



Sony, 3-CCD Color Camera



Digital cameras:  
QImaging, single-CCD color  
JVC, digital 3-CCD color

Sony,  
Color camera IEEE1394b



Digital  
Color  
camera  
USB2

## Cameras



# Particle counting FILTREX

### Analysis of oil products

Controlling particle contamination in oil products, such as fuels, hydraulic fluids and lubricants, is critical for all of the system components.

### Cleaning of mechanical parts

Numerous technologies require the use of fluids and parts free from particle contamination. Component cleanliness is particularly important in the automotive and aerospace industries and for instrumentation in general.

### Particle Counting by Image Analysis

Standardized tests using microfiltration membranes have been developed to control the fluids in use easily and with great precision. The membranes retain at their surface all of the particles present and are examined under a microscope, where the particles are counted and their sizes measured in order to determine the pollution class of the fluid or solvent used to clean the parts.

# Applications - Systems

## Sample Preparation



Millipore membranes  
and filter holders



I.F.T.S material

Cleaning systems using  
solvent or rinsing solution  
and high pressure.



Millipore material ®



Membrane filtration system

## Qualification and calibration



Calibration pattern for  
validating the counting  
and sizing.  
Random dispersion  
of particles and chrome  
fibers laser-engraved on  
glass.



Certified calibration rule for  
calibrating the system

## Technical specifications

|                    |  |
|--------------------|--|
| <b>Acquisition</b> | Monochrome or color camera                             |
| <b>Optics</b>      | Microscope or stereo microscope or scanner             |
| <b>Movement</b>    | Compound microscope, stereo/zoom microscope or scanner |
| <b>Computer</b>    | Pentium PC, 3GB RAM, Windows XP                        |



### From 2.5 microns

Counting from 2.5 microns can only be done with a compound microscope. The microscope can be provided with an encoded objective turret for automatic calibration and both transmitted and reflected lighting. Optionally, the microscope turret and focus can be motorized and controlled by the software.

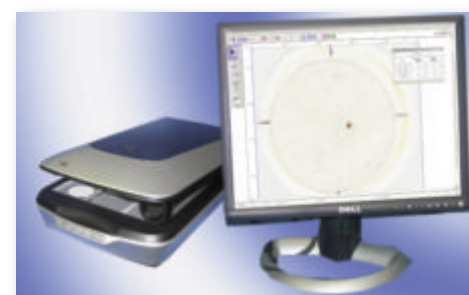
### From 10 microns

The fully-motorized zoom microscope (magnification and focusing) may even be used from 5 microns. The complete analysis of a membrane using a 50 micron threshold is possible in two minutes. Two fiber optic light sources provide transmitted and reflected illumination.



### From 100 microns

A scanner offers an economic solution for rapid analysis of particles 100 microns and larger. The membrane is acquired in a single pass at 1200 dpi. The software memorizes the calibration factor automatically and counting takes place in under three minutes.

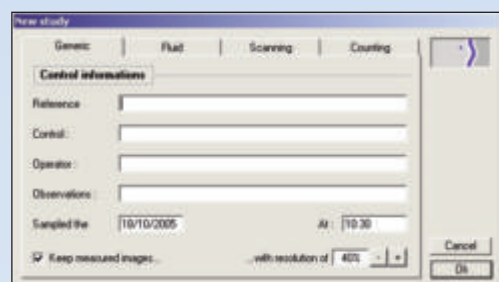


MICROVISION INSTRUMENTS  
CE 1750 - Z.I. Petite Montagne Sud  
8, rue du Forez - 91047 EVRY Cedex  
FRANCE  
Tél : + 33 (0)1 69 11 15 50  
e-Mail : info@microvision.fr  
Internet : www.microvision.fr

Distributed by GT Vision LLC  
10205 Easterday Court  
Hagerstown, MD 21742  
USA  
E-mail : americasales@gt-vision.com  
Internet : www.gt-vision.com  
Tel: +1 240 235 4118

# Particle contamination control: *FILTREX*

## Counting parameters

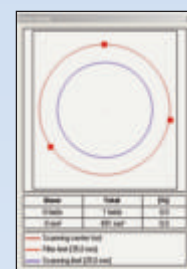
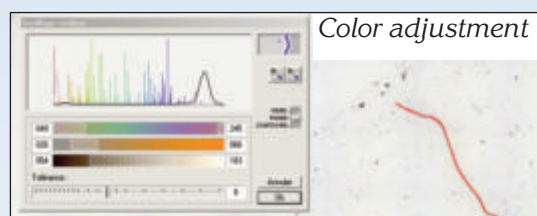
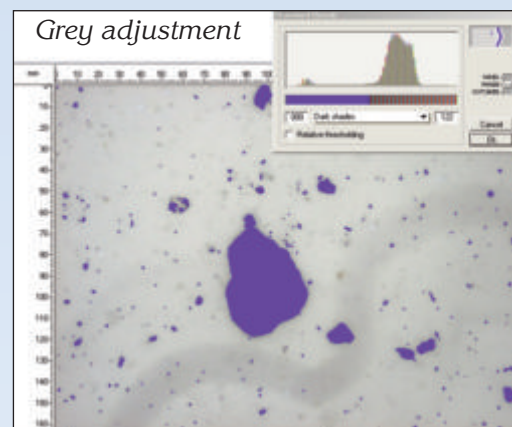


Counting parameter inputs :

- Type of counting: fluid or washing
- Choice of the standard (i.e. ISO 16232)
- Frequency of automatic focusing
- Diameter of the membrane
- Diameter of the scan area
- Classes definition, fibers ratio
- Edge effect settings

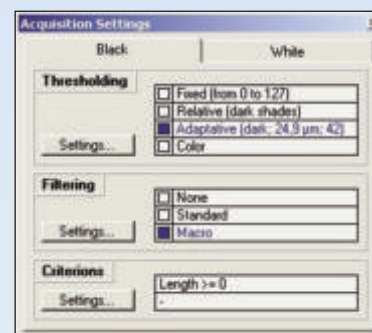
## Image acquisition

The image of the membrane, obtained with a color camera connected to the lens, is digitized and displayed on the screen in real time.

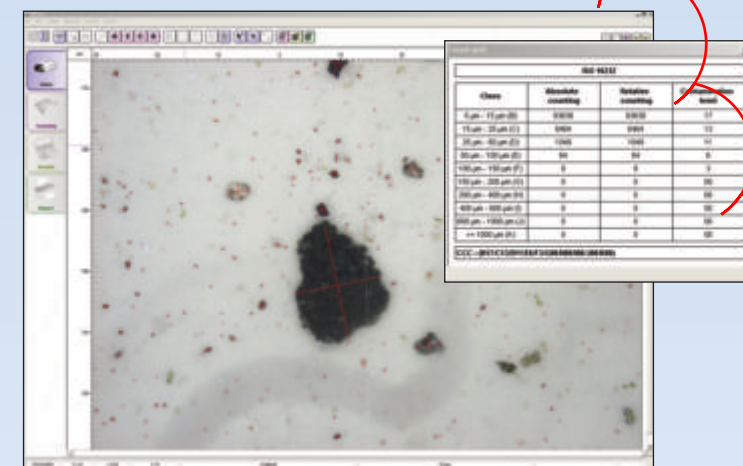


Three-point centering to circle the filtered area.

Adjustment of the detection settings for the particles and fibers

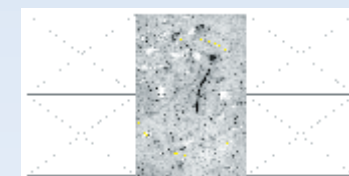


## Measurements

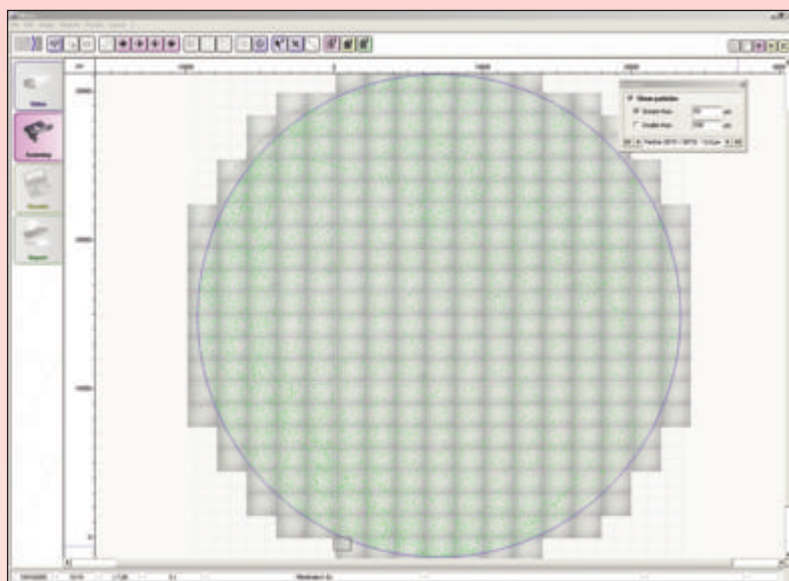


The longest length of the particles is measured

Filtrex detects and reconstructs the objects intersecting the edges of the images



## Mapping and overview



The analysis stage consists in scanning the entire membrane. The overview allows you to check and verify the counting. When you select an area, the system repositions itself on the measured field for any necessary manual corrections.

## Results

The counting results are displayed in a pre-defined order. Depending on the standards, the results indicate a cleanliness index or class and a global cleanliness index.

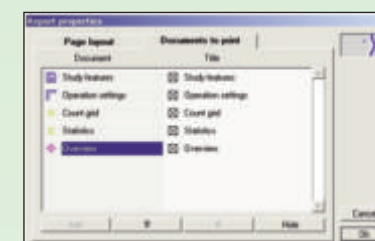
| Class               | Absolute counting | Relative counting | Contamination level |
|---------------------|-------------------|-------------------|---------------------|
| 5µm - 15 µm (D)     | 0                 | 0                 | 00                  |
| 15µm - 25 µm (D)    | 710               | 710               | 10                  |
| 25µm - 50 µm (D)    | 800               | 800               | 10                  |
| 50µm - 100 µm (D)   | 1000              | 1000              | 11                  |
| 100µm - 150 µm (F)  | 201               | 201               | 9                   |
| 150µm - 200 µm (D)  | 91                | 91                | 7                   |
| 200µm - 400 µm (F)  | 73                | 73                | 7                   |
| 400µm - 600 µm (D)  | 4                 | 4                 | 2                   |
| 600µm - 1000 µm (D) | 2                 | 2                 | 1                   |
| >= 1000 µm (D)      | 0                 | 0                 | 00                  |

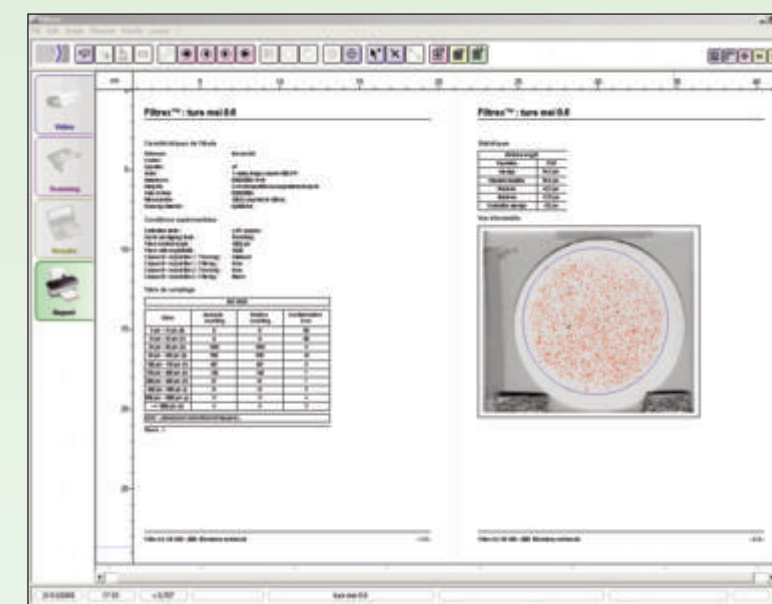
| Particle length    |          |
|--------------------|----------|
| Population         | 3074     |
| Average            | 69,7 µm  |
| Standard deviation | 53,7 µm  |
| Minimum            | 21,2 µm  |
| Maximum            | 317,3 µm |
| Quantile 0 average | 65,7 µm  |

Counting table and statistics exportable to Excel.

## Reports



Customized adjustment of the elements in the report with the option of being able to insert a logo.



Creation of the Study report in real time.