 mm dots with certificate for telecentric lenses enlargement 0.157x and 0.35x

28.2225.00 Calibration plate with 0.125 mm dots with certificate for telecentric lenses enlargement 0.735x and 1.333x

Certification

96.0090.00 Set of IQ/OQ blank forms (questionnaire format – implementation by customer – standards not included)

* without computer hardware for deliveries to CIS countries

Sample division
For representative sample division, we recommend the Rotary Cone Sample Divider LABORETTE 27 – the foundation for any precise analysis.
More information is available at **www.fritsch-international.com/l-27**.

Maintenance and Recalibration of your Particle Sizer on request.

Colour ink jet printer and laser printer on request.

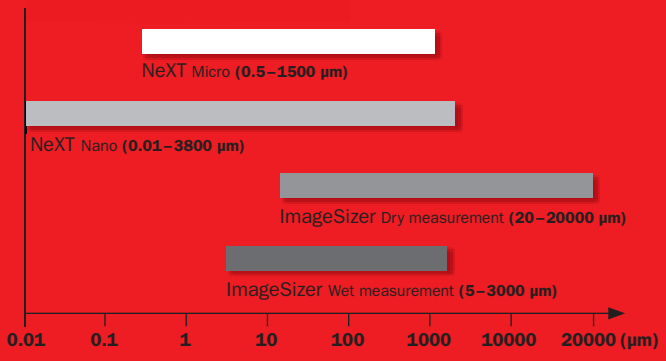
BENEFIT FROM OUR EXPERIENCE!

Choose FRITSCH Particle Sizers to take advantage of the technical superiority resulting from over 35 years of practical experience in the field of high-tech particle technology. Our expert Mr. Maik Paluga is available to assist you in all questions regarding particle sizing. He will be happy to inform you about the applications of Dynamic Image Analysis for your specific task and advise you about defining SOPs. Just a phone call away!

+49 6784 70-188 · paluga@fritsch.de
www.fritsch-international.com/particle-sizing

ANALYSETTE 22 NeXT
Micro – Nano
Static Light Scattering

ANALYSETTE 28
ImageSizer
Dynamic Image Analysis



Showing you how it's done!

Our application laboratory will be more than glad to help you find the perfect Particle Sizer for your specific task. If desired, within the scope of a product recommendation, we will conduct a particle analysis of your material. Simply request at **www.fritsch-international.com/service/sample-analysis**. The result will convince you.

Fritsch GmbH
Milling and Sizing
Industriestrasse 8
55743 Idar-Oberstein
Germany
Phone +49 6784 70-0
info@fritsch.de
www.fritsch.de

Concept and design: Zink und Kraemer AG, Trier · Cologne, www.zuk.de

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