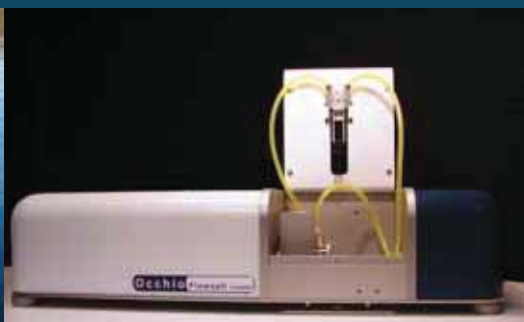




You need precision, you want morphology



# OCCHIO Flow-Cell FC200S+

The best solution for measuring suspensions, emulsions and foams



**QAQC LAB**

***www.qclabequipment.com***

Imaging solutions in particle analysis

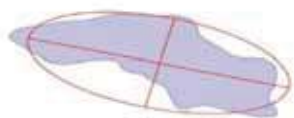
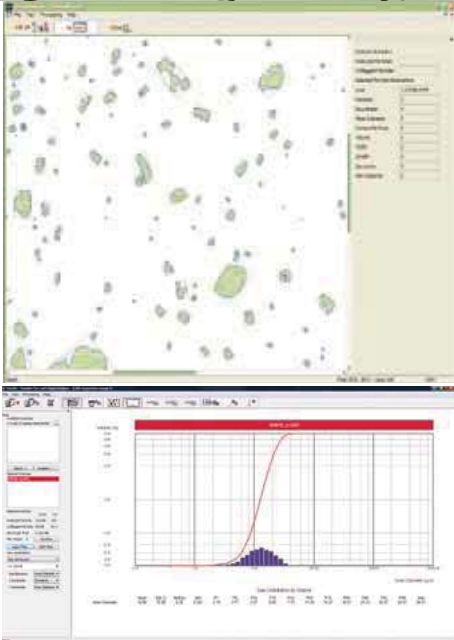
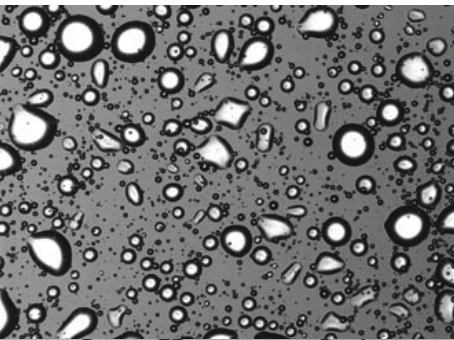
[www.occhio.be](http://www.occhio.be)

U.S. SALES & SUPPORT QAQC LAB TEL(804) 318-3686 [sales@qclabequipment.com](mailto:sales@qclabequipment.com)



OCCHIO Flow-Cell FC200S+

## Size , shape, counting for suspensions, emulsions and foams



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 Flow-Cell** bring you accuracy, profit and innovation.

### \_ Accuracy

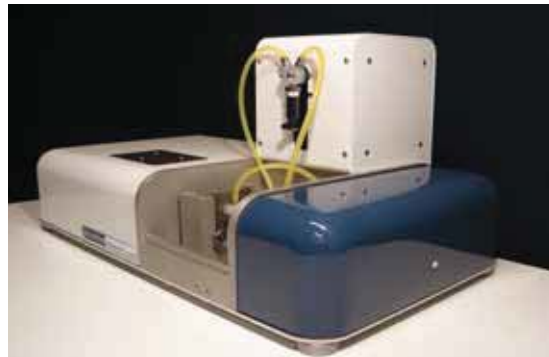
With its proprietary Light and high quality lens, **OCCHIO Flow-Cell** will change your own perception of image analysis, measuring suspensions or emulsions which are invisible under normal microscopy.

### \_ Profit

**OCCHIO Flow-Cell** is an automatic device dedicated to emulsions or suspensions quality characterization. It is easy to use and carries out rapid analyses in less than few minutes.

### \_ Innovation

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



### \_ Size measurements (from 200 nm up to 1000 µm)

Area diameter - Mean diameter - Length - Width - Maximum distance ....

### \_ Shape parameters

Elongation - Circularity - Convexity - Shape factor - Luminance & Special parameters.....

**For more information contact us**

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**Reference code: OCC242-04 Occhio Flowcell FC200S+HR**



**Particle size range (0.2 microns – 1000 microns)**

**Technical specifications**

Working condition

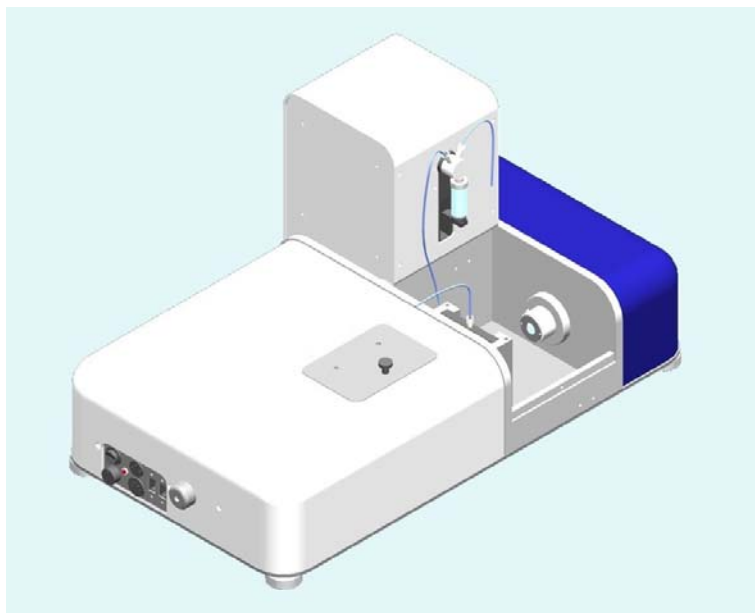
	Description
Working temperature	5-40 °C non condensing
Power Supply	100-220 Vac 50-60Hz

Computer (if supplied by Occhio, minimum specifications)

	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 with XP, Vista

Optics and imaging device (Standard FC200S+)

	Description
Standard camera type	C-mos progressive scan
Camera resolution	10 Millions pixels (3840 x 2748 pixels)
Pixel size	1.67 µm side
Lens type	Telecentric variable magnification zoom
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
Light source	Collimated monochromatic light
Light wavelength	440 nm
Light output diameter	15 mm





**Dimensions and weight**

Specifications	Description
Length	630 mm –24.8 in
Width	350 mm –13.8 in
Include tower (total height)	330 mm –13.0 in
Weight	18.5 Kg – 40.8 lbs

**Syringe module**

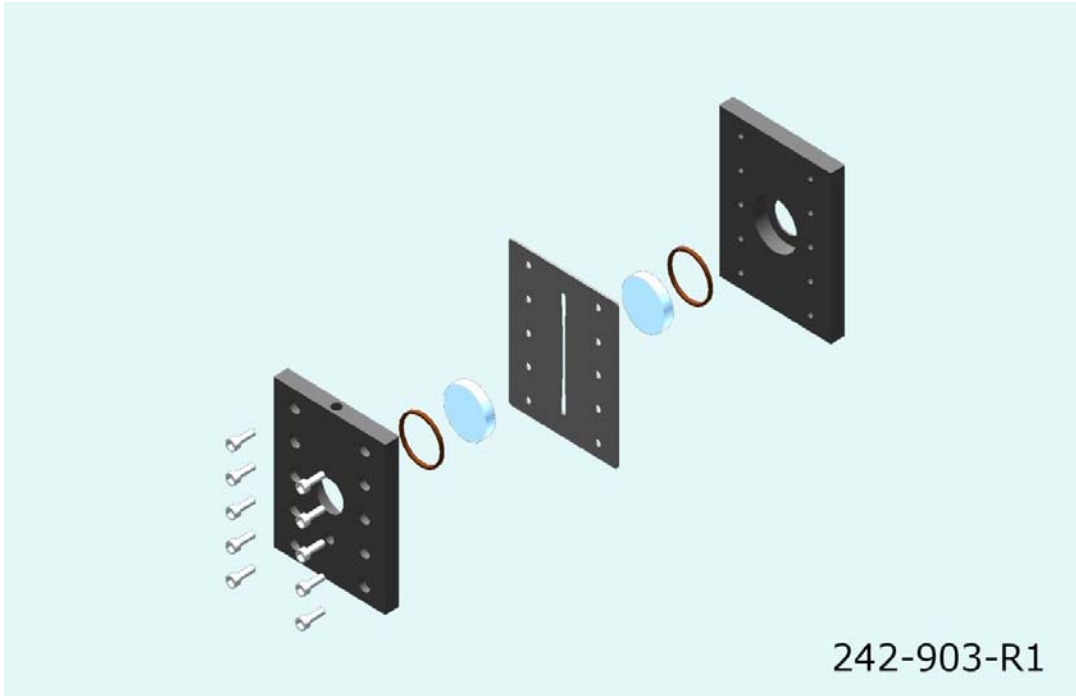
Specifications	Description
Accuracy	±1% @ >30% stroke
Fluid path	Borosilicate glass, PTFE and CTFE
Operating humidity	20% to 95% non-condensing
Operating temperature	15 to 40°C
Precision	0.05% @full stroke
Speed	1 to 1200 s per full syringe stroke
Valve	3 way 'Y' valve (standard model)

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

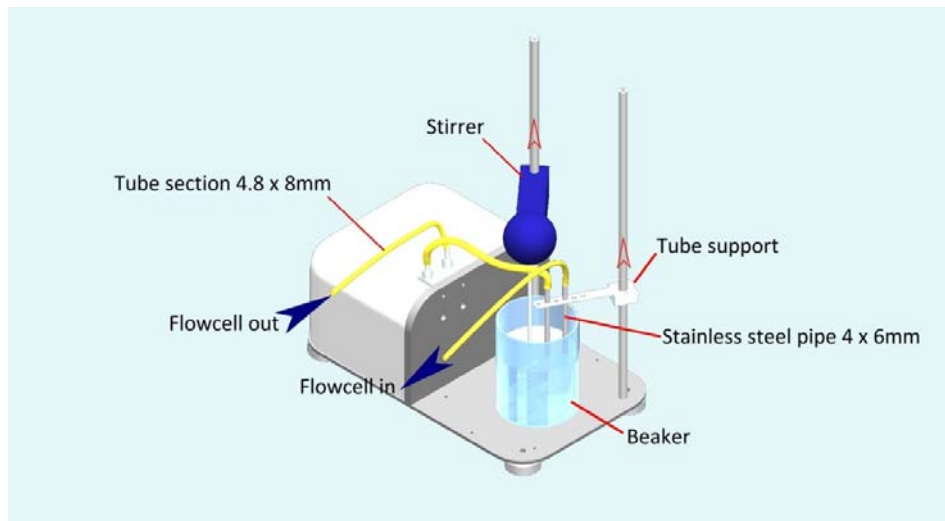
Part number	Description	Quantity
OCC011SW 	CALLISTO EXPERT	1
242-508-R1 	Flow cell glass windows for FC200M – S – S+ - HR	2
242-509-R1	Glass windows O-ring for FC200M-S-S+-HR	2

		
999-0001-R1	USB 2, m/m 1.5m, instrument connection cables	2
242-051-R1-2500x50µm	Stainless steel spacer; channel width 2500µm thickness 50µm	1
<b>Part number</b>	<b>Description</b>	<b>Quantity</b>
242-051-R1-2500x100µm	Stainless steel spacer; channel width 2500µm thickness 100µm	1
242-051-R1-2500x150µm	Stainless steel spacer; channel width 2500µm thickness 150µm	1
242-051-R1-2500x200µm	Stainless steel spacer; channel width 2500µm thickness 200µm	1
242-051-R1-2500x300µm	Stainless steel spacer; channel width 2500µm thickness 300µm	1
242-051-R1-2500x400µm	Stainless steel spacer; channel width 2500µm thickness 400µm	1
242-051-R1-2500x500µm	Stainless steel spacer; channel width 2500µm thickness 500µm	1
242-050-R1-16000x1000µm	Paper spacer channel width 16000µm thickness 1000µm	2
242-556-R1	Power supply module; 5-12-24VDC for FC200M	1
242-901-R1	Set: 10 screws for flowcell core	1
242-903-R1*	Set: complete mounted flowcell core for FC200S+ 2x 242-508-R1 2x 242-509-R1 1x 242-030-R4-AC 1x 242-031-R4-AC 1x 242-051-R1-2500x200µm 1x 242-901-R1 1x 242-527-R1 1x 242-528-R1	1
		
242-904-R1*	Set: tubing and connectors from flowcell to syringe entry (inner diameter 0.8mm).	1
242-905-R1*	Set: tubing and connectors from syringe to waste cup or from sample to flowcell entry (Inner diameter 0.8mm).	2
242-907-R1	Set: tubing and connectors from flowcell to syringe entry (inner diameter 1.6mm).	1
242-908-R1	Set: tubing and connectors from syringe to waste cup or from sample to flowcell entry (Inner diameter 1.6mm).	2
242-906-R1	Set: O-ring and plastic coupling for flowcell entry 1x 242-527-R1 1x 242-528-R1	1
242-513-R1*	Syringe 1ml	1
242-517-R1	Syringe 0.1ml	1
242-516-R1	Syringe 2.5ml	1







**Option (ref: 242109): external membrane pump module for 'FC200S+' and 'FC200S+HR' models**



Module specification

Pump specifications	Description
Power supply 0-12Volt DC	The pump is powered by a 3 poles DIN cable supplied with the module. Voltage variables 0 to 12 Vdc via a potentiometer located on the left side of the instrument (FC200S+)
Valves and membrane	Polypropylene and PTFE
Pumping flow	0 to 2000ml/min
Stainless steel beaker	Stainless steel conical beaker 300ml
Overhead stirrer	Max volume 2liters Consumption 8w Speed 0-2000 rpm power cables delivered with the stirrer, speed and power supply are independent of the instrument
Stainless steel inlet outlet tube	One tube 6x4mm diameter and 80mm length, compatible with '242-565-R1' Tygon Solva 4.8x8mm
Tube support	One tube support with blocking screw

Starting kit for '242109' option (these parts are delivered with the option)

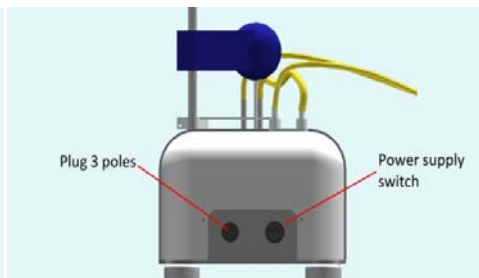
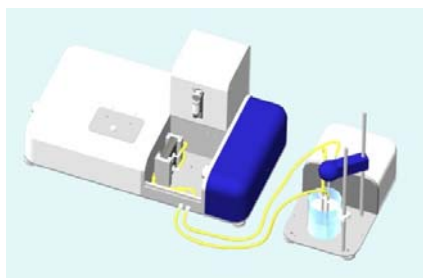
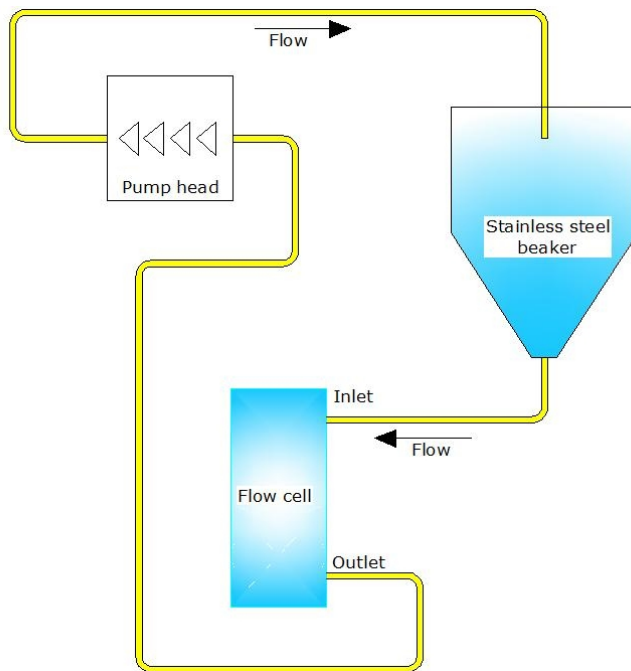
Part number	Description	Quantity
242-508-R1 	Flow cell glass windows for FC200M – S – S+ - HR	2
242-509-R1 	Glass windows O-ring for FC200M-S-S+ -HR	2
242-567-R1	Pipe flow in/out, AISI 316; 4x6mm length 80mm	2
242-565-R1	Tube Tygon Solva 4.8x8mm; 2m	1



242-050-R1-16000x250µm	Paper spacer channel width 16000µm thickness 250µm	2
242-050-R1-16000x400µm	Paper spacer channel width 16000µm thickness 400µm	2
242-050-R1-16000x500µm	Paper spacer channel width 16000µm thickness 500µm	2
242-050-R1-16000x800µm	Paper spacer channel width 16000µm thickness 800µm	2
242-050-R1-16000x1000µm	Paper spacer channel width 16000µm thickness 1000µm	2
242-901-R1	Set: 10 screws for flowcell core	1
242-902-R1*	Set: complete mounted flowcell core for FC200M 2x 242-508-R1 2x 242-509-R1 1x 242-040-R1 1x 242-041-R1 1x 242-050-R1-16000x400µm 1x 242-901-R1 2x 242-532-R1	1



Recommended flow path for '242109' option



Option '242-571-R1': Backlight set. One set includes 2 backlight Red and Green



Option (Ref: OCC014SW) CALLISTO EXPERT+



CALLISTO EXPERT+ (1 License) (CALLISTO EXPERT + algorithms for bubbles analysis + trajectometry for absolute counting)

## Occhio 'FC200S+HR' short instrument overview

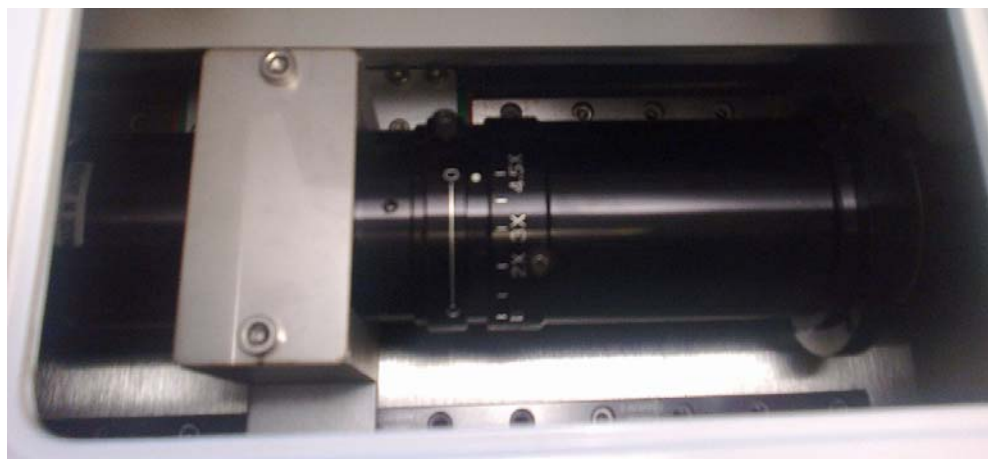
### ***Instrument calibration***

A first calibration is imposed using the magnification table according with the camera and lens specifications.

#### FC200S+

Zoom magnification	Front lens magnification	Global magnification	Instrument calibration $\mu\text{m}/\text{pixel}$	Image size ( $\mu\text{m}$ ) Standard camera 2748x3840 pixels
0.75x	2x	1.5x	1.11	3050x4262
1x	2x	2x	0.835	2295x3206
2x	2x	4x	0.417	1147x1603
3x	2x	6x	0.278	765x1069
4.5x	2x	9x	0.19	522x730

A second calibration, according with customer specifications, is done using standard latex beads from 400nm up to hundreds microns. A calibration table is implemented in the software allows compute distribution values through an automatic size correction.



Model	Occhio Flowcell FC200S+
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Sample dispersion	Water, alcohols, oil, PEG, acid low concentration
Sample particles size range	From 200nm to 1mm
Sample concentration	According with sample property and flowcell thickness (Typical dilution 5%)
Sample analysis	Size distribution cumulate and proportional curve Number distribution or volume weighted distribution Particles counting distribution (size expressed in particles/ml for each size bins)
Standard Operating Procedure includes	Analysis volume(priming, analysis, rinsing) Volume sampling Light intensity calibration Background calibration Particles counting Creation of a particle database Image storage Filtering procedure Automatic reporting generation

**Software mains features**

Model	Callisto Software for Flowcell FC200/M/S+/HR
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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