OmniMet™
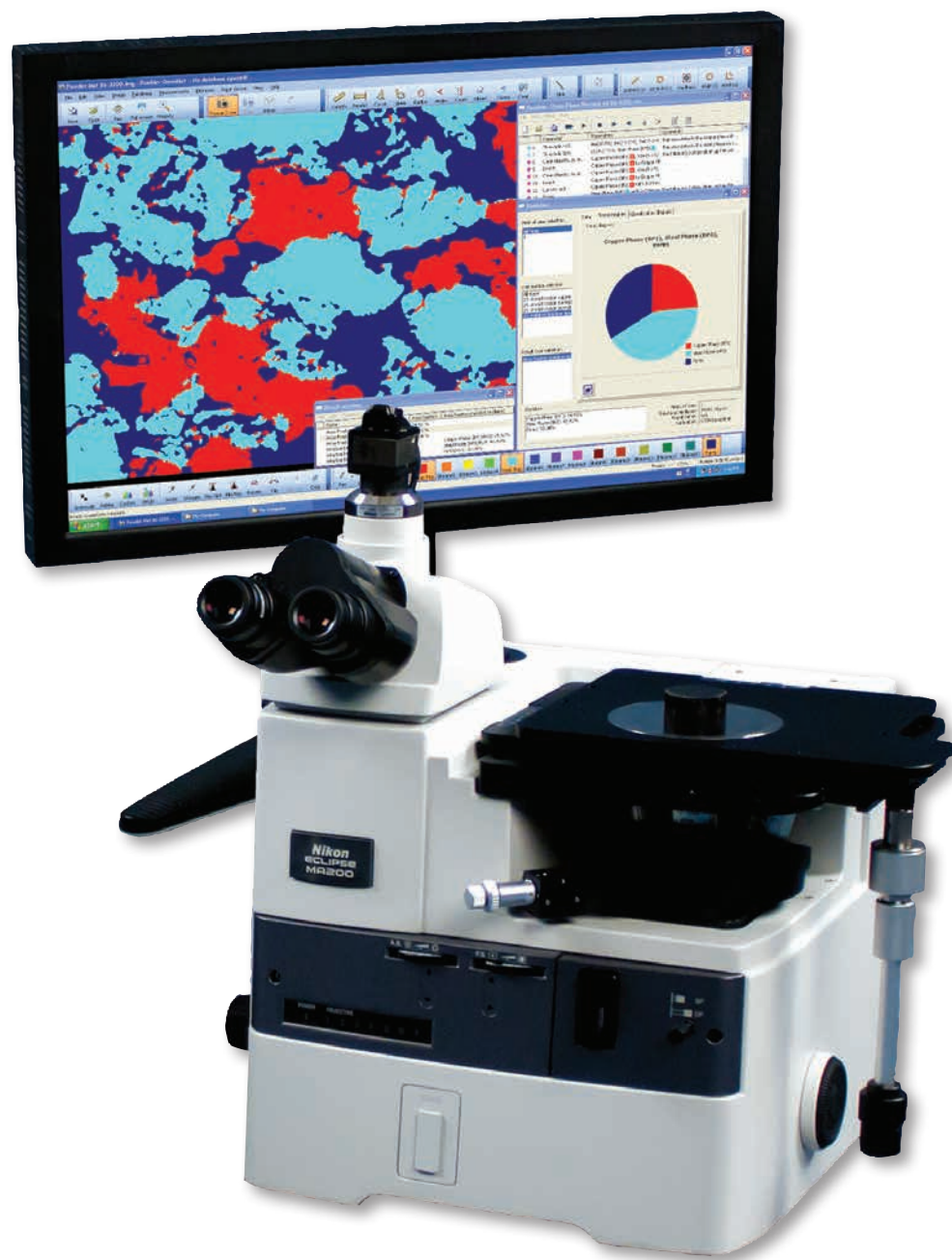## Solutions for Image Capture & Analysis

BUEHLER

Solutions for Materials Preparation, Testing and Analysis

OmniMet™ Modular Imaging System

OmniMet delivers powerful image analysis possibilities combined with flexible database functionality. Customize OmniMet with intuitive user friendly point-and-click measurement possibilities, pre-programmed analysis Scripts, or with capabilities for running user programmable analysis Scripts. The database utilizes a multi-tiered approach to logically organize numerous users and image data with unprecedented ease.

The OmniMet system offers seamless point-and-click integration of microscopes, cameras, and image analysis software via an intuitive Microsoft® Windows® interface. In general any standard format image may be viewed directly from a calibrated microscope or be imported into OmniMet for analysis. OmniMet software is offered at different levels of flexibility, functionality, and analytical power to meet the metrology needs of every laboratory requiring image data archiving and quantitative image analysis.

Capture, Measure, Report, Organize with OminMet Modular Imaging System.

Point-and-click Measurements

- Make simple to complex measurements with intuitive menu options
- Reduce steps with application specific Modules and Scripts
- Comply to national standards with the click of a button

Seamless Integration

- Connect to a multitude of cameras, microscopes, and motorized stages
- Calibrate captured images to equipment magnification
- Purchase as a system for a turnkey solution

Automated Imaging Analysis

- Create or run pre-programmed Scripts to eliminate repetitive steps
- Improve quality control by following the same process each time
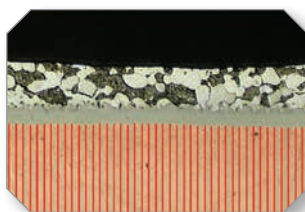- Export data to Word or Excel automatically

Flexible Modular System

- Choose from a variety of Modules and Scripts to customize according to application
- Choose level of automation with six different Editions
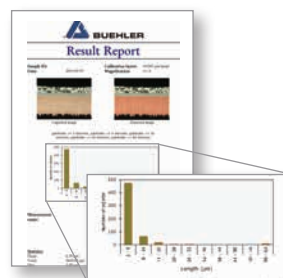- Upgrade functionality from one Edition to another at any time

Capture
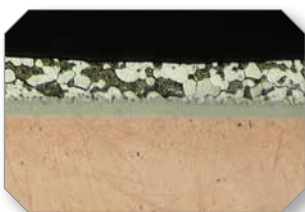
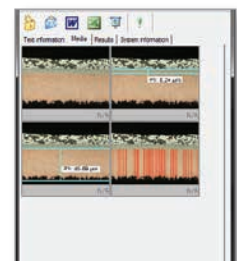## Measure

Report

Organize

Image Capture

OmniMet seamlessly interfaces with cameras, microscopes and motorized stage controllers to capture, analyze and store images. Calibrate images to microscope settings to burn in scale bars and other annotations. A variety of image manipulation and camera tools may be applied to refine and sharpen the image for analysis.

See the Buehler Product Catalogue for a full listing of cameras and microscopes.

The following are included in OmniMet Capture N' Measure Edition and higher:
- Load and save images
- Brightness and Auto-White Balance
- Digital Zoom, Rotate, Calibrate and Annotate
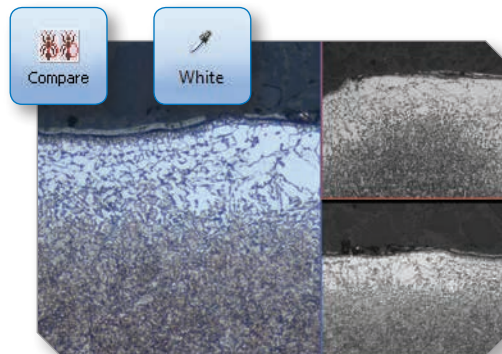
*With image capture, two or more images may be opened side by side and imspected visually*

Capture Modules

Multi-Focal Imaging *(optional module 86-4130)*

A multi-focal image of a circuit board is shown. In this case, due to the non-flat nature of the surface, the image needs to be focused in multiple planes to create a multi-focal image suitable for subsequent analysis and reporting.

This module is ideal for applications including:
- Electronics
- Fasteners
- Uneven surfaces
- Metallic foams
- Ceramic Composite Matrix (CMC's)
- Coatings
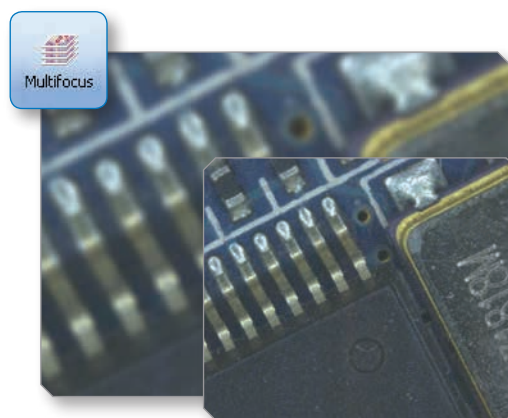
Mosaic Image Stitching *(optional module 86-4140)*
Larger images may be easily stitched together using the Montage application. If the single view images are calibrated then the larger stitched image will also be calibrated and suitable for quantitative image analysis.

- Drag and drop images onto the Montage window
- Montage assists with image alignment for a seamless composite image
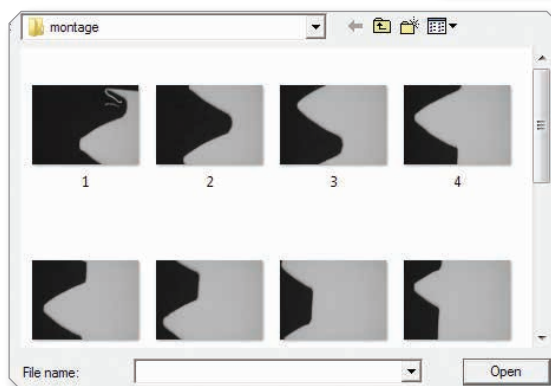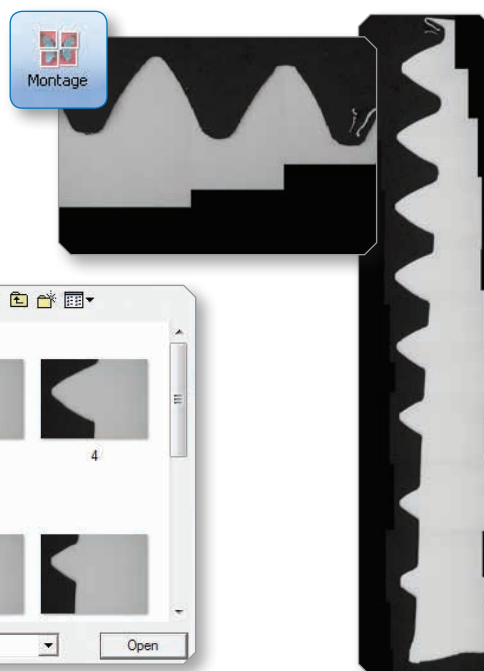
Measure

Standard Measurement Modules

Analyze images with interactive point-and-click measurement modules. Intuitive buttons allow for quick measurements. Burn in results directly onto the image.

The following are included in OmniMet™ Capture N' Measure Edition and higher:

- Length
- Radius
- Angle
- Parallel Lines
- Curve (freehand)
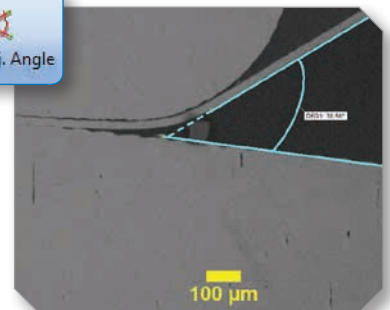- Count Objects
- Area & Perimeter
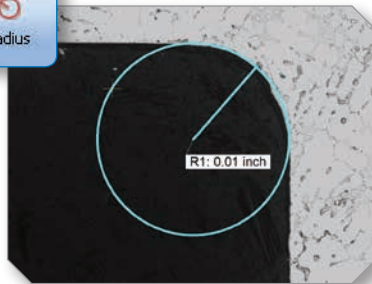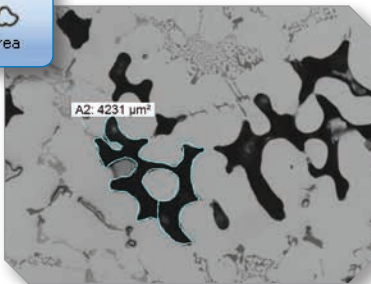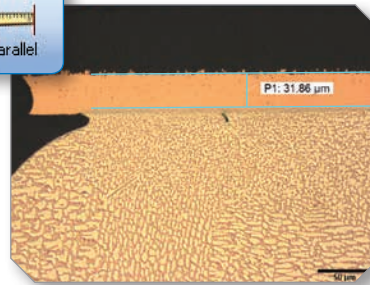
Advanced Measurement Modules

Perform analysis with increased versatility with Advanced Measurement Modules.

The following are included in OmniMet Advanced Edition and higher:

- Fixed Parallel Lines
- Polygon
- Circle - 3-point
- Adjustable Angle
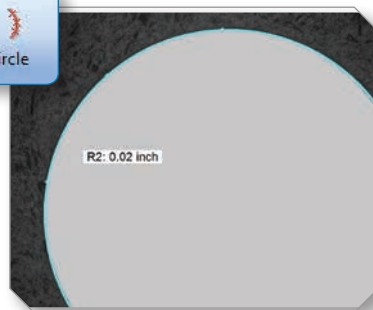
Object Analysis *(optional module 86-4110)*

Measure objects by applying a threshold within a specified region of interest: entire image, rectangle, or freehand ROI.

Show results by area fraction, area position, number of objects, perimeter, compactness, length, feret diameter, center of gravity, inclusion, and exclusion of objects by size.
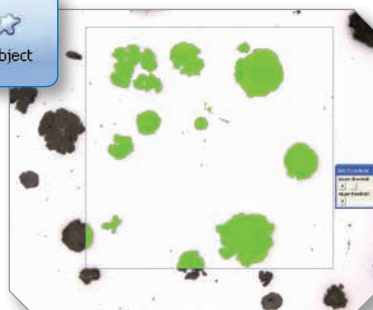
Square Region of Interest

Freehand Region of Interest

Advanced Measurement Modules (cont'd)

Grain Size *(optional module 86-4125)*

Grain sizes may be easily estimated according to ASTM E112 using linear and circular intercept techniques:

- Linear intercept method is recommended for uniform grain sizes
- Circle intercept method is recommended for measurement of non-symmetrical grain sizes
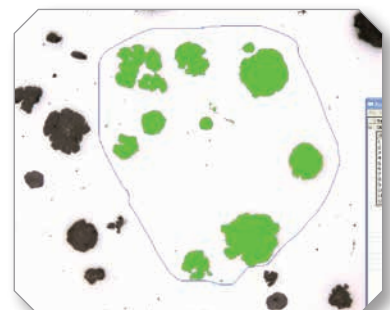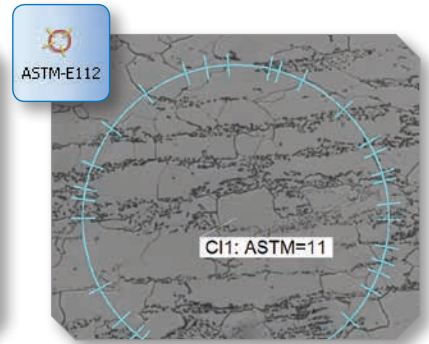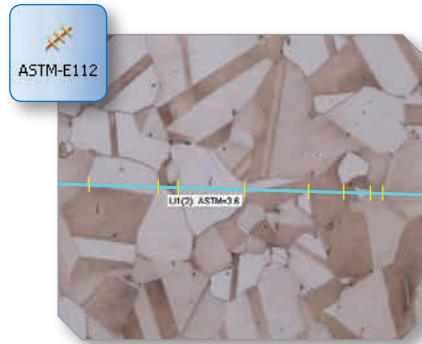
Weld *(optional module 86-4115)*
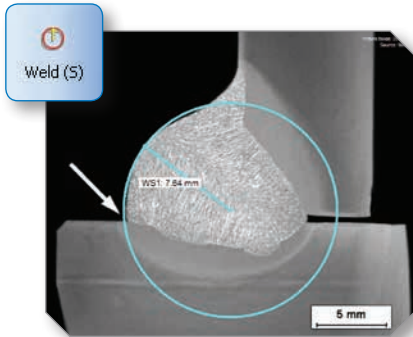
Use Weld (S) to determine effective weld depth by measuring the radius
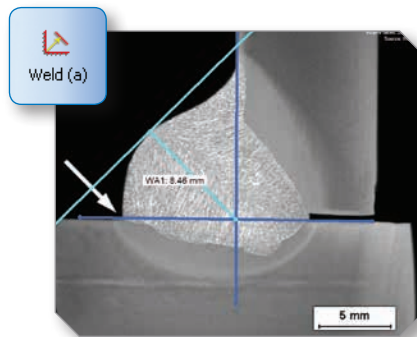
Use Weld (a) to measure angular A-measurements
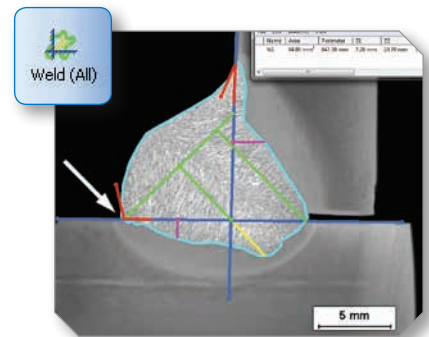
Use full weld outline, Weld (All), to determine effective depth penetration and area

Hardness *(optional module 86-4120)*

- Measure Vickers and Knoop indentations interactively, quickly and easily
- Allows load force in gf, kgf, or N
- Delivers accurate HV/HK values along with the diagonal indent dimensions
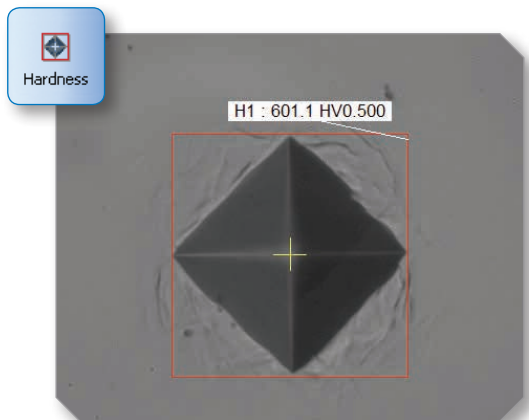
Vickers

Knoop

Measure

⟩ Application Specific Scripts

Automate analysis using pre-programmed, application specific Scripts. A variety of image filters, thresholding, and measurements are performed on the image with the click of a button. Statistics and results are shown and can be easily exported to Microsoft® Excel® or Microsoft Word®. Popular applications and associated routines are shown below. Easily follow industry standards such as ASTM E112 Grain Size or ASTM E1245 Inclusion Rating.

Available with OmniMet™ Express and OmniMet Enterprise Editions. See page 12 for a full listing of available application specific scripts.

Cast Iron *(optional Script 86-3400)*
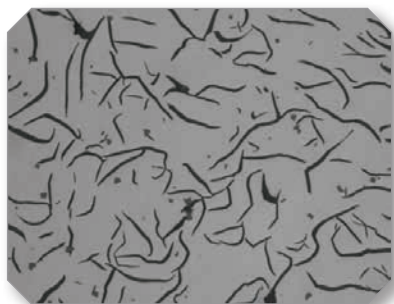
As polished, grey iron specimen.
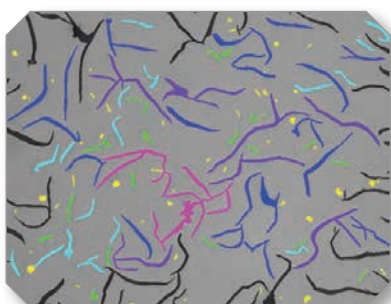
Individual flakes have been color-coded based on string length.
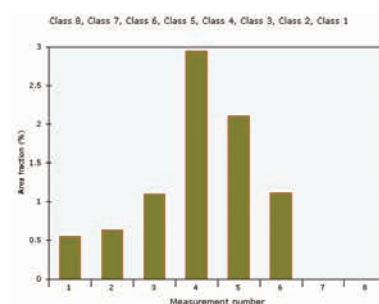
Relative area-fraction of the eight ASTM A247 graphite size classes.

Grain Size *(optional Script 86-3100)*
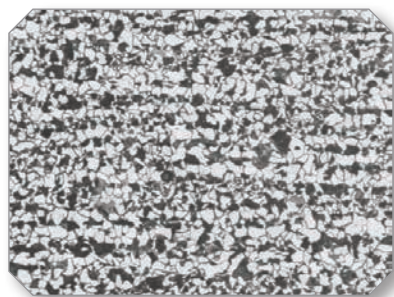
Microstructure of a two phase material.
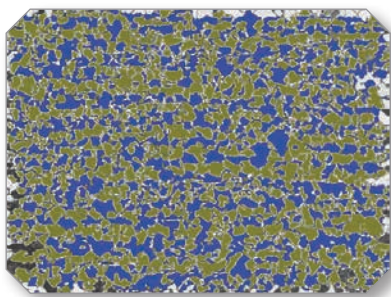

The grains were sorted into two categories with thresholding.
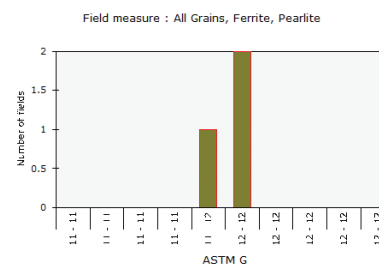
The graph shows the average grain size for each phase.

Coating Layer *(optional Script 86-3300)*
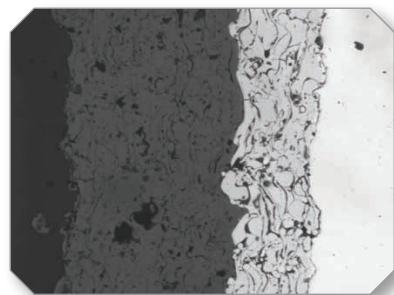
A thermal spray coating is shown with a wear layer and a bond coat.
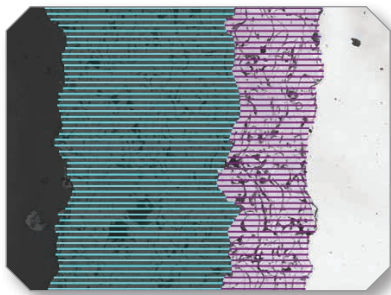
The thickness of each layer is measured across the micrograph.
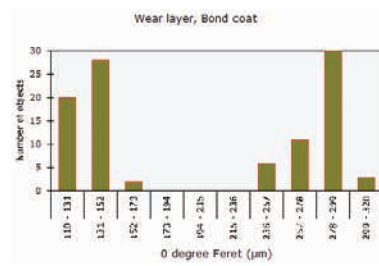
The wear layer and bond coat thicknesses are shown.

ScriptEditor for Full Flexibility

Every Script is based on a series of primary imaging commands that are available with the click of a mouse in ScriptEditor. Here, the user can create custom Scripts from scratch or modify existing Scripts to meet their specific application needs. Significant time may be saved by writing reusable Scripts to handle common image analyses and complex procedures.

Available with OmniMet™ Enterprise Edition.

START

Capture or Freeze live image to start Analysis. Existing images can also be loaded from a case.

Apply a broad range of image filters such as color correction, white balancing, or dilineation *(to sharpen edges and lines for subsequent steps).*

Thresholding can be easily applied to detect different phrases present in the sample with either color or grayscale techniques.

Refine thresholding with bitplane operations such as Boundary Fill and logical operators.

A variety of measurements can be performed automatically or by user prompt.

Results and statistics are shown clearly and can be exported to Excel® or Word® templates.

Report

Generate statistical information, annotate images, and send data directly to Microsoft® Word® or Excel®. Standard Word and Excel templates are pre-loaded with any OmniMet™ Edition.

Word

One Click Reporting

Excel

- Export data and results to a Buehler standard report template with one click.
- Templates are user-customizable to adjust the number of images, logo and report title.
- Reports auto populate with the original captured image and the resultant image.
- Relevant graphs display automatically along with the images
- Available sample information completes the report.
- Use Excel interactive to log result data live *(while measuring)*.

Cases for Organization of Results

Cases

- Organize images, results and reports into user defined cases
- Drag and drop images into case window
- One-click data export to Excel® or Word®
- Control access with multiple user accounts
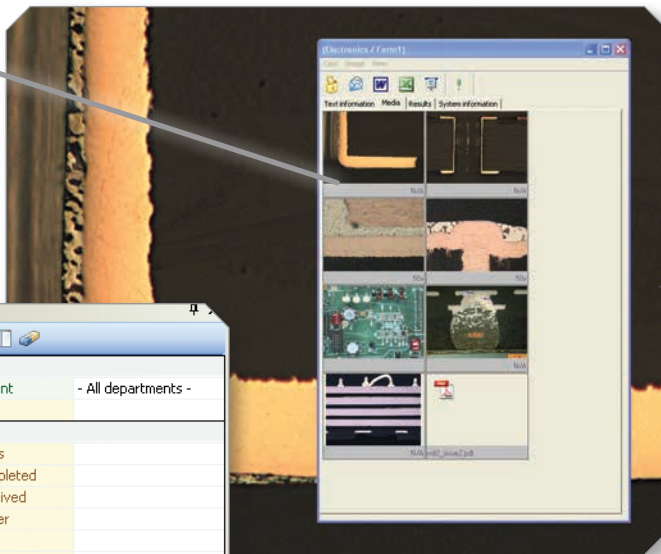
Project Management

- Search case by any field
- Fully customizable text fields

Database for Networking Workstations

Database Administration

- Create a new database using either Microsoft® Access® or SQL
- Establish database as local or server based
- Upgrade existing databases to be compatible with OmniMet™ version updates
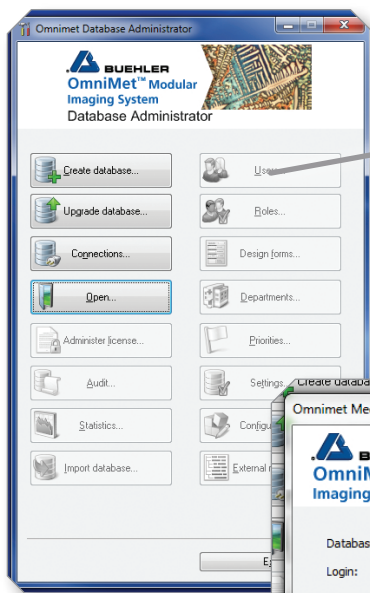
Database Login

- Open an established database from an easy drop-down menu
- Implement password protection and multiple user accounts

OmniMet™ Editions, Upgrades & Updates

❭ OmniMet Modular Digital Imaging System & Software Solutions

- Flexible platform with preconfigured software or hardware packages
- Optional Capture and Measurement Modules available to customize software solution
- Systems include software pre-installed on a Windows® 7, 64-bit workstation with Microsoft® Office® 2013
- All OmniMet prodcts include OmniMet mousepad and Buehler® SumMet™ guide
- Volume discounting available for all OmniMet Editions

Try OmniMet today with a Free, 15-day Trial (FN01484)

Available Editions *(Training available through webinars. Contact Buehler for details.)*

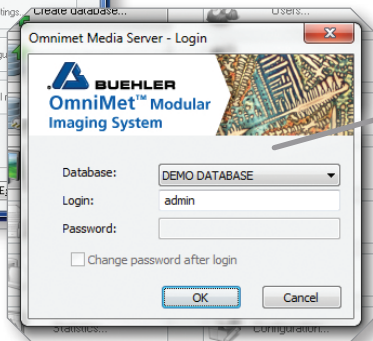| Systems*	Software**	Editions
86-1-1001	86-1-1000	**OmniMet Viewer** allows networked users to view images and measurements completed on an OmniMet imaging system on the same network.
	86-1-1010	**OmniMet Capture N' Measure (CnM)** enables image capture with basic measurement functions without database functions. Measuring functions included are length, parallel lines, curves, area + perimeter, radius, angle and count. Results can be burnt into the image but cannot be stored or exported to Excel®.
86-1-1003	86-1-1002	**OmniMet Basic** offers imaging system calibration, image capture, manual measurements, database for archiving, and MS Office report templates for presenting results. Measurements include lengths, width, area, curve length, radius, angles, text annotations, and scalebars. Optional Capture Modules may be added for specific applications.
86-1-1005	86-1-1004	**OmniMet Advanced** offers imaging system calibration, image capture, manual measurements, databases for archiving, MS Office report templates for presenting results, and enhanced measurement capability. Optional Capture and Advanced measurement modules may be added.
86-1-1007	86-1-1006	**OmniMet Express** offers imaging system calibration, image capture, manual measurements, databases for archiving, MS Office report templates for presenting results, and enhanced measurement capability. Optional Capture, Advanced measurement modules and Pre-programmed Application specific Scripts may be added.
86-1-1009	86-1-1008	**OmniMet Enterprise** offers imaging system calibration, image capture, manual measurements, databases for archiving, MS Office report templates for presenting results, and enhanced measurement capability. Optional Capture, Advanced measurement modules and Pre-programmed Application specific Scripts may be added. ScriptEditor enables the user to write fully customizable analysis Scripts for complete control to develop customized image analysis solutions.

* System Package includes software pre-installed on a Windows 7, 64-bit workstation with MS Office 2013, mousepad and SumMet CD.
  Includes keyboard and mouse, does not include a monitor.
** Software Only package includes software, mousepad and SumMet CD and is compatible with Windows 7 computer, (32 or 64-bit) with MS Office.

❭ Upgrades and Updates

Existing customers may update their OmniMet software to the latest versions. Additionally lower level OmniMet software packages may be upgraded to higher level packages for increased functionality.

Upgrade OmniMet to a higher functional level:
Customer license number and site ID MUST BE INCLUDED with purchase order.

Upgrade From / To	Basic	Advanced	Express	Enterprise
Capture N' Measure	86-5006	86-4006	86-3006	86-1006
Capture Basic	x	86-4002	86-3002	86-1002
Capture Advanced	x	x	86-3004	86-1004
Express	x	x	x	86-1003

Update OmniMet to the latest software release:
86-4202 Update Basic
86-4204 Update Advanced
86-4205 Update Viewer
86-4206 Update Capture N' Measure
86-4201 Update Express
86-4203 Update Enterprise

OmniMet™ Software Modules & Features

Software Description	Viewer	CnM	Basic	Advanced	Express	Enterprise
Capture						
Load and Save	•	•	•	•	•	•
Brightness, Auto-White Balance, Color Correction	•	•	•	•	•	•
Digital Zoom, Rotate, Calibration & Annotation	•	•	•	•	•	•
Camera Interface (USB, EEE I394, Capture Cards, DirectShow, Twain, etc.)		•	•	•	•	•
Motorized Stage Controller			•	•	•	•
Capture Modules *(optional)*	◊	◊	◊	◊	◊	◊
Measure						
Standard Modules: Length, Area, Radius, Count, Parallel Lines	•	•	•	•	•	•
Advanced Modules: 3-point Circle, Adj. Angle, Polygon				•	•	•
Advanced Measurement Modules *(optional)*				◊	◊	◊
Color Threshold (size, intensity), 16 Bitplanes					•	•
Automation Capable: Read & Run Scripts					•	•
ScriptEditor: Read, Run, Write, and Edit Scripts						•
Application Specific Scripts *(optional)*					◊	◊*
Report						
Report Data, Report Generator *(requires Microsoft® Office)*	•		•	•	•	•
Results Window with measurements log				•	•	•
Organize						
Database Interface	•		•	•	•	•
Database Creation & Administration			•	•	•	•

• *Included with package*
◊ *Optional module (purchased separately)*
* *OmniMet Enterprise comes with a selction of Scripts.*

❯ Capture and Advanced Measurement Modules *(optional)*

Capture Modules

86-4130 **OmniMet Multi-Focal Images** Used to create focused images from multiple images of the same specimen when the viewing surface exists in different focal planes. Beneficial for removing edge rounding or viewing rougher surfaces when sharply focused images are required for analysis.

86-4140 **OmniMet Mosaic Multiple Image Stitching** Used to stitch multiple images together to create one large, calibrated stitched image. Measurements are possible on the stitched image. Useful for documenting features larger than one field of view. A motorized stage is not required.

Advanced Measurement Modules

86-4110 **OmniMet Object Analysis** 'Single phase' image analysis for measurements of image features and field characteristics: Area Fraction, Area Position, Number of Objects, Perimeter, Compactness, Length, Feret Diameter, Center of Gravity, Inclusion and Exclusion of Objects by Size.

86-4115 **OmniMet Weld Measurement** Tools for determining weld characteristics. Use a circle radius to determine effective weld depth, angular A-measurements, or full weld outline characterization to determine effective depth, penetration and area.

86-4120 **OmniMet Hardness** Measure Vickers and Knoop indentations interactively, quickly, and easily. Allows load force in gf or kgf and delivers accurate HV/HK values along with the diagonal indent dimensions.

86-4125 **OmniMet Grain Size** Measure grain size interactively using ASTM-E112 methodology with linear intercept or circle intercept methods.

BUEHLER

Application Specific Scripts *(optional)*

86-3050* **Manual Interactive Thickness** Measurements of line lengths with statistics for length and thickness measurements.

86-3100* **Grain Size** Automated grain size measurements in accordance with ASTM E112. Average grain size by intercept methods and grain size distributions using areas are delivered. Additional processing identifies ALA grain size and duplex populations in accordance to ASTM E930 and ASTM E1181 where appropriate. ISO 643 compliant.

86-3300* **Coating Layer Thickness** Measures coating, plating or layer thickness of cross-sectioned samples in compliance with ASTM B487.

86-3500* **Particle Sizing** Detects and measures particles in a field of view providing statistics on quantity and size distribution. Suitable for non-agglomerated particulates, precipitates, and powders.

86-3550* **Porosity Assessment** Provides automated measurements of fine holes or pores in a material.

86-3750* **Dendritic Spacing** Delivers measurements of lengths between dendrite arms in cast aluminum alloys.

86-3200* **Phase Area Percent** determines phase area and percentage area of multiple phases in accordance with ASTM 562

* Included with OmniMet™ Enterprise

86-3150 **Intercept Grain Size** Automated grain size determination delivering average grain size per field using straight line and circular intercept methods in accordance with ASTM E112.

86-3310 **Surface Roughness** Surface roughness measurements in accordance with ASME B46.1-02

86-3350 **Decarburization Depth Assessment** Determines depth of total or partial decarburization according to the relative amount of free ferrite present according to ASTM E1077.

86-3400 **Graphite in Cast Iron** Automated analysis of graphite in cast iron in accordance with ASTM A247. Measures size and class count of graphite nodules and area percentages of ferrite graphite and pearlite. For gray iron graphite length is also provided.

86-3525 **Cleanliness Assessment** Provides cleanliness assessment of particles on filter paper meeting the requirements of ISO 4406.

86-3600 **Indentation Hardness** Provides the capability to measure and analyze Knoop and Vickers indents in accordance with ASTM E384. Reports can be exported in HK, HV, HRC, and HRB scales with graphical displays of the hardness profile.

86-3700 **Banding Assessment** Determines the degree of microstructural banding in conformance with ASTM E1268. Delivers quantitative information on the degree of orientation, anisotropy index, and mean feature spacing.

86-3850 **Inclusion Rating** Determines area percentage, mean free path distances, and average numbers of intercepts for oxide and sulfide stringers in ferrous metals in accordance with ASTM E1245.

Motorized stage and focus packages

Compatible only with OmniMet™ Capture Basic version 9.0 and higher:

86-10003 Motorized stage and focus drive for Nikon MA200
86-5435   Motorized stage and focus drive for Nikon Eclipse ME600 and L150, 100mm x 100mm stage scan size

Monitors

85-0124 24in Monitor, LCD with 1920 x 1200 display capability
85-0127 27in Monitor, LCD with 2650 x 1600 display capability
85-0135 22in Monitor, Touch Screen with 1920 x 1080 display capability

Shop online at www.buehler.com. *(US, DE, FR and UK only)*

For a complete listing of consumables, visit our website at www.buehler.com or refer our Product Catalogue. Buehler continuously makes product improvements; therefore technical specifications are subject to change without notice.

Sectioning	Mounting	Grinding & Polishing	Imaging & Analysis	Hardness Testing
AbrasiMet • AbrasiMatic • IsoMet	SimpliMet	EcoMet • AutoMet • MetaServ	OmniMet	◈Wilson®