

Particle Sizer



IDEAL FOR

- ANALYSIS OF PARTICLE SHAPE AND SIZE
- POWDERS AND BULK SOLIDS
- PARTICLE SIZES FROM 20 μm TO 20 mm
- QUALITY CONTROL
- RESEARCH AND LABORATORY
- FAST ALTERNATIVE TO SIEVE ANALYSIS

DYNAMIC IMAGE ANALYSIS

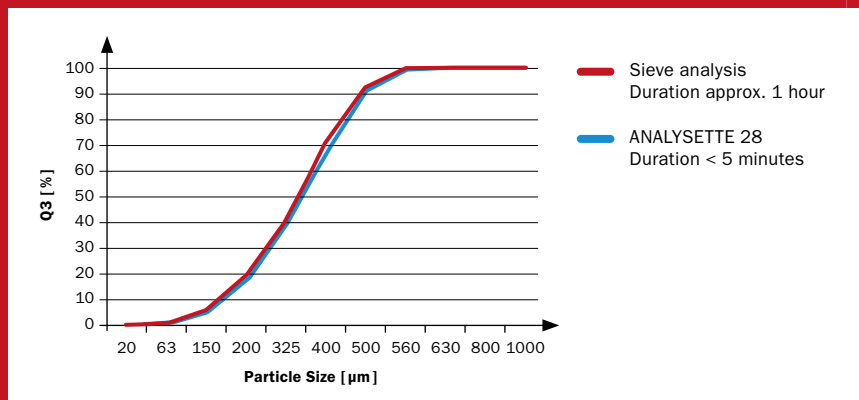
New possibilities with Dynamic Image Analysis

The FRITSCH ANALYSETTE 28 ImageSizer is ideal for all applications where reliable statements on particle shape are beneficial. At the same time, it offers a cost-effective alternative to sieving due to fast and efficient particle size measurement. The optical process of the Dynamic Image Analysis provides direct visual analysis results in the easiest way possible with a considerably expanded measuring range of up to 20 mm. This gives you the greatest possible flexibility in a wide range of measuring tasks – at a perfect price-performance ratio.

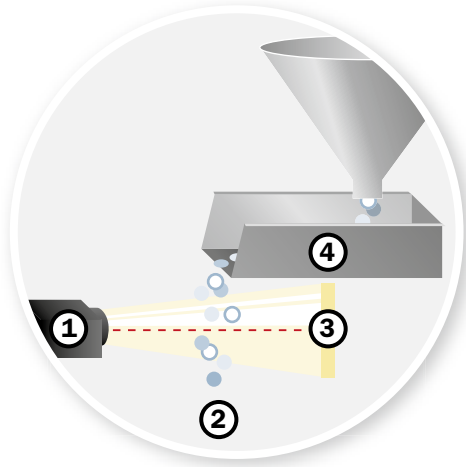
Discover the possibilities!

Fast alternative to sieving

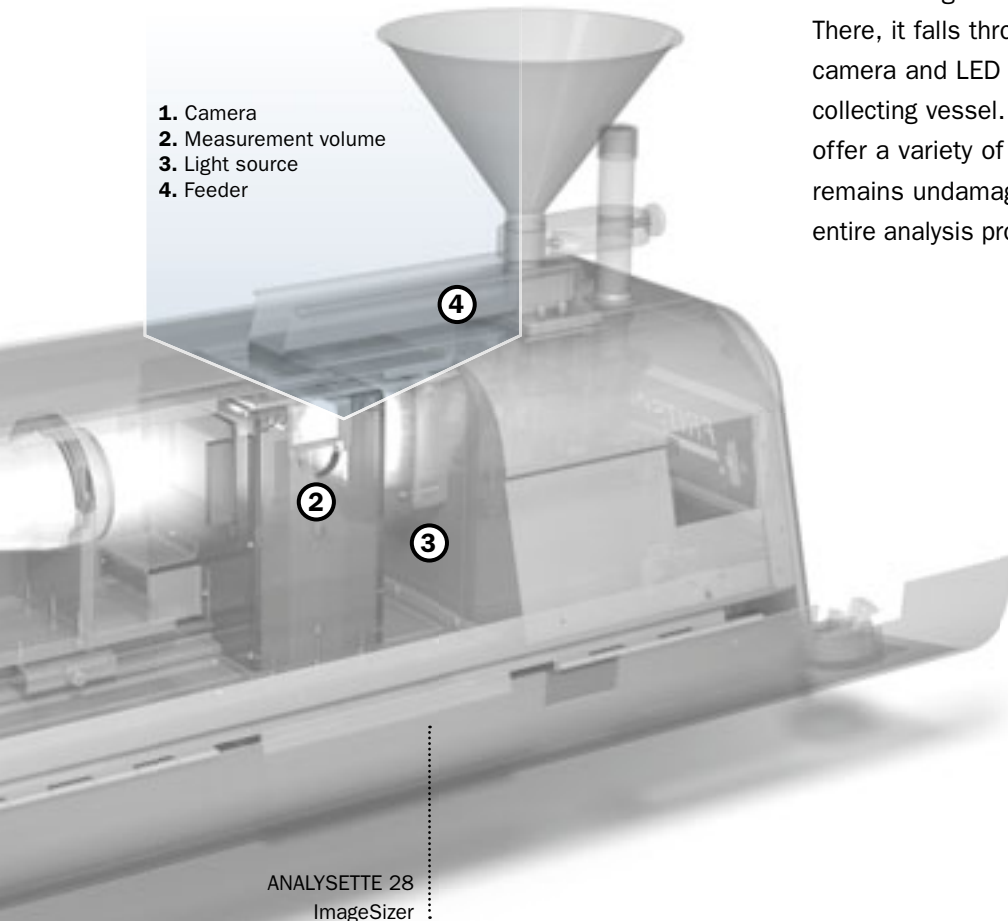
If you perform many and frequent sieve analyses, the ANALYSETTE 28 ImageSizer is the ideal, time-saving alternative in just three steps: Add the sample, start the measurement, read the result. Without a preparatory and concluding weighing, assembling the sieve stack and time-consuming cleaning. And with substantially reduced follow-up costs, as there is no need to calibrate or purchase new sieves. Additionally, you receive besides the equivalent results about the particle size distribution, also valuable statements about the particle shape. And the presentation of the sieving results conform to standards, is directly included in the FRITSCH evaluation software ISS.



YOUR ADVANTAGE: DYNAMIC IMAGE ANALYSIS



1. Camera
2. Measurement volume
3. Light source
4. Feeder

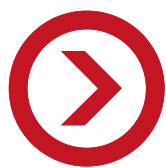


ANALYSETTE 28
ImageSizer

The Dynamic Image Analysis offers the same benefits as an analysis via microscope, but delivers an average of up to 30 images per second due to the fully automatic process. As with a microscope, you can see the result of the analysis directly without any complicated evaluation. The special advantage: instead of just one image, any freely definable number of images can be recorded and evaluated. For faster representative results and higher precision in evaluation. And this for a particle size of 20 μm to 20 mm.

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

🎯 **Ideal for the analysis of:** Fertilisers | Refractory products | Glass and ceramics | Carbon products | Catalysts
Plastics | Foodstuffs | Metal powders | Pharmaceutical products
Carbon black and coal | Salts and sand



ANALYSETTE 28 ImageSizer

FAST ANALYSIS OF PARTICLE SHAPE AND SIZE

- Extra-wide measuring range of 20 µm – 20 mm, individually adjustable
- High-performance camera with telecentric lenses
- Extensive library for morphological analysis
- Practical tools for reliable quality monitoring
- Fast, simple operation via SOP control
- Practical report generator for individual presentation of results

The new ANALYSETTE 28 ImageSizer is the ideal instrument for uncomplicated quality control of dry, free-flowing materials. Via the optical analysis of the particle shape and particle size, damaged particles, contaminates, agglomerates and oversized or undersized particles are identified accurately and fast, and can also be viewed as single images. The measuring time depending on the sample quantity, is under 5 minutes. And the result is available immediately. Your advantage: higher quality, reduced rejects and lower costs.



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



Brilliantly simple to operate for absolutely reliable quality control in three steps: Fast, safe, easy.

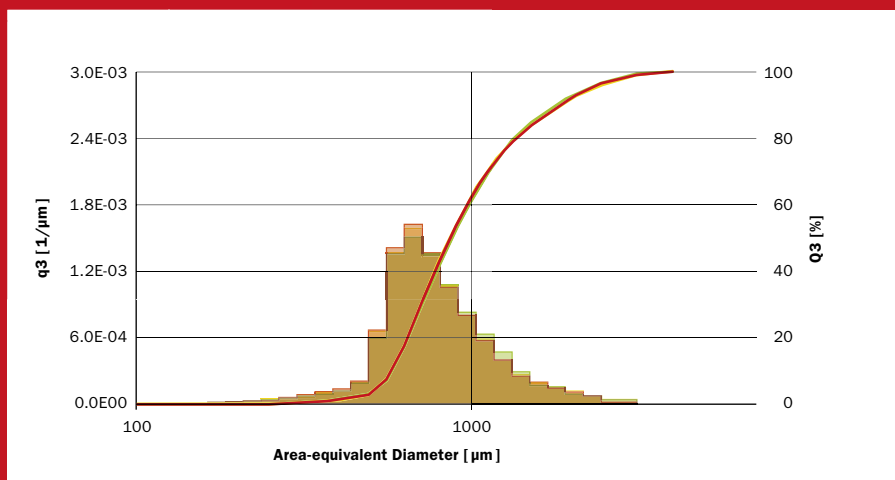
Short measuring times below 5 minutes – a great advantage, particularly compared to sieving.

5 megapixels for a large measuring range

Due to the particularly large field of view, large and small particles are captured in one image, therefore covering a larger particle range.

Integrated image analysis software ISS

with a comprehensive library of parameters for morphology description and the unique FRITSCH Cloud. Your advantage: particularly easy and flexible evaluation of measuring results.



Consistent reproducibility thanks to pixel-precise evaluation for consistent results during quality control without any influence from wear or other external factors – a clear advantage compared to sieving.



Strong lenses – simple operation

With 5 megapixel camera and practical functions



Heavy-duty for industrial applications

The core of the ANALYSETTE 28 ImageSizer is one of the highest-performance industrial cameras. Its 5 megapixels enable highest resolution, even with smallest particles. The lenses are optimised for industrial use: 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. And a direct Ethernet connection to the computer provides the fastest possible data transmission for evaluation of the results.

Always the right lens

The ANALYSETTE 28 ImageSizer is equipped as standard with a telecentric lens for the measuring range 150 μm – 20 mm. Depending on the application, you can additionally or alternatively choose between three further telecentric lenses. They can all be retrofitted at any time, and are easy to replace.

The highest possible shape precision due to telecentrics

Thanks to the bi-telecentric lenses of the integrated camera, the ANALYSETTE 28 guarantees completely distortion-free images of each individual particle at the same reproduction scale – wherever it is located in the measurement volume. Your advantage: a higher enlargement consistency and a more uniform CCD chip illumination. The specially selected aperture ensures the greatest possible depth of field, without affecting the resolution due to the diffraction limit.

Extra-strong illumination

Due to a strobe LED array for perfect measurements, even with a smaller aperture. The flashing frequency is freely selectable between 0.08 μs and 100 μs , allowing optimal adaptation to each sample, and can easily be saved in the SOPs.



Optimal sample feeding via feeder

The U-shaped cross section of the feeder ensures good material feed. The included sample guiding plates guarantee that the sample material even at a rapid feed rate falls into the falling chute at exactly the best possible lens focus range. Ask for different coatings of the feeder when using special sample materials.

Optimal number of particles due to AutoCheck

The AutoCheck function displays the particle concentration and therefore the ideal feed rate of the feeder. This can then be easily set and saved in the SOPs. Your advantage: always the optimum number of particles per image for a reliable and significant analysis.

Variable measuring time

The duration of the measurement can be varied depending on the desired number of images or number of measured particles.

Clean Design of the measuring chamber

Due to its special geometry, the measuring chamber is automatically kept clean that air flushing is not necessary. And nevertheless, if soiling should occur, it is fast and easy to clean.



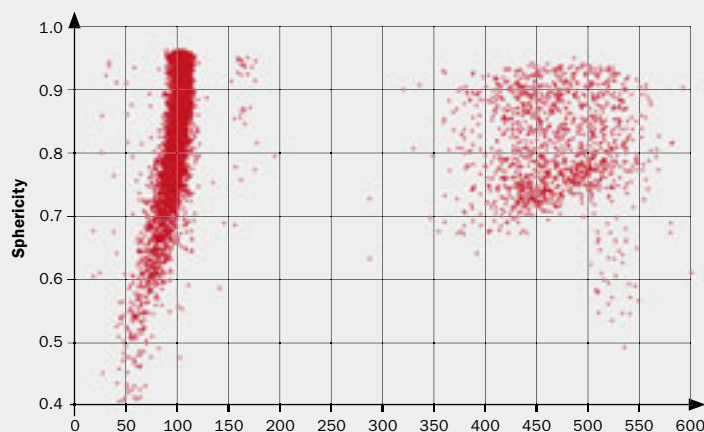
The FRITSCH Cloud

Easy evaluation with ImageSizing-Software ISS

For all applications where besides the size also the shape affects the critical properties of a particle system, the ANALYSETTE 28 provides reliable statements and new findings. It 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 of the ANALYSETTE 28 offers a comprehensive library of morphology parameters for you to choose from.

THE FRITSCH CLOUD: MORPHOLOGY AT A GLANCE

Even the evaluation of the measuring results is uniquely simple with the ANALYSETTE 28. The evaluation software ISS displays each recorded particle clearly as a data point in the FRITSCH Cloud. Its position in this Cloud shows the really important information for you about the morphology. You freely choose which statement is of interest to you: 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. Especially convenient: 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.



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

Minimum Feret Diameter in [µm]

Selection of possible shape parameters



Cross Section



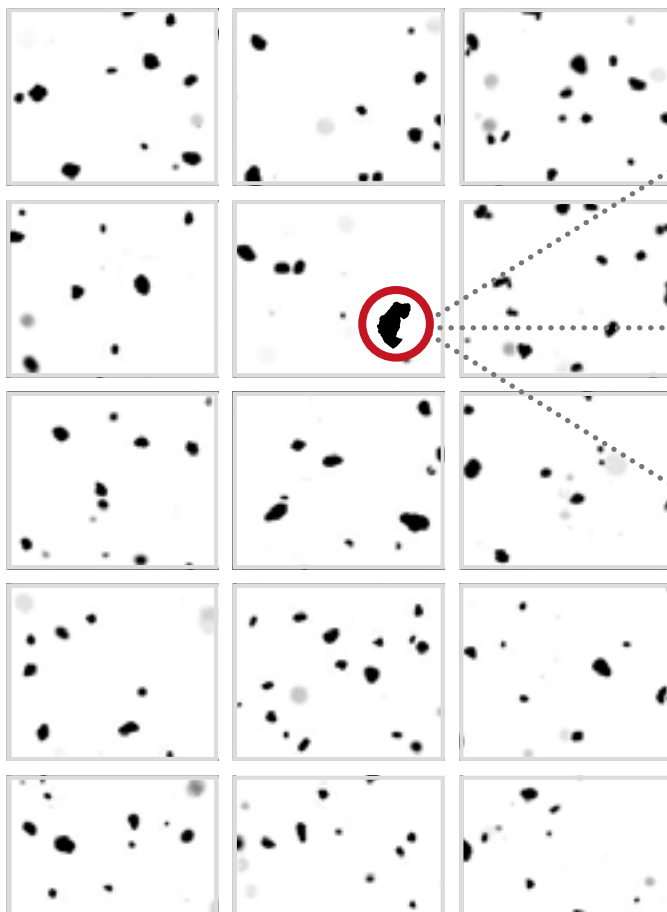
Convex Hull Area



Perimeter



Convex Perimeter



Single image analyses from the image gallery

Area	
Contour Hull Area [µm²]	109440
Convex Hull Area [µm²]	134937
Cross Section [µm²]	109440
Diameter	
Area Equivalent Diameter [µm]	373.3
Circle Fit Diameter	373.2
Contour Hull Area Equivalent Diameter [µm]	373.3
Convex Hull Area Equivalent Diameter [µm]	382.5
Perimeter Equivalent Diameter [µm]	428.9
Ellipse fit	
Ellipse Aspect Ratio	0.892
Major Ellipse Axis [µm]	383.5
Minor Ellipse Axis [µm]	351.2
Ferret diameter	
Aspect Ratio	0.894
Maximum Ferret Diameter [µm]	475.4
Minimum Ferret Diameter [µm]	354.6
Image	
Focus Filtermeter	0.783
Morphology	
Circularity	0.892
Convexity	0.911
Solidity	0.952
Perimeter	
Convex Perimeter [µm]	1228.1
Perimeter [µm]	1347.5

Area Equivalent Diameter [µm]	
Contour	True Fit
Enabled	True
Color	Red
Rectangle	False
ConvexHull	True
Enabled	True
Color	Blue
Ellipse fit	False
Enabled	False
Color	Blue

Name	Value
Image Width (Pixel)	1224
Image Height (Pixel)	1025
Pixel Size	2.5002 µm
Total Particles	1
Valid Particles	1
ID	344

Practical single image analysis

The images of all particles can be saved if necessary and viewed directly in the evaluation software ISS. To do this, simply open the gallery with all images in order to have a quick overview of the typical particle shape of the analysed sample. Or select a certain data point in the FRITSCH Cloud with a simple mouse click to see the corresponding image. All available size and shape parameters are automatically displayed for each selected particle.

FRITSCH-Plus:

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.

FRITSCH-Plus: Freely configurable report generator

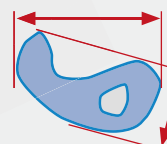
For automatically displaying the results clearly arranged on the monitor, either as a Cloud, as a cumulative curve, as a bar chart or in a table form. Or simply use the pre-defined layout according to the stipulations of the sieve analysis. The displayed results are printed out as you set it up on the monitor.



Circle Fit Diameter



Contour Hull Area



Feret Diameter

TECHNICAL DATA

ANALYSETTE 28 ImageSizer

	ANALYSETTE 28 ImageSizer
Measuring range	20 µm–20 mm
Method of analysis	Dynamic Image Analysis
Standards	ISO 13322-2
Type of analysis	Dry measurement of free-flowing powders and bulk solids
Measurement values	Particle shape and particle size
Lenses	<p>4 different, easy-to-change telecentric lenses</p> <p>Measuring ranges:</p> <ol style="list-style-type: none"> 1. 150 µm–20 mm (included) 2. 52 µm–6.7 mm (optional) 3. 28 µm–3.5 mm (optional) 4. 20 µm–2.7 mm (optional)
Size of the measuring field (FoV) / resolution at 5 megapixels	<p>4 lenses:</p> <ol style="list-style-type: none"> 1. 45.90 x 38.44 mm / 18.75 µm / pixel 2. 16.00 x 13.39 mm / 6.53 µm / pixel 3. 8.45 x 7.07 mm / 3.45 µm / pixel 4. 6.35 x 5.32 mm / 2.59 µm / pixel
Camera	2/3", 5 megapixel CCD (b/w) camera interline progressive scan, Gigabit Ethernet
Typical measuring time	< 5 min (depending on the desired measuring statistics)
Typical sample quantity	10–100 g
Measuring speed	Max. 15 image/s at 5 mil. pixels Max. 30 image/s at 1.2 mil. pixels
Evaluation	Fast image analysis for morphology description and particle size determination
Required computers	<p>Minimum hardware requirements</p> <ul style="list-style-type: none"> · Intel Core i7 Quad Core processor or equivalent · 8 GB system memory · Primary drive: 256 GB SSD · Secondary drive: 1 TB HDD · NVIDIA graphics card · USB port · 22" monitor with 1920 x 1080 pixels or better · Additional network interface card supporting JumboFrames for connection of the GigE camera (e.g. Intel Pro/1000 GT) <p>Minimum software requirements</p> <ul style="list-style-type: none"> · Windows 7 or higher (64 bit) · Adobe PDF reader
Dimensions (w x d x h)	90 x 30 x 50 cm
Net weight	43.8 kg

ORDERING DATA

Order No. Article

PARTICLE SIZER ANALYSETTE 28 ImageSizer

ANALYSETTE 28 ImageSizer



28.2000.00 **Particle Sizer ANALYSETTE 28 ImageSizer**
for fast analysis of particle shape and size of powders and bulk solids
incl. telecentric lens for measuring range 150 µm–20 mm,
software ISS and USB-interface
for 100–120/200–240 V/1~, 50–60 Hz, 60 watt

Lenses with holder

28.2012.00 Telecentric lens – measuring range 52 µm–6.7 mm
28.2013.00 Telecentric lens – measuring range 28 µm–3.5 mm
28.2014.00 Telecentric lens – measuring range 20 µm–2.7 mm

Accessories

83.5641.00 Computer incl. monitor for ANALYSETTE 28
with English keyboard and Windows
83.5640.00 Computer incl. monitor for ANALYSETTE 28
with German keyboard and Windows

Sample division

For representative sample division, we recommend the Rotary Cone Sample Divider LABORETTE 27 – the foundation of any precise analysis.
More information is available at www.fritsch.de.

The software ISS is included in the scope of delivery of the ANALYSETTE 28.

Maintenance and recalibration of your Particle Sizers on request.

Computers, colour ink jet printer and laser printer on request.

BENEFIT FROM OUR EXPERIENCE!

Choose FRITSCHE Particle Sizers to take advantage of the technical superiority resulting from more than 30 years of practical experience in the field of high-tech particle technology.

ANALYSETTE 22

MicroTec plus and NanoTec plus

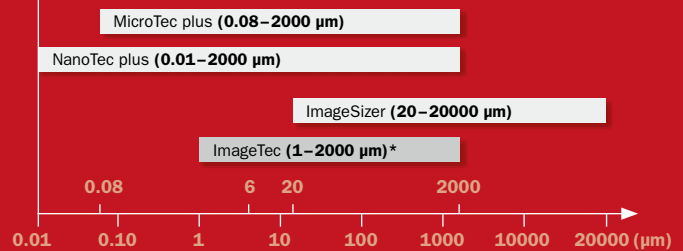
⊙ Static Light Scattering



ANALYSETTE 28

ImageSizer and ImageTec*

⊙ Dynamic Image Analysis



* in the final test phase

ANALYSETTE 28 ImageTec*

The ideal instrument for brilliantly simple wet measurement for fast, uncomplicated and reliable quality control.

- Fast analysis of particle shape and size in suspensions and emulsions
- Measuring range 1 µm–2 mm
- Powerful centrifugal pump
- Particularly easy operation

We will be happy to advise you

Our expert Dr. Günther Crolly will be happy to assist you in all questions regarding FRITSCHE particle sizing.

Or send us your sample for a free-of-charge and non-binding sample analysis – in three easy steps at

www.fritsch-sizing.com/service.

You'll be convinced by the result.

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