

**A) Image Analysis Software.**

**Model: Metimage Lx Plus**

**Make: Metavis**

A	<b><u>SALIENT FEATURES</u></b>
	<ul style="list-style-type: none"> <li>● Easy and user friendly interface with minimum clutter on screen.</li> <li>● Monochrome and true color image support.</li> <li>● Capability to analyze images from cameras and scanners with format at least up to 2k x 2k pixels or better.</li> <li>● Has inbuilt drivers for direct image acquisition from frame grabbers and USB digital cameras.</li> <li>● Live image preview and capture from within the software.</li> <li>● One click image captures and save operation with auto filename generation to enable easy and rapid image capture of several fields from a sample.</li> <li>● Additional inbuilt Twain support for image capture thru Twain compatible image capture devices</li> <li>● Comprehensive image processing tools for color, gray and binary operations.</li> <li>● Functions include image transformations, image operations, pixel operations, image arithmetic, image processing (Binary, gray scale, color), background subtractions, shading corrections, image filtering, image enhancements, image segmentation etc.</li> <li>● Binary mask/bit plane support with 16 bit planes.</li> <li>● Capability for manipulating individual binary masks with filters, Boolean, logical operations &amp; feature extractors to derive and extract features/objects from image.</li> <li>● Comprehensive image analysis features.</li> <li>● Minimal user intervention for most analysis (macro driven) to ensure repeatability and accuracy.</li> <li>● Automatic analysis modes to avoid manual thresholding of images.</li> <li>● Comprehensive Macro builder/editor to design and run a set of processing or analysis operations at one stroke.</li> <li>● Load and save user definable macros.</li> <li>● Batch run feature to analyze several image fields at one stroke and automatically generate a comprehensive report.</li> <li>● Generate customizable reports that can be saved in Microsoft Word format for easy retrieval and archiving. User defined or customizable report templates with images and result tables.</li> <li>● Inbuilt transfer of results and raw data to spreadsheets such as Microsoft Excel.</li> <li>● Comprehensive set of macros to cover most applications</li> </ul>

<b>B</b>	<b><u>GENERAL ANALYSIS MODULES</u></b>
	<ul style="list-style-type: none"> <li>• Spatial and intensity calibrations</li> <li>• Repeatable and accurate spatial calibration with traceable accuracy</li> <li>• Auto edge detection tools to minimize human error</li> <li>• Interactive feature measurements (lengths, distances, morphometry, ratios, area fractions, color fractions, densitometry etc.).</li> <li>• Ability to define a measurement set to suit a analysis requirement</li> <li>• Automated feature measurements with a comprehensive list of size, shape, position, color, texture and skeletal measurements). Ranges/bins.</li> <li>• Classification and reporting of features into user definable, Inter-particle distance measurements for each feature.</li> <li>• Field measurements (intercepts, chord sizes, areas)</li> <li>• Stereology with user definable grids and point count, area fraction measurements etc.</li> </ul>

<b>C</b>	<b><u>MATERIALS ANALYSIS MODULES</u></b>
	<ul style="list-style-type: none"> <li>• Grain size estimation Analyze (Includes methods as per ASTM E 112, E 1382, IS 4748. Results can also be presented in other formats. Automatic and semiautomatic interactive methods allow analysis of different sample types. Both plan metric and intercept method are provided</li> <li>• Phase/Volume fraction measurements Phase: Phase (Area%, volume fraction) measurements (includes methods as per ASTM E562) .Allows the user to measure phase percentages or volume fractions from the image. Up to 48 phases can be measured. Automatic and semiautomatic interactive methods allow analysis of different sample types.</li> <li>• Graphite flake measurements: Graphite flake measurements (includes method ASTM A 247) Identify and measure graphite flakes: Obtain %graphite area, Measure and classify graphite flakes according to length</li> <li>• Nodularity measurements : Nodularity (includes method ASTM A 247)</li> <li>• Identify and measure graphite nodules. Obtain nodularity, nodule density. Classify nodules on the basis of size.</li> <li>• Porosity measurements Identify: Porosity (Includes ASTM B 276) and measure porosity. Obtain areas, sizes, percentages etc</li> <li>• Decarburization depth Obtain : Decarburization depth ASTM E 1077, ISO 3887, total or partial decarburization depths</li> <li>• Coating Thickness Measure :</li> <li>• Coating thickness ASTM B 481, ISO 1463, cross sectional thickness</li> <li>• Banding:</li> <li>• Measure banding levels according to ASTM E1268</li> <li>• Dendrite Arm spacing: Use the interactive dendrite orientation feature to properly align measurement lines over dendrites. Measure - Total spacing count, Mean spacing, Minimum spacing, and Maximum spacing.</li> </ul>

- Inclusion Rating (as per ASTM E 1122): Inclusions according to the ASTM E 45 and ASTM E-1245 method. Both JK Inclusion ratings and second phase constituent method analysis can be performed.