## Microscope Digitial Cameras Specifications

| Specifications | Universal model | | Standard model | Introductory model | | Standalone model |
| --- | --- | --- | --- | --- | --- | --- |
| | DP72 | XC10 | DP25 | UC30 | SC30 | DP21 |
| Resolution (megapixels) | 12.8 | 1.4 | 5.0 | 3.2 | 3.3 | 2.0 |
| Chip size (inches) | 2/3 CCD | 2/3 CCD | 2/3 CCD | 1/1.8 CCD | 1/2 CMOS | 1/1.8 CCD |
| Pixel size (μm) | 6.45 x 6.45 | 6.45 x 6.45 | 3.4 x 3.4 | 3.45 x 3.45 | 3.2 x 3.2 | 4.4 x 4.4 |
| Exposure times | 23 μs-60 s | 100 μs-160 s | 200 μs-16 s | 100 μs-10 s | 61 μs-1.75 s | 50 μs-8 s |
| Live frame rates | 57 fps @ 340 x 250 (4x4)<br>29 fps @ 680 x 512 (2x2)<br>15 fps @ 1360 x 1024 | 50 fps @ 344 x 258 (4x4)<br>25 fps @ 688 x 516 (2x2)<br>15 fps @ 1376 x 1032 | 32 fps @ 640 x 480 (4x4)<br>24 fps @ 854 x 640 (3x3)<br>8 fps @ 2560 x 1920 | 35 fps @ 688 x 514 (3x3)<br>13.6 fps @ 1040 x 772 (2x2)<br>7 fps @ 2080 x 1544 | 49 fps @ 508 x 384 (4x4)<br>37 fps @ 680 x 512 (3x3)<br>28 fps @ 1024 x 768 (2x2)<br>10 fps @ 2048 x 1532 | 27 fps @ 800 x 600 (2x2)<br>15fps@1600 x 1200 (connected to PC: 1394b)<br>7.5 fps @ 1600 x 1200 (connected to PC: 1394a)<br>15 fps @ 1600x1200 (stand alone) |
| Dimensions (mm, W x D x H) | 112 (Ø) x 87.8 (H) | 86 (Ø) x 48 (H) | 86 (Ø) x 48 (H) | 86 (Ø) x 48 (H) | 58 (Ø) x 33 (H) | 84 (Ø) x 42.5 (H) |
| Weight (g. approx) | 1.150 | 420 | 350 | 350 | 188 | 261 |
| Camera adapter | c-mount | c-mount | c-mount | c-mount | c-mount | c-mount |
| PC interface | PCI-Express x1 Rev 1.0a or later | IEEE1394a | IEEE1394a | IEEE1394a | USB 2.0 | IEEE1394b or IEEE 1394a |

## PC Requirements

| | |
| --- | --- |
| CPU | Intel Core series 1.8 GHz or higher (Intel Core i5-650, 3.2 GHz recommended) |
| RAM | 2GB or more recommended (4GB for Windows 7 64bit) |
| Hard disk | 2 GB or more free space |
| OS | Windows XP Professional SP3 (32 bit) / Windows Vista Business, Ultimate SP2 (32 bit) / Windows 7 Professional (32 bit/64 bit) |
| Graphic card | 1280x1024 monitor resolution with 32 bit video card |

- **OLYMPUS CORPORATION is ISO14001 certified.**
- **OLYMPUS CORPORATION is FM553994/ISO9001 certified.**
- Windows, Office, Word, Excel are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- All other company and product names are registered trademarks and/or trademarks of their respective owners.
- Images on the PC monitors are simulated.
- Specifications and appearances are subject to change without any notice or obligation on the part of the manufacturer.

**OLYMPUS**®

Image Analysis Software

# OLYMPUS Stream

*Your Vision, Our Future*

For Materials Science Microscopes

## OLYMPUS Stream Micro-Imaging Software: A New Standard for Workflow Flexibility
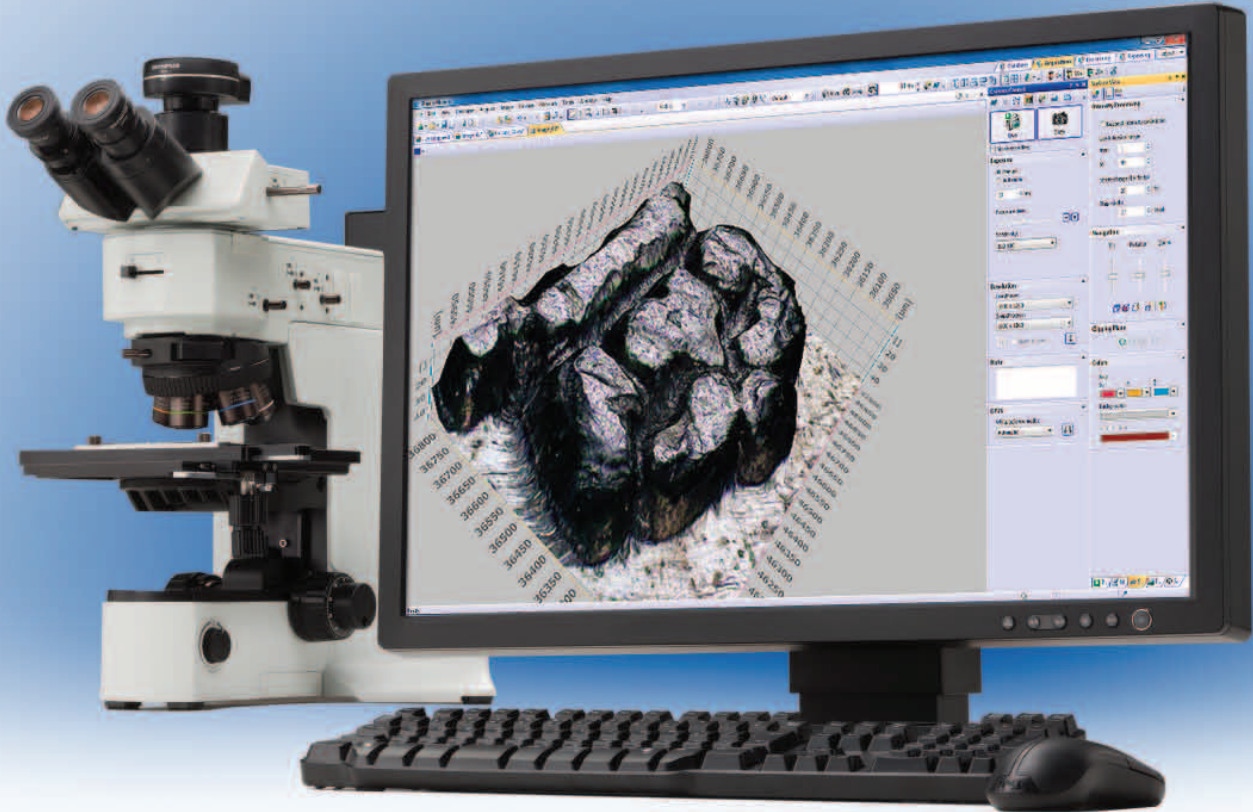
# OLYMPUS Stream, Designed with Your Workflow in Mind

Today's busy work environment requires advanced tools that promote efficiency and adapt to everyone's individual workflow. The OLYMPUS Stream image analysis software allows you to seamlessly acquire images, process and measure them, and create a flexible database that also accommodates other tools in your workflow, such as SEMs, AFMs, and optical microscopes. The OLYMPUS Stream system provides you with the flexibility to fit your product to meet your needs without changing your operation.

## Keep Your Workflow Streamlined

Your time is just as important as your working conditions. That's why the OLYMPUS Stream system can be personalized to fit your process flow. An easy-to-use interface guides you effortlessly through every step from image adjustment and capture, measurements, report creations, and archiving—or whatever you need to achieve. As a result, you'll find that you can complete your tasks more efficiently, regardless of their complexity.

## Build Your Olympus System Your Way

The OLYMPUS Stream software system can be purchased in a variety of packages designed to fit your needs— whether you require the capabilities found in the entry-level OLYMPUS Stream Start or the advanced automation controls found in OLYMPUS Stream Motion. The packages are also expandable with specific application modules to meet unique analysis needs.

There's a right package for your requirements. You can create your system exactly as you wish—your way.

## Easily Expand to Future Applications

With the OLYMPUS Stream system, you're prepared not only for today's applications but for tomorrow's as well. Whatever the future may bring, OLYMPUS Stream system solutions will let you keep up with advances in technology.
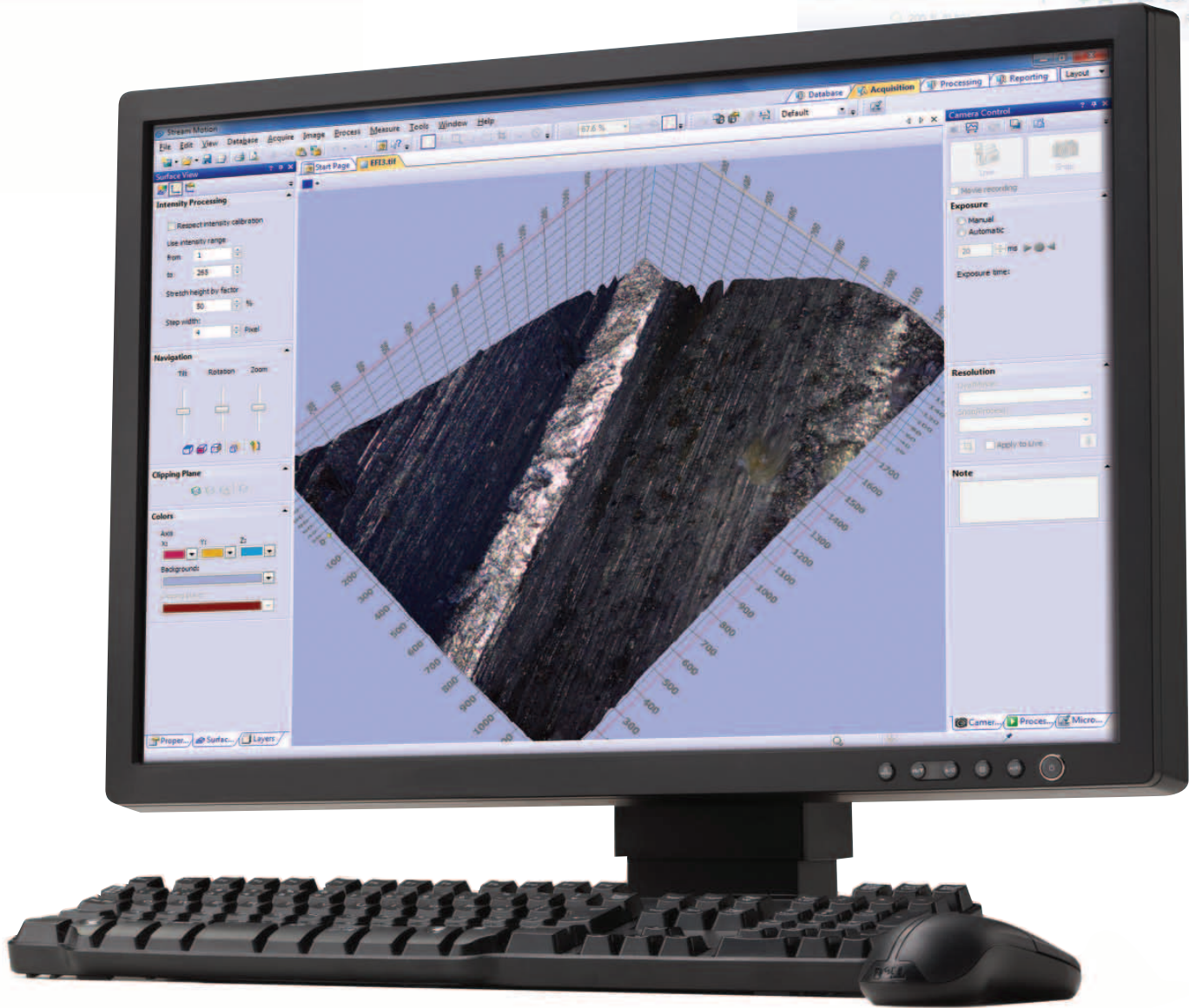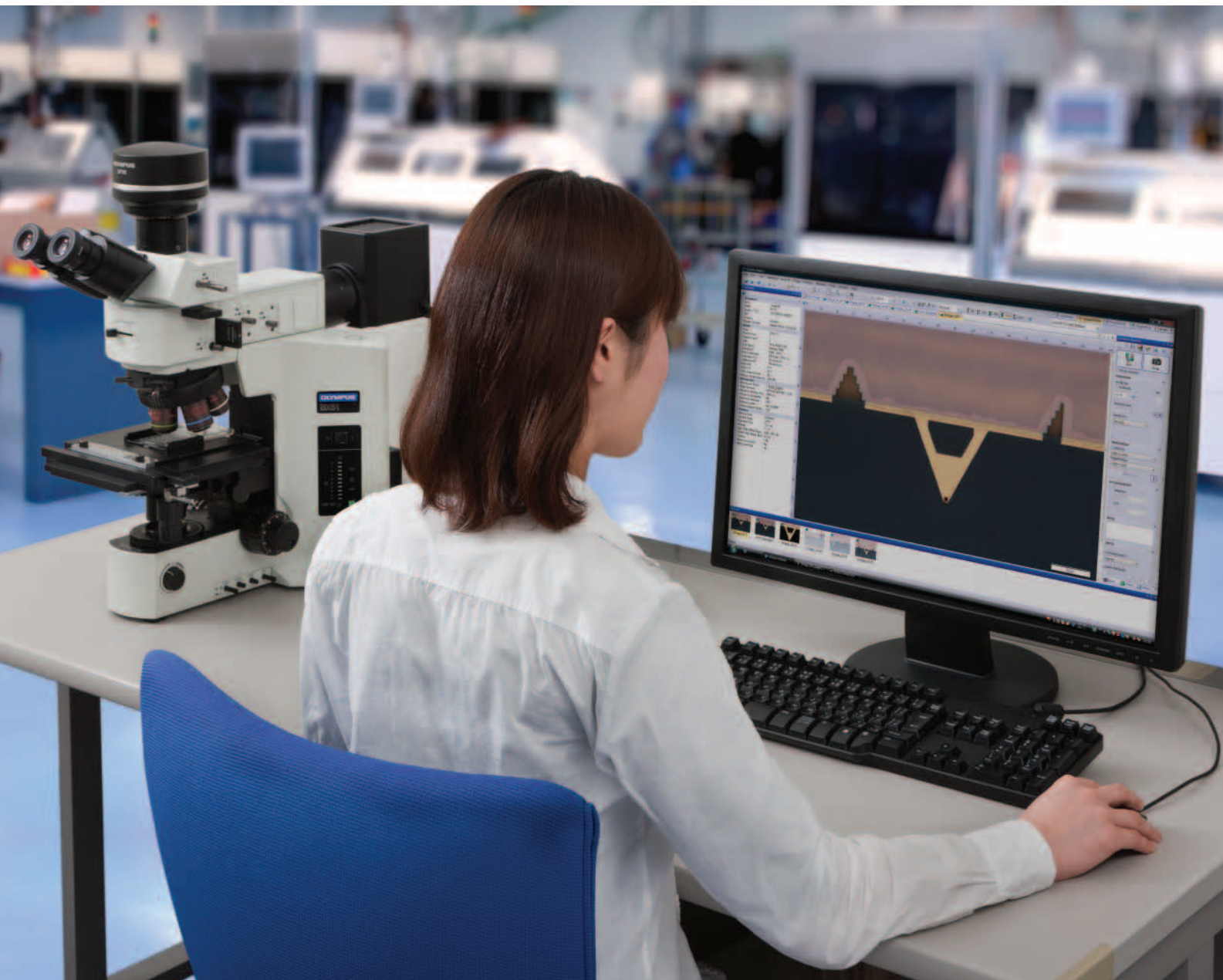
# Keep Your Workflow Streamlined
# OLYMPUS Stream Software Adapts to Your Every Requirement
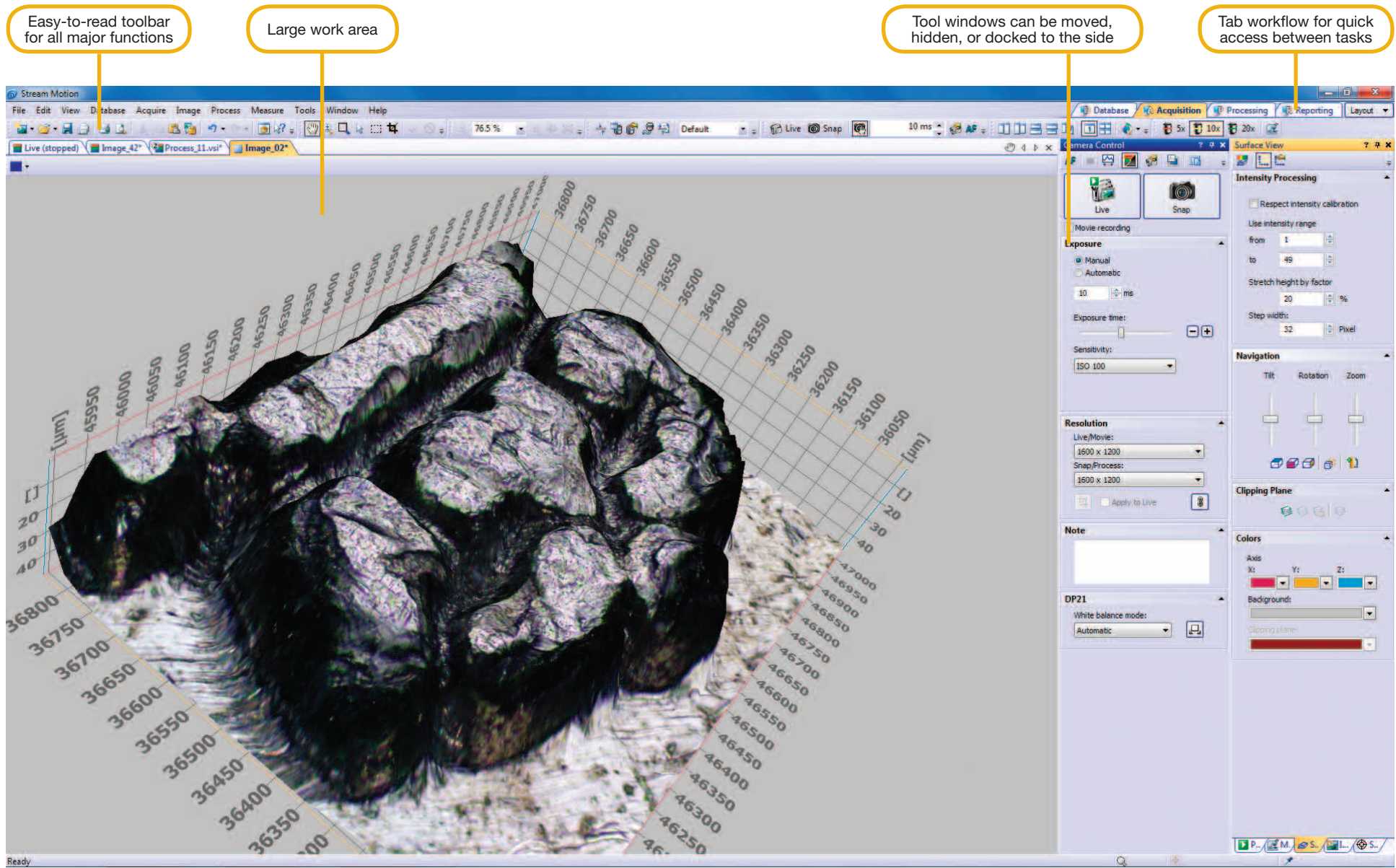
## User Interface Function

As you progress from image capture to report creation, the tool windows you need are always displayed at every stage. You can quickly and easily access control parameters.

## Dynamic User Interface

Depending on your needs, you can arrange the layout of the tool window to best fit your workflow. You can create customized layouts with all the necessary functions for each activity.

## My Function

You can create intuitive workflows based on the most frequently used functions, simplifying repetitive tasks so that even new users are able to operate the software easily and efficiently.



Easy-to-read toolbar for all major functions

Large work area

Tool windows can be moved, hidden, or docked to the side

Tab workflow for quick access between tasks

OLYMPUS Stream Motion user interface example

## Microsoft Office Integration

OLYMPUS Stream can create professional reports directly into Microsoft Word. Report templates and headers can be flexibly modified according to your company's needs. The images can be zoomed and annotated along with the metadata. Statistical analysis and graphing are also accomplished using Excel with the output easily imported into your report. OLYMPUS Stream uses a unique compression method that allows you to store view reports without the need for any unique applications software.
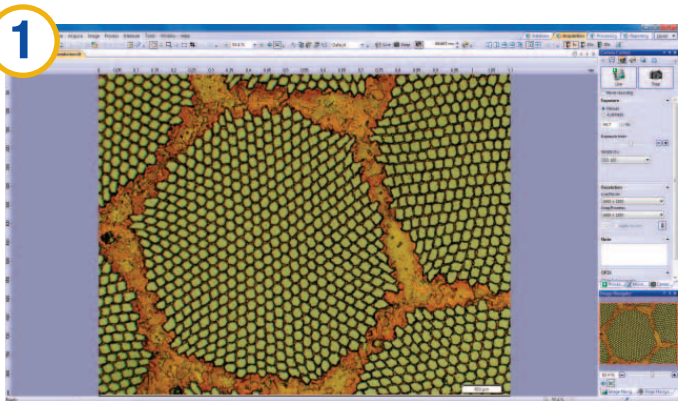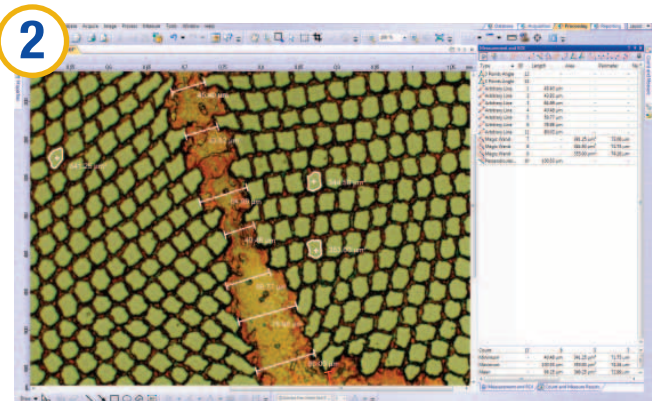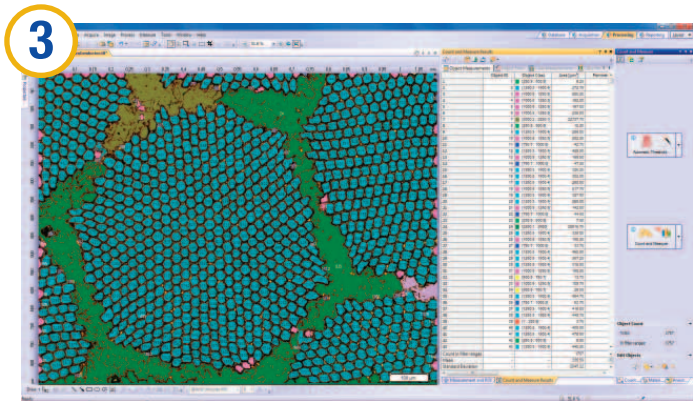
---

**1**



### Image Acquisition

Place your sample on the system and adjust the optics for a crisp, pleasing image.

**2**



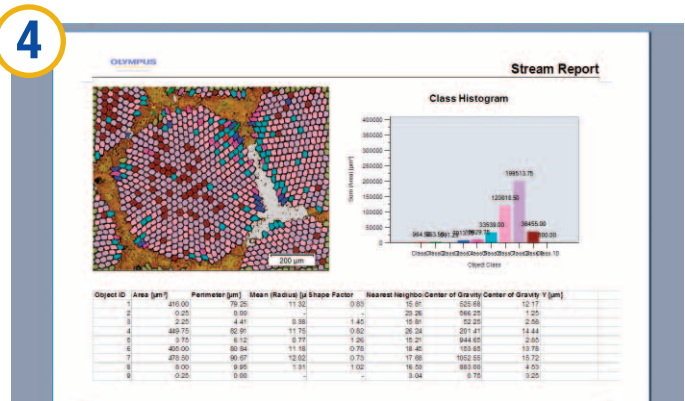### Measurements

Capture your image with a simple mouse click and measure it adding enhancements with advanced image-processing techniques.

**3**



### Object Detection

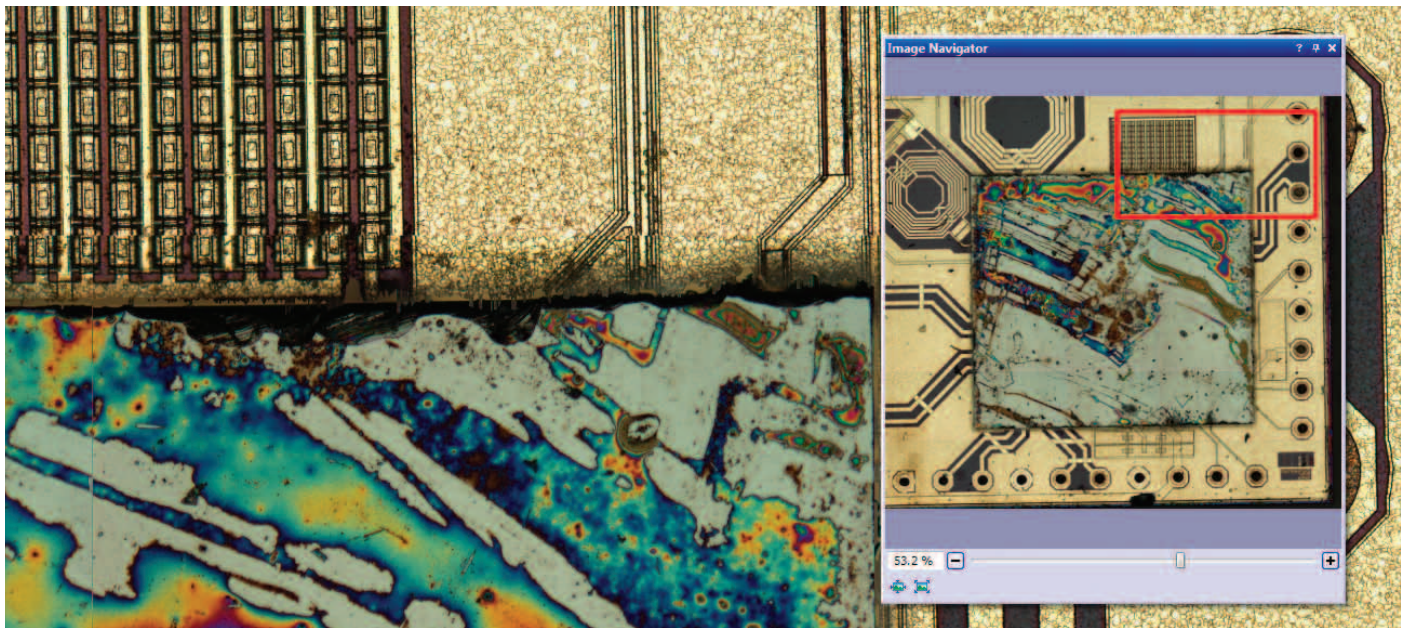Make a quick measurement with the mouse, or use preset particle-counting applications activated with a mouse click.

**4**



### Report Generation

Save your data and export it to your customized report, which can be edited in Microsoft Word.
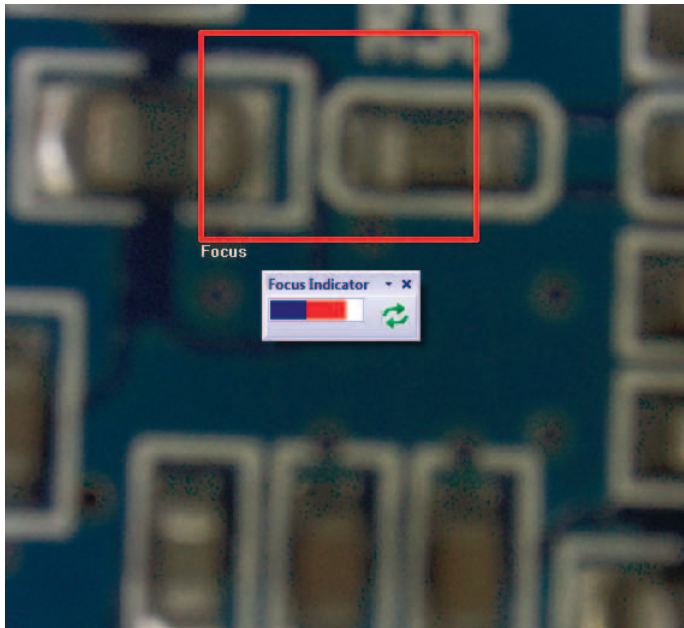
# OLYMPUS Stream Adapts to Your Workflow



Peeled integrated circuit

## Live Image Navigation

Using the OLYMPUS Stream image navigation allows you to pan and zoom on live or stored images. The image navigator interface provides immediate updates at your loc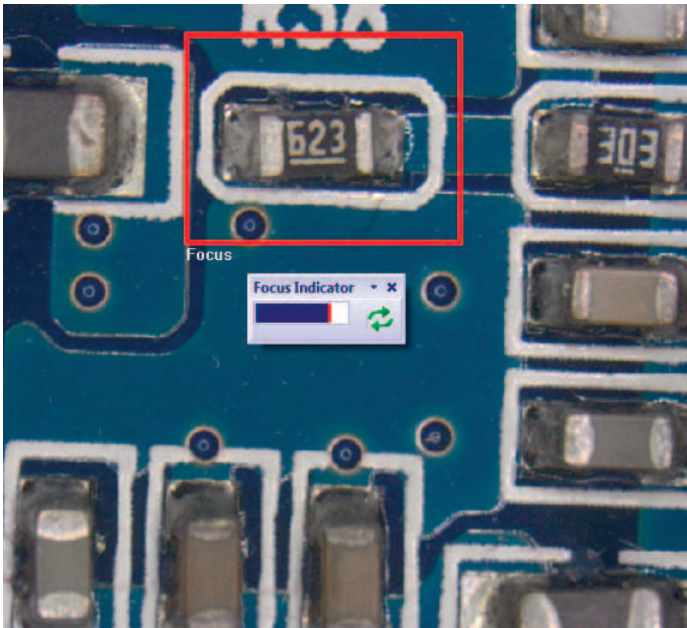ation on both the zoomed and unmagnified images. The navigation system provides you with fast, immediate views of your sample before you acquire an image. All image viewing and manipulation is carried out with a clean, simple user interface, providing fast and intuitive results.



Perfectly focused image of diamond

## Instant Extended Focus Image (EFI)

OLYMPUS Stream software easily provides images for samples that extend beyond the depth of focus. The instant Extended Focus Image allows you to use the fine focus adjustment to combine many images in the z-axis to provide you with a single combined output that can be used for visualization or measuring in x and y.
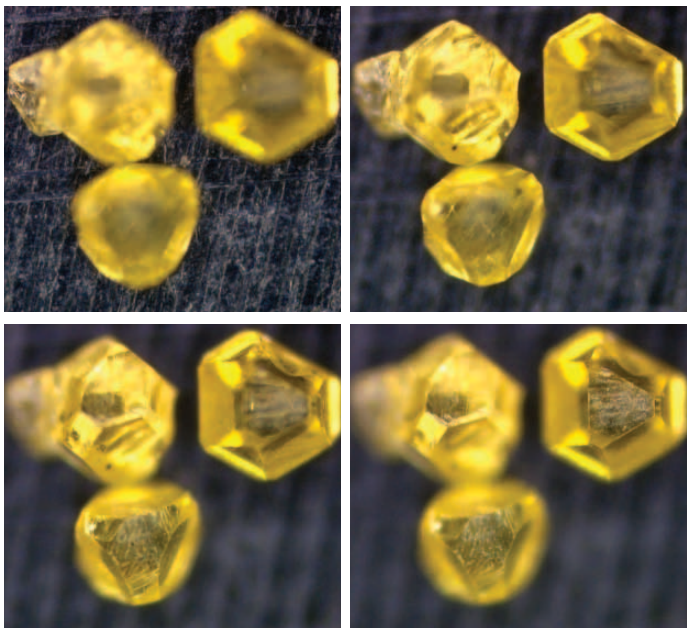


Unfocused



Focused

## Optimized Focus and Exposure

The OLYMPUS Stream focus indicator enables users to select a region of interest and bring it into optimum focus using the focus control of the microscope. This function is essential when a large optical depth of field makes it difficult to find the best focus position by eye. OLYMPUS Stream's live histogram display and overexposure indicator let you easily find the optimum exposure time to avoid overexposed images that cause a loss of detail. Your digital camera's exposure time can then be adjusted manually or automatically when using the family of Olympus DP series cameras.
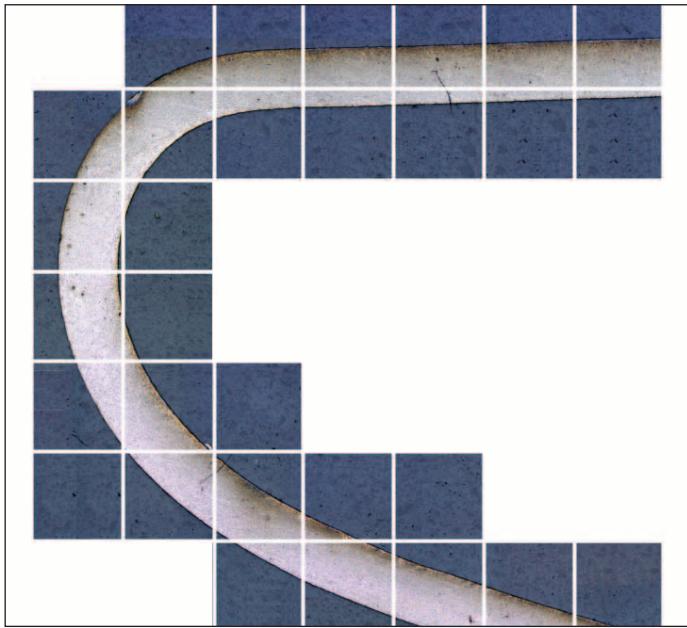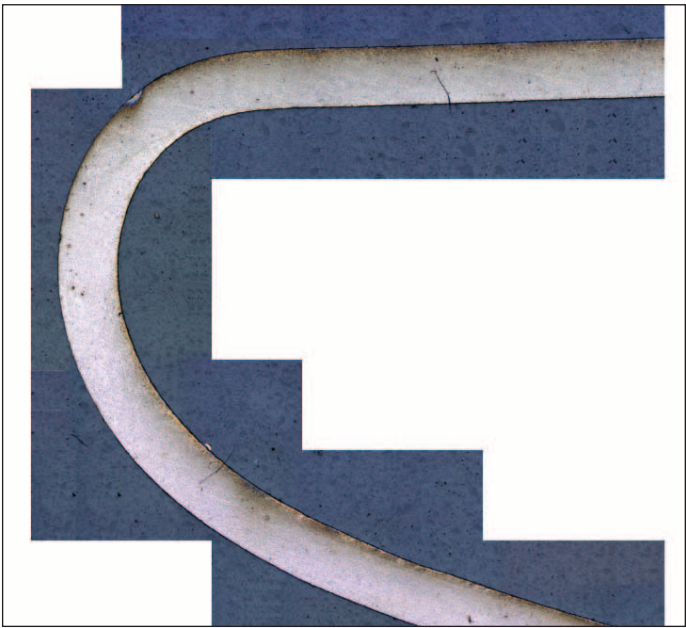


Multiple image acquisition of Platinum wires cross sections

## Manual Multiple Image Alignment (MIA)

OLYMPUS Stream software provides MIA to enable the creation of panoramic images of samples that extend beyond the field of view. The simple step-by-step process allows you to quickly combine the images. The OLYMPUS Stream software then quickly stitches them together, providing you with an output ready for simple visualization or complex measurement.

# Olympus Offers Solutions to Save You Time
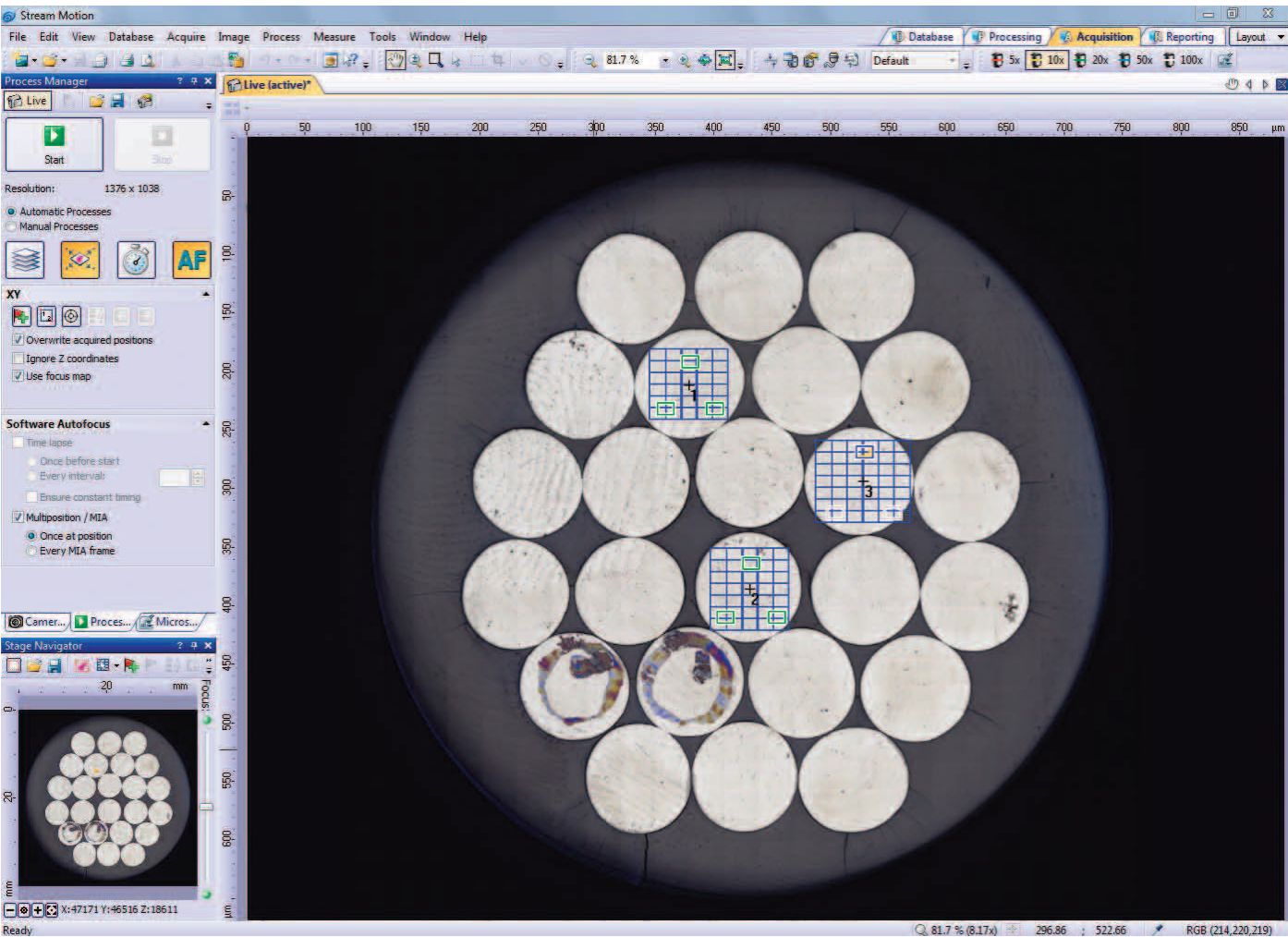


Multiple Image acquisition Pt wires cross sections

## Autofocus

For precise sample focusing and speedy image acquisition, OLYMPUS Stream offers two autofocus options. For surfaces with high contrast, OLYMPUS Stream can also use its contrast-based software autofocus. For surfaces with low contrast, such as polished or transparent materials, the laser autofocus unit is a fast, repeatable option when integrated with the Olympus BXiS microscope system. Both systems provide perfectly focused images with the simple click of a button.

## Macro Recorder

OLYMPUS Stream provides a way to preset complex imaging and measuring tasks with the Macro Recorder. The Macro Recorder creates step-by-step processes, which, after completion, are stored and then implemented with a single click. This capability provides all operators with the same settings and consistent output.

## Automatic MIA/EFI

When creating large, high-resolution automated MIA (montage overview) images, the combination of OLYMPUS Stream with a motorized stage easily provides a fast result. The operator selects MIA scanning by using the stage navigator tool, which steps the operator though the entire process. When using the automatic EFI function with a motorized focus unit, the software recommends the optimum number of images required to provide perfectly focused images that are outside the depth of field.

## Tilt Compensation

OLYMPUS Stream can predict a sample's tilt by taking three points on the coordinate data when performing automated MIA using motorized systems. This shortens the time and increases the repeatability for stage height adjustment when acquiring images.
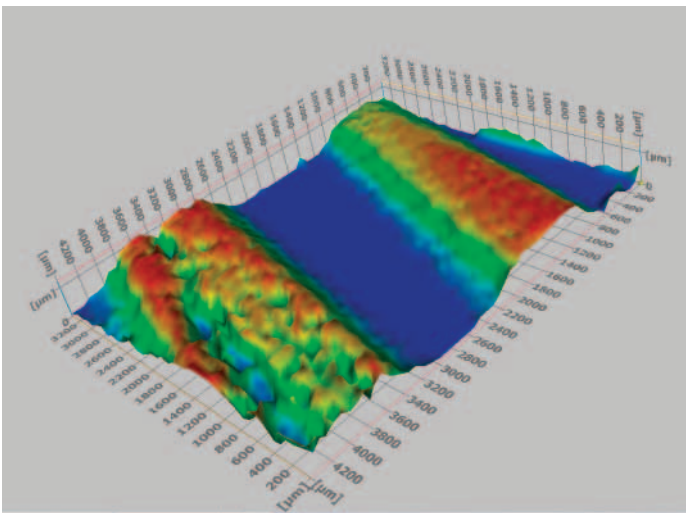
# OLYMPUS Stream Gets You the Image You Want



Coin detail
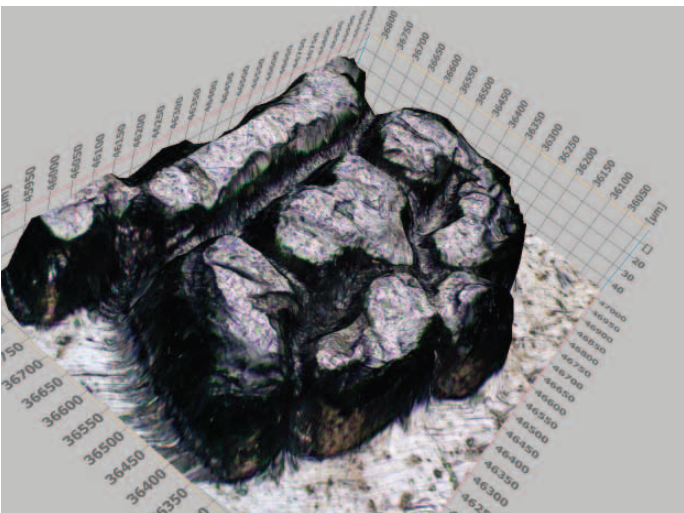


3D profilometry of wear track

## 3D Image Creation

By using the a motorized focus unit, images with different focus positions can be recorded automatically. In addition, calibrated z-profile measurements using z-stack data and 3D image creation using the 3D-EFI function are made possible. The three-dimensional view of the sample becomes crystal clear with a few mouse clicks.
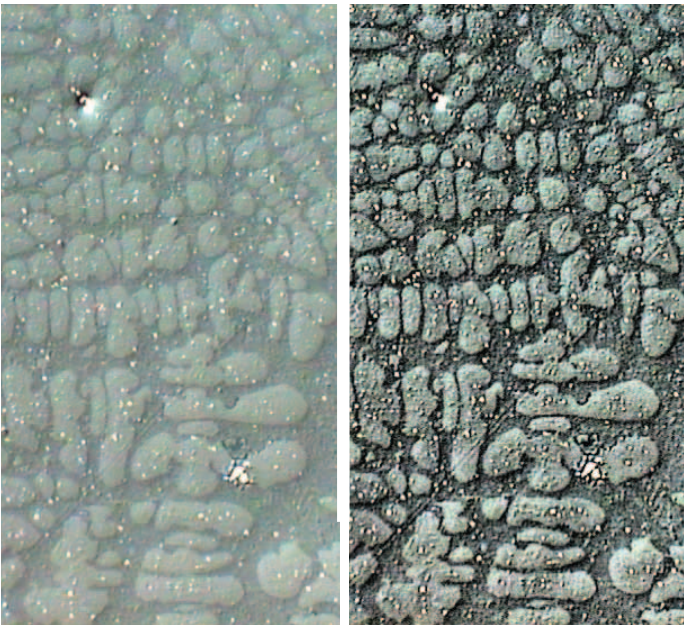


Filter (Enhancement of contrast by DCE filter)



Arithmetics

## Image Processing

OLYMPUS Stream has a variety of filters for edge detection, smoothing, and other purposes. You can visualize image features by enhancing and modifying with a processing filter on the acquired image. For best results, you can check or adjust the filter results in a preview display. Additionally, image manipulations such as sum, subtraction and erosion are also easily carried out without losing your valuable original image.
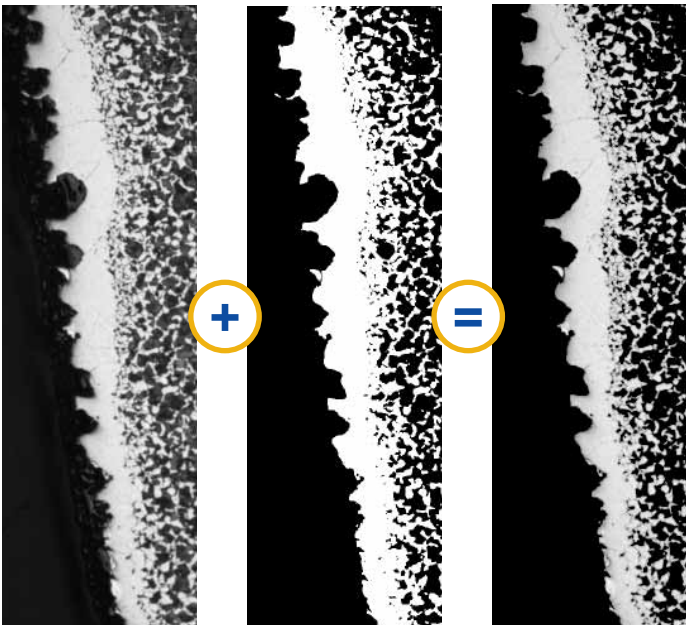
# From Simple Measurements to Particle Analysis



Measurement operation



Original image



Phase detection

## Basic Measurement

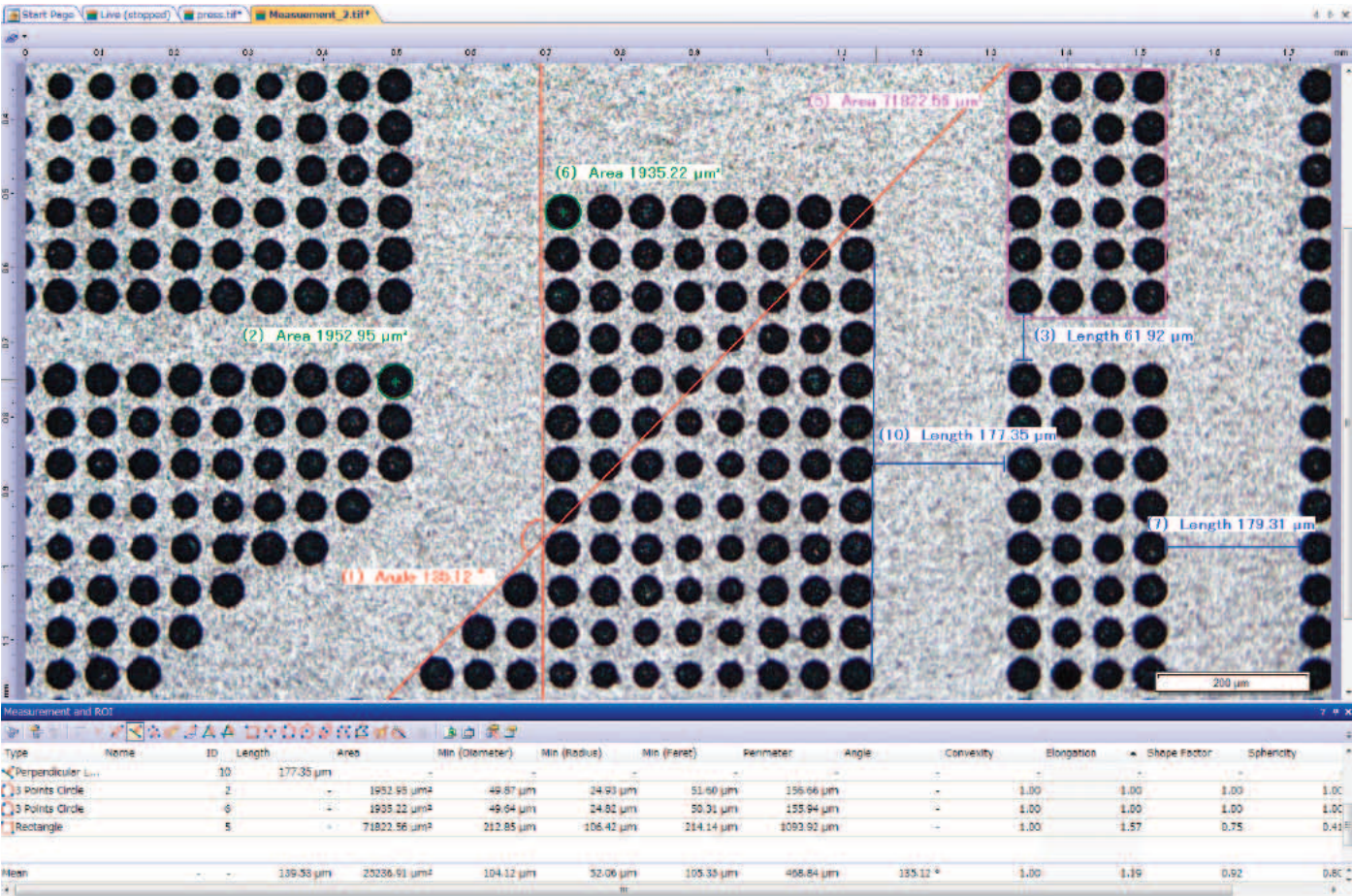Optical inspection and quality control require frequent measurements. OLYMPUS Stream provides interactive measurement functions such as distances, angles, rectangles, circles, ellipses and polygons. The measurements are made with your mouse and show immediate feedback indicated on the image or in the live data table. All results are saved with the image files as records. To further improve on accuracy, optical data such as system magnification are automatically available when combined with the Olympus Microscope system.

## Measurement Result

Included with the OLYMPUS Stream Basic package and other more advanced packages is an integrated data analysis package. The data analysis provides statistical analysis on your data based on your needs. You can calculate mean standard deviation, min, max, and more. All of the data gathered is exported to Microsoft Excel with a single click.

## Magic Wand

OLYMPUS Stream Essentials and other more-advanced packages include a wand for automatically detecting the edges of the sample you wish to measure. The Magic Wand allows you to select the measurement points—free hand for simple or multiple lines, plus free hand polygon measurements for irregularly shaped objects.

## Layer Management

Each image as it is captured and annotated is broken into layers (original image, measurement data, annotations etc.), allowing you to change processing files (smoothing and/or sharpening) without affecting your measurement results. You can easily retain your measuring data as you carry out your analysis and measurements.
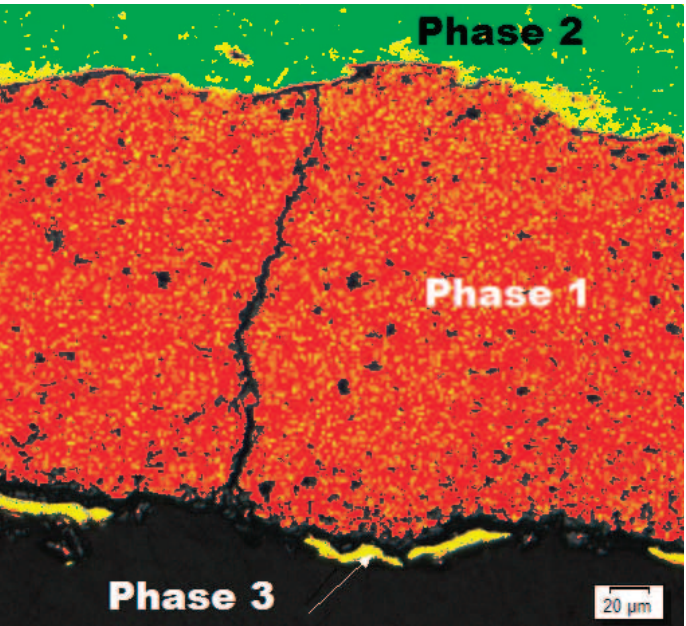
## Traceability

For quality control and traceability recording the conditions of image acquisition is essential. With OLYMPUS Stream, you can quickly create a calibration report for important information like magnification, objective lens type, pixel size, scale bar, etc. The Info Stamp created from updated calibration information can be used for overlaying on the acquired image and reports.
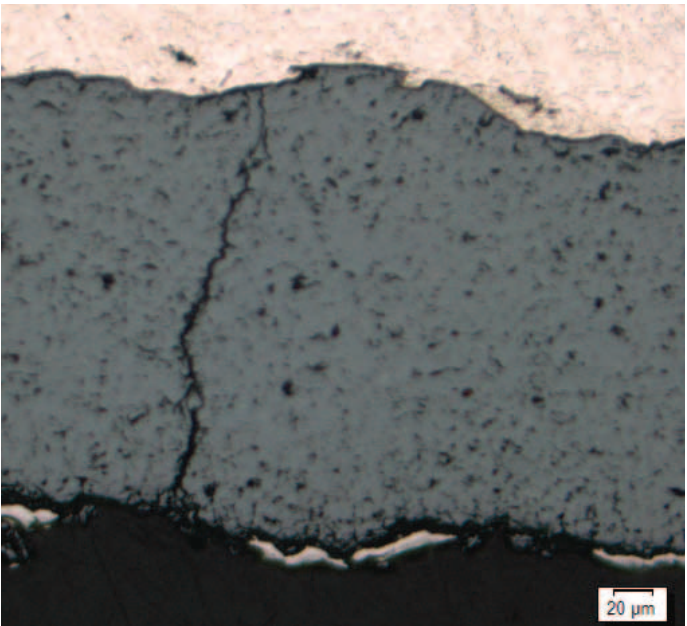
## Phase Analysis

OLYMPUS Stream Essentials and other more-advanced packages offer a very flexible and powerful phase analysis tool with ROI selection. It speeds and simplifies the extraction of phase fraction data of more than one compound in the same image.
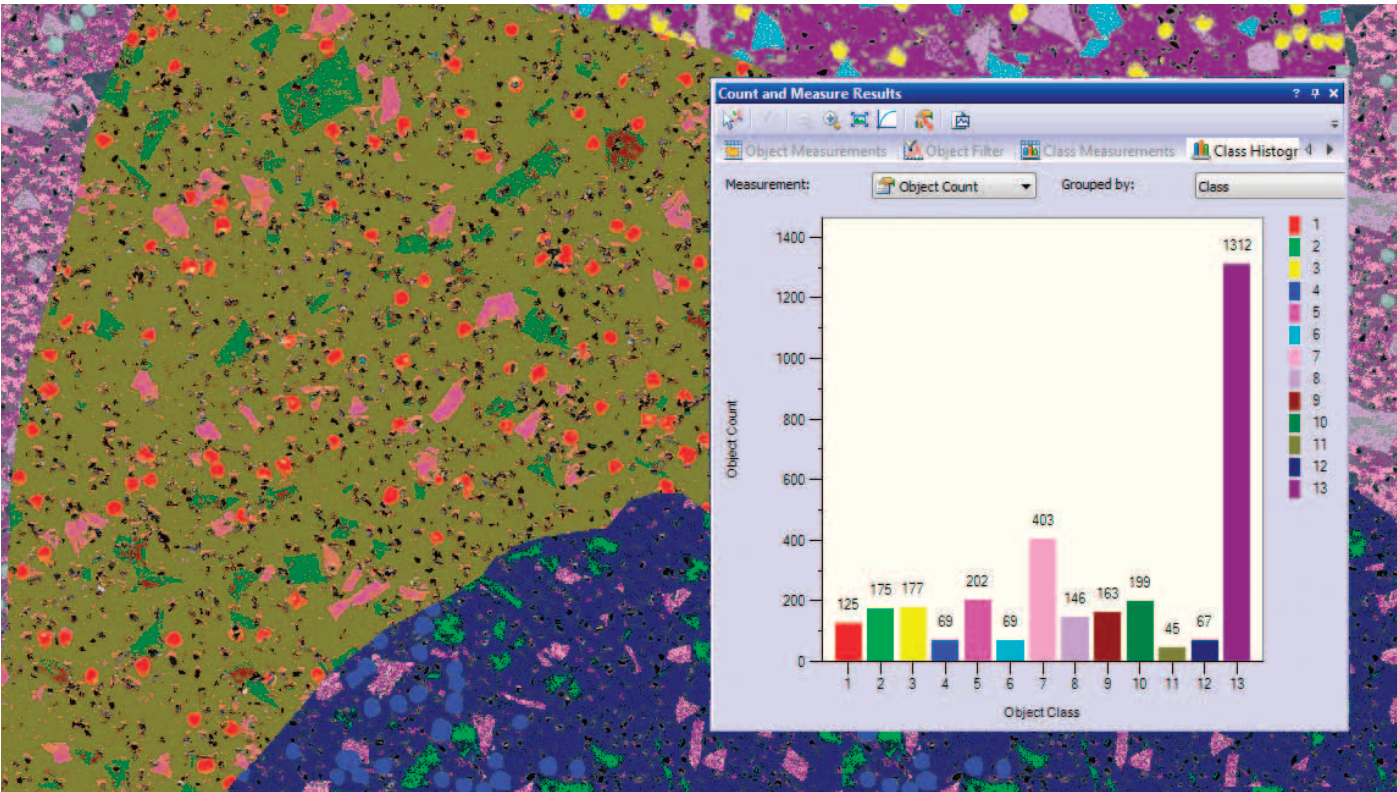


Object detection and classification

## Count and Measure

Object detection and size distribution measurement are among the most important applications in digital imaging. OLYMPUS Stream incorporates a detection engine that utilizes threshold methods to reliably separate objects (e.g. particles, scratches) from the background. OLYMPUS Stream offers more than 50 different parameters for shape, size, position, and pixel properties (intensity, gray value) for object classification.

# OLYMPUS Stream Provides Intuitive Workflow Interfaces

With the click of an icon on the Materials Solution tool window, you can execute the most complex image analysis task quickly, precisely, and in compliance with most common international standards.
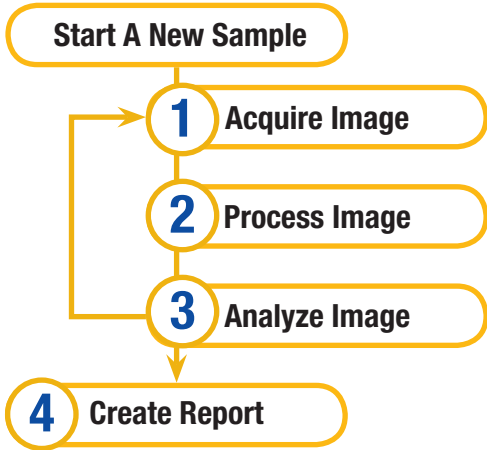
**Start A New Sample**

1 **Acquire Image**

2 **Process Image**

3 **Analyze Image**

4 **Create Report**



Example: Grains Planimetric

# Specialized Solutions for Metallography and Materials Science
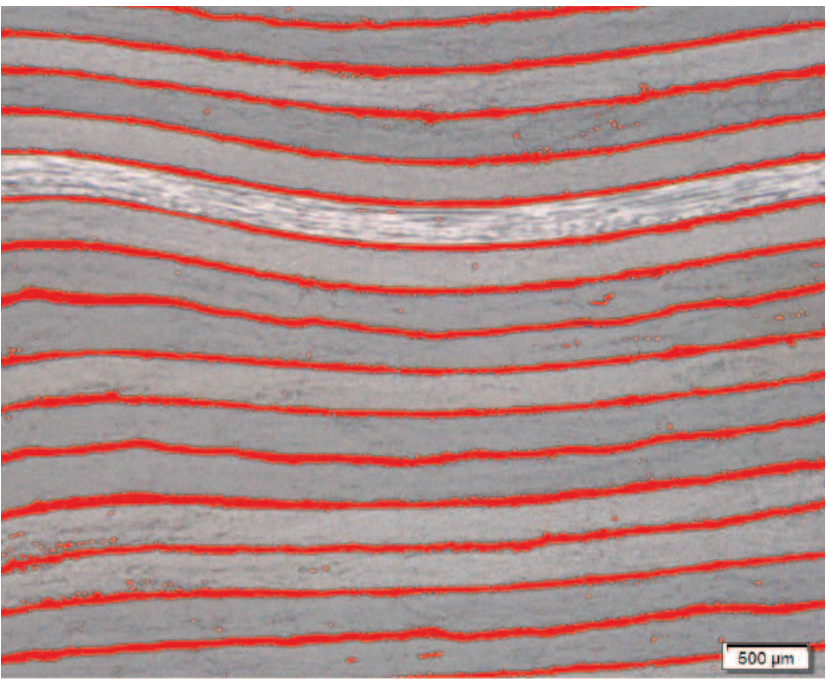


Carbon Fiber Fabric

## Layer Thickness Measurement

One or more layers of cross-sectioned samples can be measured. With the OLYMPUS Stream software technology, the shapes are defined and the layers automatically measured. This module is used for a wide variety of applications, such as evaluating paint-coating thickness and layer thickness evaluation of multilayer materials such as composite plastics.
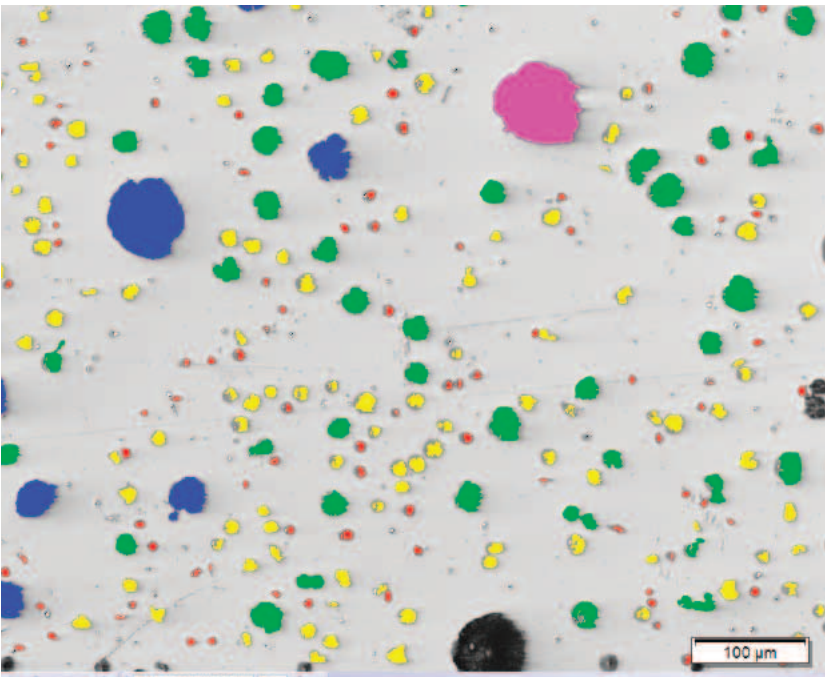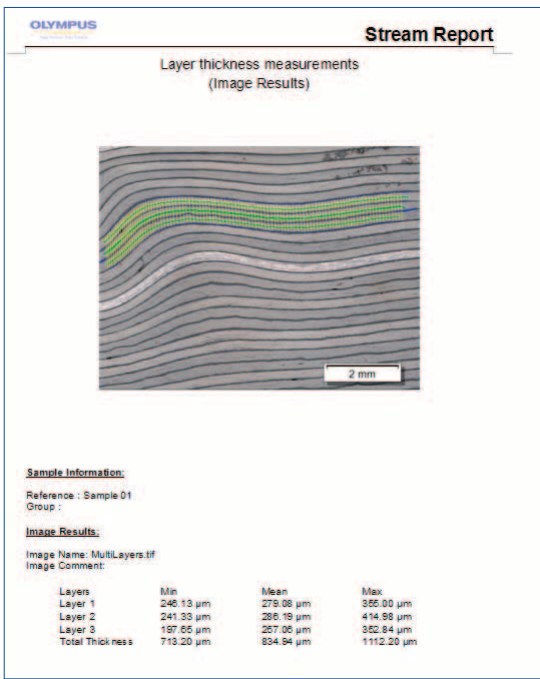


Polished Cast Iron

## Cast Iron

This module is for casting manufacturers who need to measure and control the graphite nodularity to check the mechanical characteristics of their cast products. With OLYMPUS Stream, this nodularity can be calculated by graphite size, shape, and distribution. The results are automatically created according to international standards (JIS G5502, ASTM E247, and ISO945).
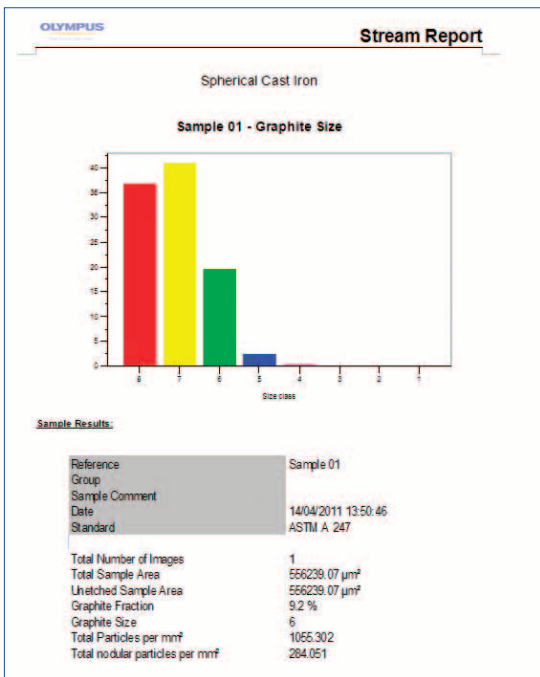
# Specialized Solutions for Metallurgy and Materials Science
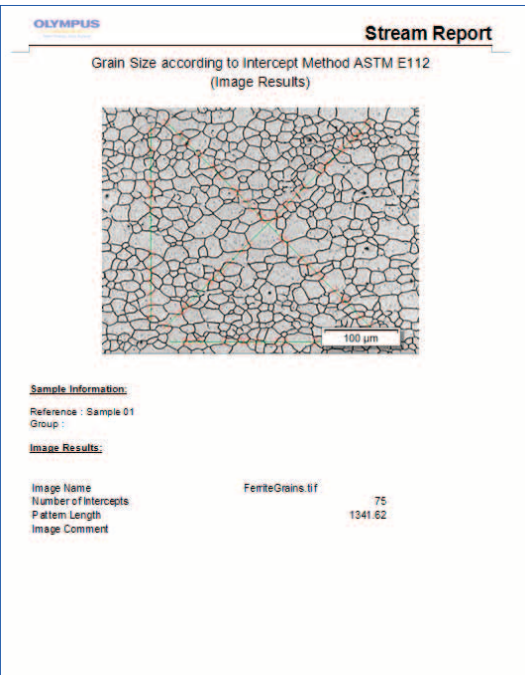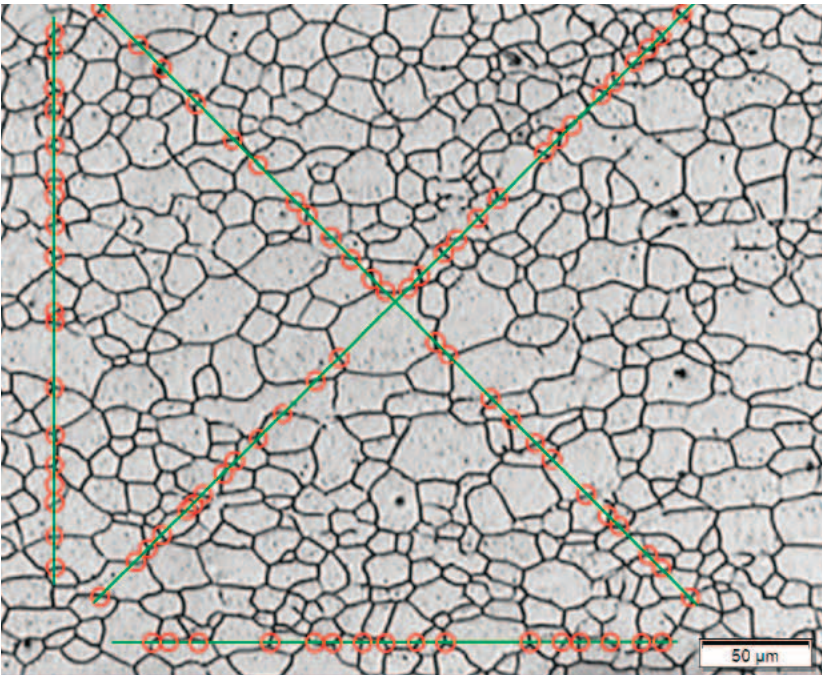




## Grain Sizing Intercept

This module is for steel manufacturers measuring and controlling grain size after cross-sectioning, polishing or etching steel samples. OLYMPUS Stream can calculate the grain size number G by the intercept method automatically with no time consuming manual actions. The results are created according to international standards (JIS G5502, ASTM E112, and DIN50601).

## Non-Metallic Inclusion Rating in Steel

This module is for steel manufacturers measuring and controlling the shape and size of non-metallic inclusions (oxide, alumina, sulphide, or silicate) in steel. OLYMPUS Stream can evaluate non-metallic inclusion with the results created automatically according to international standards (ASTM E45 Method A and DIN 50602 Method M).
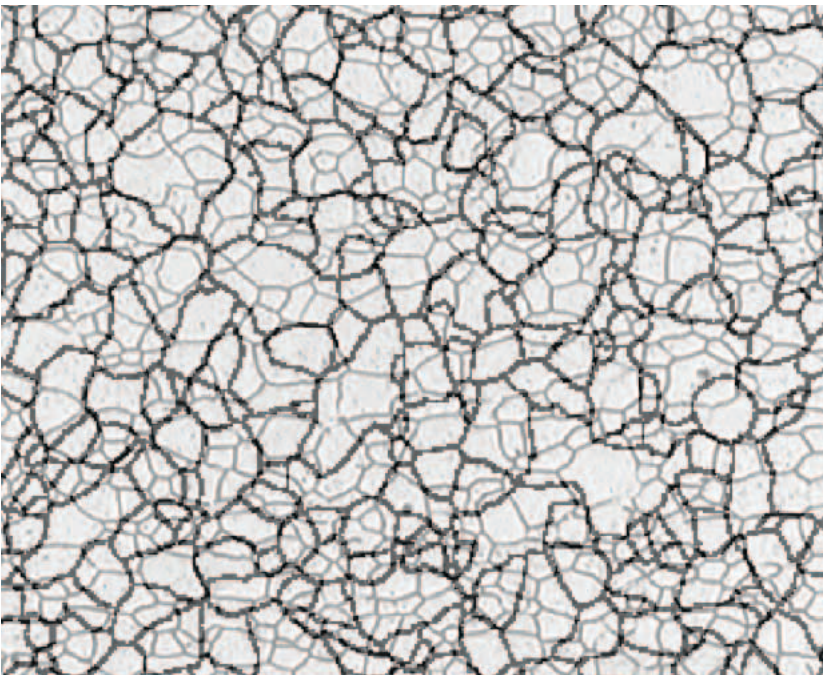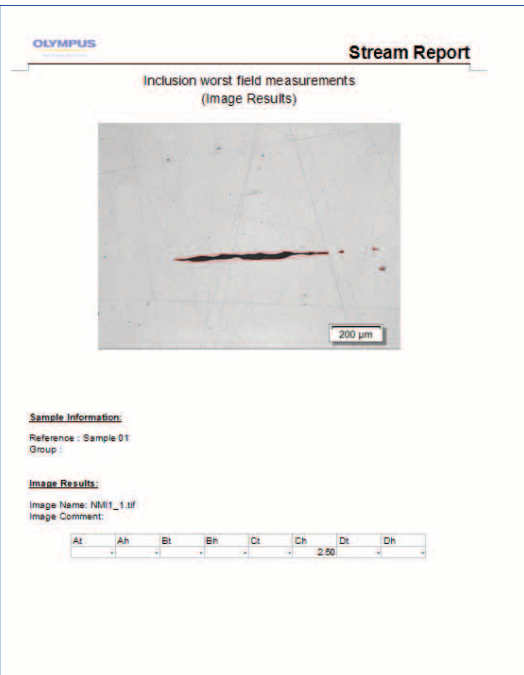




Steel microstructure with superimposed reference image as overlay for live evaluation

## Grain Sizing Planimetric

This module is for steel manufacturers measuring and controlling grain size after cross-sectioning, polishing or etching steel samples. OLYMPUS Stream can automatically calculate the grain size number G by the planimetric method. The results are created according to international standards (JIS G5502, ASTM E112, and DIN50601).

## Chart Comparison

A live or still image can be compared with standard charts. Overlay comparisons can be made, and function preview is available. This module can be used for ASTM grain size number evaluation, non-metallic inclusion rating, and cast-iron shape class evaluation.
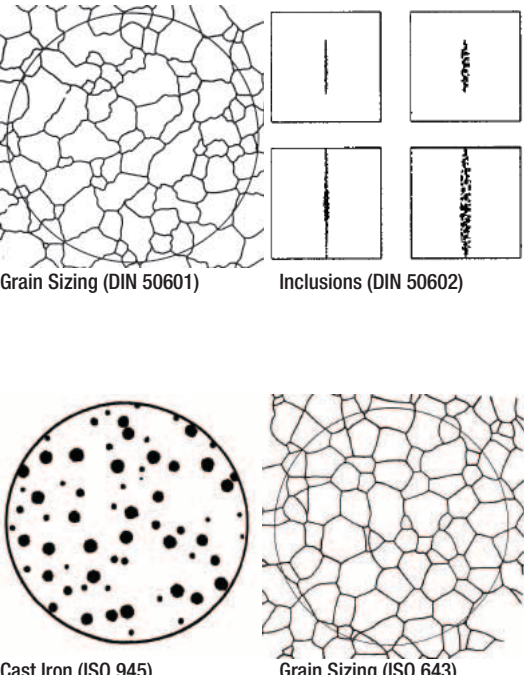
## Build Your Olympus System Your Way
# Olympus Broad Range of Digital Cameras

### DP72

With this color digital camera, resolution, sensitivity, frame rate, and color fidelity combine to provide the highest level of performance. The DP72 is compatible with all samples and observation modes, including fluorescence, and produces clear 12.8M-pixel sample images.

### DP25

This high-resolution 5M pixel color CCD camera provides the highest performance in brightfield observation for most applications. The DP25 accommodates all techniques with high color fidelity.

### DP21

This 2M-pixel color CCD camera can be controlled from a space-saving, intuitively operated hand- switch. The hand-switch incorporates the 12 most frequently used measurement functions for efficient inspection of industrial parts.

### Comparison Table for Camera Selection

| | | Universal model | | Standard model | Introductory model | | Standalone model |
|---|---|---|---|---|---|---|---|
| ■ | Available | Outstanding performance | First-rate Flexibility | Exceptional Color Fidelity | For standard applications | Cost-performance | Space saving |
| ■ | Olympus recommendation | DP72 | XC10 | DP25 | UC30 | SC30 | DP21 |
| Image sensor | | 2/3 in. Color CCD | 2/3 in. Color CCD | 2/3 in. Color CCD | 1/1.8 in. Color CCD | 1/2 in. Color CMOS | 1/1.8 in. Color CCD |
| Pixel density (megapixel) | | 12.8 | 1.4 | 5.0 | 3.2 | 3.3 | 2.0 |
| Frame rate (fps) | | 57~15 | 50~15 | 32~8 | 35~7 | 49~10 | 27~15 |
| ADC* | | 12 bit | 14 bit | 12 bit | 14 bit | 10 bit | 12 bit |
| Observation | Bright condition (e.g. Brightfield) | ■ | ■ | ■ | ■ | ■ | ■ |
| | Low light condition (e.g. Darkfield) | ■ | ■ | ■ | ■ | ■ | ■ |
| | Very dark light condition (e.g. Fluorescence) | ■ | ■ | | | | |
| Measurement / Analysis | Find minute difference at low magnification | ■ | | ■ | | | |
| | High accuracy measurement/ analysis | ■ | | ■ | | | |
| | Thresholding analysis (B/W mode) | ■ | ■ | ■ | ■ | | ■ |

*Analog-to-digital converter. Actual bit depth of the camera depends on software used.

| Projection magnifications | Video camera adapter | Projection area (F.N.) | | | | | |
|---|---|---|---|---|---|---|---|
| | | DP72 | XC10 | DP25 | UC30 | SC30 | DP21 |
| 1X | U-TV1XC | 11.0 | 11.0 | 11.0 | 8.9 | 8.0 | 8.9 |
| 0.63X | U-TV0.63XC | 17.5 | 17.5 | 17.5 | 14.1 | 12.7 | 14.1 |
| 0.5X | U-TV0.5XC | 22.0** | 22.0** | 22.0** | 17.8 | 16.0 | 17.8 |
| 0.35X | U-TV0.35XC | - | - | - | - | 22.0** | - |

**Insufficient peripheral light intensity or vignetting may be distinct depending on optical system.
Practical Field of View (mm) = Projection Area (field number) / Objective Lens Magnifications
Generally, required sensitivity becomes higher in the order of BF (Brightfield) -> DIC -> POL (Polarized light) -> DF (Darkfield) -> FL (Fluorescence). However, it actually depends on how much light will come back from the sample.

## Easily Expandable to Future Applications
# OLYMPUS Stream Expands to Meet Your Future Needs
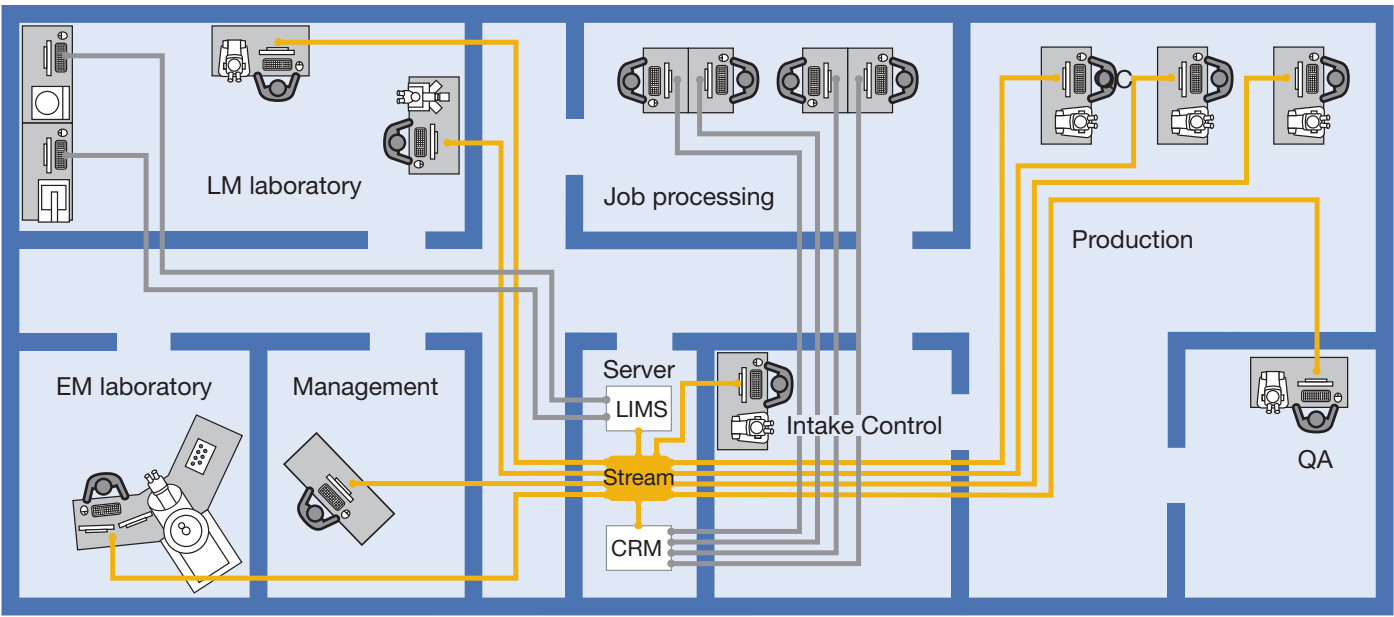


### Database Management

When you need to efficiently browse through thousands of images and other files created in the past, OLYMPUS Stream can streamline your workflow from image capture through data management.

The software incorporates a client-server database based on Microsoft SQL Server Express. It allows you to assign user-definable fields (creation date, project ID, parts number, deadline, and metadata) into image and other files and folders, permitting efficient data sharing and quick searches.

### Simple Network Connections

The OLYMPUS Stream NETCAM option lets any authorized network user connect to your OLYMPUS Stream PC and visualize the same image in real time with a web browser. What's more, the DP21 also provides self-contained integration into your local network, allowing you to share your work across your office or around the world.

### Microsoft Office 2010

Stay up to date with OLYMPUS Stream. The report tool can use the new version of the very popular Microsoft Office suite. OLYMPUS Stream is there and is designed for the future.

### Windows 7 64-bit

The 64-bit edition of Microsoft Windows 7 is the new reference in operating systems. OLYMPUS Stream fully utilizes all of the advanced capabilities of 64-bit computing for your everyday tasks. You can smoothly execute advanced image processing tasks (like counting more than 2 million objects simultaneously) that were impossible before.

# OLYMPUS Stream Specifications
## Main license

| | | Start | Basic | Essentials | Motion |
|---|---|:---:|:---:|:---:|:---:|
| **Basic image acquisition** | | | | | |
| Live image acquisition | Captures live image in various format | ■ | ■ | ■ | ■ |
| Live pan and zoom | Zoom into live image using mouse wheel, displays crosshair in overlay | ■ | ■ | ■ | ■ |
| **Basic image tools** | | | | | |
| Image history and properties | Displays image history and properties | ■ | ■ | ■ | ■ |
| Image navigator | Enables tool window for image navigation and zooming | ■ | ■ | ■ | ■ |
| Gallery view | Displays thumbnails of open images in a gallery | ■ | ■ | ■ | ■ |
| Layers | Enables viewing, extraction and deletion of single image layers | ■ | ■ | ■ | ■ |
| Image processing and filters | Enables contract adjustment, edge detection, smoothing and sharpening of images and shading correction | ■ | ■ | ■ | ■ |
| Static annotations | Draws text, arrows, lines, rectangles and ellipses on the image | ■ | ■ | ■ | ■ |
| **Interactive measurements** | | | | | |
| Field of view measurement | Measures distances, angles, rectangles, circles, ellipses and polygons | ■ | ■ | ■ | ■ |
| Advanced measurement | Interpolated polygon, Magic wand | — | — | ■ | ■ |
| **Olympus device control** | | | | | |
| Olympus microscope control | MX61A, MX61, MX61L, SZX-MDCU, SZX2-MDCU, BX-UCB, IX-UCB, BX-REMCB, U-CBS | ■ | ■ | ■ | ■ |
| Olympus cameras | Controls Olympus cameras[1] and old compatible models[2] (RoHS and non-RoHS) | ■ | ■ | ■ | ■ |
| **Extended image acquisition** | | | | | |
| Movie | Create movie files (*.avi format) | — | ■ | ■ | ■ |
| Software autofocus | Perform contrast-based sorftware autofocus[3] | — | ■ | ■ | ■ |
| **Reporting** | | | | | |
| Data export and statistics | Exports measurement data to Microsoft Excel and OLYMPUS Stream workbook, including statistical analysis of measurements | — | ■ | ■ | ■ |
| Report composer | Creates Microsoft Word documents, directly from OLYMPUS Stream (requires Microsoft Word 2003, 2007 or 2010) | — | ■ | ■ | ■ |
| Extension to Microsoft Word | Creates additional menu for report creation into Microsoft Word | — | ■ | ■ | ■ |
| **Basic customization** | | | | | |
| MyFunctions | Creates a workflow and large button bar for frequently used commands | — | ■ | ■ | ■ |
| **Extended device control** | | | | | |
| Non-Olympus cameras | Controls non-Olympus cameras | — | ■ | ■ | ■ |
| Imaging source converter | Controls DFG-1394 A-D (CON 800) converter | — | ■ | ■ | ■ |
| **Advanced customization** | | | | | |
| Layout management | Allows recording and editing of layouts | — | ■ | ■ | ■ |
| Macro recorder | Allows recording and editing of macros | — | — | ■ | ■ |
| **Advanced acquisition process** | | | | | |
| Instant EFI | Instantly creates an EFI image while focusing | — | Option | ■ | ■ |
| Manual MIA | Creates panoramic images over areas (requires manual XY stage) | — | Option | ■ | ■ |
| Time lapse | Captures still images over time frequency | — | — | ■ | ■ |
| **Extended image tools** | | | | | |
| Image arithmetic | Performs arithmetic and logical operations with image | — | — | ■ | ■ |
| **Basic image analysis** | | | | | |
| Phase analysis | Perform threshold-based phase segmentation on full images and ROIs[4], calculates area, area fraction and objects count | — | — | ■ | ■ |
| **Advanced automated acquisition process** | | | | | |
| Automated EFI | Automatically creates an EFI image via a predefined number of frames, step size and top/bottom range (requires motorised Z) | — | — | — | ■ |
| Automated MIA | Creates panoramic images over areas (requires motorised stage) | — | — | — | ■ |
| Automated Z-stack acquisition | Automatically acquires Z-stacks (requires motorised Z) | — | — | — | ■ |
| Stage navigator | Position list and stage navigator to capture images at several stage positions or over stage areas | — | — | — | ■ |
| **Stage control** | | | | | |
| 3rd party stage controls | Controls XY stage controllers from Märzhauser | — | — | — | ■ |
| **Advanced image tools** | | | | | |
| Intensity calibration | Performs intensity calibration of channels | — | — | — | ■ |
| Z-stacks projection | Calculates projections over Z-Stacks | — | — | — | ■ |
| **Data management** | | | | | |
| Client-server database | Provides image and data management solution for microscopy (utilises Microsoft SQL Server Express 2005 or 2008) | — | — | — | ■ |

[1] Altra 20, DP20, DP21, DP25, DP70, DP71, DP72, SC20, SC30, XC10, XC30
[2] CC12, CVI, CVII, CVIII, CVIIIu, F-View II
[3] Requires Olympus microscope with motorized Z-axis or external motorised Z-axis (supported in OLYMPUS Stream Motion)
[4] Rectangle, circle, polygons and magic wand.

# Materials Solution for Essentials, Motion

| **Layer thickness measurement** | |
|---|---|
| Description | Measures the thickness of single or multiple layers (cross section view) |
| Supported standards | n/a |
| Measurement types | Layer boundaries can be specified using automatic detection, magic wand or manual mode. Individual measurements can be added or deleted later on. |
| | Measurement of any type of layers (with even or uneven boundaries) is supported. Layer thickness measurement calculates mean, maximum and minimum values as well as statistical data for each individual layer. |
| Output | Spreadsheet with individual measurements. Report automatically created in Microsoft Word. |

| **Cast Iron Analysis** | |
|---|---|
| Description | Measures the distribution, shape and size of graphite content in cast iron samples |
| Supported standards | EN ISO 945-1, ASMT A247, JIS G5502, KS D 4302, GB/T 9441 |
| Measurement types | On polished samples: Automatic measures the characteristics of the graphite content (Size, Shape and Distribution) On etched samples: Measures the ferrite to pearlite ratio |
| | Integrated workflow which take into account the sample status (etched or polished) Stores all results in the image property for additional data mining |
| Output | Spreadsheet with individual measurements. Report automatically created in Microsoft Word. |

| **Grain sizing intercept** | |
|---|---|
| Description | Measures the mean grain index using the intercept method |
| Supported standards | ASTM E112, GB/T 6394, GOST 5639, ISO 643, DIN 50601, JIS G0551, JIS G0552 |
| Measurement types | Selection of pattern (Circles, Cross, Cross & Circles, Vertical Lines, Horizontal Lines, Horizontal & Vertical Lines). Definition of the number of test lines for determination of grain elongation. |
| | Display the g-value in the Material Solution Tool Window. Stores all results in the image property for additional data mining. |
| Output | Spreadsheet with individual measurements. Report automatically created in Microsoft Word. |

| **Grain sizing planimetric** | |
|---|---|
| Description | Measures the distribution of grain index using the planimetric method |
| Supported standards | ASTM E112, GB/T 6394, GOST 5639, ISO 643, DIN 50601, JIS G0551, JIS G0552 |
| Measurement types | Automatic extraction of grain boundaries. User interaction using Stream sliders for improved usability. |
| | Display the g-value histogram in the Material Solution Tool Window for direct interaction Stores all results in the image property for additional data mining. |
| Output | Spreadsheet with individual bins measurements, OLYMPUS Stream chart with the distribution. Report automatically created in Microsoft Word. |

| **Non Metallic Inclusion rating in Steel** | |
|---|---|
| Description | Measures the non metallic inclusion rating in steel using the worst field method |
| Supported standards | ASTM E45 Method A, DIN 50602 Method M, ISO 4967 Method A, GB/T 10561 Method A, JIS G0555 Method A, UNI 3244 Method M |
| Measurement types | Automatic detection of non metallic inclusion using colors, shape and size. Automatic classification of oxydes, sulfides, silicates and aluminates |
| | Live display of the detected inclusion with its rating. Stores all results in the image property for additional data mining. |
| Output | Spreadsheet with individual measurements. Report automatically created in Microsoft Word. |

| **Chart Comparison** | |
|---|---|
| Description | Allows the user to compare live or selected images with standard charts |
| Supported standards | ASTM E112, ISO 643 (Option), DIN 50602 (Option), ISO 945 (Option) and DIN 50601 (Option) |
| Measurement types | Multiple displays available, including live overlay. User interaction using OLYMPUS Stream sliders for improved usability. |
| | Calculates statistics on the selected values. Stores all results in the image property for additional data mining. |
| Output | Report automatically created in Microsoft Word using selection of pre-defined templates. |

# Other optional software

| **Particle Detection for Essentials, Motion** | |
|---|---|
| Description | Automatically Count & Measure of objects and particles |
| Supported standards | n/a |
| Measurement types | Multiple threshold methods are available (automatic, manual HSV, manual and adaptative). |
| | The system can automatically measure multiple parameters on all segmentd objects (Area, Aspect Ratio, Bisector, Bounding box, Gravity Center, ID, Mass Center, Intensities Values, Convexity, Diameters, Elongation, Feret, Extent, Next Neighbor Distance, Orientation, Perimeter, Radius, Shape, Sphericity ...). |
| Output | Spreadsheet and charts with individual measurements. Report automatically created in Microsoft Word. |

| **3D Surface View for Motion** | |
|---|---|
| Description | Displays a 3D perspective of an image stack acquired with a motorised Z. (available with Stream Motion) |
| Display | Creates a new image with a 3D perspective. Easy navigation and rendering with the mouse |
| | Measurement of height profiles on the 2D projection |
| Output | The result image can be exported. Animation can also be created automatically. |

| **Netcam for Essentials, Motion** | |
|---|---|
| Description | Live transmission of images over the network |
| Display | Remote Live view of the image using Microsoft Internet Explorer |
| Output | Several users can share the same image at the same time. |