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Digital Cameras

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Image analysis software

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Software for grain size measurement

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Software for cast iron analysis

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Software for cleanliness analysis

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## Imaging solutions for material analysis





## Digital cameras

### CMOS USB 3.0 cameras

#### Sony Sensors

High frame rate

High sensitivity

High color fidelity

#### CV3-2 Camera

Extra large sensor for a wider field of view

CMOS digital color camera with 2.3 Megapixels resolution (1936\*1216), 40 frames/second, 1/1.2" sensor, C Mount, USB 3.0 interface

#### CV 3-3 Camera

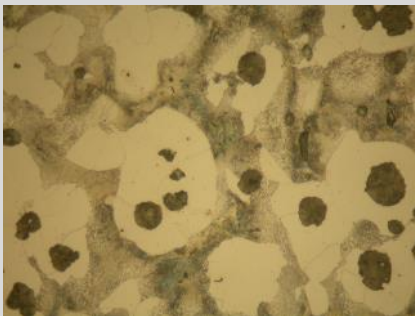
The excellent compromise between speed and resolution

CMOS digital color camera with 3 Megapixels resolution (2056\*1536), 57 frames/second, 1/1.8" sensor, C Mount, USB 3.0 interface

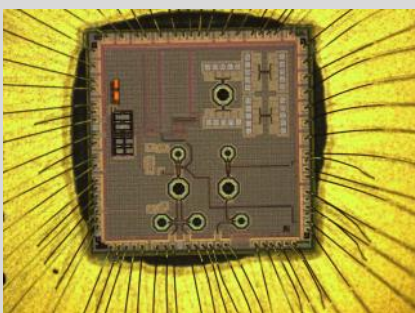
#### CV 3-5 Camera

Large sensor and 5 megapixels resolution

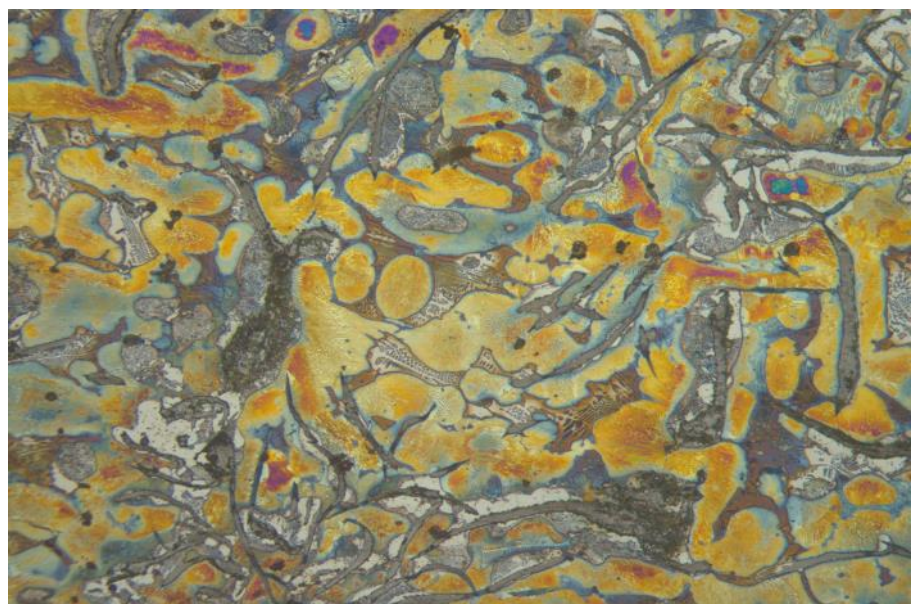
CMOS digital color camera with 5 Megapixels resolution (2456\*2054), 36 frames/second, 2/3" sensor, C Mount, USB 3.0 interface



Cast Iron

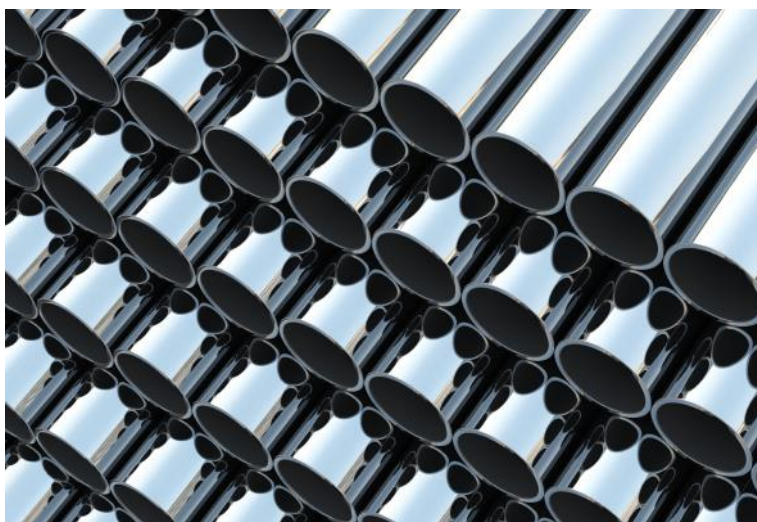
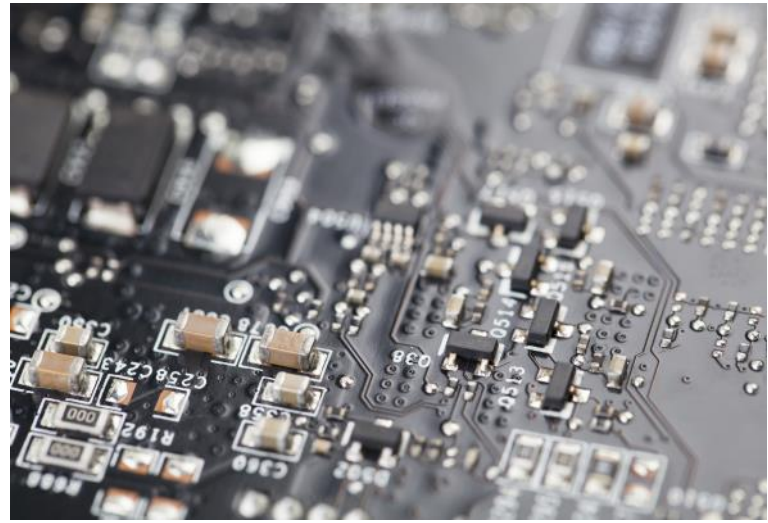


Electronic Industry



Cast Iron







## Perfect Image Software

### Imaging tools for material analysis

#### Friendly & interactive image acquisition

Perfect Image allows capture of high-resolution images from our digital cameras or from any Twain devices.

The user-friendly interface allows you to adjust many camera settings to ensure optimal image quality such as: auto exposure, auto white balance, gamma, saturation, hue, etc ....

User defined camera settings are recalled on a single mouse click.

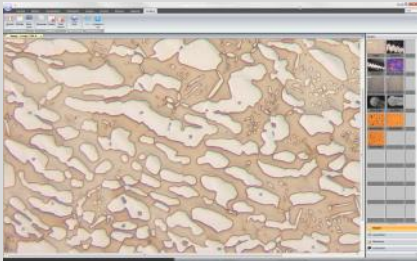


Image acquisition

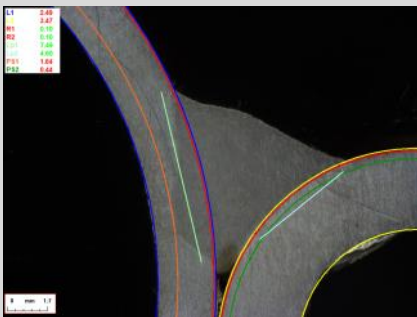
#### Image labelling and Image enhancement

Annotation feature allows quick and easy documentation of your images (text, arrow, scale bar...). An additional set of tools allows you to adjust the levels of your images (color, brightness, contrast, saturation...).

#### Calibration

Perfect Image allows easy calibration of your optical devices.

After image acquisition, calibration information is automatically stored in the image file, ensuring complete traceability and minimizing the risk of errors.



Weld bead measurement

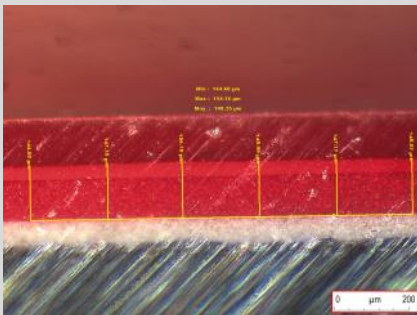
#### Interactive measurements

Perfect Image includes a large range of measurements tools: Length, Area, Angle, Radius, Diameter...

For most common applications, some specific tools are also available:

- Layer thickness measurement
- Hardness measurement
- DAS measurement
- Objects counting ...

Perfect Image measurement tables are completely configurable so as to cater to any kind of request.



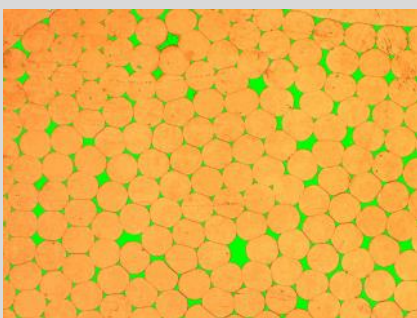
Layer thickness measurement

#### Phase analysis

Perfect Image offers a fast and flexible phase content analysis function. Phase detection is applicable to both black and white and colour images.

Phase content, Void fraction, Porosity rate...

The phase analysis tool is fully customizable to meet all your needs.



Void fraction measurement

## Perfect Image Software

### Imaging tools for material analysis

#### Multifocus / Extended depth of field

Reconstruction of a sharp image from images acquired at various focus levels. Multifocus is an essential function that can correct the flatness defects on a microscope or a binocular.

After capturing a stack of images with a different focal point, the sharpest areas are extracted in a new perfectly sharp image.

#### Metaview / Image stitching

Create panoramic image from neighboring images. Images from the mosaic are captured with a manual movement X and/or Y (or by an automatic movement with the use of a motorized stage). These images are then used by the MetaView software for a semi-automatic reconstruction of high resolution panorama image.

#### Reports

Perfect Image is provided with a powerful and intuitive report generator. All generated results can be exported into customized templates.

Generated documents can be exported to the most common applications (Word, Excel).

#### Image database

Perfect Image software can be complemented with the optional LEM module (image database).

Images are saved through keywords defined by the operator.

Databases can be created locally or on a main server.

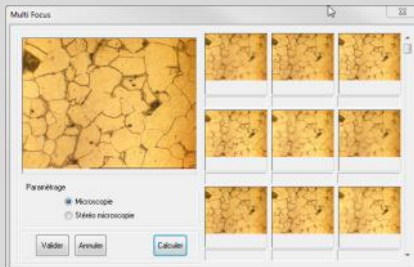


Image with infinite depth of focus



Image stitching

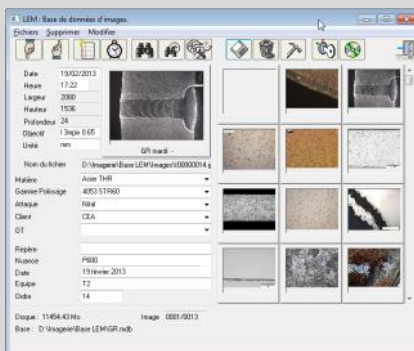


Image database



Inspection of electronic components

## Perfect Image Gold Software

### Optional module for automated measurements

#### Fields of applications

Gold module is mainly dedicated to particles size analysis, phase analysis, porosity measurement, objects counting, etc.... in many different areas : Metallurgy, Pharmaceuticals, Quality control...

The provided tools with the gold module allow automation of repetitive tasks and the analysis of a large number of samples.

#### Tools and Automation

Gold module characterizes precisely and easily objects morphology. All steps of the objects analysis are available within the module, from sample characterization, automated sample analysis, results publishing and reporting.

Many filters based on objects shape and dimensions are implemented in the module. These are filters from mathematical morphology including : erosion, dilation, skeletons, watershed, feeling holes, border kill, cleaning, automatic object separation, ... all these filters are customizable by the operator.

Gold module has a powerful macro commands editor that automates repetitive tasks. Macro commands are built in a step by step mode by recording the differents tasks to be chained. Macro commands are also designed to accept VbScript commands (VisualBasic programming language from Microsoft). Basic macro commands can call other macro commands.

#### Reports and Statistics

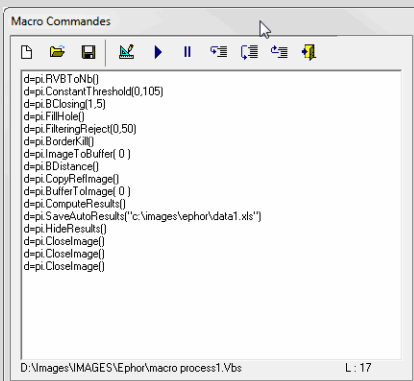
All generated results can be exported to Excel, the operator has immediate access to all Excel features to create and edit complete reports.



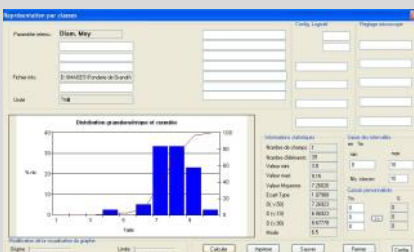
Powder analysis



Granulometry on industrial diamond



Creating macros



Statistical monitoring



Tire footprint analysis using image analysis





## Cast Imager Software

### Software for cast iron analysis

#### Cast Iron analysis

Cast Imager is a stand alone software dedicated to cast iron analysis in a production environment, where simplicity and speed of use are essentials.

#### Nodularity

With Cast Imager, graphite nodules are automatically dedected and analysed according to their shape and size. Artefacts can be automatically or manually removed.

Graphite nodules are analyzed according to ASTM A 247, EN ISO 945 and NF A04-197 standards.

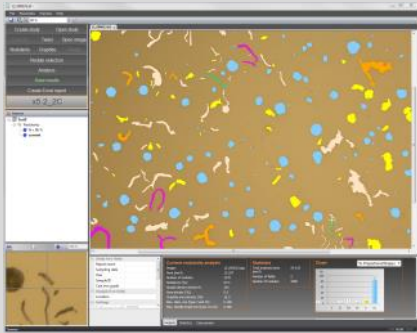
Cast Imager continuously displays the number of detected nodules, total analysed area, nodule density and max. diameter.

#### Ferrite/Perlite rates

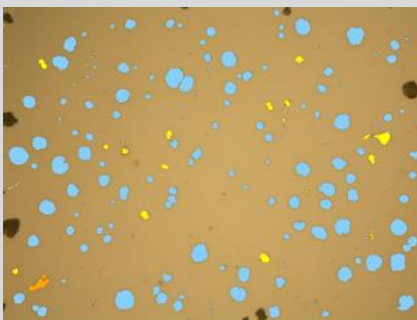
Ferrite and Perlite rates are calculated taking into account the graphite's rate. This rate is manually filled or comes from the study of the sample before etching.

#### Analysis report / Results archiving

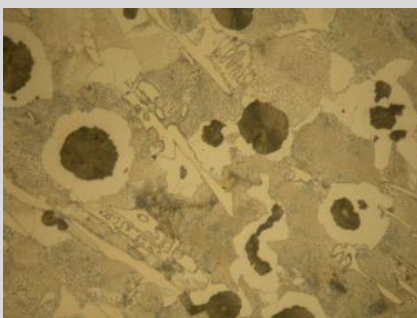
Creating an analysis report is done on a single mouse click through Excel. Results are saved by casting reference and are immediately usable by a process monitoring software.



Cast Imager Software



Graphite nodularity analysis



Ferrite rate analysis



Cast Iron casting



## Grani Software

### Grain size measurement

#### Grain size analysis

Grani is a stand alone software dedicated to grain size measurements according to ASTM E 112 and EN ISO 643 standards.

Simplicity and friendliness of use for quick and accurate measurement of your samples.

#### Intercept method

Intercept method allows reliable and reproducible measurements through 5 masks adjustable in size and position, complying with ASTM E 112 and EN ISO 643 standards.

Grain boundaries are automatically dedected and all manual adjustments are possible.

#### Image comparison method

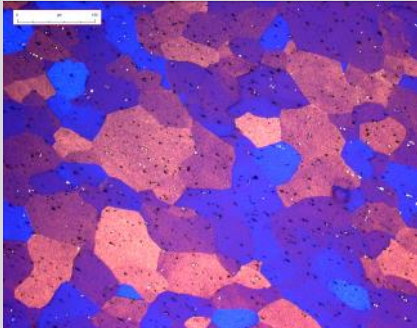
Comparison to reference images allows a quick estimate of the grain size index on the live or frozen image. This method can be extended to any application requiring the use of other reference images.

#### Granulometry analysis

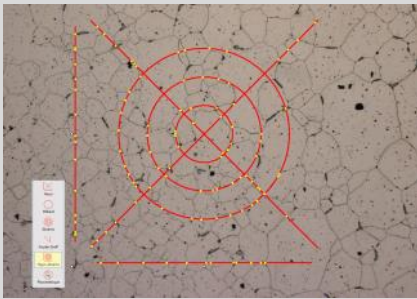
Highlighting and detection of grains boundaries by automatic thresholding. Grain size distribution according to the G index, statistical results (Min, Max, Average, ...).

#### Analysis report / Results archiving

Creating an analysis report is done on a single mouse click through Excel. Results are saved by study reference and are immediately usable by a process monitoring software.



Sample observed with polarized light



Intercept method

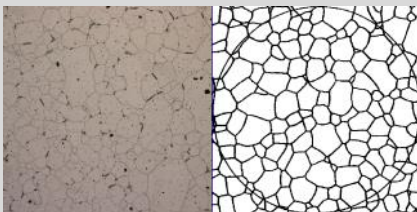
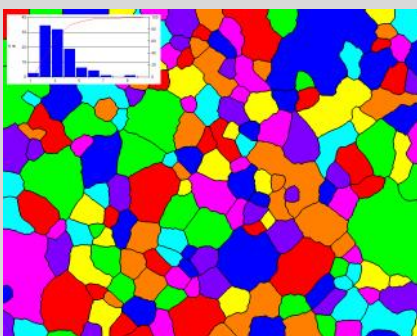


Image comparison method



Granulometry analysis



Lamination

## Filtre Expert Imaging Station

### Cleanliness analysis

#### Imaging station dedicated to cleanliness analysis

Filtre Expert is a solution dedicated to the analysis of residual particles on mechanical parts and in hydraulics fluids. The filtration membranes having served to recover the contaminant particles are analyzed to quantify the size and the number of pollutants.

#### Filter digitization: Optical Microscope or Scanner

Digitization of the membrane by means of a high resolution professional scanner allows a quick and easy analysis. Detection limit of the particles is 50  $\mu\text{m}$ .

The use of an optical microscope coupled to a motorized scanning stage X, Y and Z can meet the most stringent standards. Detection limit of the particles is 5  $\mu\text{m}$ .

#### System administration

Filtre Expert software allows you to work according to various international standards: NF L 41-101, ISO 16232, ISO 4406...

The operator can also configure the counting classes and the pollution code to meet specific standards: PSA D79 5452, Volvo STD 107-0002, ...



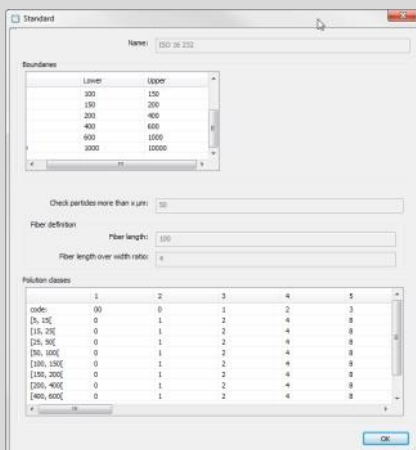
Fiber on membrane surface



Motorized stage for optical microscope



Digitization on a flatbed scanner

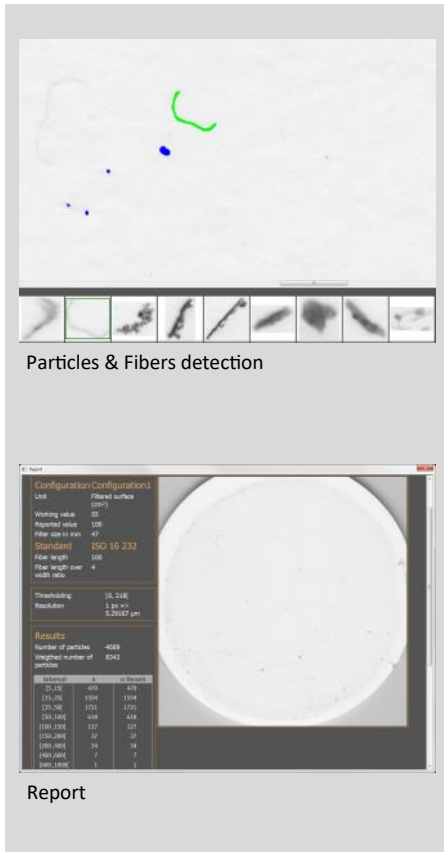


System administration



Membrane inspection on an optical microscope





**Measure / Count / Classify**

Filtre Expert is designed for instant getting started with a step by step measurement procedure.

Particles and fibers detection on the membrane is performed in a few seconds. Particles are measured by their greater length. Filter Expert automatically rebuilds objects crossing several fields.

While exploring the filter, particles and fibers are sorted according to the selected counting standard.

Images of the most distinctive particles and fibers of the membrane are automatically extracted for visual operator checking and reporting purposes.

**Report**

Creating an analysis report is done on a single mouse click through Excel.

The results are saved by study reference and are immediately usable by a process monitoring software.



Weld bead measurement station



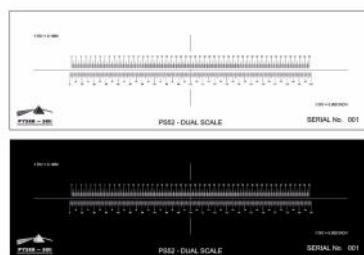
Macro-photography bench



High magnification zoom lens



Macro/Micro photography bench



Calibration slides



Microscope motorization



Our imaging solutions are sold through a worldwide network of specialized distributors.

Please contact us to locate the nearest distributor.

The biggest names in the industry rely on Clara Vision solutions



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