



# COFFEE LABORATORY

You need precision, you want morphology

## FOR THE PARTICLE SIZE ANALYSIS OF COFFEE



# OCCHIO Zephyr ESR

The new solution for particles and granulates analysis



## COFFEE BEAN GRADING

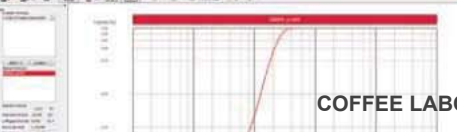
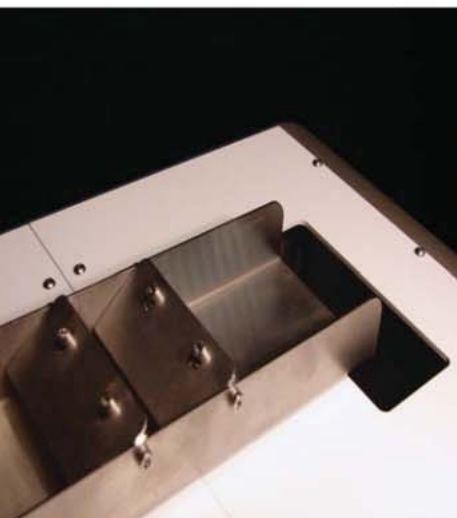
### Imaging solutions in particle analysis

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OCCHIO Zephyr ESR

## Size, sieves correlation and shape analysis for particles from 30 microns up to 30 mm



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 ZEPHYR ESR** bring you accuracy, profit and innovation.

### \_ Accuracy

With its proprietary Light and high quality lens, **OCCHIO ZEPHYR ESR** will change your own perception of image analysis, measuring particles like granulate, sand, ceramics, fibers etc..

### \_ Profit

**ZEPHYR ESR** is an automatic device dedicated to sieveable powders characterization. Associated with the software **CALLISTO**, It is easy to use and carries out rapid analyses in less than few minutes.

### \_ Principle and innovation

Based upon a combination of mechanical and gravity dispersion, the **OCCHIO ZEPHYR** provides for a fast and accurate size and shape analysis of sieveable powders. The instrument combines a high quality imaging system with a robust mechanical quality design for at-line and on-line process control. The powder is dispersed by means of vibrating feeder and gravity dispersion. The system uses a combination of specific lens & lights.

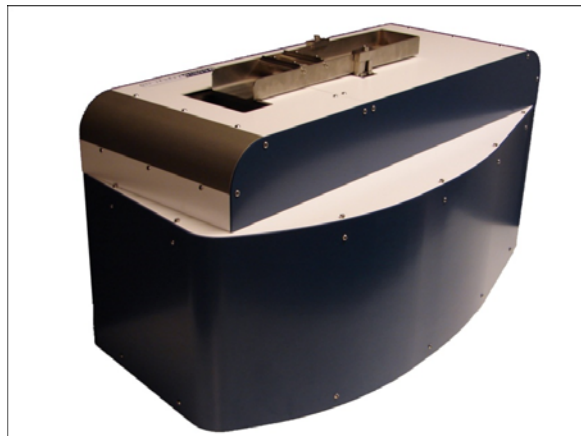


**CLICK HERE**

**PRODUCT DEMONSTRATION**



**Reference code: OCC163 Occhio Zephyr ESR**



**Particle size range (30 microns – 30.000 microns)**

**In option WET module (30 µm-1 mm)**

### **Technical specifications**

#### **Working conditions**

	Description
Working temperature	Temperature 5°C – 45°C Humidity 35% - 80% non condensing
Power Supply	100 or 220 Vac 50-60Hz (auto-switching is not available please ask to Occhio to set power supply)

#### **Computer (supplied by Occhio)**

	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 Vista

#### **Optics and imaging device**



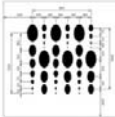
	Description
Standard camera type	Camera 5Mpixels Gigabit Ethernet 2/3" interline progressive scan CCD
Camera resolution	5.0 Millions of pixels 2448 x 2050 pixels
Pixel size	3.45 µm
Lens type	Macro lens, non telecentric
Lens resolution	Calibration: 20 µm/pixel up to 40 µm/Pixel* (+/- 5%) * for others lens configurations please contact Occhio
Field of view	48960 x 41000µm @20µm/pixel 98000 x 82000µm @40µm/pixel
Light source	Diffused light LED
Light wavelength	Red light

Light output diameter	100 mm x 200 mm
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**Dimensions and weight**

	Description
Weight	37 kg or 81.6 lbs
Length	840 mm – 33.07 in
Large	405 mm – 15.95 in
Height	438 mm – 17.24 in

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

Part number	Description	Quantity
OCC011SW 	CALLISTO EXPERT	1
163-300-R1 	Glass plate for Zephyr ESR 141 x 131 x 6 mm	2
163-101-R1	Zephyr ESR funnel opening 50x50mm	1
163-104-R1	Zephyr ESR funnel opening 56x56mm	1
163-105-R1	Zephyr ESR funnel opening 68x68mm	1
163-400-R1 	Zephyr ESR calibration slide	1
999-0014-R1*	Vacuum cleaning (220VAC-240VAC)	1
999-0015-R1*	Vacuum cleaning (110VAC)	1
999-0015-R1	Vacuum cleaning filter	1
163-500-R1	Zephyr and Zephyr ESR communication cable A	1
163-501-R1	Zephyr and Zephyr ESR communication cable B	1
999-0003-R1 or 999-0004-R1	Power supply cable North America or Power supply cable Europe	3
999-0013-R1**	Computer + LCD, FullHD, 21.5" + Mouse + Keyboard US Minimum configuration: Processor Intel Core i5-650 @3.2GHz, RAM:4MB cache 4 GB @ 1156MHz Hard DISC 500MB LCD, Display FullHD 21.5";mouse+Keyboard USB (English), Windows 7	1
999-0010-R1	Keyboard USB (FR) instead of Keyboard US according with customer country	1
999-1003-R1	Standard for Zephyr ESR Dry certified sand sample	1 bottle

\*One part delivered, 110VAC or 220VAC model, according with the country power supply network.

\*\*PCI communication card for Zephyr ESR are installed on the computer

## Option (ref: 163107) linear auto-sampler

Linear auto-sampler includes sample beakers, for dimensions and configuration please contact Occhio technical support.



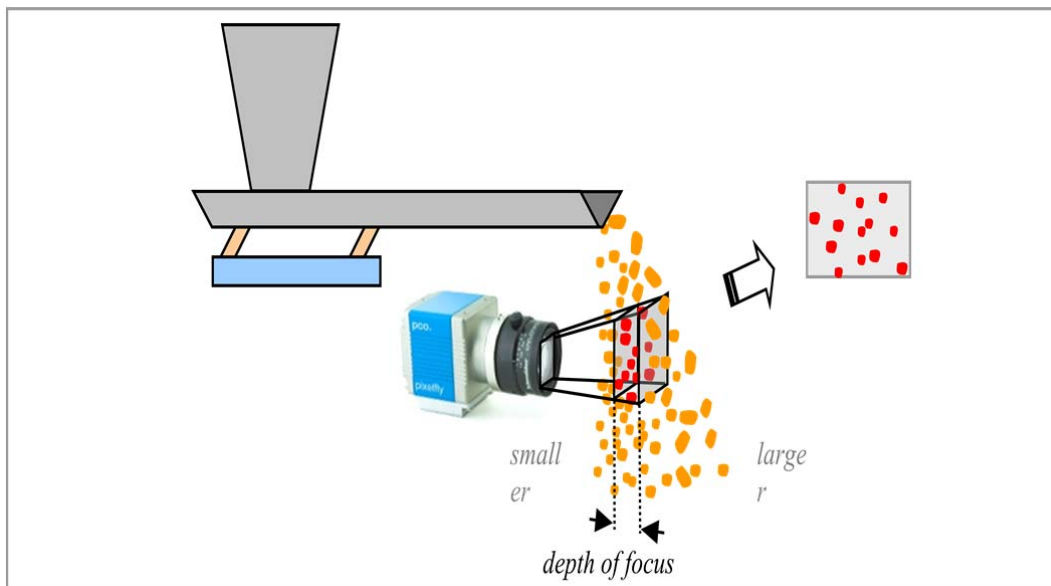
## Option (ref:163106)Wet analysis

Flowcell option: to analyze particles in suspension for particle size range (30  $\mu\text{m}$ -1 mm): includes Flowcell + specific pump

## Occhio Zephyr ESR short instrument overview

Based upon a combination of mechanical dispersion and gravity phenomena, the Occhio Zephyr ESR provided, for a fast and accurate size and shape analysis of sieveable powders. The instrument combines, high quality imaging system with a robust mechanical design for at-line and on-line process control.

The powder is dispersed by vibrating feeder and particles will go down the analysis cell by gravity phenomena. During this second step, the high resolution optical bench allows to analyze all particles.



### **High speed sample analysis**

The sample is feed directly onto the Occhio Zephyr ESR vibrating feeder and thanks to standard operation procedure analysis duration and cleaning time are automatically set, the measurement starts. Within a few seconds, results are displayed and database is generated.

This instrument is able to analyze a large quantity of sample in just a few minutes due to the high-speed air flow.

All Occhio instruments are based upon specific optical technology, using high quality lenses with low distortion and mounted on a precision, robust mechanical system suitable for industrial working conditions.

### **Sample analysis**

Model	Occhio ZEPHYR ESR
Sample dispersion	Vibrating feeder combined with air flow
Sample particles size range	From 30 $\mu$ m to 30 mm
Time measurement	1-3 minutes (sample et quantity dependent)
Sample analysis	Size distribution cumulate and proportional curve Number distribution or volume weighted distribution Sieves correlation (according with OCCHIO)
Standard Operating Procedure includes	Maximum number of particles Control on vibrating feeder (initial speed, acceleration, max) Particles per picture Light intensity calibration Background calibration Creation of a particle database Image storage

	Filtering procedure Automatic reporting generation
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**Software mains features**

Model	Callisto Software for Flowcell FC200M
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 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	Manual pumping fast speed, low speed. Valve switching, rinsing procedure. Current live image analysis.

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