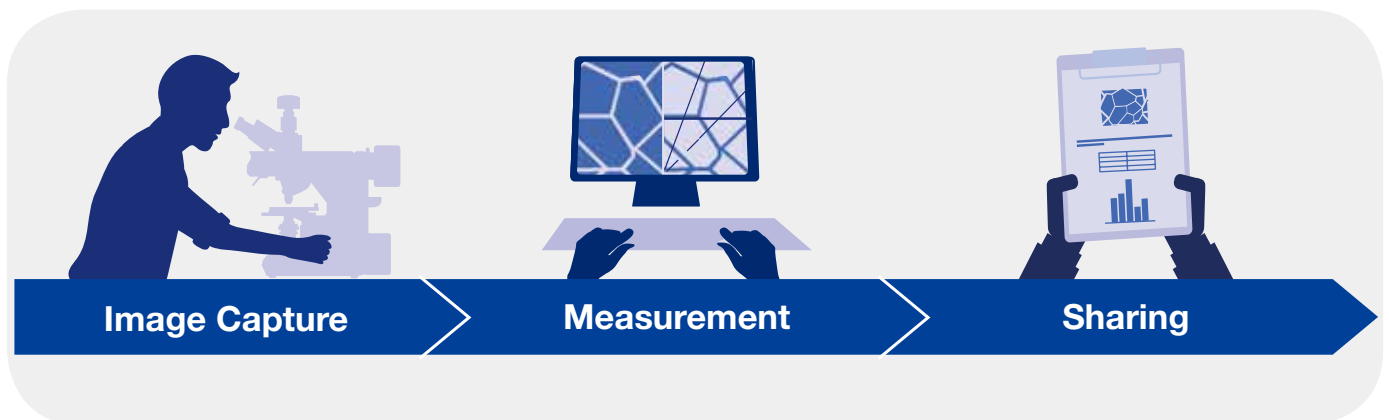




# OLYMPUS Stream Image Analysis Software: Simplify Your Inspection Workflow



## Fast, Efficient Inspection Workflows

For inspection experts, technicians, and lab managers, OLYMPUS Stream software offers intelligent step-by-step workflows to acquire sharp, crisp images that are ready for quantitative measurements and professional reporting based on the latest standards. Users of any experience level can conduct complex image analysis tasks, from image acquisition to standard reporting, under any imaging condition.

Designed for flexibility, OLYMPUS Stream software has a broad scope of functions necessary to conduct fast and precise observation sessions on a large variety of samples while maintaining data security and measurement reliability. Optional solutions enable users to adapt OLYMPUS Stream software to their application, including quality analysis, research and development, process development, and quality control.

## Intuitive Solutions for Manufacturing Quality Control and Materials Research

### Step-By-Step Guidance

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An easy-to-use interface guides you through every step of the inspection process from image acquisition, to measurement and analysis, to reporting and archiving. As a result, you can finish even complex tasks more efficiently.

### Designed for Olympus Hardware

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The software works seamlessly with various Olympus microscopes and digital cameras.

### Optimized for the Industrial Lab

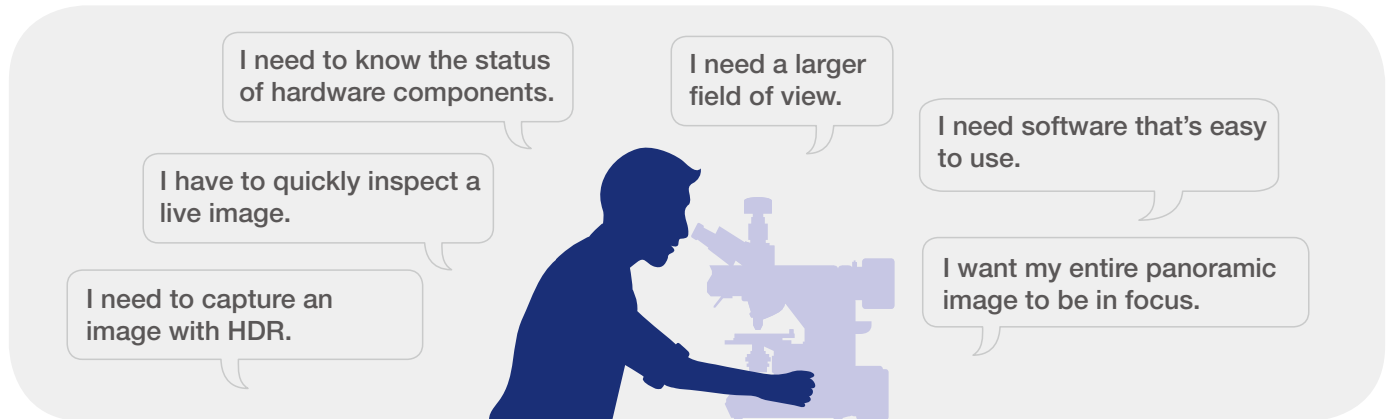
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With specific application modules, OLYMPUS Stream software provides a unique workflow to produce consistent measurements and results that comply with international standards.

# Step-By-Step Guidance

## Smart Technologies

OLYMPUS Stream software's dynamic user interface reduces desktop clutter and confusion by only displaying the tools and functions you want to use. The interface guides you through every step of the process, including image capture, image processing, and report creation. Both simple and complex measurements can be easily conducted using the software's intuitive set of tools.



## Simple Layouts

The software's organized layouts contain the minimum necessary functions for performing the required tasks. Simplified layouts help streamline the inspection workflow and efficiently guide users through the inspection process.

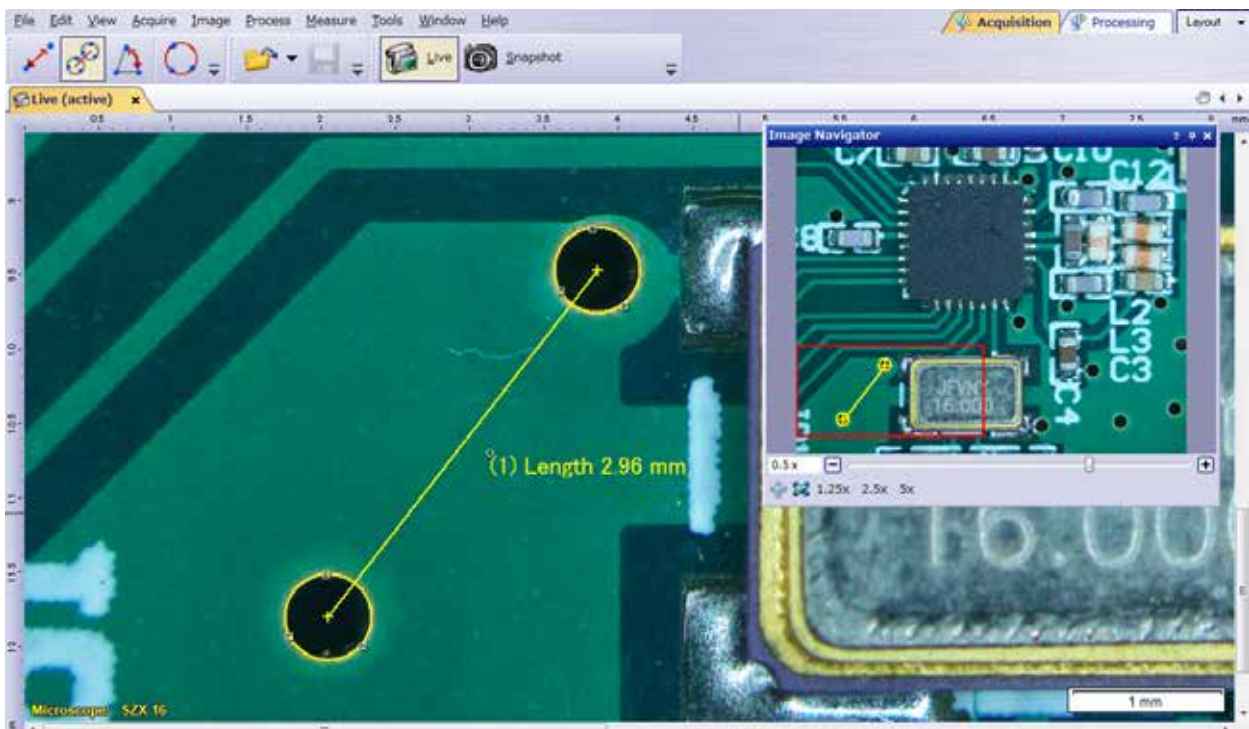
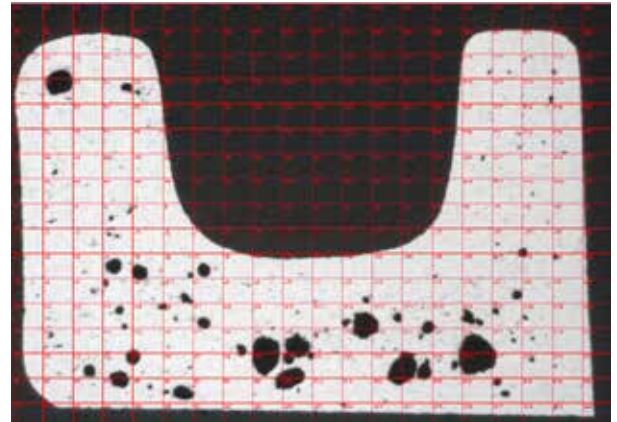


Image acquisition: capture your image with a simple mouse click

## Tools for Live Images

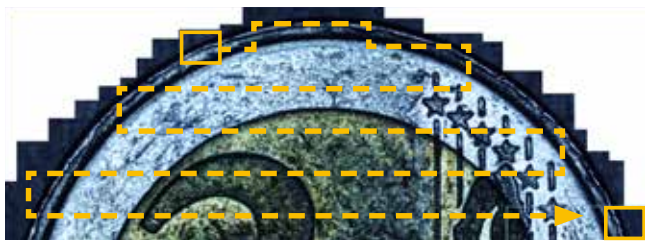
OLYMPUS Stream software supports live image functions for instant feedback and response to complex problems. Real-time image processing increases productivity and reduces analysis time. The software enables users to interact with the live image, which is automatically calibrated, and perform quantitative measurements.



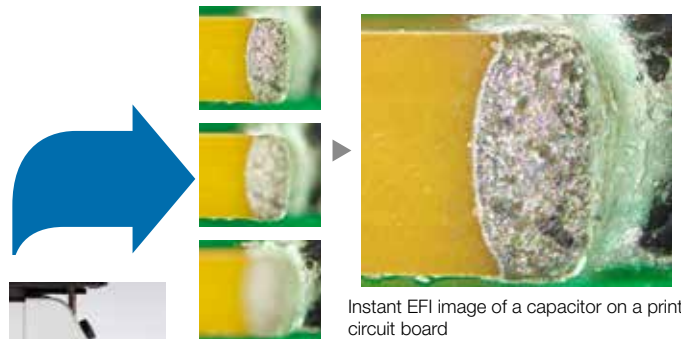
Estimating pore size using live digital reticles  
(Cross section of die casting)

## Quick Panoramic Images and Extended Depth of Focus

Quickly create images of samples that extend beyond the standard depth of focus or the field of view. The instant Extended Focus Image (EFI) function uses the fine focus adjustment to combine many images taken at different Z-levels to build a single combined image that is entirely in focus. Instant Multiple Image Alignment (MIA) enables users to create panoramic images simply by moving the XY stage; a motorized stage is no longer necessary.



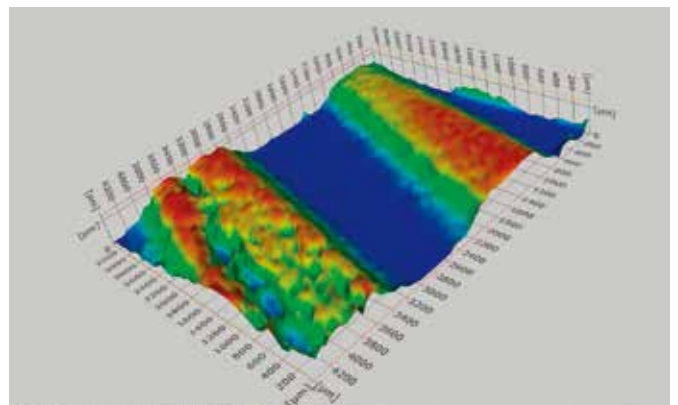
Instant MIA image of a coin



Instant EFI image of a capacitor on a printed circuit board

## 3D Solution

This solution creates height maps from stacks of images acquired automatically or manually at different Z positions. The resulting image can be visualized in three dimensions using the surface view. Measurements, such as 3D profiles and height differences between two or several points, can be performed, and the results exported into Microsoft Excel spreadsheets.



3D profilometry of wear track

# Save Time

I need ideal exposure time.

I can't remember the order of functions.

I'd like to take images of large areas repeatedly and efficiently.

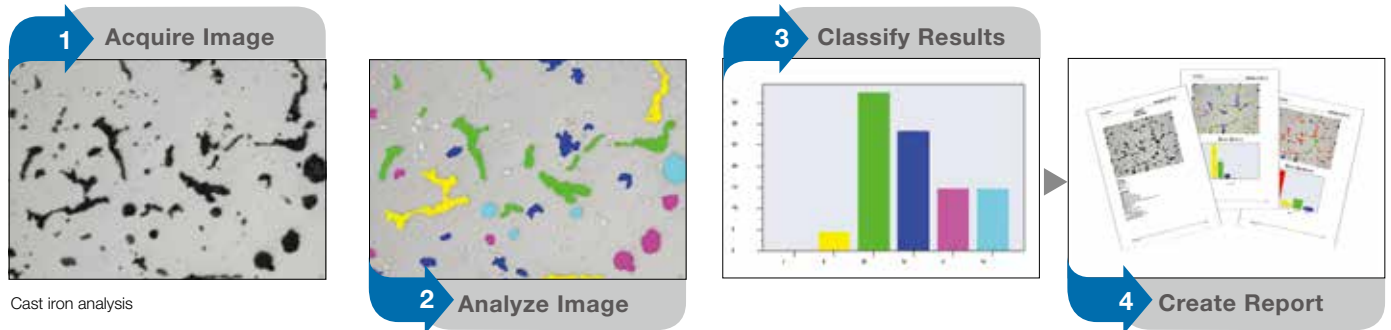
I want to create and edit a report quickly.

I need to update my report with a new image and measurement.

I need quantitative information from my sample.

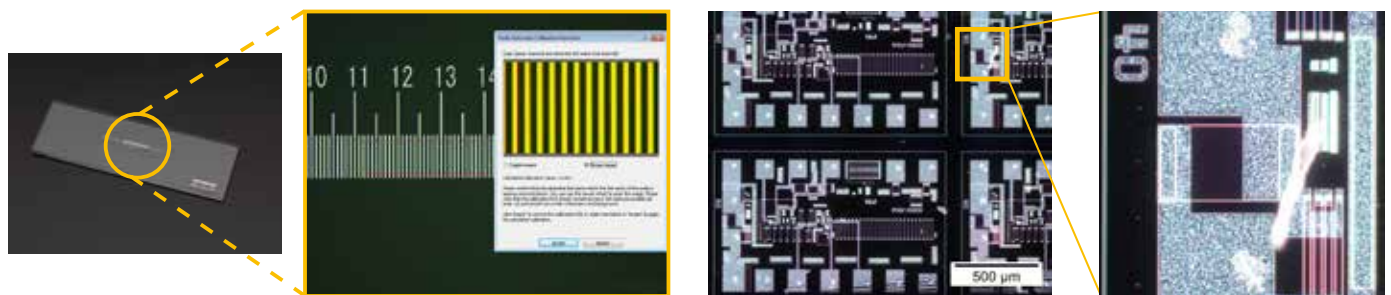
## Guided Operation for Dedicated Purpose Analysis

It can be difficult to remember the correct order of functions when performing image analysis. OLYMPUS Stream software offers intuitive tools to perform complex image analysis tasks in compliance with most common international standards. This reduces the amount of operator training required to conduct the analysis, leaving more time to complete the task rather than remembering how to do it. When using a motorized stage, the alignment feature speeds up your work on multiple sample locations. (see pages 11–15 for more materials solutions information).



## Automated Inspection Tools

The software's automated tools can create a very large set of data in just a few minutes. Automatic magnification calibration using a calibrated grating reticle helps ensure that your images are displayed with the proper scale bar and that your measurements are confirmed. Images of very large areas can be acquired automatically using motorized XYZ stages, enabling the creation of images of large parts with high resolution.

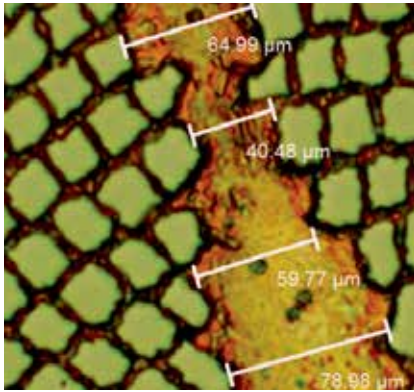


## Recall Acquisition Setting

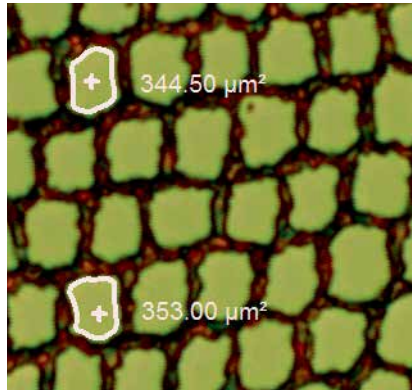
The recall acquisition setting enables users to quickly recall previously used camera settings to capture repeatable images with a consistent look and feel. When using a motorized microscope, this function can automatically recall previous hardware settings. The software also guides the user to manually recall settings when using BX, GX, and MX series microscopes and stereo microscopes.

## Quantitative Information That Matters

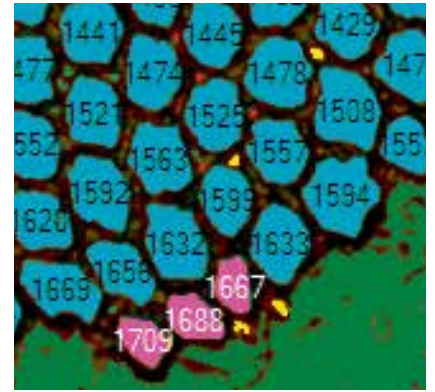
OLYMPUS Stream software features a large set of tools that provide quantitative information about your sample. Interactive measurements on live and still images provide the basic dimensional information (length, area, and diameter), and the results are directly visible on the image. Advanced interactive measurements include the magic wand and complex polygonal shapes for semiautomatic area measurement, while the Count and Measure solution provides access to more than a hundred single particle parameters for pure quantitative analysis based on the threshold method.



Basic measurement (superconductor)



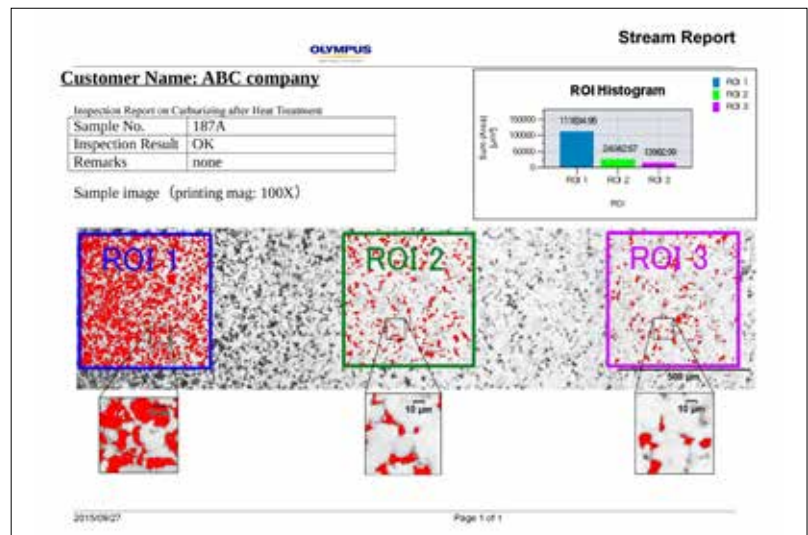
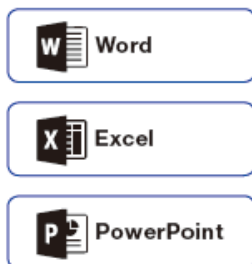
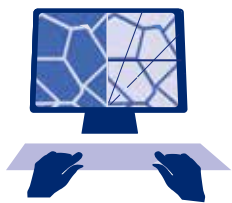
Magic wand (superconductor)



Object detection (superconductor)

## Efficient Report Creation

Creating a report often takes longer than capturing the image and taking the measurements. OLYMPUS Stream software provides intuitive report creation to repeatedly produce smart and sophisticated reports based on predefined templates. Editing is simple, and reports can be exported to Microsoft Word, Excel, or PowerPoint. In addition, OLYMPUS Stream software's reporting tool enables digital zooming and magnification on acquired images. Report files are a reasonable size for easier data exchange by email.



Professional report summarizing particle count data, including image details using digital zooming

# Designed for Olympus Hardware

## A Modular Approach to Build Your System

OLYMPUS Stream software is a powerful and user-friendly tool for making measurements because it was developed for Olympus microscopes with the assistance of experienced microscope users. There's no need to manually record the optical parameters of Olympus UIS2 objectives when used with a conventional microscope. Furthermore, magnification calibration is not required when importing Olympus DSX and LEXT images into the software. OLYMPUS Stream software is available in a variety of packages designed to fit various needs from the entry-level OLYMPUS Stream Start software to advanced packages.

### Control Olympus microscopes

- Upright, inverted, and stereo frames
- Nosepieces and illuminators, both motorized and coded
- Assign functions to the hand set

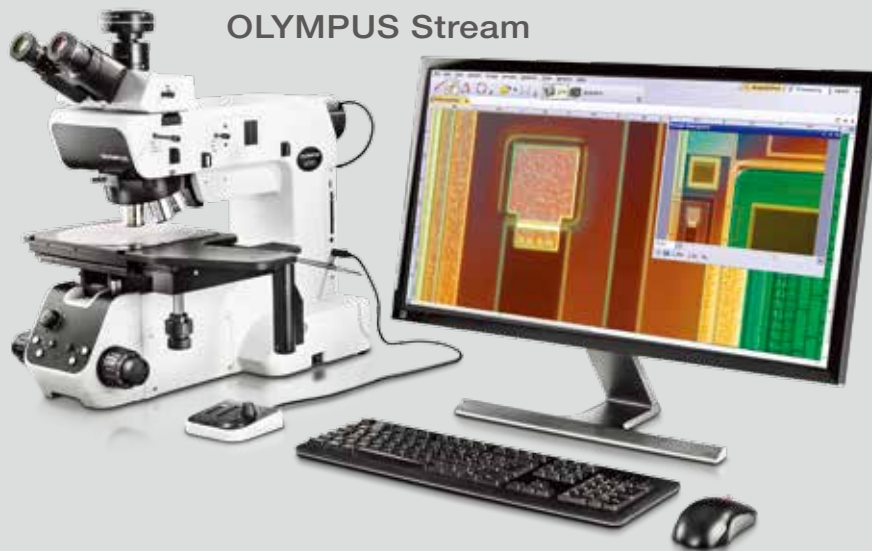
### Automatic recognition

- Microscope unit names
- Observation conditions
- Correct magnification

**CONFIGURABLE**

**RELIABLE DATA**

**OLYMPUS Stream**



**HIGH IMAGE QUALITY**

**SEAMLESS SHARING**

### Olympus cameras

- Well-balanced color tuning
- Image processing, including HDR
- Online shading correction

### Seamless data import for post-processing

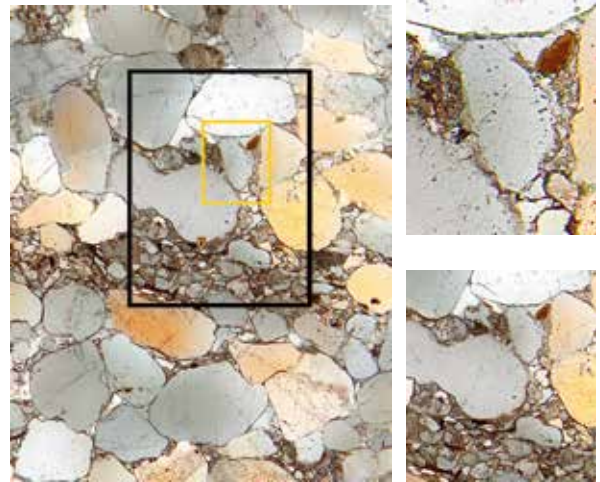
- DSX digital microscopes
- LEXT laser microscopes
- Other lab-based imaging systems



# Olympus Digital Cameras

## Resolution and Color Fidelity

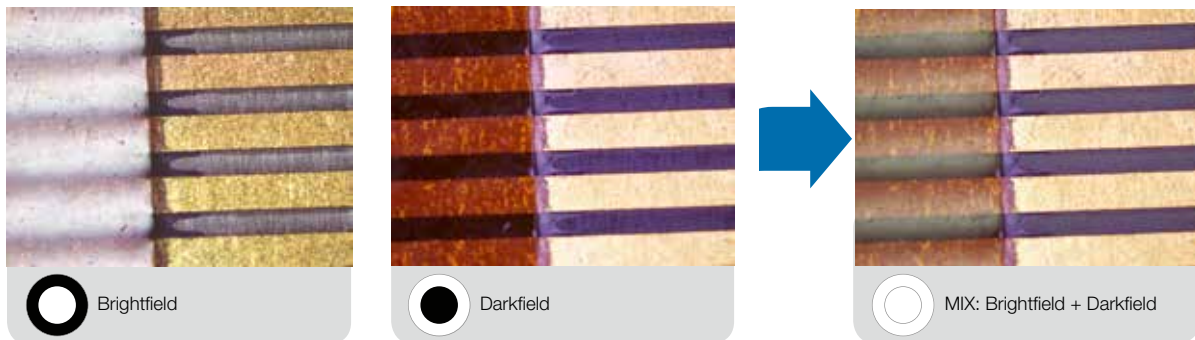
True-to-life samples are important for reproducible and high-quality measurements. Excellent spatial resolution combined with a high pixel count exploit the full optical resolution of the objectives and enable small structures and details within the samples to be imaged, even with low magnification objectives. High-definition images enable users to make observations exclusively on-screen without using the eyepieces.



The low-noise, high-resolution images of a 9-megapixel sensor enable the user to zoom deep into the sample, revealing its structures (sandstone)

## Dedicated Observation Methods

OLYMPUS Stream software supports various illumination methods, including MIX observation. This illumination technique combines directional darkfield, which uses a circular LED to illuminate one or more quadrants at a given time, and brightfield, fluorescence, or polarization, enabling users to highlight defects and differentiate raised surfaces from depressions that are normally difficult to see with conventional microscopes. MIX observation helps reduce a sample's halation and is useful for visualizing a sample's surface texture.

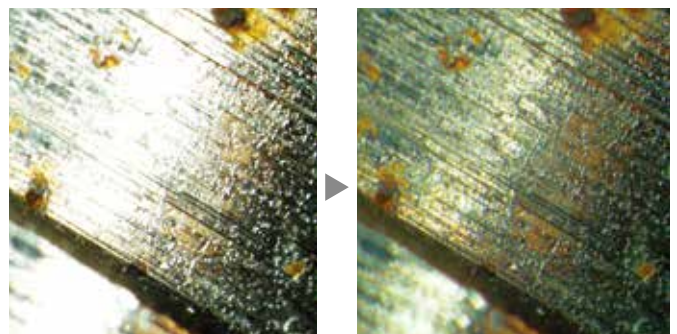


Conventional: brightfield shines the light straight down on the sample while traditional darkfield highlights scratches and imperfections on a flat surface by illuminating the sample from the side of the objective

Advanced: MIX is a combination of brightfield and directional darkfield from a ring of LEDs; the LEDs can be adjusted to select which direction to illuminate from

## Enhanced Contrast

High dynamic range (HDR) imaging improves image contrast in difficult conditions (very bright areas together with very dark areas in the same image). All cameras supported by OLYMPUS Stream software can be used in this mode, and dedicated cameras have an available live mode.



Clearly exposed for both dark and bright parts using HDR (sample: fuel injector bulb)

# Optimized for the Industrial Lab

## Solving Your Inspection Challenges

Industrial labs often have demanding conditions and require repeatable and reproducible results as part of their standard operating procedures. OLYMPUS Stream facilitates inspection, measurement, and analysis with a simple and reliable workflow. The software offers a variety of tools for various materials science analyses, so you can be confident in your results.



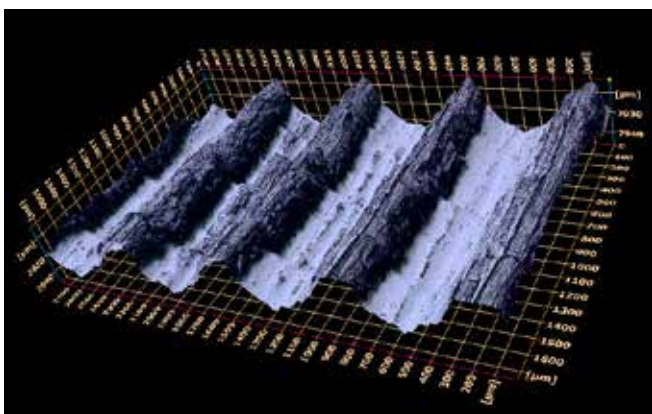
Olympus industrial microscopes support metallurgical analysis



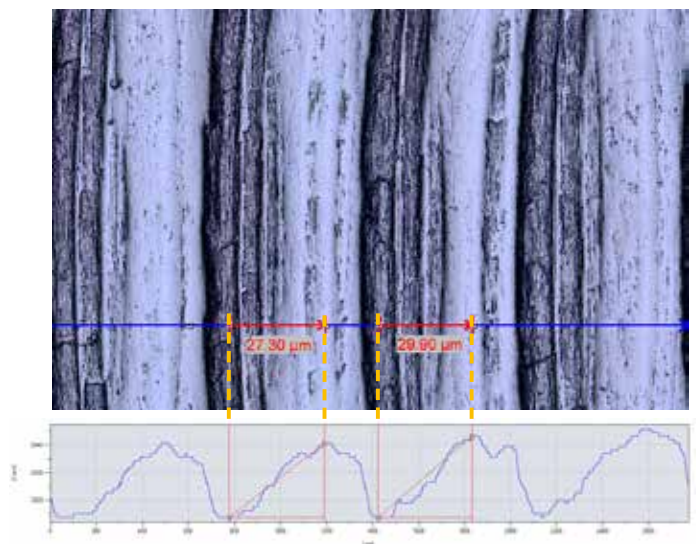
### 3-Dimensional Measurement and Line Profiles

New materials, new techniques, and the drive toward nanotechnology demand higher standards of measurement and quality control. Without the appropriate tools for 3D imaging, it is impossible to quantitatively analyze images from a sample. The OLYMPUS Stream 3D solution provides coded and motorized Z control and instant EFI with height mapping capabilities to measure a 3-dimensional sample.

Data obtained: 3D surface view, 3D measurement, 3D profile measurement



3D surface view (roughness test sample)



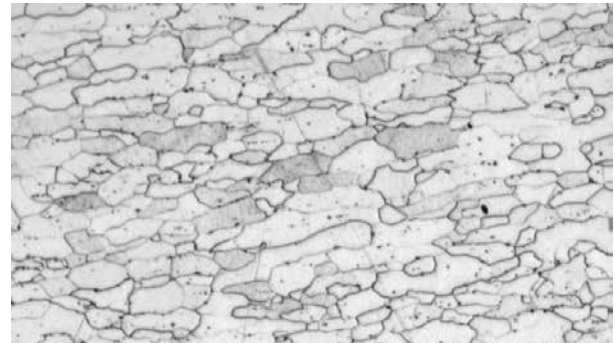
Single view and 3D profile measurement



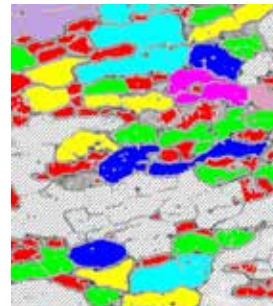
## Count and Measure Solution

Detecting objects and measuring size distribution are among the most important applications in digital imaging. The OLYMPUS Stream Count and Measure solution uses advanced threshold methods to reliably separate objects, such as particles and scratches, from the background. More than 50 different object measurement and classification parameters are available, including shape, size, position, and pixel properties. Two classification parameters can be selected simultaneously. OLYMPUS Stream software with the Count and Measure solution can also be used to support the DSX510 or DSX510i digital microscope for particle analysis common to metallography evaluation and similar applications.

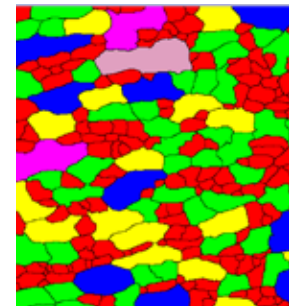
Data obtained: number of detected particles, individual measurement results, and class histograms



Etched steel microstructure (original image)



Grain boundary detection with conventional software



Grain boundary detection using the powerful "Separate Objects" filter



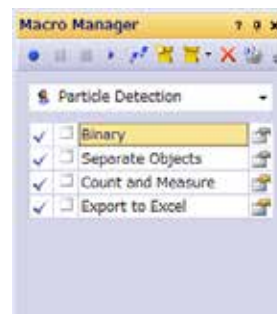
## Recommended Functions

### Efficient Analysis

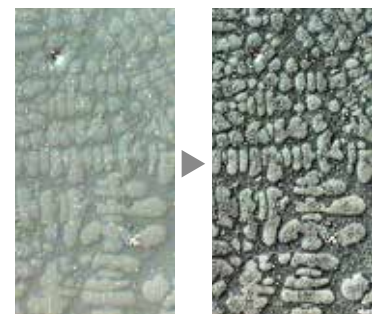
Users can preset complex imaging and measurement tasks with the Macro Manager. The set of tasks can then be performed with a single click. This capability helps ensure consistent output when different operators are using the Count and Measure solution.

### Powerful Image Filters

OLYMPUS Stream software has a variety of useful filters for edge detection, smoothing, and other purposes. For example, the "Separate Objects" filter, "DCE" (Differential Contrast Enhancement) filter, and "Grayscale" filter help make threshold settings and particle detection easier.



Example of Macro Manager set up for Count and Measure



Enhanced contrast using the DCE filter (Dendrite in an aluminum casting)

# Optimized for Industrial Laboratory Work

## Solutions for Metallography (Metal/Casting Industries)



Traditionally, metallography is the study of the microscopic structure of metals and alloys using optical, digital, and laser scanning microscopes. By analyzing a material's microstructure using this OLYMPUS Stream software solution, its performance and reliability can be better understood. Today, metallography is used in materials development, incoming inspection, production and manufacturing control, and failure analysis.



### Grain Sizing in Microstructures Using the Intercept Counting Method

This solution is for manual ferritic or austenitic grain size measurement of steel. It gives a single averaged value using the different available standards (ASTM E112-13; ISO 643:2012; JIS G 0551:2013; JIS G 0552:1998; GOST 5639-82; GB/T 6394-2002; and DIN 50601:1985).

#### Key features

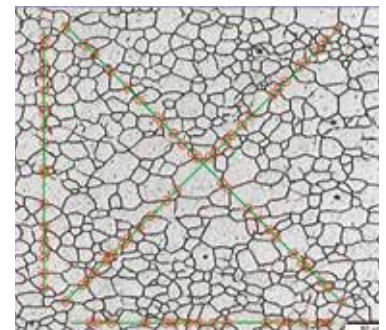
- Counts the number of grain intercepts with patterns
- Direct visualization of the pattern and grain boundaries
- Select from multiple standards

#### Typical applications

- Metallic materials and other types of materials with a geometric structure
- Non-twinned materials (ferrite, aluminum, BCC metals)

#### Associated functions

- Various image filters
- HDR



Grain sizing intercept solution  
(Microstructure with ferritic grains)



### Grain Sizing in Microstructures Using the Planimetric Method

This solution is for automatic grain size distribution measurement on etched microstructures (it also works on aluminum microstructures) using the different available standards (ASTM E112-13; ISO 643:2012; JIS G 0551:2013; JIS G 0552:1998; GOST 5639-82; GB/T 6394-2002; and DIN 50601:1985).

#### Key features

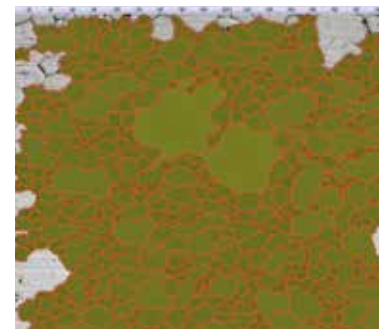
- Counts the number of grains included in the image
- Powerful grain boundary reconstruction by the separator filter
- Area percentage of secondary phase

#### Typical applications

- Metallic materials and other types of materials with a geometric microstructure
- Thermally processed metals

#### Associated functions

- Various image filters
- HDR



Grain sizing planimetric solution  
(Microstructure with ferritic grains)



### Graphite Nodularity Evaluation

This solution automatically evaluates graphite nodularity and content in cast iron samples (nodular and vermicular types). The form, distribution, and size of graphite nodes are classified according to ISO 945-1:2010; ASTM A247-16a; JIS G 5502:2001; KS D 4302:2006; GB/T 9441-2009; ISO 16112:2017; JIS G 5505:2013; ASTM E2567-16a (for nodularity only); and NF A04-197:2004 (for form only) standards. This solution also assists with determining the ferrite-pearlite ratio in cast iron cross sections.

#### Key features

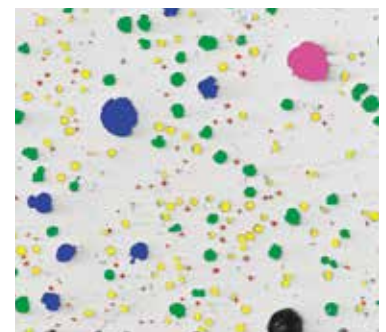
- Measures both the ferrite-pearlite ratio (on etched samples) and graphite distribution (on non-etched samples)
- Measures the distribution of vermicular graphite using standard charts
- Select from multiple standards

#### Typical applications

- All cast iron samples (metallic parts requiring high strength, castability, etc.)

#### Associated functions

- Grayscale mode



Cast iron solution  
(Ductile cast iron showing nodular graphite)



## Rating Non-Metallic Inclusion Content in High-Purity Steel

Classify non-metallic inclusions using the image of the worst field or worst inclusion found manually in the sample. This solution provides results in accordance with ASTM E45-13 Method A, ISO 4967 (method A):2013, EN 10247:2007 Method M, EN 10247:2007 Method P, DIN 50602:1985 Method M, JIS G 0555:2003 Method A, UNI 3244:1980 Method M, and GB/T 10561:2005 Method A. Individual inclusions are displayed and can be edited by the user.

### Key features

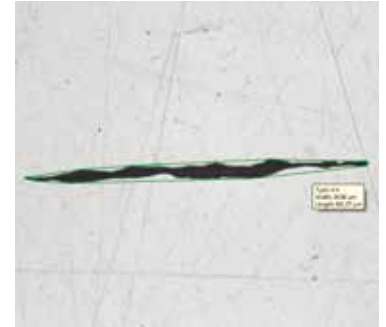
- Exclusively based on the worst field method
- Users need minimal training
- Select from multiple standards, including the most complex (EN 10247)

### Typical applications

- All high-purity steels
- Roll bearing, special steels, controlled dilatation steel, etc.

### Associated functions

- Various image filters
- HDR



Inclusion worst field solution  
(Steel with non-metallic inclusions)



## Comparison of Actual and Reference Images

Easily compare live or still images with autoscaled reference images. This solution includes reference images in each available chargeable set (ASTM E 112-04, ISO 643:1983, ISO 643:2012, DIN 50602:1985, ISO 945-1:2008, SEP 1520:1998, SEP 1572:1971, EN 10247:2007, and ISO 4505:1978). The solution also supports multiple modes, including live overlay display and side-by-side comparison. Additional reference images can be purchased separately.

### Key features

- Not dependent on microscope magnification
- Works with live and still images
- Select from multiple standards

### Typical applications

- Metallic and other materials
- Thermally processed metals

### Associated functions

- Easy focusing and capturing tools

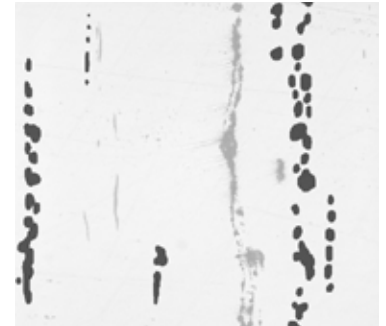


Chart comparison solution  
(Steel with non-metallic inclusions)

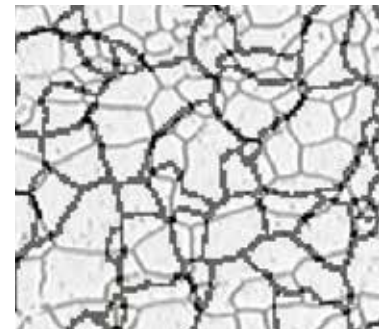


Chart comparison solution  
(Microstructure with ferritic grains)

**Other recommended solutions:**

**Count and Measure, Particle Distribution, Porosity, Extended Phase Analysis, Weld Measurement, 3D**

# Solutions for Machinery Processing (Automotive/Machined Parts Industries)



When cutting, drilling, polishing, and milling metal parts, many types of small defects may occur. To ensure the high quality of these parts, they must be strictly scrutinized during the production process to identify any scratches, cracks, pore size, or contamination.



## Welding Distortion

OLYMPUS Stream software offers an optional solution for measuring the geometric distortion induced by heat during welding. With this solution, it is easy to perform asymmetry, multiple perpendicular lines, and A-throat measurements, enabling detailed and quantifiable measurements of the welding distortion. These measurements are important for assessing the quality of the weld.

### Key features

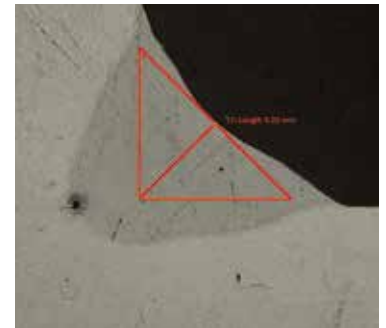
- Measures throat thickness, asymmetry, and thickness of welds
- Geometry is shown on the live image

### Typical applications

- Fillet-welded joints (tee, lap, and corner joints)
- Arc-welded joints

### Associated functions

- MIA and EFI



Weld measurement solution  
(A-throat measurement in a weld seam)



## Phase and ROIs Measurement

The software is used to measure multiple phases in a microstructure by selecting color or gray level intensity (threshold). Sixteen different phases can be defined as well as multiple regions of interest (ROIs) (including the magic wand). Several color spaces can be used (RGB or HSV), and minimal size criteria can also be defined. The results are then expressed as phase fraction area calculations. To create reproducible results, the ROIs can be defined using discrete sizes for comparative measurements.

### Key features

- Selecting different phases using multiple thresholding techniques
- Multiple ROIs (including magic wand) can be selected
- Results are calculated per ROI and per phase

### Typical applications

- Welding quality check
- Die casting
- Steel microstructure
- Composite materials

### Associated functions

- MIA and EFI



Advanced phase analysis solution  
(Phase analysis in dual phase polymer)



## Particle Distribution

Measuring the physical characteristics of particles is a common task in a wide range of industries and is often a critical parameter in the manufacture of many products. The Materials Solution Particle Distribution classifies particle parameters based on their morphology, including characteristics such as size, diameter, area, color, and elongation, and builds a graphical representation of the distribution. Class bins can be defined with color codes to give a better understanding of the results.

### Key features

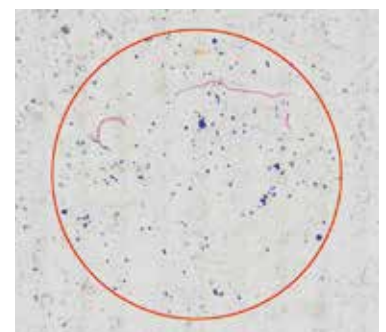
- Counts the number of particles in one or multiple images (motorized solution)
- Classifies according to a selected dimension among a large number of choices
- Codes and validates results according to a user's standards

### Typical applications

- Reactivity of dissolution rate (ex. catalyst, tablets)
- Stability in suspension (ex. sediments, paints)
- Efficacy of delivery (ex. asthma inhalers)
- Texture and feel (ex. food ingredients)
- Appearance (ex. powder coatings and inks)

### Associated functions

- MIA and EFI



Particle distribution  
(Particles extracted on membrane filter)

**Other recommended solutions:**

**Count and Measure, Cast Iron, Inclusion Worst Field, Grains Intercept, Grains Planimetric, 3D**

# Solutions for Electronics (Electronic Device/Semiconductor Industries)



As electronic devices such as computers, cameras, and smartphones continue to shrink, components such as lead frames and connectors are also getting smaller. For example, the average distance between electrical connector pins is now only 0.2 mm. In printed circuit boards, very thin plates are coated and verifying the homogeneity of this coating is a key element of product quality.



## Throwing Power Measurement

Use this solution to measure the distribution of copper plating thickness in through-holes or micro-vias and to perform all the steps necessary to make critical measurements of printed circuit boards (PCBs). This includes dimple depth or the difference in height between the copper plating within a via and around its perimeter.

### Key features

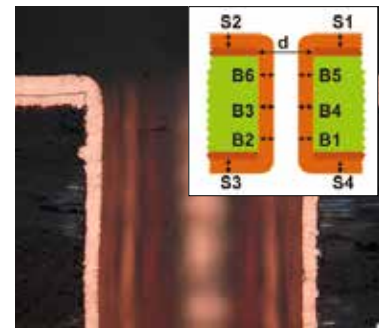
- Manually measure selected points on a live image in a cross-sectioned sample
- Extensive user guidance through all points, according to the sample geometry
- Automatic result correction for samples not fully cut through the center of the hole

### Typical applications

- HDI printed circuit boards

### Associated functions

- Easy focusing and capturing tools



Throwing power solution  
(Cross section of a through hole of a PCB)



## Automatic Critical Dimension Measurement

Use this solution to create edge-detection-based measurements in a live image with pattern recognition. Use the software to create scanners to measure distances (point-to-line, circle-to-circle), circle diameter, circle roundness, and bounding boxes (width, length, and area). The integrated validation tool provides a pass/fail flag for every measurement.

### Key features

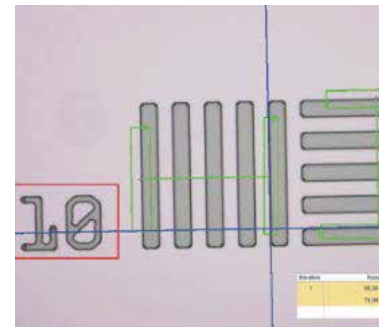
- Expert users can define a measurement routine
- Execute the measurement recipe using a controller without changing the measurement parameters or the tolerance
- Immediate "Fail" or "Passed" flag

### Typical applications

- Semiconductor products

### Associated functions

- Easy focusing tools



Automatic measurement solution  
(Wafer structure)



## 3-Dimensional Measurement and Line Profiles

This solution creates height maps from stacks of images acquired automatically or manually at different Z positions. The resulting image can be visualized in three dimensions using the surface view. Measurements, such as 3D profiles and height differences between two or several points, can be easily performed. The results can then be exported into workbooks and Microsoft® Excel® spreadsheets.

### Key features

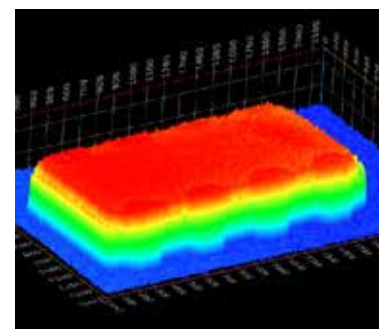
- 3D image obtained with the focus-variation method without any size limit
- Extract a 3D profile by selecting a line and measure the orthogonal distances on the profile with feedback on the image
- Export 3D profiles for compatibility with roughness calculation by using third party software

### Typical applications

- 3D profile for evaluation of surface flatness
- Failure analysis

### Associated functions

- Easy focusing tools

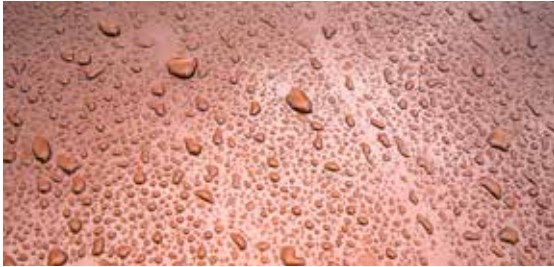


3D solution  
(IC chip on a PCB)

**Other recommended solutions:**

**Count and Measure, Particle Distribution, Porosity, Extended Phase Analysis**

# Solutions for Surface Coatings and Thin Film Deposits (Coating Industries)



Surface coatings are any mixture of film-forming materials that contain pigments, solvents, and other additives, which, when applied to a surface and cured or dried, yield a thin film that is functional and often decorative. Surface coatings include paints, drying oils and varnishes, clear synthetic coatings, and other products that protect the surface of an object from the environment. These products can also enhance the aesthetic appeal of an object by accentuating its surface features or concealing blemishes.



## Thin Coating Thickness Evaluation (Calotest Method)

This solution enables coating thickness from top-view images using the Calotest method. With the Calotest method, a grinding sphere wears a tiny crater through the coating. The software uses the sphere and sample geometry to calculate the thickness of the coating.

### Key features

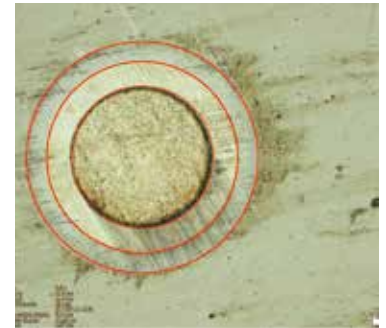
- Guides the user through a selection of shapes and print morphologies
- Measurements are easy to perform
- Complies with international standards

### Typical applications

- CVD, PVD, plasma spray coatings
- Anodic oxidation layers
- Surfaces treated by ion sputtering or ion plating
- Chemical and galvanic deposits
- Polymers, paints, and lacquers

### Associated functions

- Various image filters



Coating thickness solution  
(A printed thin coating on a metal substrate obtained with the Calotest method)



## Layer Thickness Measurement

Measures layer thicknesses either perpendicular to neutral fibers, via the shortest distance, or with a parallel method. Users can now measure layers with even or uneven boundaries. Layer thickness measurement software calculates mean, maximum, and minimum values as well as statistical data for each layer. Layer boundaries can be specified using automatic detection, magic wand, or manual mode. Individual measurements can be added or deleted later.

### Key features

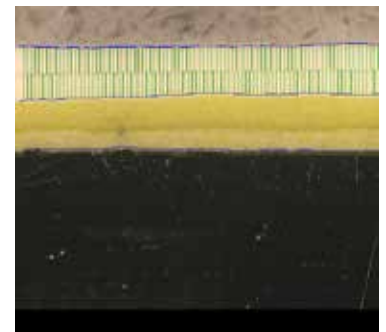
- Select different phases using automatic, magic wand, and manual measurement modes
- Automatic layer measurement is performed using the neutral fiber as reference layer
- Flexible selection of multiple points or inter-distance

### Typical applications

- CVD, PVD, plasma spray coatings
- Anodic oxidation layers
- Chemical and galvanic deposits
- Polymers, paints, and lacquers

### Associated functions

- EFI and MIA



Layer thickness solution  
(Cross section of paint and primer lacquer on steel)



## Pore Fraction and Density Measurement

The Porosity solution in OLYMPUS Stream software includes a tool for measuring the area fraction and number of pores on cross-sectional surfaces and coatings. The software uses the threshold method to differentiate between the pores and the substrate on color or gray level images. Pore density and the size of the largest pore is calculated for every selected region of interest and on the whole image.

### Key features

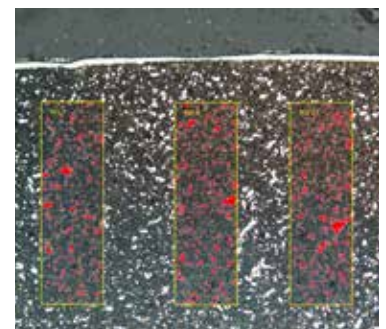
- Several thresholding techniques are available
- A size limit per pore can be fixed
- Measurement per ROI is available

### Typical applications

- Voids in chemical materials
- Level of porosity in foam

### Associated functions

- MIA and EFI



Porosity solution  
(Cross section of carbide coating in thermal deposition processing)













**Other recommended solutions:**

**Count and Measure, Particle Distribution, Extended Phase Analysis**



## Materials Solutions for Every Purpose

More information is available on the application solution pages of the Olympus website ([www.olympus-ims.com/application-solutions](http://www.olympus-ims.com/application-solutions)).

Solutions	Descriptions	Application example	Recommended Industry											
			Metal/Casting	Automotive	Glass/Ceramic	Coating	Consumer Goods	Electronic Devices	Semiconductors	Fluids & Oils	Machined Parts	Carbon/Composites	Chemical/Plastic/Rubber	Industrial Scientific Research
 Grain Intercept	Steel manufacturers use this solution for measuring and controlling grain size after cross-sectioning, polishing, or etching steel samples. This function is based on overlaying "test lines" and counting the number of intercepts with grain boundaries	Page 11	■	■			■					■		■
 Grain Planimetric	Steel manufacturers use this solution for measuring and controlling grain size after cross-sectioning, polishing, or etching steel samples. This function reconstructs boundaries for each grain and conducts grain sizing with the area percentage of the second phase.	Page 11	■	■			■					■		■
 Inclusion Worst Field	Steel manufacturers use this solution for measuring and controlling the shape and size of nonmetallic inclusions (oxide, alumina, sulfide, or silicate) in steel.	Page 12	■	■			■					■		■
 Cast Iron	Casting manufacturers who need to measure and control the graphite nodularity and check the mechanical characteristics of their cast products use this solution.	Page 12	■	■			■					■		■
 Chart Comparison	A live or still image can be overlaid onto standard charts for comparison. Function preview is available.	Page 12	■	■			■					■		■
 Layer Thickness	One or multiple layers of a cross-sectioned sample can be measured using the Layer Thickness solution. The shapes are defined, and the layers are automatically measured.	Page 15		■		■								■
 Coating Thickness	This solution enables the measurement of coating thickness from top-view images using the Calotest method.	Page 15		■		■								■
 Automatic Measurements	This solution is used for creating measurements based on edge-detection on a live image with pattern recognition.	Page 14							■	■				
 Throwing Power	This solution measures the distribution of copper plating thickness in through-holes or micro-vias.	Page 14							■	■				
 Porosity	This solution enables pores to be measured either for area fraction or the number of surface pores using ROIs (circular, triangular, rectangular, and polygonal) and thresholds.	Page 15	■	■	■	■	■	■	■	■	■	■	■	■
 Particle Distribution	This solution is used to create particle size distribution histograms and tables from multiple images or image series.	Page 13	■	■	■	■	■	■	■	■	■	■	■	■
 Advanced Phase Analysis	This feature offers a new integrated solution to perform phase analysis on a selection of various regions of interest (ROIs) including triangles, circles, rectangles, and polygons.	Page 13	■	■	■	■	■	■	■	■	■	■	■	■

# OLYMPUS Stream Software Version 2.3 Specifications

## Main License Specifications

	■ : Standard ■ : Optional	Start	Basic	Essentials	Motion	Desktop
<b>Image Acquisition</b>						
Basic image acquisition including HDR and auto-calibration of magnification and Live HDR*1, and position navigation*1		■	■	■	■	
Software autofocus*2 and movie acquisition (Avi format)			■	■	■	
Time lapse, instant EFI, and instant/manual MIA*3			■	■	■	
Motorized EFI/MIA and Z-stack acquisition			■	■	■	
Remote live view (NetCam)			■	■	■	
<b>Image and Customization Tools</b>						
Basic tool windows (image history, properties, navigator, and gallery view tool window)*4		■	■	■	■	■
Annotations, layer management, scale bar, cross hair, info stamp display, and image filters		■	■	■	■	■
Digital reticle/grid, line profile display, My Function, layout management, and Macro Manager			■	■	■	■
<b>Measurements / Image Analysis</b>						
Basic interactive measurement (distance, angles, rectangles, circles, ellipses, polygons, circle-to-circle distance, angle ruler, and line ruler) and data export to MS Excel		■	■	■	■	■
Phase analysis, magic wand, freehand polyline, interpolated polygon, morphology filter, and image arithmetics			■	■	■	■
3D measurements, 3D profile measurements, and 3D surface view			■	■	■	■
<b>Reporting*5</b>						
Report creation (MS Word, and MS Excel formats)			■	■	■	■
Presentation creation			■	■	■	■
<b>Data Management</b>						
Stream document storage*6			■	■	■	■
Workgroup database with structured data format			■	■	■	■
<b>Device Support</b>						
Olympus microscopes*7 and Olympus cameras*8		■	■	■	■	
Non-Olympus cameras and image source converters*9			■	■	■	
Non-Olympus stage controllers*9			■	■	■	
<b>PC Requirements</b>						
CPU	Intel Core 2 Duo or higher (Intel Core i5, i7 recommended)					
RAM / Hard disk / DVD drive	3 GB or more (8 GB recommended)/2.4 GB or more free space/DVD+R DL compatible					
OS*10	Windows 10 Pro (32-bit/64-bit) , Windows 8.1 (32-bit/64-bit) Pro, Windows 7 (32-bit/64-bit) Ultimate with SP1, Windows 7 (32-bit/64-bit) Professional with SP1					
.NET Framework	Version 4.5.2 or 4.6.1					
Graphic card*11	1280 × 1024 monitor resolution with 32-bit video card					
Web browser	Windows Internet Explorer 8, 9, 10, or 11					

\*1 Requires the DP74 camera, and the Live HDR function requires a 64-bit OS.

\*2 Requires an Olympus microscope with motorized Z-axis or external motorized Z-axis with OLYMPUS Stream Motion or Automation Solution.

\*3 Instant MIA may not work properly with some cameras.

\*4 Write and read all major file formats and open Olympus proprietary formats (DSX, LEXT and POIR file formats).

\*5 Requires Microsoft Office 2016, 2013 (SP1) or 2010 (SP2).

\*6 Using Microsoft SQL Server Express.

\*7 Supports MX61A, MX61, MX61L, MX61A, MX63L, MX63, GX53, BX3M-CB, BX3M-CBFM, BX-UCB, BX-REMCB, IX-UCB, SZX-MDCU, SZX2-MDCU, U-CBS, STM7.

\*8 Supports DP21, DP22, DP26, DP27, DP73, DP74, LC20, LC30, SC30, SC50, SC100, SC180, UC30, UC50, UC90, XC10, XC30, XC50, XM10.

\*9 Please contact Olympus for supported device information.

\*10 The DP74 supports Windows 10/8.1 (64-bit) and Windows 7 (32-bit/64-bit). The DP73 supports Windows 8.1/7 (64-bit). The SC180/UC90 support Windows 10/8.1/7 (64-bit).

\*11 Required configurations for Live HDR in DP74. Graphic board applicable to CUDA made by NVIDIA (compute capability 2.1 or higher). Graphic board driver applicable to CUDA 7.0 or higher.

## Special Solution Specifications

Solutions	Compatibility			Functions
	Basic/ Essentials	Motion	Desktop	
				Measurement Type
<b>3D</b>	■	Included	Partially included*	3D Surface View, 3D Measurement, 3D Profile Measurement, Motorized Z-stack/EFI, Instant EFI with height map (requires coded or motorized Z-axis).
<b>Automation</b>	■	Included		Automation Solution (Motorized/Manual/Instant MIA, Motorized/Instant EFI without height map (requires coded or motorized XYZ-axis) and with time lapse.
<b>Weld Measurement</b>	■	■	■	Weld Measurement solution (measurements for geometric distortion introduced by the heating during welding).
<b>Count &amp; Measure</b>	■	■	■	Multiple threshold methods are available (automatic, manual HSV, manual and adaptive) The system can automatically measure multiple parameters on all segmented objects (Area, Aspect Ratio, Bisector, Bounding Box, Gravity Center, ID, Mass Center, Intensity Values, Convexity, Diameters, Elongation, Feret, Extent, Next Neighbor Distance, Orientation, Perimeter, Radius, Shape, Sphericity, etc.) Spreadsheet and charts with individual and distribution measurements.

\*Not possible to use the functions relating to image acquisition.

## Materials Solutions Specifications

	Compatibility			Output			Functions	Supported Standards	Multiple Stage Location* Sample Alignment* <sup>1</sup>
	Basic	Essentials/Motion	Desktop	Automatic Report Creation	Workbook with Individual Measurement	Store All Results in the Image Properties			
<b>Solutions</b>							Measurement Type		
<b>Grain Intercept</b>	■	■	■	■	■	■	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 Displays the G-value in the Material Solution tool window	ISO 643: 2012, JIS G 0551: 2013, JIS G 0552: 1998, ASTM E112: 2013, DIN 50601: 1985, GOST 5639: 1982, GB/T 6394: 2002	■
<b>Grain Planimetric</b>	■	■	■	■	■ <sup>2</sup>	■	Automatic extraction of grain boundaries User interaction using Stream sliders for improved usability Displays the G-value histogram in the Material Solution tool window for direct interaction	ISO 643: 2012, JIS G 0551: 2013, JIS G 0552: 1998, ASTM E112: 2013, DIN 50601: 1985, GOST 5639: 1982, GB/T 6394: 2002	■
<b>Inclusion Worst Field</b>	■	■	■	■	■	■	Automatic detection of non-metallic inclusion using colors, shape, and size Automatic classification of oxides, sulfides, silicates, and aluminates Live display of the detected inclusion with its rating	ISO 4967 (method A):2013, JIS G 0555 (method A): 2003, ASTM E45 (method A): 2013, EN 10247 (methods P and M): 2007, DIN 50602 (method M): 1985, GB/T 10561 (method A): 2005, UNI 3244 (method M): 1980	■
<b>Cast Iron</b>	■	■	■	■	■	■	On polished samples: automatically measures the characteristics of the graphite content (size, shape, and distribution) On etched samples: measures the ferrite to pearlite ratio Integrated workflow that takes into account the sample status (etched or polished)	ISO 945-1: 2010, ISO 16112: 2017, JIS G 5502: 2001, JIS G 5505: 2013, ASTM A247: 16a, ASTM E2567:16a, NF A04-197: 2004, GB/T 9441: 2009, KS D 4302: 2006	
<b>Chart Comparison</b>	■	■	■	■	■	■	Multiple displays available, including live overlay User interaction using Stream sliders for improved usability Calculates statistics on the selected values	ISO 643: 1983, ISO 643: 2012, ISO 945: 2008, ASTM E 112: 2004, EN 10247: 2007, DIN 50602: 1985, ISO 4505: 1978, SEP 1572: 1971, SEP 1520: 1998	
<b>Layer Thickness</b>	■	■	■	■	■	■	Layer boundaries can be specified using automatic detection, magic wand, or manual mode (using 2 or 3 points). 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.		
<b>Coating Thickness</b>	■	■	■	■	■	■	Prints are measured from top view Calculation of the coating thickness according to the sample geometry	EN 1071: 2002, VDI 3824: 2001	
<b>Automatic Measurements</b>	■	■			■		Automatically measures distances (point-to-point, point-to-line, circle-to-circle, point-to-circle, line-to-circle) Automatically measures circle diameter (roundness, bounding box) Automatically measures angles between two lines Definition of tolerances values for measurement and visual validation Expert and user mode for measurement repeatability		■
<b>Throwing Power</b>	■	■		■	■	■	Manual measurements of selected point of interest on the sample Predefined points that will be triggered by the operator Selection of the vias type and documentation of the analysis Report and automatic calculation according to the manual measurements		
<b>Porosity</b>	■	■	■	■	■	■	Pore detection per ROIs (triangle, circle, rectangle, polygon, or magic wand) with overlapping capability Measurement of the pore density, count, and specific area Measurement of the biggest pore Measurement of a specified size range		■
<b>Particle Distribution</b>	■	■	■	■	■	■	Particles are defined using simplified threshold settings. Automatic classification according to a selected parameter (size, color, or shape) Measurement of ROIs and multiple thresholds Definition of validation and coding according to user-defined standards		■
<b>Advanced Phase Analysis</b>	■	Included	Included	■	■		Phase fraction per ROIs (triangle, circle, rectangle, or polygon) Magic wand, freehand polyline, interpolated polygon, morphology filter, and image arithmetics also usable Measurement of the total phase percentage per phase and per ROI Selectable minimum area detection		■

\*1 Possible with OLYMPUS Stream Motion and other Stream packages with the Automation solution

\*2 Stream chart with the distribution can be output.

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Olympus offers an extensive product line for materials science and industrial microscopy. OLYMPUS Stream is also available as post-processing software (Stream Desktop) for the entire range of DSX series digital microscopes and the LEXT 3D measuring laser microscope. Learn more about the LEXT 3D measuring laser microscope and DSX series digital microscopes on our website, [www.olympus-ims.com](http://www.olympus-ims.com).



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The DSX series' advanced digital technology delivers superior image quality with operating simplicity, making it suitable for users of any experience level. The DSX microscopes' intelligent interface is as easy to use as using a smartphone or tablet.

**Try OLYMPUS Stream software for 30 days free of charge.  
Please visit the Olympus website for more information:  
[www.olympus-ims.com/stream](http://www.olympus-ims.com/stream)**

[www.olympus-ims.com](http://www.olympus-ims.com)

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