ACUCAL

High Tech Quality Instruments

Metallurgical Image Capturing & Measurement Software

Type: ACUMET+

INTRODUCTION

ACUCAL offers Metallurgical Image Capturing & Measurement Software with all High Resolution Microscopy Cameras. It is the most efficient and flexible image processing software for Metallurgical Microscopes. It has intuitive user interface and simple to use navigation with a suite of image processing techniques, measurements and enhancement tools that set it apart from other mainstream softwares.

It is essential software for study and documentation of microstructures using fast and automatic image processing techniques ***Software comes with facility of Report Generation in excel***

FEATURES

- Compatible for all ACUCAM Series camera.
- Windows Win7, Win8, Win 10,Win 11 (32/64 bit)/Max/Linux.
- Ultra Fine color engine.
- Diversified useful tools.
- easy to acquire images, count, measure, and classify objects, and automate work.
- Machine vision; Astronomical observation.

What's in the included software

User-friendly UI design

- Well-arranged menus and toolbars ensure quick operating;
- The unique design of 5 sidebars Camera, Folders, Undo/Redo, Layer, Measurement are orderly classified ;
- Convenient operating method (Double click or right-click context menu) as much as possible;
- Detailed help manual.

Software Tools

Image Editing	Cut, Copy, and Paste. Selected copy by free hand AOL controlled by four arrow keys available on keyboard or mouse with zoom preview. Crop, duplicate, restore. Resize, Compression Conversion to other format BMP, JPG, TIF, PNG, GIF & PSD Flood fill or spray with selected colour at selected portion
Grid Creration	5X5, 10X10 & 100X100 grids (or cells) Drawing tool curve, line, square, and circle with node control and provision to ch angle colour & thickness of the line. Write text in any colour or font Pointer to place on an object in either of four directions with provision to change its colour & thickness. Eraser works only on line, arrow or on any drawing tool.(not on original image) Camera Lucida. Montage feature to merge stored image together. Useful to Merge different focuses of same image ,Image stitching, Highlighter Write text in any colour or font Pointer to place on an object in either of four directions with provision to change its colour & thickness Eraser works only on line, arrow or on any drawing tool.(not on original image) Camera Lucida Montage feature to merge stored image together. Useful to Merge different focuses of same image ,Image stitching Highlighter
View	Zoom in/out, Zoomed preview, Rotation at 90, 180,270 or custom, Image flipping; horizontal or vertical axis, Intensity histogram Image Information, Redo/Undo on all operations
Image Processing	Background subtraction and contrast enhancement of colour or greyscale images Arithmetic image functions (Boolean Math; Add, AND, OR, XOR, DIFF, MIN, MAX, +, -, /, *, And Simple).
Routine Filters	Invert, Brightness, Contrast, Hue, Saturation, Blur, Noise Remove, Emboss, Engrave, Gamma R, Gamma G, Gamma B, Yellow, Magenta, Cyan, Mosaic, Smooth, Desideration, Pseudo Colour, Colorize, Oilify, Despeckle, Posterize.
Special Filters & Karnels	High Boost, High Spatial, Low Pass Spatial, Ranking (Max, Med, Min), Point detection, Line detection, Homogeneity
Edge Detection	Laplacing, Sobel, Krisch, Prewitt Gradient, Shift & Difference, Combine, Contrast Base, Quick, Range And Variance.
Morphometry	Skeletonizing, Pruning, SKIZ, Histogram Equalization, Histogram Smoothing, Histogram Peak, Histogram Valley, Segmentation by Over/Under and Quantized, Contorting, Dilation / Erosion on Binary, Gray & coloured Images, Opening/ Closing on Gray & Binary Images, Special Opening/Closing, Split/Combine of RGB, YUV, YIQ, XYZ, & HSL, Changing any Image to 1, 4, 8 & 24 bits, Medial Axis. Transformation, Halftone. Image Addition, Image Average, Image Subtraction, Image Multiplication.
Measurement	Spatial calibration Line measurements for Distance, Length, Width, Perimeter, Angle, Three Point Radius Area by enclosed line controlled by four arrow keys available on keyboard arrows with zoomed preview.
Live Measurement	Live Measurement can handle monochrome (8 bits) and colour (24 bits) images. Multiple images of any size can be opened and displayed on the screen for analysis or comparison. The software support most common formats BMP, JPEG, TIFF, PNG, GIF & PSD. The live image can be observed and captured on the same platform. And the software also support Measurement On Live Images. Live measurements for Line , Ellipse , Rectangle , Circle , Centre Circle , 3 Point Circle , 2 Line Angle , 3 Point Angle, Centre to Centre, Parallel line Perpendicular line , Point to Point Horizontally, Point to Point Vertically , Poly line ,Perimeter , Curved Area , Curved Length , Perpendicular Distance, Min Distance, Max Distance, Circle to Point and Chord.
Count & Classification	Identification of objects in an image, count them, obtain several features measurements. Objects identification by user or automatically. User defined classification on basis of size or intensity.
Threshold Particle Measurement	Manual, Auto bright and Auto dark methods to identify intensity range defined object to be measured. Various calculation & measurements available for selected Particle are; Dimensions, Area, Perimeter, Feret Length, Min/Max Radius, Thread Length, Thread Width, Fibre Length, Fibre Width.
Morphometry	Roundness, Shape, Orientation, Elongation, Equal Circular Diameter, Equal Sphere Volume.
Locational	Centroid X, Centroid Y, Major X1, Major Y1, Minor X1, Minor Y1, Major X2, Major Y, Major X2,Minor Y2, Box X1, Box X2, Box Y, Box Y2 & Box Area.

Phase Segmentation	Measure area fraction & volume fraction. Identify multiple phases within Microstructure. Also delineate phases from the histogram as per ASTM Standard E562 & E1245.Phase detection and its area estimation on the basis of its grey scale. Option for multiple phase delineation and coloured overlays display in the same field of histogram.
Nodules measure	Nodularity as per ASTM 247 standard. The Nodules & Flakes are separated on the basis of its shape and aspect radio. The detail measurement of each microstructure is available for further analysis. The processed image displays non-Nodules in different colour. The Nodules can be classify by its range on the basis of its size & shape.
Porosity	They are recognized on the basis of its intensity as per ASTM B-276 standard. The measurement of each pore is displayed. The processed image displays pores in Red colour.The total number of pores count with the percentage of minimum and maximum size. On the basis of count, the average size pores report.
Case Depth	ASTM ISO 2639-02, BS-6479-84, IS-6416-88 JIS G0557DIN 50790. The test determine the depth of hardened surface under low magnification by measuring the distance from the surface to the point shaving a different coloration towards core.
Coating Thickness	This application rapidly measures the thickness or width of a coating at multiple positions along a sample as per ASTM B487 standard. Tabulated results available for min/max and mean of width measured at various points of sample cross section. Thickness of metal & Oxide coating through interactive or automated methods by microscopically examination of cross section as per ASTM 1077 industrial method
Decarburisation	Measured depth or width of decarburisation occurs as per ASTM 1077 standard. measurements of Depth of partial/total decarburisation from the surface of steels.
Grain Size	The module analyze Grain image and measure the Grain no. & Grain size using ASTM E 112 , JIS G-551, E-930, E-1181, ISO 643-03, BS 490 DIN 643-03, IS-4748-88, SIS 111101 GOST 5639-82 The options for measurement available are 1. Manual Trace, 2. Popular Comparison Method, 3. Quick single Grain measurement, 4. ALA method, 5. Interception method. Various filters to make user defined templates. Grain boundary repair mathematical function.Heyns Lineal Intercept Method, Abrams Three Circle Method,Heyns Abram Intercept Method ,Random Line Method Comparison Method Cementite (Iron Carbide),Inclusion Analysis Rusting (ASTM-E1268)Spheroidization
Non Metallic Inclusion	Measure inclusions and report ASTM E-45, E-1245 AND DIN-50602, JIS G-552 numbers, cumulative length, width ratio.
Graphite Flakes	Graphite Flakes length, width, distribution and percentage as per ASTM A-247-67, ISO 9451-1, DIN EN 945-94, BIS 7754 JIS G5504, IS-7754. Spheroidal Graphite: Automatic separation of nodules from non-nodules on the basis of its spherodicity. The nodule size designated by Arabic numbers 1 to 8 and nodule form designated by roman numbers I to VI. The nodules per sq.mm, ferrite, pearlite ,graphite, carbide report in fetched sample. Lamellar graphite: Provide graphite length and its size class designated by Arabic numbers 1-8 on the basis of A247 ASTM standard. Graphite type is designated by capital letter A to E and is reported on the basis of its orientation.
SG Iron Analysis	The module automatically analysed & calculate Nodulanty/Non Nodulanty percentage. Determine its class and number from 1 to 8 as per ASTM, JIS, BIS &ISO standard s, Nodules per square mm is also on Etched sample it reported. Determine percentage of pearlete, graphite, ferrite and carbide.
Cast Iron Analysis	The dedicated module determines flake size from 1 to 8 as per ASTM, JIS, and BIS & ISO standards. The type distribution percentage A, B, C, D, E is calculated interactive tools. Flakes per square mm is also calculated simultaneously.
Dendrite Arm Spacing Report	a)Three options: Direct printout with original image processed Image & Tabular results b)Export to MS Office or Excel for further modification