

OLYMPUS

Your Vision, Our Future

Materials Imaging Software

Start, Basic, Essentials, Motion

Stream Family

Redefining Materials Science

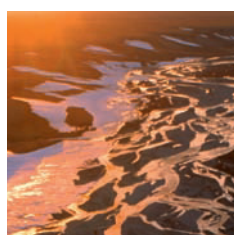




OLYMPUS STREAM – DESIGNED WITH YOUR WORKFLOW IN MIND

Precision, efficiency and ease of use

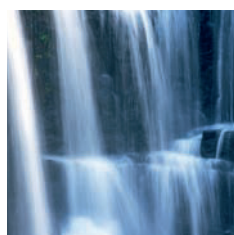
When you image and analysis samples, you are often faced with complex and interrupted processes that can make tasks take much longer than you want them to. Olympus has vast experience in bringing together optical precision, automation, analytical power and data management via workflow-oriented software. The new Stream materials science analysis product range takes this one step further, offering peerless flexibility and ease of use that can make any task a controlled workflow.



A new dawn in imaging and analysis

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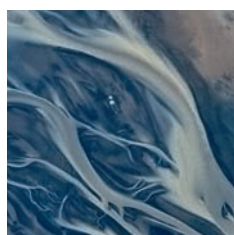
With the Stream software Olympus has combined its expertise to ensure that your tasks, whatever they are, can be completed more efficiently in the way that you would like to do them.



The right solution for your workflow

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The fundamental capabilities of the Olympus Stream software are laid out in the entry-level package – Start – and are built upon by each successive member. As a result, there is always the right package for your requirements.



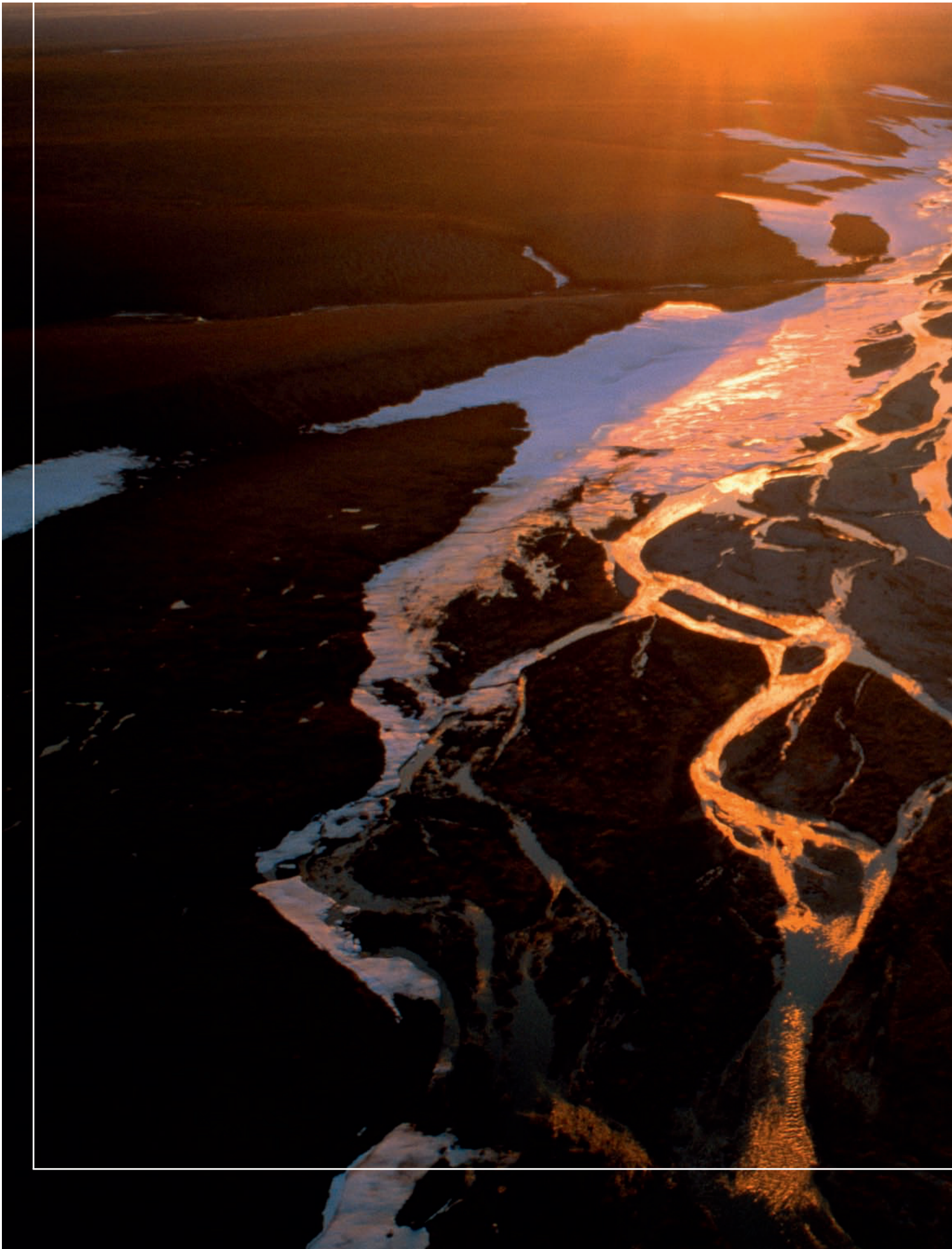
Expanded tools: familiar interface

16–19

Some tasks require additional analysis tools and often need to meet one or more of a number of national and international norms and standards. The Olympus Stream Extensions offer this and more, all accessible via the familiar Stream interface.

Your Vision, Our Future

Olympus is dedicated to ensuring that the best solutions are available for your work, from microscopes and digital cameras to software and data storage. Olympus Stream brings all of our experience to you, giving you control over every aspect of your workflow, measurements and data management. Our goal is your success, both now and in the future.

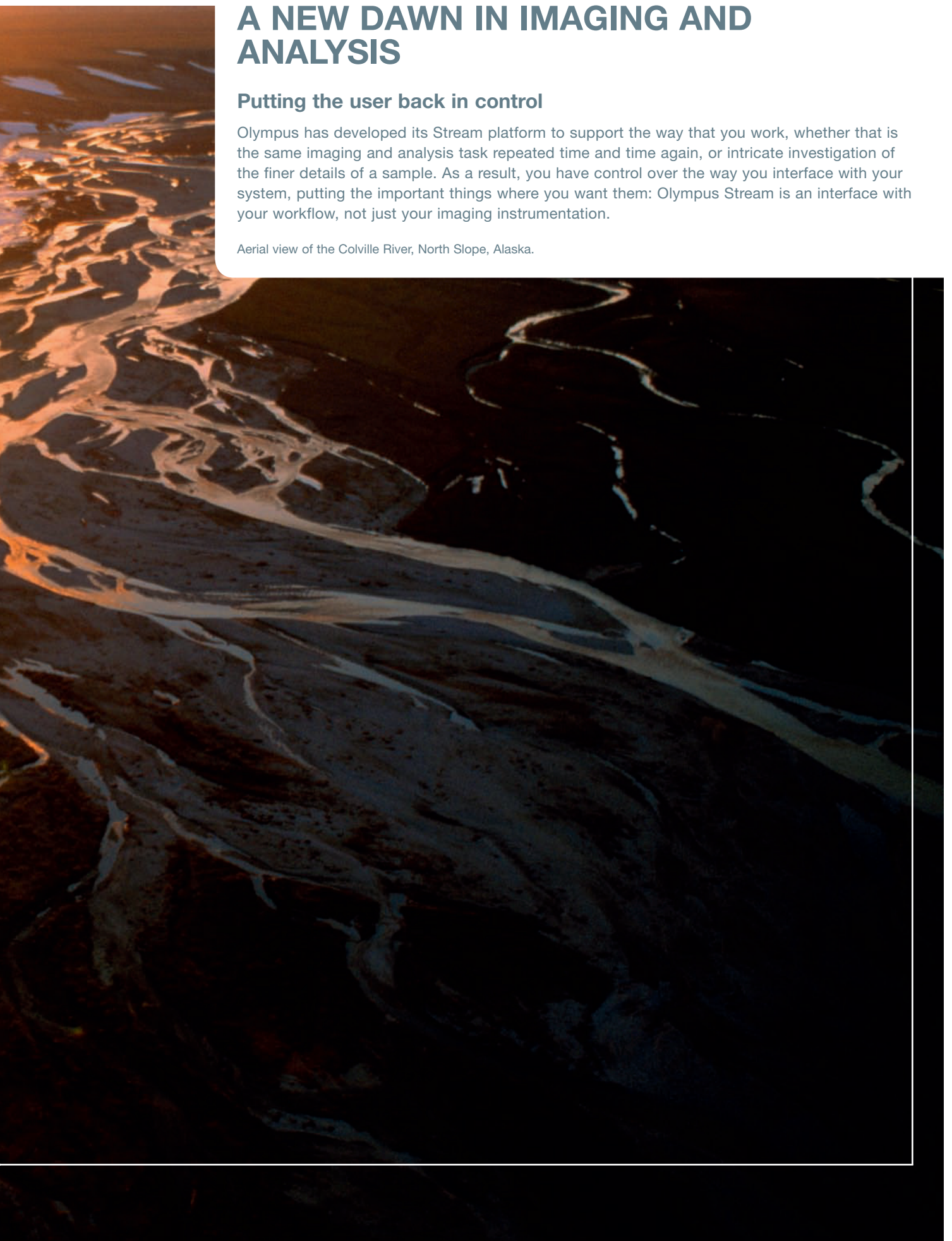


A NEW DAWN IN IMAGING AND ANALYSIS

Putting the user back in control

Olympus has developed its Stream platform to support the way that you work, whether that is the same imaging and analysis task repeated time and time again, or intricate investigation of the finer details of a sample. As a result, you have control over the way you interface with your system, putting the important things where you want them: Olympus Stream is an interface with your workflow, not just your imaging instrumentation.

Aerial view of the Colville River, North Slope, Alaska.





EVERYBODY IS AN EXPERT

Whether you are conducting routine investigation and control, or high-end materials research, the Olympus Stream platform ensures that you quickly become the expert.

Together in harmony

All microscope hardware devices and accessories are fully integrated into the Stream environment. You don't have to know details about the hardware used, as the software leads you to the right result with a minimum of mouse clicks.

Dynamic interface

A Creating an efficient workflow requires careful definition of the tasks and tools at each stage. With the Stream platform's dynamic GUI the same is true – the tools you need for each stage are clearly available, without clutter or the need to search. Olympus has developed a number of interface layouts, which develop with the increasing complexity of the package in use.

- **Acquisition layout** – Here you can select between different acquisition processes and change the camera settings
- **Processing layout** – This is where measurements are completed on the image and the measurement button bar is therefore clearly displayed
- **Reporting layout** – The report generating functions provide all of the tools required for documenting and passing on these results
- **Database layout** – Images are stored securely in a database enabling efficient search and retrieval of data and metadata
- **Personalised layout** – Stream users can also create, save and reuse their own layouts to suit individual requirements, or to provide a dedicated workflow for standard tasks

A blank canvas

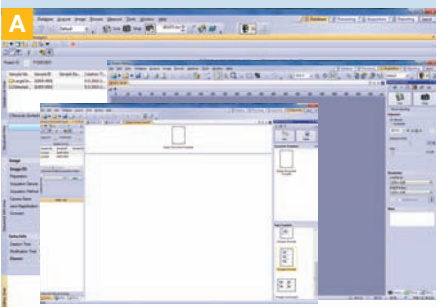
B C It is your workflow, so with Stream you can have it your way. Within each of the layouts you can specify how many or few tools and controls are shown on screen, eliminating unnecessary controls and placing the ones frequently used exactly where you want to have them.

Our expertise in your hands

Olympus has brought its imaging and analysis expertise directly to you via the unique workflow management concept. This novel idea guides you, step by step, through tasks such as multiple image alignment, phase analysis, report generation, as well as complex processes utilising microscope automation. In effect, the workflow management concept ensures there are no mistakes, just reproducible results.

Integration, not re-education

Stream has been developed to integrate seamlessly with Microsoft Windows and Microsoft Office software programs, rather than reinventing key processes. As a result you will feel "at home" using Stream, even for complex processes such as complex calculations and statistics, which are completed directly in Excel, or for report template generation in Word.



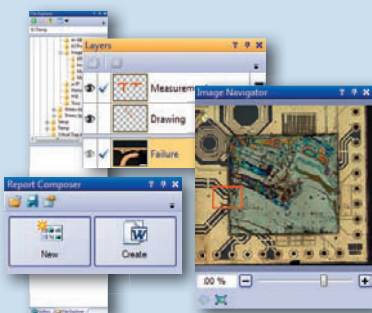
A Dynamic interface: direct access to workflow-oriented screen layouts



B Put the tools you need where you want them

C The ultimate toolbox

Choose the right tools for every process from over 100 task-related toolbars and toolboxes



SPEED AND EFFICIENCY

With such an extensive range of tools and options available in the Stream platform coupled with the customisation capabilities, efficiency is delivered whatever your workflow requirements. To maximise and enhance this, the Stream software ensures that all processes are carried out as fast as possible.

Working in real time

D Olympus has developed the Stream platform with digital live processing technology so that you can perform many image operations on the live image. For example, zooming into the live image enables you to proof the details, and interactive measurements can be completed without any delay. In addition, live histogram and over-exposure warnings help to exploit the entire dynamic range of the chosen camera.

FUTURE-PROOF

Olympus Stream is ready for your future applications, even if you don't know what they are yet.

Ready for professional data management

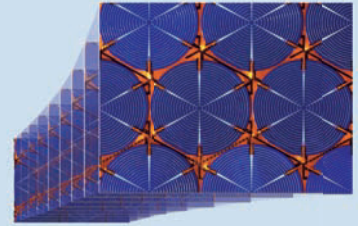
E Stream is able to store, retrieve, share and secure data based on client server technologies, guaranteeing the highest performance for your work without any limitations in image storage capacity, access speed or data sharing.

Ready for virtual microscopy

F Stream supports the Virtual Sample Image (VSI) format, which allows giant, high-resolution images of complete samples to be stored and analysed, independent of space and time. The unique Stream memory management bypasses any limitations of the operating system, enabling it to handle even the largest of images. As a result, images can be acquired and handled in uncompressed formats.

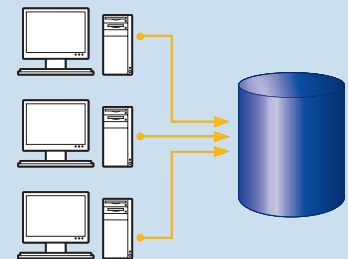
D Speed up your work

Live image zoom



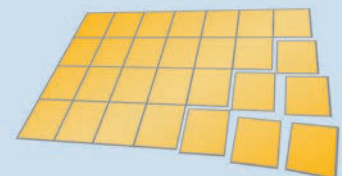
E Client/server technology

Advanced technology for robust data storage and data sharing



F Virtual Sample Image format

Navigate a virtual image as though viewing the sample on the microscope



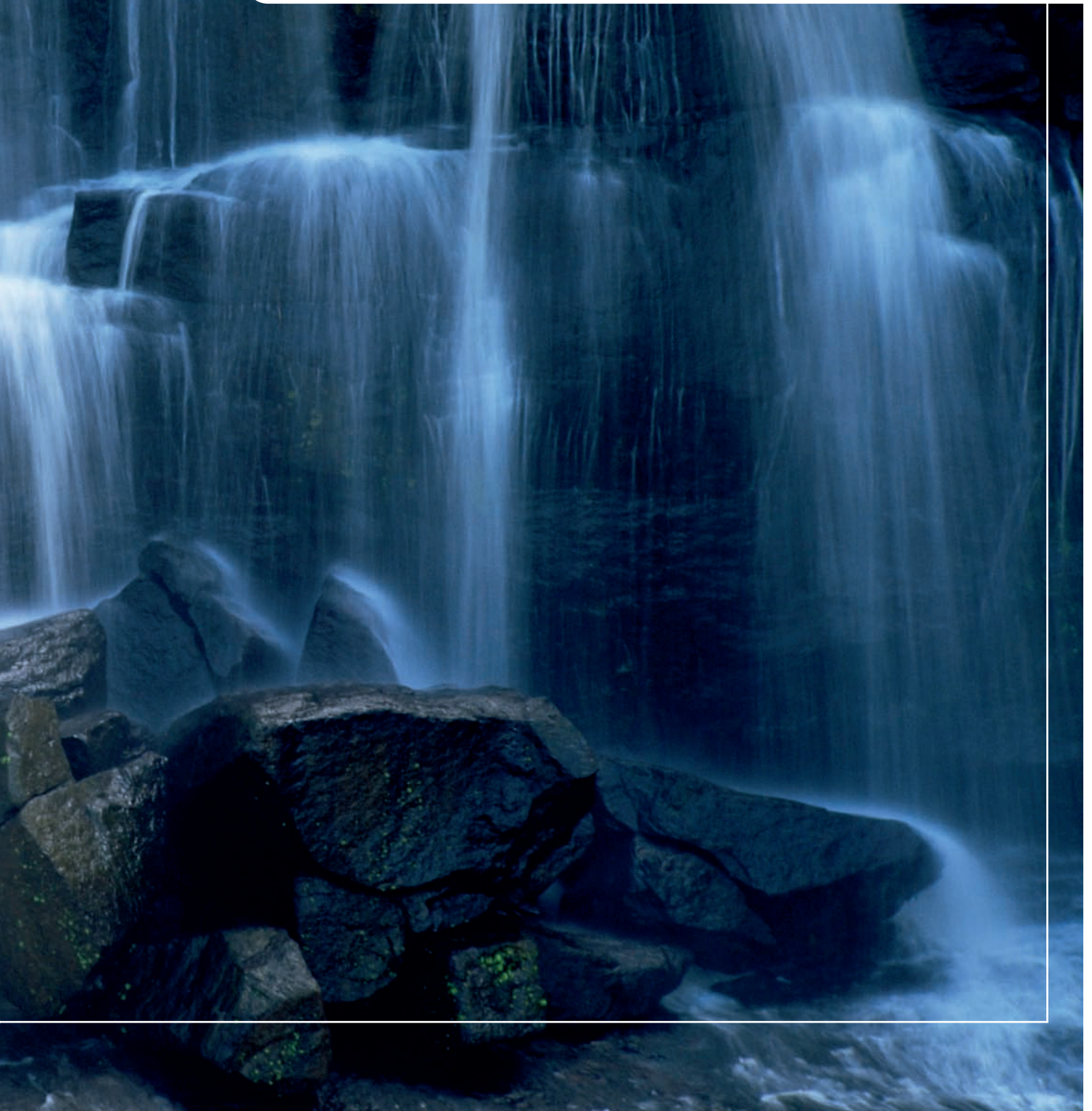


THE RIGHT SOLUTION FOR YOUR WORKFLOW

Flexibility by design

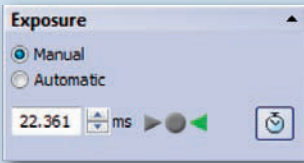
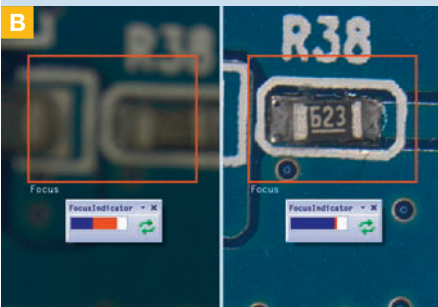
For most tasks you want to be able to control how the various processes happen and the way that results are presented, analysed and stored. Stream offers this throughout the four packages – Start, Basics, Essentials and Motion – with all the tools you’ll need presented as you would like: you have control over what is displayed on your screen and the software takes care of the rest.

Ebor Falls, Guy Fawkes River National Park, New South Wales, Australia.



A Exposure assistant

Arrows indicate the optimum exposure time

**B**

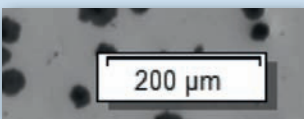
Focus indicator for consistently sharp images

C Split screen

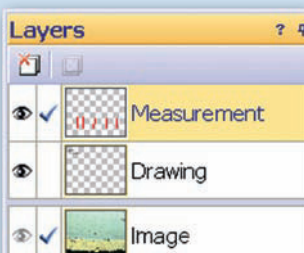
Display 2 or more images with synchronised magnification

**D User-definable scale bar**

Each image is automatically calibrated when acquired

**E Working with layers**

The image, measurement results and annotations are stored in separate image layers



STREAM START

Stream Start is the entry level image capture and processing software for microscopy applications, with a focus on acquisition and measurement. It is the basis of all the other Stream members.

Acquisition

A B Acquiring perfect, high-resolution images using Stream Start is very easy, since the automatic exposure control, live histogram display and the over-exposure indicator ensure that the entire dynamic range of the camera is used whilst avoiding blooming or glare artefacts. The Stream focus indicator enables users to select a region of interest and bring it into focus. The digital zoom – operated with the mouse wheel – enables a quick check of the live image window to be sure the desired details are captured by the camera, before actually acquiring and saving the image. As a result, images are produced with the maximum fidelity and reproducibility, independent of the user.

Display

C D The powerful image navigator window incorporates a comprehensive range of state-of-the-art functions. For example, there is always an overview of the image so you don't lose track of where you are while zooming into the details. Furthermore, images can be synchronised for easier comparison. A zoom indicator and a calibrated scale bar ensure simple sample exploration. The gallery view provides a quick thumbnail view of all images and associated files (texts, reports and templates), which can be sorted on a number of different criteria.

Imaging

E Images and files are always captured with the associated metadata, such as exposure, X/Y calibration and objective used. As a result the image is not just a set of pixels. Using the layers concept, annotations and drawings, such as arrows, boxes, ellipses, etc. can be added to the images to draw attention to important details without affecting the original data. A full range of image filters for smoothing/sharpening or enhancing images is available, either as predefined or user-defined functions.

Measurement

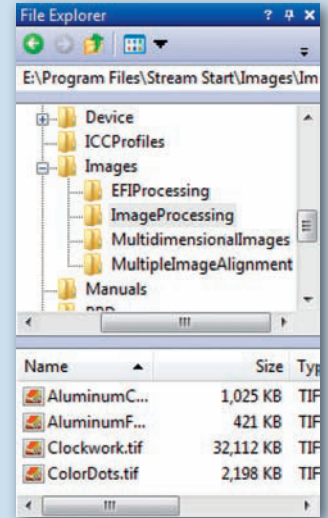
F Stream Start includes a special measurement environment suited to interactive measurement tasks and dimensioning such as distances, angles, rectangles, circles, ellipses and polygons. A measurement cursor shows the measured distance as well as orthogonal helper lines that make the whole process simple and accurate. All measured objects are saved with the image files.

Device control

Stream integrates seamlessly with the extensive Olympus microscope and camera ranges. Therefore, users can set magnifications, change observation methods, store all the relevant settings, set exposure times, as well as apply colour and shading corrections, all within the Stream software.

G Direct access to your files

The file explorer gives direct access to your stored data



Make use of a vast range of easy-to-use measurement tools and add user information to your image without modifying the original image data

Type	Name	Point X	Point Y	Length	Angle	Area	Perimeter
3 Points Circle		-	-	-	-	3.89 mm ²	6.99 mm
4 Points Angle		-	-	-	121.79 °	-	-
Closed Polyg...		-	-	-	-	11.41 mm ²	13.33 mm
Perpendicular...		-	-	2.90 mm	-	-	-

A Movie recording

Acquire and share movies

**B** Statistics in Microsoft Excel

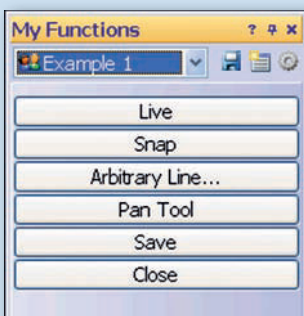
Stream can directly export measurement results into Microsoft Excel

**C** Reporting in Microsoft Word

Access your Stream images and image operation functions directly in Microsoft Word

**D** Individualised workflow

More efficiency for your key tasks



STREAM BASIC

Alongside the Stream Start functions, Stream Basic offers enhanced functionality in image acquisition, processing and measurement, and includes a documentation tool.

More to see

A Stream Basic provides an extended image acquisition process, which captures as many images as possible within a defined period, creating a movie. It also integrates with a number of non-Olympus cameras and supports an analogue/digital image source converter for greater flexibility.

The power of statistics

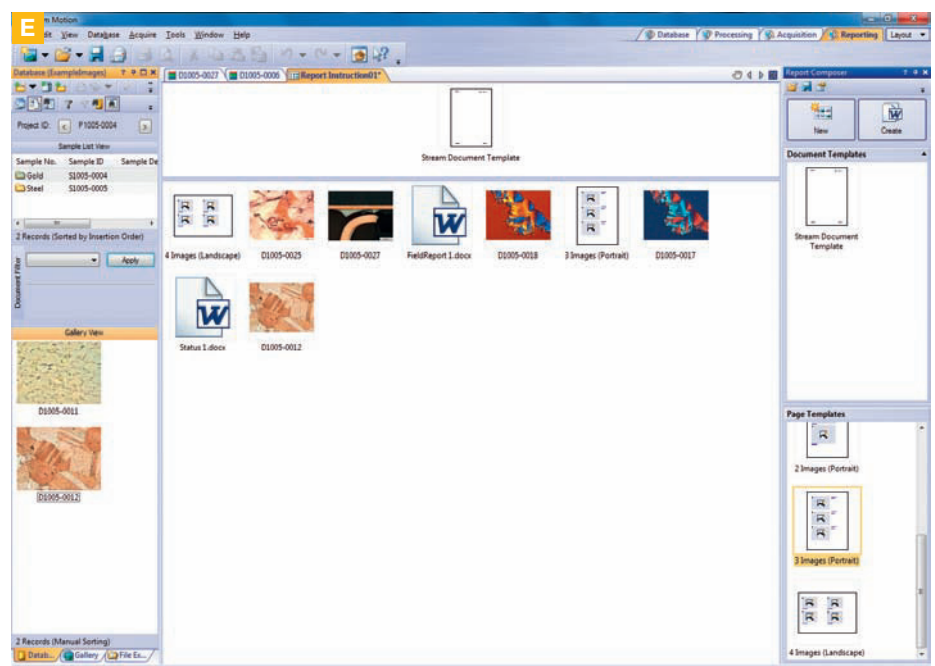
B As well as the same measurement environment as Stream Start, Stream Basic includes additional statistical evaluation tools. These enable results to be screened with regard to mean values, extremes or standard deviation, and are continually updated during the measurement process. With one mouse click, measurement data can be exported to Microsoft Excel for an advanced statistical analysis.

Reporting

C E The integrated digital report options enable quick and easy generation of professional reports directly in Microsoft Word, by enabling users to simply drag and drop image charts and result tables. For consistent reporting, task templates can be generated with the Stream report add-in directly in the “.dot” Word format. The combination of Stream capabilities in image handling with the extensive functionality of Microsoft Word results in professional reports that are easy to create and to modify.

Customisation

D Stream Basic includes the option to create workflows based on the most frequently used functions. This therefore makes standard processes much easier, even for inexperienced users.



STREAM ESSENTIALS

Stream Essentials brings in advanced functionality for the acquisition, visualisation, processing and analysis of images.

Limitless acquisition

Everything in focus

F When analysing thick samples, Stream Essentials features instant Extended Focal Imaging (instant EFI) technology to produce perfectly focused images. The iEFI provides images with infinite depth of focus even if the Z-drive is not motorised: having started the process with a mouse click, the user simply focuses through the sharpness levels from top to bottom (or vice versa) and the program takes a series of snapshots and then calculates one sharp image. The result can be viewed in real time during the acquisition process.



Size doesn't matter

G Stream Essentials also provides manual multiple image alignment (MIA) for the creation of panoramic images, overcoming the physical limitations of the optical field of view. Images with overlapping edges are acquired at neighbouring positions; pattern recognition is used to stitch the individual images together into one large, seamless, high-resolution image.

Enhanced tools

1 + 1 = 3

Stream Essentials includes various techniques of processing images. Besides the established filters, arithmetic operations can be performed with ease. For example: by subtracting two images, differences can be clearly shown or, by adding the same image, low-intensity areas can be clarified.

Phase analysis

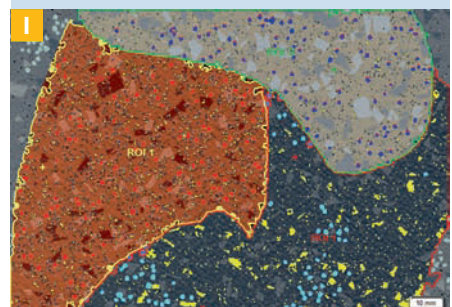
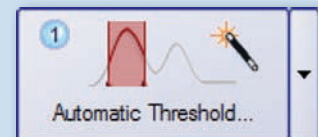
H-J Furthermore, Stream Essentials features advanced multi-phase analysis capabilities for threshold-based object detection and object counting. The new automatic threshold algorithm ensures quick results. Or the user can define thresholds by picking grey values with the pipette tool directly from the image. Furthermore, multi-phase analysis supports the easy selection of multiple regions of interest (ROIs) for a better result. It automatically calculates area and area fraction, and the number of objects and the results can be exported to Excel with one mouse click for further analysis.



Free-form panorama images

H Automatic threshold

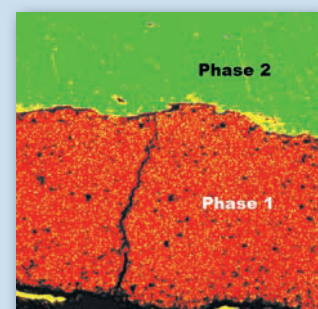
Stream can automatically set the threshold for your phase analysis



Define ROIs for more accurate phase analysis

J Phase analysis results

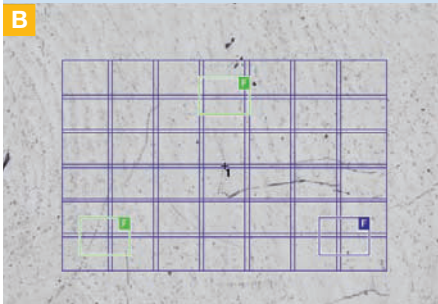
Results can be collected across multiple images



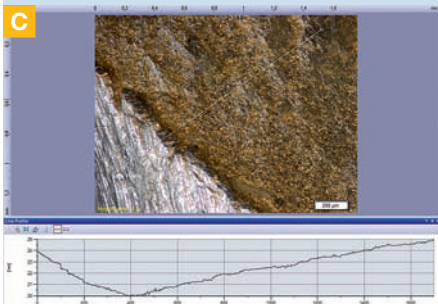


A 3D EFI acquisition

Results can be collected across multiple images



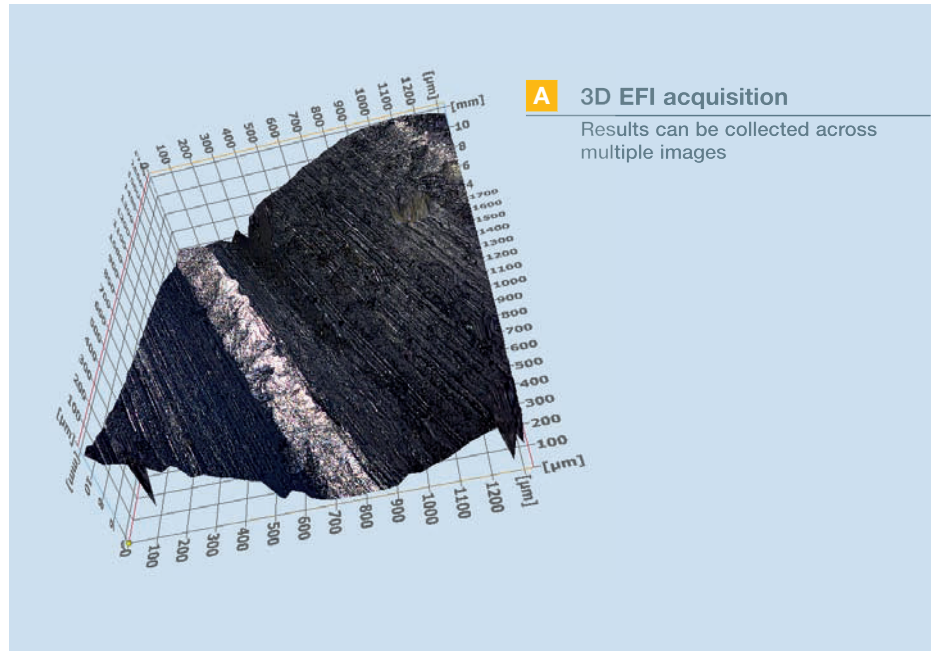
Easily define the target scan area in the sample overview image



Z-profiling: Measurement based on the height map acquired from Z-stacks

D Automated real-time focus

Laser AF support for high-speed applications



STREAM MOTION

Stream Motion provides the ultimate integration of motorised components for microscopy imaging and analysis, enabling large numbers of samples to be processed. It also features automated EFI and MIA and a data management solution for handling and sharing large amounts of data.

Extended device control

Stream Motion incorporates support for a wide range of motorised stages and Z-drives from the most renowned manufacturers, providing superb accuracy and reproducibility even when dealing with the smallest of features.

Amazing automation

A B For some applications, creating large, high-resolution overview images is a daily task which the Stream Motion's automatic MIA process manager will make much easier and quicker. The stage navigator tool enables the user to select their MIA scanning area on a low-resolution overview image. Stream can combine any number of images due to the bespoke compression and memory management capabilities of the Virtual Sample Image (VSI) format. The 3D scan area feature also ensures that the automatic MIA can combine with the automatic EFI processing for extended depth of field, to ensure perfectly focused large images, even with complex sample structures. The process manager automatically calculates the optimum z-step, ensuring that the optimum number of images are acquired.

The 3rd dimension

C The Z-drive can also be used to provide a Z-stack acquisition, which maintains the image information of each individual layer within the VSI image. As a result the user can navigate the captured image as if they were using a microscope. The Z-stack acquisition can also be used for calibrated z-profile measurements.

Autofocus

D Stream Motion offers two different autofocus options. For ultimate control, the Olympus laser autofocus unit speeds up the automated image acquisition processes significantly. The laser enables automated focusing on surfaces that contrast-based autofocus systems cannot use, such as polished or transparent materials. For lower throughput systems where there is plenty of contrast, Stream Motion can also use software autofocus. Both systems ensure perfectly focused images with the simple click of a button.

Sample navigation

E The built-in stage navigator creates a low-magnification overview of the complete sample for efficient sample navigation and stage control. Once the overview image is created, a simple mouse click moves that part of the sample into position. For tasks where the same stage positions will be used repeatedly, multiple coordinates can be stored and reloaded when needed.

Dynamic annotations

Stream Motion provides enhanced annotation capabilities enabling interesting positions to be marked as reference points, which can be named and have an audio annotation assigned to them. All annotations within an image appear in a tree structure similar to the Windows Explorer. By clicking an annotation within the annotation tree the image is automatically centred to an associated location. This is a great advantage for the very large images created by MIA.

Data management

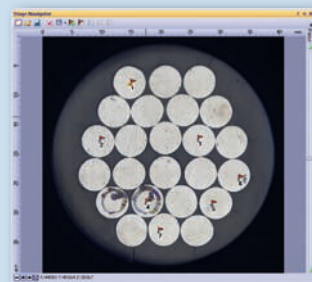
F-H As the amount of data captured by an imaging system increases, the basic database capabilities of Microsoft Access quickly become inadequate. Stream Motion incorporates a client-server database based on Microsoft SQL Server Express. As a result, Stream Motion not only provides a smooth workflow for capturing and processing images, but also for storing, retrieving and querying. Furthermore, if the number of workstations increases, Stream Motion can be integrated with a centralised server for all data, without any hassle.

Expandable

Stream Motion ensures that the vast majority of materials science tasks can be tackled both efficiently and with great repeatability. Some tasks though require a further degree of specialisation and, for these, Stream Motion can be expanded with a new set of application module extensions.

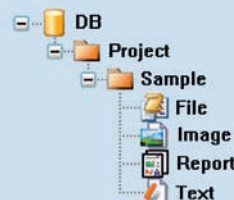
E Sample explorer

Set markers within the image and return to them at any time



F Structured data storage

Stream data structure



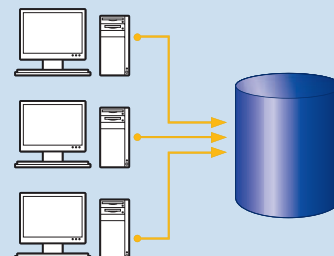
G Don't search – find!

Advanced filter functions for quick data access



H Client/server technology

Advanced data management technology for up to 5 users





EXPANDED TOOLS: FAMILIAR INTERFACE

Standards-compliant modules

The Materials Extensions for the Olympus Stream software provide the user with the correct tools for their task – making them an expert right from the start, without the need for extensive training or know how. The extensions integrate fully with the Stream software’s workflow-oriented processes, guiding the user through every step and meeting all the appropriate national and international standards on the way. Because the more you see, the more impressive and reliable the results of your experiments are – and this is the source of our motivation: to supply you with the best optical systems possible.

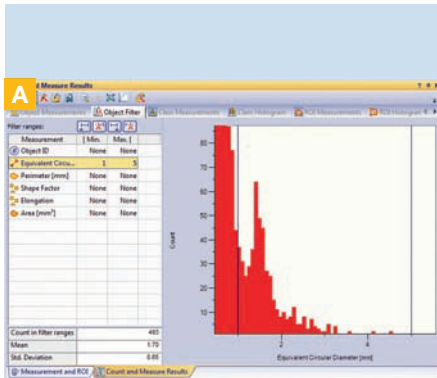
Aerial view of a river delta in Iceland.



OBJECT DETECTION AND CLASSIFICATION

Object analysis is an increasingly important process across the materials sciences. The Stream Extensions incorporate a powerful detection engine which utilises new automatic or dynamic threshold methods to separate objects (e.g. particles, scratches) from the background with superior clarity.

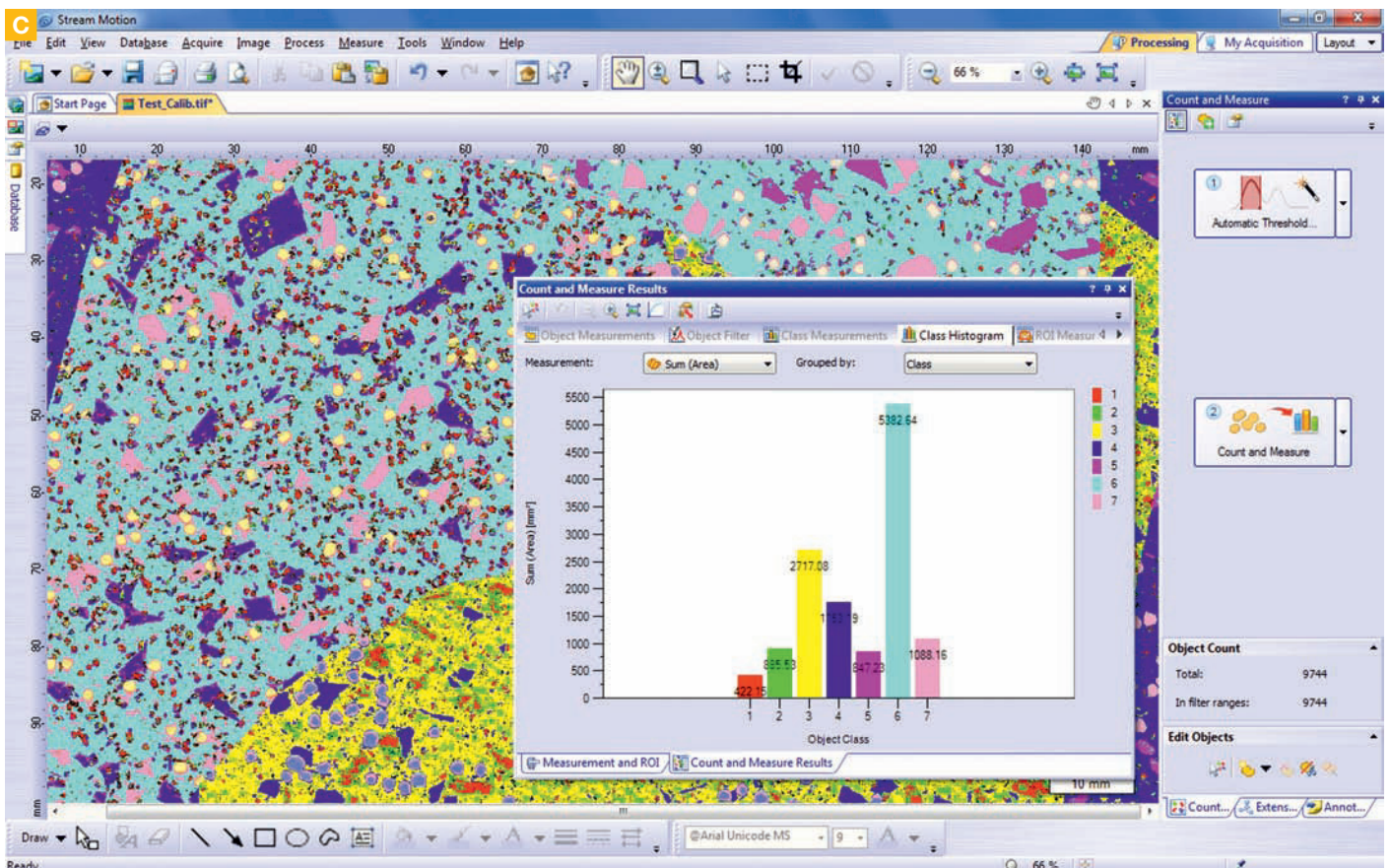
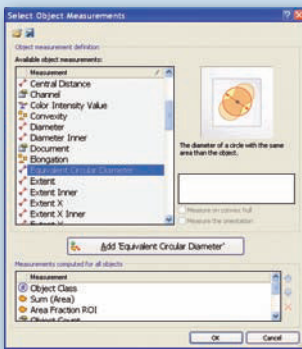
A–C Due to the expansive nature of this particular measurement, the object classification tool offers more than 50 different parameters for geometric (shape, size, position) and pixel properties (intensity, grey value) which can be combined via logical and arithmetic operations in order to create object classes. Once defined, Stream can automatically output very detailed information on each individual object detected, indicating the object class. Furthermore, Stream produces an object class diagram showing the number of objects in each class. For further processing and analysis, the spreadsheet can be exported to Microsoft Excel.



Extensive classification possibilities

B Detailed object listing

Each detected object is listed with detailed parameters



NETCAM

D The Stream extensions are supplied with the capabilities to stream live images via the Internet, essentially turning the system into a webcam. This is a very useful feature for second opinions and discussions.

Netcam enables the transfer of live images which the system has acquired via an intranet or the Internet (TCP/IP) and makes them accessible for other users. An HTML page is automatically created on the Netcam server and can be accessed by a client. The Netcam client does not require any specific operating system. Netcam works with commonly used Internet browsers.

3X THE POWER

The Stream Materials Science Extensions are categorised into 3 major groups (extended measurements, metallography & advanced metallography), each offering dedicated workflows for specific measurement and analysis tasks. Each of the Materials Science Extensions can be added individually to Stream Motion.

Extended measurements

E Quantitative results are what really count – from basic two-dimensional length measurements to more complex multi-phase analysis. The Materials Extensions ensure that results are available more quickly, as well as being fully reproducible and saved securely. Measurement and analysis tools include layer thickness measurement, weld measurement, micro hardness measurement and point count (ASTM E562).

Metallography

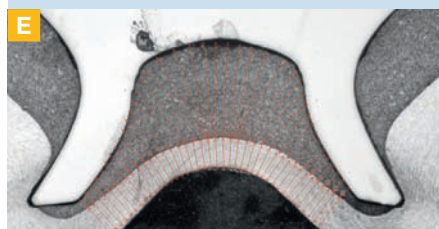
F G As an extremely in-depth field, metallography requires a number of precise techniques to accurately image and evaluate the microstructure of a specimen. As such, there is often a requirement for two or more distinct technologies to be combined into one instrument, without compromising on quality. Measurement and analysis tools include grain sizing intercept (ASTM E112), grain sizing planimetric (ASTM E112), cast iron (graphite and pearlite/ferrite) (EN ISO 945), chart comparison and ASTM E112 chart, DIN 50601 chart, DIN 50602 chart, ISO 643:2003 chart and EN ISO 945 chart.

Advanced metallography

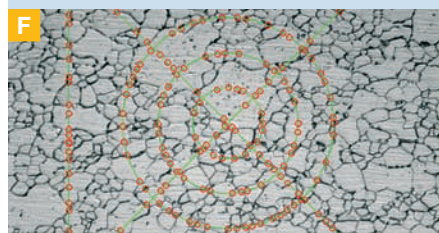
H Advanced metallography requires instrumentation that is able to perform highly sophisticated, in-depth analyses. For example, analysis of non-metallic inclusions or the measurement of decarburisation depths requires an advanced approach to digital image analysis in order to ensure precise data is obtained. Several Materials Extensions to the Olympus Stream software are available to solve such tasks in accordance with international and national standards. Measurement and analysis tools include inclusion (ASTM E1245), worst field inclusion (ASTM E45), decarburisation (ISO 3887), banding (ASTM E1268) and dendrite arm spacing.

D Netcam: live images online

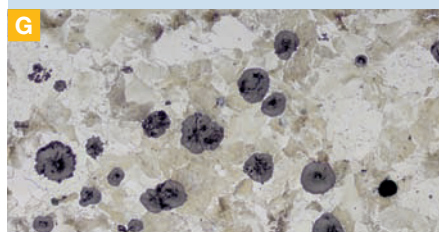
Efficient web-based live image viewing using the Netcam feature



Layer thickness measurement



Grain sizing via the intercept method using the Stream extension manager



Graphite and ferrite/pearlite analysis of cast iron



Inclusion analysis

Specifications

		Stream Start	Stream Basic	Stream Essentials	Stream Motion
Basic image acquisition					
Live image acquisition	Captures live images in various formats	●	●	●	●
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 filters and tools	Enables contrast adjustment, edge detection, smoothing and sharpening of images, and shading correction	●	●	●	●
Static annotations	Draws text, arrows, lines, rectangles and ellipses on the image	●	●	●	●
Interactive measurement					
Field of view measurement	Measures distances, angles, rectangles, circles, ellipses and polygons	●	●	●	●
Olympus device control					
Olympus microscope control	Controls motorised Olympus microscope systems BX2, IX2, GX, SZX, SZX2 and MX, reads out Prior SZX-ZE	●	●	●	●
Olympus cameras	Controls Olympus cameras ¹ and old RoHS-compatible models ²	●	●	●	●
Extended image acquisition					
Movie	Creates ".avi" movie files	–	●	●	●
Software autofocus	Performs contrast-based software autofocus ³	–	●	●	●
Reporting					
Data export and statistics	Exports measurement data to MS Excel and Stream workbook format, enables statistical analysis of measurements	–	●	●	●
Report generator	Creates reports interactively with MS Word Add-in (requires MS Word 2003 or 2007).	–	●	●	●
Basic customisation					
MyFunctions	Creates a workflow and large button bar for frequently used commands	–	●	●	●
Extended device control					
Non-Olympus cameras	Controls non-Olympus cameras ⁴	–	●	●	●
Imaging source converter	Controls DFG-1394 A-D (CON 800) converter (FireWire and USB 2.0)	–	●	●	●
Advanced acquisition process					
Instant EFI	Instantly creates an EFI image while focusing	–	–	●	●
Manual MIA	Creates panoramic images over areas (requires manual XY stage)	–	–	●	●
Time lapse	Captures still images over time frequency	–	–	●	●
Extended image tools					
Image arithmetic	Performs arithmetic and logical operations with images	–	–	●	●
Basic image analysis					
Phase analysis	Performs threshold-based phase segmentation on full images and ROIs, ⁵ calculates area, area fraction and object count	–	–	●	●
Advanced customisation					
Macro recorder	Allows recording and editing of macros	–	–	●	●
Advanced automated acquisition process					
Automated EFI	Automatically creates an EFI image via a predefined number of slices, 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)	–	–	–	●
Position lists and stage navigator	Captures images at multiple stage positions or over stage areas	–	–	–	●
Stage control					
3rd-party stage controls	Controls X/Y-stage controllers for OASIS, Prior ProScan, Ludl MAC, Märzhäuser Tango, ITK Corvus, LANG LStep	–	–	–	●
Advanced image tools					
Projections of display	Calculates projections of image display (min., max. mean)	–	–	–	●
Intensity calibration	Performs intensity calibration of channels	–	–	–	●
Dynamic annotations	Marks reference points on image and enables text or audio annotations	–	–	–	●
Data management					
Client-server database	Provides image and data management solutions for microscopy (utilises Microsoft SQL Server 2005 Express)	–	–	–	●

¹ Altra 20, DP20, DP21, DP70, DP71, DP72, SC20 (XP only), SC30, UC30, XC10, XC10IR, XC10T, XC10TIR, XC30, XC50, XM10, XM10IR, XM10T, XM10TIR

² CC12, CVI, CVII, CVIII, CVIIIu, F-View II

³ requires Olympus microscope with motorised Z-axis or external motorised Z-axis (supported in Stream Motion)

⁴ QImaging cameras: MicroPublisher 3.3 RTV, QImaging MicroPublisher 5 RTV, Jenoptik cameras: ProgRes C3, ProgRes CT3, ProgRes C5

⁵ Rectangle, circle and polygon

The manufacturer reserves the right to make technical changes without prior notice.

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