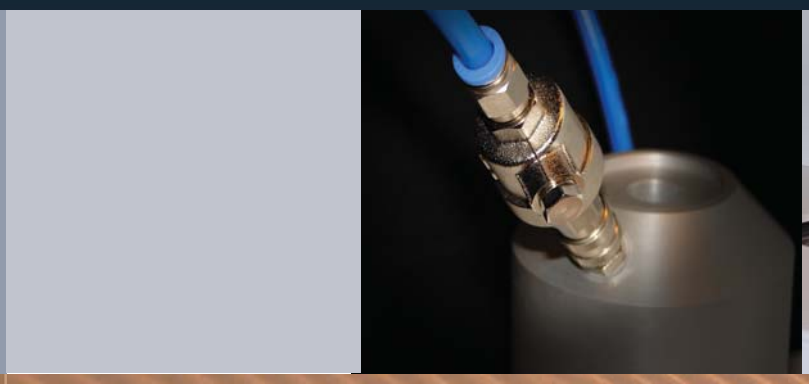
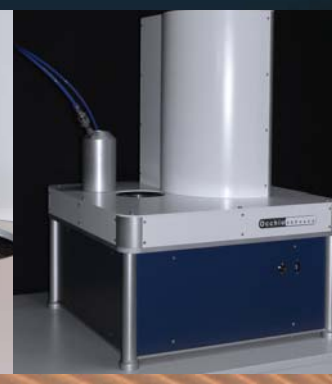
Occhio

Imaging solutions





OCCHIO 500 NANO

The best solution for measuring powders

Imaging solutions in particle analysis

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By a team focused on powder characterisation

Through the efforts of an international and multidisciplinary team of engineers, **OCCHIO** offers you a complete range of solutions, starting from 200 nanometers and ranging up to centimeters.

Whether it is for laboratory instrumentation, «at line» or even «on line» solutions, **OCCHIO** is prepared to be your partner in high-level powder characterization. **OCCHIO** and **OCCHIO 500 NANO** bring you accuracy, profit and innovation.

_ Accuracy

With its proprietary Blue Collimated Light and high quality telecentric lens, **OCCHIO 500 NANO** will change your own perception of image analysis, measuring particles which are invisible under normal microscopy.

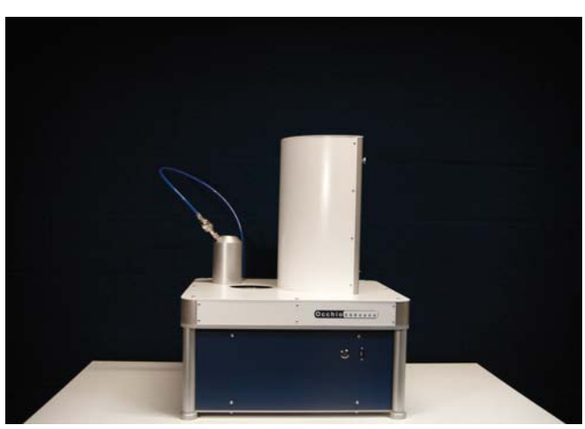
_ Profit

OCCHIO 500 NANO is an automatic device dedicated to powder quality characterization. It is easy to use and carries out rapid analyses in less than 2 minutes. **OCCHIO 500 NANO** is able to accurately measure very small samples.

_ Innovation

Morphology measurement is more than shape description. To improve, you need robust and significant measurement. Based on decades of university research, the **OCCHIO 500 NANO** provides your R&D department with dedicated parameters, specially engineered for your industrial purposes.

CLICK IMAGE FOR PRODUCT DEMONSTRATION



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From samples to reports, your solution is ready for use

OCCHIO 500 NANO

More than a microscope, the system combines an integrated vacuum dispersion device, monochromatic collimated back-light for ideal contrast, telecentric lens for unrivalled image quality, wide depth of focus, with an integrated computer and advanced software for size and morphometric analysis.

OCCHIO 500 NANO provides you with high quality images with a resolution of less than 400nanometers. The entire system is engineered to remove diffraction so that a clear and precise image of each particle's outlines is quickly obtained.

Be the best at every step of the measurement process

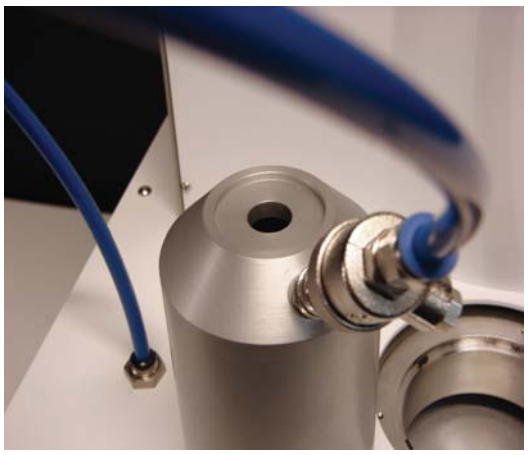

Image acquisition

- Use one of the best high-resolution camera on the market 6.6 Mega Pixels
- Eliminate diffraction with monochromatic Blue backlighting illumination.
- Increase the quality of the particle's outlines with collimated light and telecentric lens.
- Be perfectly focused on each particle thanks to a continous auto-focus.
- Use the entire range of pixel values to obtain a perfect threshold.
- Avoid vibration problems due to the high-speed camera.
- Reduce maintenance costs and increase robustness with a fixed camera and light.

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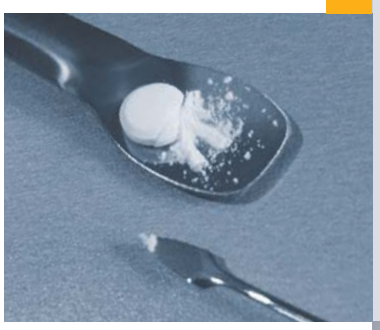
INTERGRATED DISPERSER

From samples to reports, your solution is ready for use



This **patented** disperser provides perfectly prepared slide glass. Without any sample contamination or damage, this Vacuum Disperser will gently deposit millions of individual grains of powder on a slide glass within a few seconds.

Be the best at every step of the measurement process

Dispersal

- Maintain the integrity of the powder. There is no impact. The Vacuum Disperser uses the vacuum strength to gently dissociate agglomerates.
- Good orientation of each individual particle with natural sedimentation on the sample glass.
- Avoid contamination with the dispersion done directly onto the glass plate already placed on the analysis instrument.

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Size and morphometric measurements

_ Size

The **Inner Diameter** (also known as Sieve Diameter) is the maximum inscribed disc within a particle, known as, is computed with a true Euclidean Distance Transform. The fast and accurate algorithm developed is exclusive to **OCCHIO**, providing for computing real size distributions.

The **Area Diameter** is the diameter of the equivalent area circle.

The **Mean Diameter** is the mean of all radii joining the centre of mass and the outline's pixels.

The **geodesic lenght is real**the, is real lenght of folded fibers

Area and **Volume** are also computed on the particle projected area.

_ Shape

Inertia **Elongation** measurement is computed from one minus the ratio between inertial ellipse axes.

Feret Bounding Box is the bounding box parallel to the Inertia Ellipsoid.

Width and **Length** are computed directly on this Feret Bounding Box.

Max Distance is the maximum distance found within the particle.

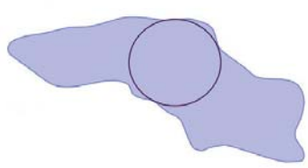
ISO.Solidity as Convexity is defined as one minus the ratio between convex area and particle area.
The convex area is built with a virtual rubber band fitted on each particle.

ISO.Circularity is defined as the ratio between the equivalent area circle perimeter divided by the actual particle perimeter.

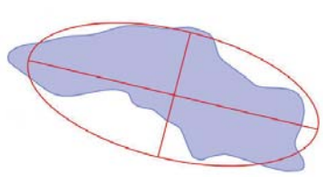
O.Bluntness is expression of a maturity in the abrasion process. It specifies how far we are from a perfectly rounded shape

O.Porosity is porosity estimator

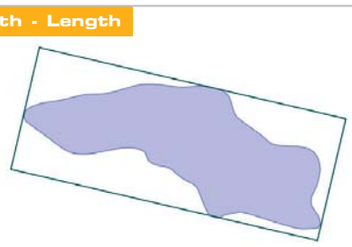
Inner Diameter



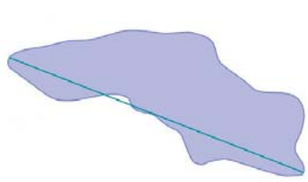
Elongation



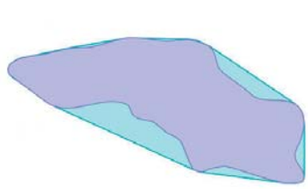
Width - Length



Max Distance



Convexity



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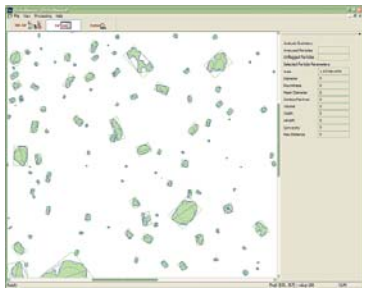
CALLISTO SOFTWARE

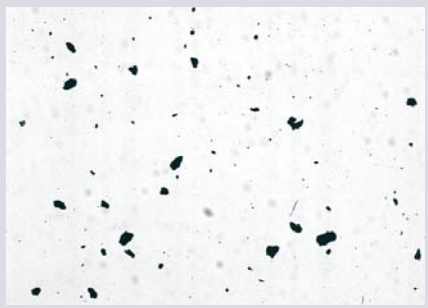
From samples to reports, your solution is ready for use

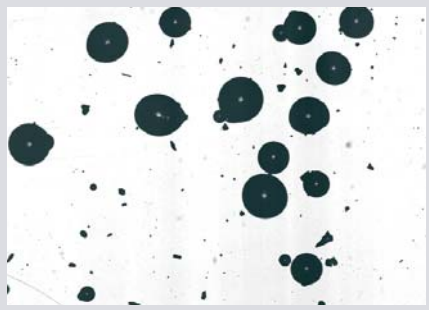
CLICK FOR DEMOSTRATION



CALLISTO

CALLISTO Software ensures accurate powder characterization with an automatic procedure including powder dispersion, analysis and report generation.





Achieve the best results at every step of the measurement process

Measure

- Automatic calibration of the device before each analysis optimizes accuracy.
- Use the best in image analysis, employing accurate and robust parameters based on the latest developments in mathematical morphology.
- Carry out reproductions with a very simple procedure wherever measurement are made.

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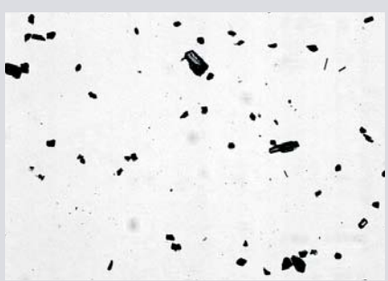
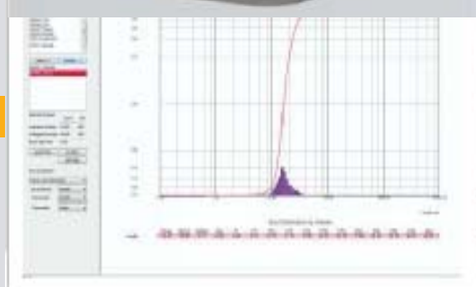
CALLISTO SOFTWARE

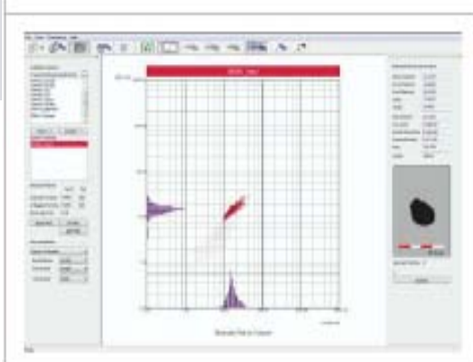
From samples to reports, your solution is ready for use

CALLISTAT

Just as **OCCHIO 500 NANO** could become part of your process, Callisto, and its dedicated statistical software package, can make sample comparison, real time statistics, 3D interactive plots and customizable reports available to everyone on your network, no matter where they are located.







Achieve the best results at every step of the measurement process

Result presentation

- Compare unlimited number of measurements.
- Share complete results with colleagues or clients who are connected to your network.
- Understand your product perfectly with individual ID CARD and photographs of every grain.
- Summarize measured parameters of hundred-thousands of particles with a mouse click.
- Visualize your products in innovative 2-D or 3-D morphological space.
- Print the report you have designed to fulfill your quality policy requirements.

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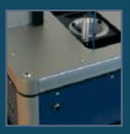
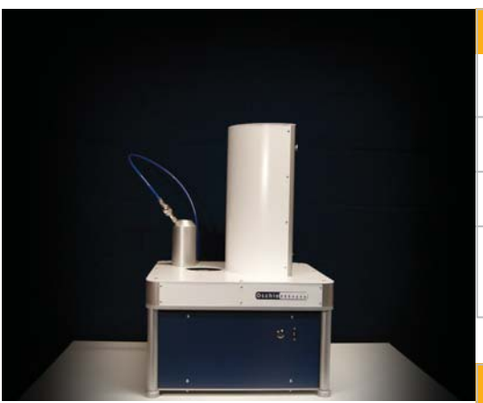


OCCHIO 500 NANO SPECIFICATIONS

- Particle range : from 0.4 μm up to 2000 μm.
- Representative measurements in less than 2 minutes.
- Number of particles analyzed defined by the user (from one to millions).
- Storage and computing of individual particle characteristics.
- Real-time storage of full resolution particle outlines.
- Parameters : Sieve Diameter, Equivalent Diameter, Mean Diameter, Volume, Area, Width, Length, Elongation, Solidity, Hole Detection, Perimeter, Geodesic lenght



OCCHIO 500 NANO TECHNICAL SPECIFICATIONS	
Dimensions	54 x 54 x 72 cm or 21.2x21.2x28.3 inches
Total weight	38.5 kg or 84.9 lbs
Power	110-240 V 50/60 Hz
Operating Environment	Temperature 5ºC - 45ºC Humidity 35% - 80% non-condensing

IMAGING DEVICE
CMOS integrating active pixel sensor
Pixel Pitch 3.5 x 3.5 microns 6.6
Mega Pixels - Digital outpout
Telecentric Lens
Collimated blue back-lighting

COMPUTER (included inside OCCHIO 500 NANO)
Windows XP , Vista or Windows 7
Intel Core i5-650 3.2 GHz, 4MB CACHE; RAM 4 GB 1156MHz ;HD 500GB
Ergonomic Flat Panel Display
Wireless optical mouse and Keyboard

*Specifications subject to change without notice.

Occhio

www.occhio-instruments.com

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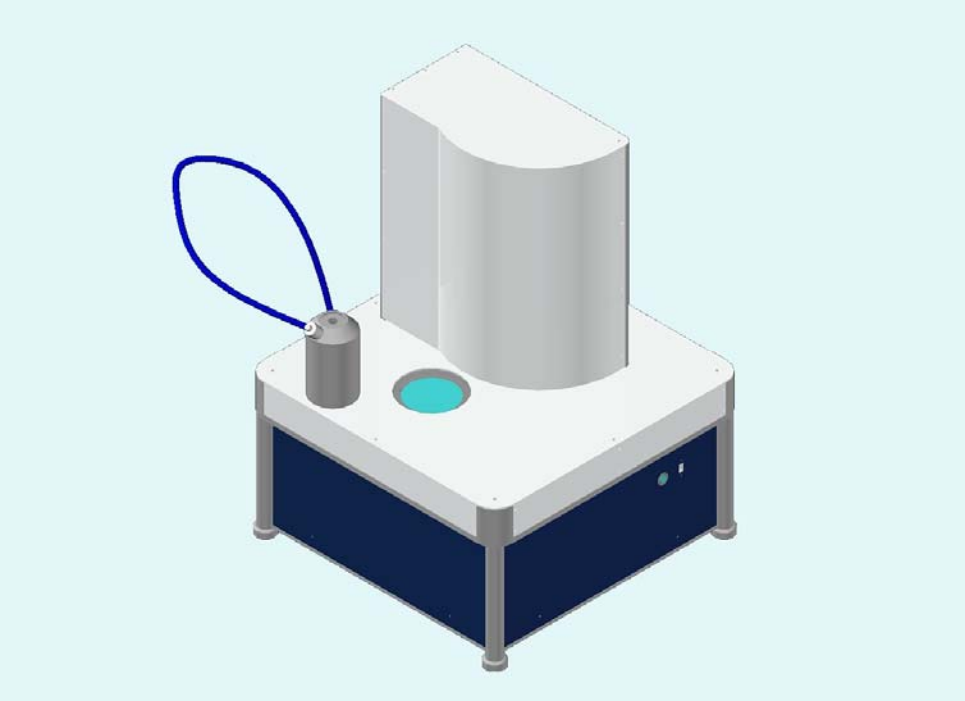
Reference code: OCC023 Occhio500nano

Technical specifications



Particle size range (0.4 microns – 2000 microns)

Dimensions and weight

	Description
Length	540 mm – 21.2 in
Width	540 mm – 21.2 in
Base height	300 mm – 11.2 in
Include tower (total height)	720 mm – 28.3 in
Weight	38.5 Kg – 84.9 lbs
Connection	3 USB II at 480Mbps, Ethernet, VGA

Working condition

	Description
Working temperature	5-40 °C non condensing
Power Supply	100-220 Vac 50-60Hz

Integrated computer (minimum specification)

	Description
Processor	Intel Core i5-650 @3.2GHz, 4MB cache
Ram	4 GB @ 1156MHz
Hard Disk	500MB
Display	LCD, FullHD, 21.5”
Mouse, keyboard	USB (English)
Operating system	Windows seven compatible XP or Vista or

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Optics and imaging device

	Description
Standard camera type	C-mos progressive scan
Camera resolution	6.6 Millions pixels (2200 x 3000 pixels)
Pixel size	3.5 µm side
Lens type	Telecentric variable magnification zoom
Lens resolution	From 0.38 to 4.7 µm/pixel
Field of view	836 x 1140 µm @0.38 µm/pixel 10266 x 14000 µm @4.7 µm/pixel
Light source	Collimated monochromatic light
Light wavelength	440 nm
Calibration slide	Calibration slide is integrated in the instrument
Light output diameter	25 mm

Starting kit parts (these parts are included in the packing box at the delivery)

Part number	Description	Quantity
OCC011SW	CALLISTO EXPERT	1
023-058-R1 	Particles are dispersed on 96mm diameter glass plate	5
023-060-R1 	Vacuum sample dispersion chamber (Aluminium) Diameter 84mm Height 140mm Sample introduction hole diameter 16mm	1
023-500-R1 	Stop valve include tube and fast coupling	1
023-501-R1	Vacuum sample dispersion chamber sealer ring	1
023-502-R1 	Sample holder, plastic cups for dispersion unit	10
023-503-R1	Plastic membrane foil, 50µm thickness	1
999-0003-R1 or 999-0004-R1	Power supply cable North America or Power supply cable Europe	3
999-0007-R1	LCD, FullHD, 21.5”	1
999-0008-R1	Mouse	
999-0011-R1 or 999-0010-R1	USB Keyboard(English) or USB Keyboard(FR)	1

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023-100-R1	Spatulas kit (2mm ; 3mm ; 4mm ; 6mm)	1
999-1001-R1	Standard 10µm Dry borosilicate glass beads 10µm nominal diameter, for instrument calibration	1 g

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HR Option

Option code – 023-HR	Description
High resolution camera type	C-mos progressive scan
Camera resolution	10 Million pixels (3840 x 2748 pixels)
Pixel size	1.67 µm side
Lens resolution	From 0.19 to 1.11 µm/pixel
Field of view	730 x 522 µm @0.19 µm/pixel 4262 x 3050 µm @1.11 µm/pixel

Occhio 500nano short instrument overview

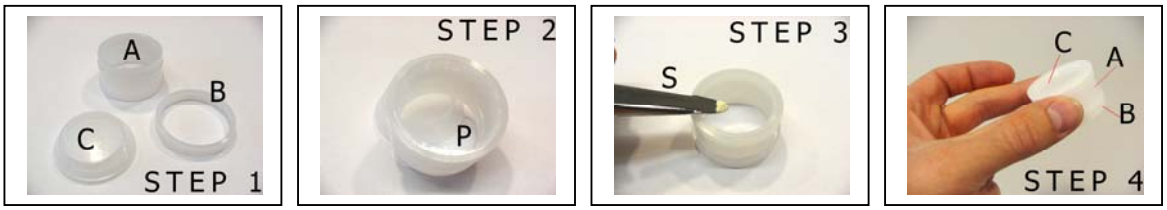
Instrument calibration

Occhio 500nano includes a calibration slide. A calibration procedure is available on the Standard Operating Procedure. Light, background and size calibration could be done in few second before each analysis. For an advanced calibration procedure, using standards glass beads, a 'calibration table' could be charged by the software automatically before each analysis.

Dry powder preparation and dispersion

Sample preparation

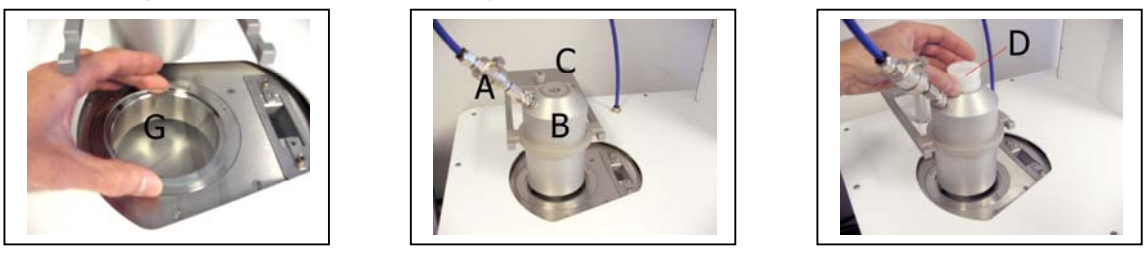
One or more samples can be prepared and sealed in small caps. After four simple steps and in just a few seconds, your samples are ready for the analysis



A: Plastic cup
B: sealer ring
C: Plastic cover
P: Plastic membrane
S: Sample

Sample dispersion

Place the glass on the plate, mount the disperser on its holder, place the sample cup on the dispersion chamber and run your S.O.P.



G: Glass plate
A: Vacuum check valve

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B: Vacuum chamber
C: Vacuum chamber holder
D: sample cup

Model	500nano
Sample support	Monolayer dispersion on a round plate
Plate diameter	96mm
Sample particles size range	From 400 nm to 2 mm* *max object size
Sample dispersion	By vacuum on round glass support
Sample analysis	Size distribution cumulate and proportional curve Number distribution or volume weighted distribution
Standard Operating Procedure includes	Glass plate clean check Optical (size) calibration Light intensity calibration Auto focus Vacuum dispersion Particles counting Creation of a particle database Image storage Filtering procedure Automatic reporting generation

Software mains features

Model	Callisto Software for 500nano
Size parameters (Iso 9276-6; 7; 8) All the size parameters are displayable or not according with the customer setting preference	ISO Area diameter ISO Inner diameter Mean diameter Perimeter diameter Crofton diameter Half Crofton diameter Width Length Ellipse Width Ellipse Length ISO Max Distance ISO Geodesic Length
Shape parameters (Iso 9276-6; 7; 8) All the shape parameters are displayable or not according with the customer setting preference	Occhio Bluntness Occhio Roughness Elongation ISO Aspect Ratio Ellipsoid Elongation Ellipsoid Roundness Ellipse Ratio ISO Eccentricity ISO Straightness ISO Roundness ISO Compactness

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	ISO Extent ISO Solidity Convexity ISO Circularity Luminance mean Luminance var. Porosity
Advanced shape parameters	Developed in function of customer specifications
Image format	Bitmap
Data storage	'.oph' binary Occhio files format contains: Full size distribution values Shape and size percentiles Outline and greyscale levels of each particle
Data comparisons	Open and compare more analysis on the same plots include 'trends graphic'
Plots and figure (By number or volume weighted values)	Acquisition info (short overview of the used SOP) Size distribution Size percentiles Shape percentiles Shape distribution Mean shape by size 2D scatter-plot (fully selectable particles map) 3D scatter-plot (include animation) Percentiles sample images Sample images (BMP exportable format) Id card for each particle (BMP exportable format)
Statistics tools	Morphological and size filtering procedure
Reporting and data export	Raw data export (text format) Table distribution export (text format) Table distribution and percentile export (Excel format) Automatic or custom reporting Full image export (bmp format) Single particle image export (bmp format) Figure and graph export(bmp format)
Microscope mode pane	Use the device in manual mode select glass positioning, grab and store images, look at the particles in real time and display the values of each particles in the live image

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