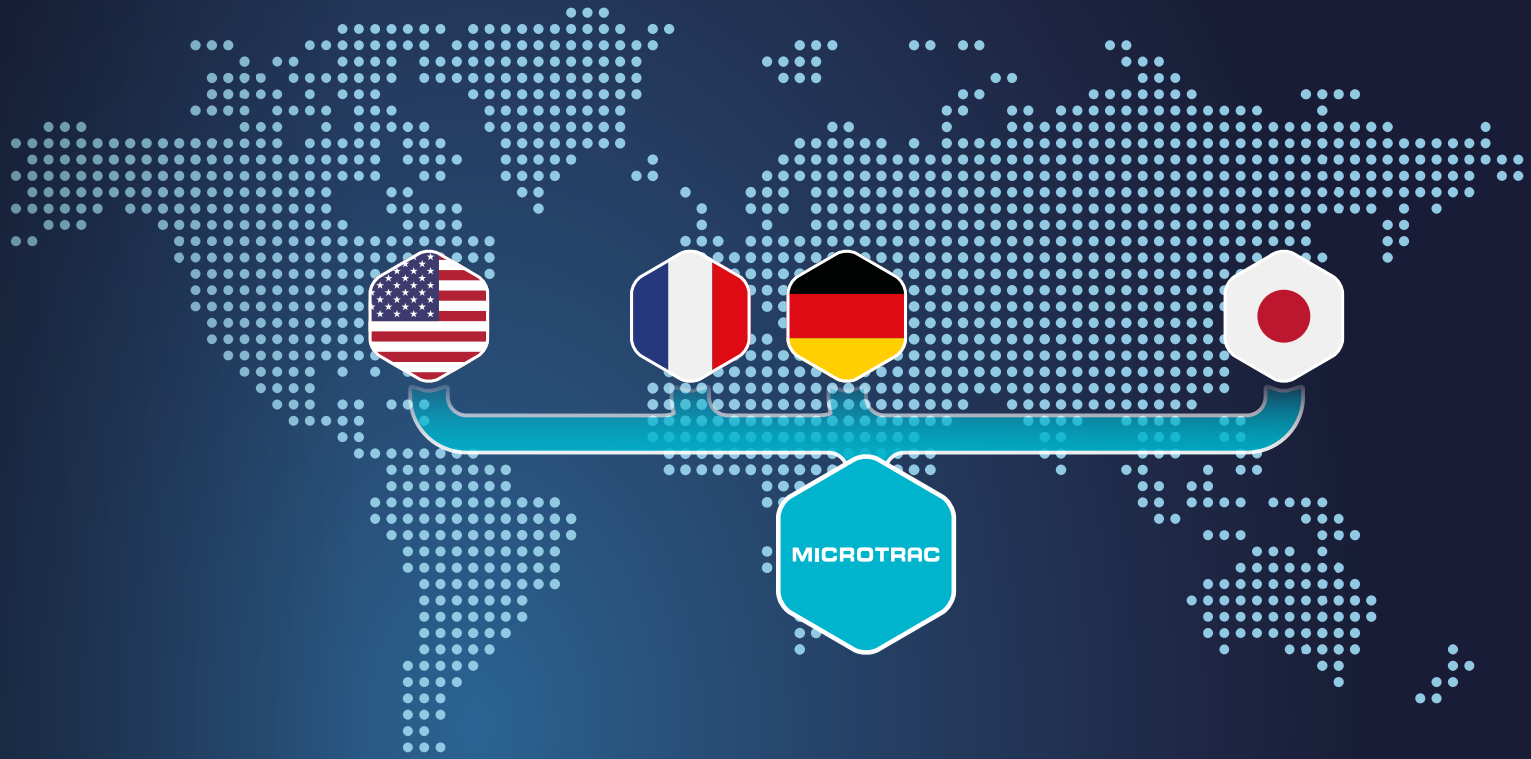
MICROTRAC
PARTICLE CHARACTERIZATION

CAMSIZER ONLINE

ONLINE 3D DYNAMIC IMAGE ANALYZER

PROCESS OPTIMIZATION THROUGH ONLINE DYNAMIC IMAGE ANALYSIS

part of VERDER scientific



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PARTICLE CHARACTERIZATION AT ITS BEST

Microtrac is your preferred partner for the comprehensive characterization of particulate systems. We provide our customers with advanced technologies to obtain consistently reliable results. Innovation and quality are at the core of everything we do.

As part of Verder Scientific, we provide worldwide support through a network of subsidiaries and distributors.

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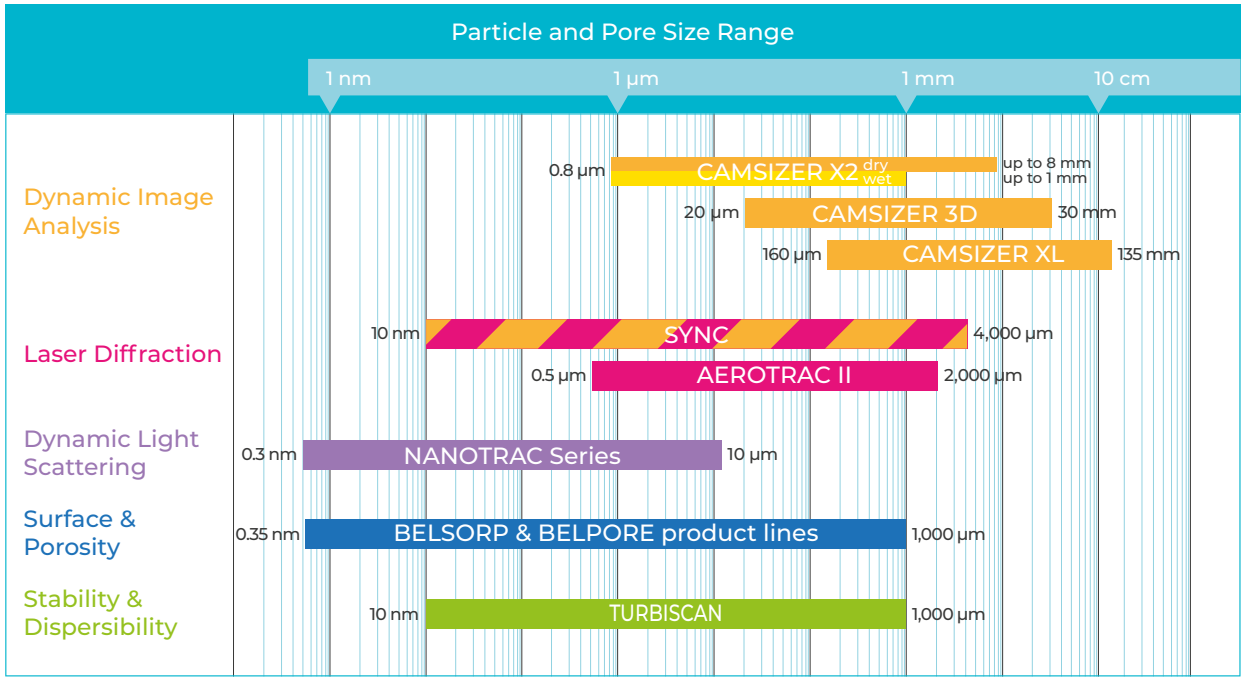
THREE PILLARS OF EXCELLENCE



GAS ADSORPTION MEASUREMENT

The BELSORP and BELPORE analyzers are used for the determination of gas and vapor adsorption amounts, as well as BET surface area and pore size distribution. The measuring instruments use gas adsorption technology to analyze both porous and non-porous powder materials.

These products are used all over the world in Research and Development, Quality Control, and Quality Assurance. The competence centers for these product lines are located in Osaka (Japan) and Haan (Germany).

PARTICLE SIZE & SHAPE ANALYSIS

Dynamic Image Analysis (DIA) and Laser Diffraction (LD) technologies are used in our optical particle analyzers for the physical characterization of particles. Microtrac is the only worldwide supplier of dynamic image analysis, static image analysis, laser diffraction, and sieve analysis equipment.

DIA is used to determine size distributions and shape parameters quickly with excellent accuracy and reproducibility over a wide measuring range. Microtrac's renowned CAMSIZER system was introduced over 20 years ago and has pushed technological innovation ever since. These instruments are developed and built in our production site in Haan, Germany.

In 2024, Microtrac celebrates 50 years of Laser Diffraction as a global leader. We are pioneers in this field, with our SYNC range. By continuously improving the instrument technology, we offer customers a robust portfolio of laser diffraction instruments that are ideal for particle sizing and characterization. The development and production site for this product line is located in Pennsylvania, USA.

STABILITY & DISPERSIBILITY ANALYSIS

Our Stability Analyzers use Dynamic Light Scattering (DLS) to measure particle size, and Static Multiple Light Scattering (SMLS) and Zeta Potential (ZP) to measure the stability and dispersibility of all your formulas. The latest addition to the Microtrac portfolio is the TURBISCAN range.

With TURBISCAN, Microtrac offers the world leading technology for Shelf-Life and Dispersibility analysis of liquid dispersions and formulations. The TURBISCAN range is developed and built in our factory in Toulouse, France.

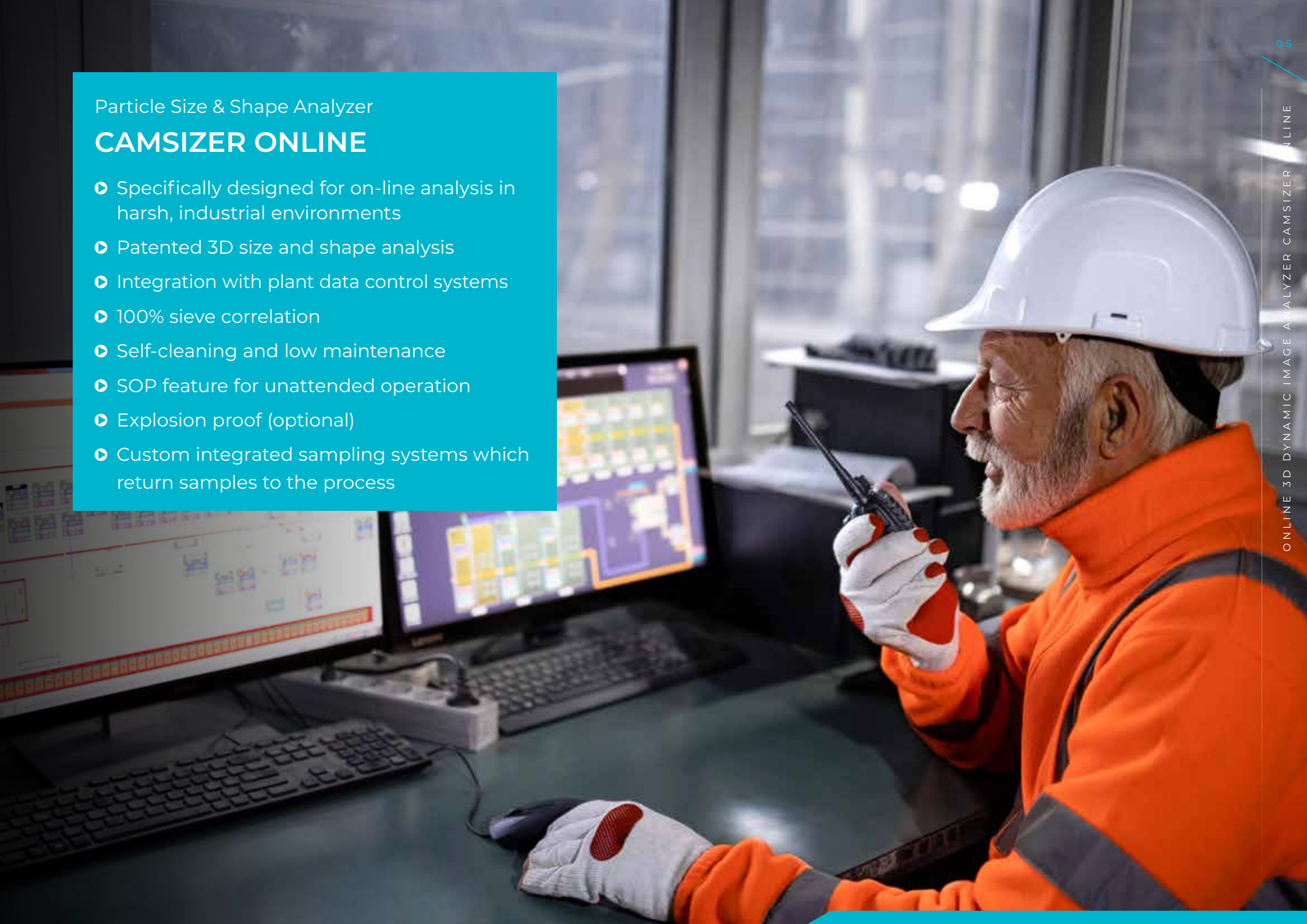
A NEW DIMENSION IN PARTICLE ANALYSIS

CAMSIZER ONLINE

The CAMSIZER ONLINE takes the proven capabilities and advantages of Microtrac's CAMSIZER technology into the process environment. Dynamic Imaging characterizes materials in motion by digitizing photographic images of the material and storing them in an image file. Calculations of material size and morphology are used to optimize process conditions. The patented 3D technology brings process measurements to another level by the ability to track particles in all orientations through the sensing zone of the instrument.

- Reliable online 3D particle size and shape analysis
- Online process and quality control
- Real-time process information
- Tailor-made solutions

Housed in a IP66 industrial hardened enclosure, the CAMSIZER ONLINE is integrated with a standard or customized sampling system to provide real-time data for process control.



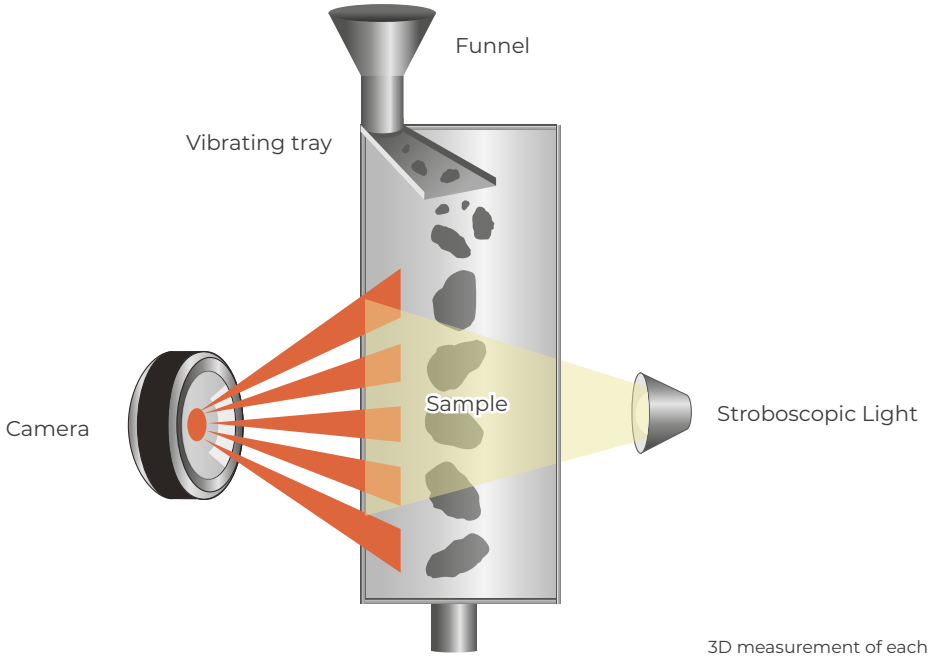
Particle Size & Shape Analyzer

CAMSIZER ONLINE

- Specifically designed for on-line analysis in harsh, industrial environments
- Patented 3D size and shape analysis
- Integration with plant data control systems
- 100% sieve correlation
- Self-cleaning and low maintenance
- SOP feature for unattended operation
- Explosion proof (optional)
- Custom integrated sampling systems which return samples to the process

CAMSIZER ONLINE SERIES

PRINCIPLE OF ONLINE 3D PARTICLE TRACKING



3D measurement of each individual particle

Process automation in the measurement of size and morphology of materials provides faster, safer and more accurate data for process optimization. Currently many plants use laboratory-based measurements for quality and process control. This requires an operator to enter potentially dangerous parts of the facility, in order to grab a sample from the process line, walk it back to laboratory for sample preparation, measurement, evaluation and reporting. This process is rather slow and can take anything from 2 to 12 hours. During that time material parameters can change and the process may be running at a suboptimal level, leading to poor quality material and the additional costs that inevitably arise from that.

Real-time analyses in the process deliver immediate information which is critical to process and quality control. By making adjustments in real-time, the process will operate at maximum production levels, all the while virtually eliminating any unplanned downtime. Microtrac's patented 3D technology utilizes an innovative scheme of tracking particles, taking multiple images of each particle and measuring length, width, thickness, perimeter and area. This enables the calculation of more than 35 3D size and shape parameters that are extremely valuable and accurate for on-line analysis.

Microtrac's patented 3D size and shape parameters enable you to measure characteristics of your product including sphericity, surface roughness, flakiness and aspect ratios utilizing the thickness. These types of measurements result in effective, lower cost coating or post processing, packaging, storage and shipment of your

CAMSIZER ONLINE / XL

3D ONLINE IMAGE ANALYSIS FOR LARGE PARTICLES

product. These measurements also enable you to run your production equipment at optimal cost and efficiency, returning money to your bottom line.

The CAMSIZER ONLINE system utilizes a funnel, vibrating tray, stroboscopic light, powerful high resolution, high speed camera and sophisticated software to perform the measurements. Particles are introduced to the vibrating tray via the funnel. The particles travel down the vibrating tray and fall, creating a tumbling motion. The Camsizer software tracks each particle as it falls through the sensing zone, taking up to 300 pictures per second. The software automatically aligns the particles for viewing (with 6-30 images of each particle). Particle size distributions utilizing one or multiple size parameters can be reported, and powerful filter functionality can enable the user to isolate groups of particles of particular interest to them and perform more targeted analysis. The analyzer's standard operating procedure (SOP) capability enables users to define their specific analysis and then continuously run their SOPs with no operator involvement, resulting in on-line analyses that are performed continuously and unattended. With the powerful reporting capabilities, plant operators are able to see the important 3D parameters for process control in real-time and run trend reports, enabling plants to anticipate problems before they occur. Furthermore, integration with your Data Control System (DCS) takes full advantage of existing inside operators who monitor every other aspect of your process. By utilizing an alarm feature or color-coded graphs on the DCS, out-of-control situations are known immediately and give your operators the ability to make real-time adjustments to keep the process running and in control.

For larger materials (up to 150 mm) the CAMSIZER XL can also be used in process applications.

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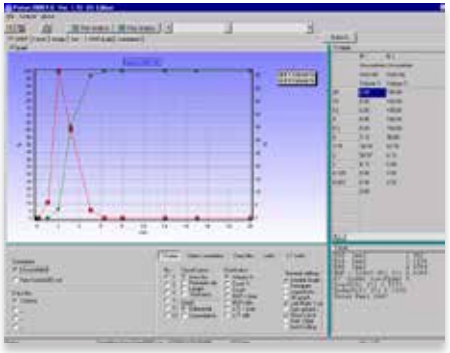
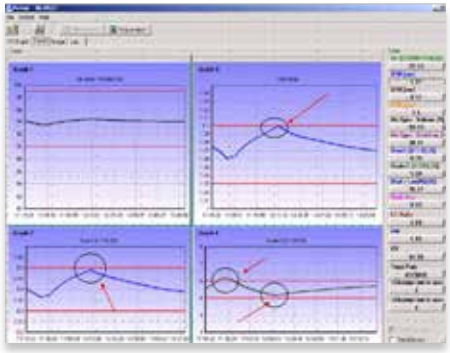
APPLICATIONS

Particle size and shape results will be available as distribution and trend data. Due to its robust design the CAMSIZER ONLINE is working 24/7, virtually maintenance-free. All electronics are housed in an industrial IP66 casing. Various applications of free flowing particles are covered fully automatically with high precision, and provide immediate results. The operator gets all important information in real-time and can react to process changes immediately.





TYPICAL FIELDS OF APPLICATION

- FERTILIZER
- FOODSTUFF
- POLYMERS
- SINTER
- INDUSTRIAL MINERALS
- FEEDSTUFF
- EPS
- WASHING POWDER
- PHARMACEUTICALS
- CONSTRUCTION MATERIAL
- AGGREGATES
- CHEMICALS
- GLASS BEADS
- COKE

FERTILIZER
– FULL MANUFACTURING PROCESS CONTROL

Fertilizer manufacture benefits from real-time material characterization at different points in the manufacturing process.

I Drying

Particle size and Shape measurement of material coming from the Dryer is used to control the drying and granulation process. Data and information transferred directly to the Control Room allows for rapid adjustments to ensure product quality.

I Sieving

Material coming from the dryer is transferred to storage silos through a sieving process. Coarse and fine material will be sieved out and the on-specification material goes to storage. Real time control of product quality ensures correct operation of the sieving process.

A fertilizer mix for patricle analysis (potash, Urea beads, DAP).

EXPANDABLE POLYSTYRENE (EPS)
– QUALITY CONTROL VIA REAL-TIME ANALYSES

Particle size and roundness are critical parameters determining quality of EPS. Material is sent to sieves to separate coarse and fine material. Real-time measurement of size and roundness at this point allows faster control to maximize output of quality product.

Particle size is important in the ability of materials to absorb moisture. Overpopulation of fine material inhibits that ability. CAMSIZER ONLINE monitors particle size and provides the control room with the information required to minimize fine material in the process.

Expanded polystyrene pellets for production.

EXTRUDATES
– PRECISE & FAST 3D MEASUREMENT

A highly viscous paste is pressed through a matrix and cut with a sharp knife. The material in use can consist of plastic granules, extrudates, washing powder, or something similar. The on-line measurement ensures a continuous size and shape information in real-time.

Extruded particles usually have the shape of small cylinders. The CAMSIZER ONLINE measures the length to thickness ratio of the cylinders, as well as the total size of the particles. This is made possible by the patented 3D capabilities of the CAMSIZER ONLINE. The 3D measurement consequently ensures reliable and fast results on the quality of the granulate.

Blue plastic extrudates.

BULK MATERIAL
– RELIABLE MATERIAL CHECK AT LOADING STATIONS

In many cases, bulk materials are first stored before being shipped as raw product to other processors. When bulk material is loaded onto trains, ships or trucks, it is important to be able to assure the end users that the loaded material exactly meets the specifications.

In the past, this quality control was performed via sieve analysis. In that case, the samples are manually taken and sent to the laboratory. There, the sieve analysis is performed and within 30 to 60 minutes the results are transmitted to the operators at loading station.

With the CAMSIZER ONLINE, fast measurements are possible within 5 to 10 minutes. In addition, the results are immediately reported to the control room. This means that the quality is analyzed in real-time during the hold loading process.

Transportation and handling of bulk material.

TECHNICAL DETAILS

SPECIFICATIONS AT A GLANCE

Measuring range	ONLINE: 30 µm - 30 mm // ONLINE XL: 160 µm - 150 mm
Measurement principle	Dynamic image analysis
Type of analysis	Dry analysis of powders, granulates and bulk material
Typical analysis time	approx. 5 - 10 minutes (depending on the desired measuring statistics)
Detection system	High-speed camera with 100 images per second (each with 5 MP)
Electrical	AC input: 100 - 132 VAC (120 VAC model) / 200 - 250 VAC (240 VAC model), 47-63 Hz, single phase
Power consumption	Approx. 75 VA maximum
Environmental	Temperature: 10°C to 35°C (50°F to 95°F) Humidity: 20% to 90% RH, non-condensing maximum Storage temperature: -10°C to 50°C (14°F to 122°F) (dry only) Pollution: Degree 2
Compliance	ISO 13322-2 Dynamic Image Analysis
Physical specifications	Case material: Stainless steel Epoxy overcoat finish (optional) Sample transport material: Stainless steel
Dimensions (H x W x D)	ONLINE: 35 x 55 x 12 in (900 x 1401 x 300 mm) // ONLINE XL: 48 x 67 x 16 in (1229 x 1693 x 400 mm)
Weight	ONLINE: 132 lbs (60 kg) // ONLINE XL: 198 lbs (90 kg)

08/2022 Subject to technical modifications and errors

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Under the roof of VERDER SCIENTIFIC we support thousands of customers worldwide in realizing the ambition we share.

As their technology partner behind the scenes, we deliver the solutions they need to make progress and to improve the everyday lives of countless people. Together, we make the world a healthier, safer and more sustainable place.

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