Power and flexibility to perform multiple inspections with outstanding efficiency.

The BX2M*/MX51 microscope lineups offer the stages of a unique X/Y travel range in 50mm through 150mm. Outstanding UIS2 optical performance. Excellent image clarity and superb resolution for all inspection demands. Greater system flexibility with unprecedented freedom to select and combine components. Logical layout for superior operation. Newly employed arm integrated reflected light illuminator for diverse applications.

* BX2M series comprises BX51(M), BX41M-LED, BX51-R, BXFM(S) and so forth.
EXCELLENT OPTICS

New standard of the UIS2 optics, wavefront aberration control guarantees the world’s highest level imaging, even further.

A new standard of the objective lens performance, using wavefront aberration control.
The Olympus UIS2 objective lenses set a new standard, with wavefront aberration control in addition to common performance standards of N.A. and W.D. Olympus challenges further highest order optics which has not been fulfilled by the conventional standards. We offer excellent performance objective lenses by minimizing the aberrations that lower resolution.

Natural color reproduction faithful to the specimen.
UIS2 objective lenses realize natural color reproduction without any coloration by using stringently selected high transmittance glass and advanced coating technology that realizes high transmittance which is flat over an ultra-wide band wavelength. In addition, since the total optical system, including the tube lens is designed to reproduce a natural color, clear images faithful to the specimen are obtained even with digital imaging.

UIS2 objective lenses with excellent image parcentricity.
In high power Semi-apochromatic UIS2 objective lenses, centration tolerance between objective lenses on the microscope nosepiece improved by a factor of 2 so that the image never fail to keep the image within the center of the field of view even with digital camera. Centration of the image between objective lenses allows for fast and fatigue free operation.

The brightest Darkfield image than ever.
New Semi-apochromatic objective lens series improves Darkfield brightness and significantly enhances sensitivity and allows quick detection of defects in the small diameter wafers used in today’s smaller sensors and other high performance electronic devices.

Glass thickness corrected objective lenses handle various glass thicknesses.
LCPLFLN-LCD objective lenses, accurately correct the spherical aberration which could become issue when viewing through glass substrates, are provided. The 20x and 50x objective lenses are useful when looking through glass thicknesses of 0 to 1.2 mm and the 100x objective lens is corrected for glass thicknesses up to 0.7 mm seamlessly.

Removes spot flare during ultra low magnification observation.
When a low reflection specimen is observed in ultra low power magnification, spot flare hinder precise observation. In UIS2 ultra low magnification observation, a depolarizer built into the objective lens end removes spot flare and, a clear, high contrast image is obtained by combining a set of polarizer and analyzer plate.

Promotes environmentally-friendly ecologization and weight reductions.
Olympus was the first to consider the environment and to tackle manufacturing ecology. As part of this, the UIS2 optical system uses eco-friendly glass free of lead and arsenic. In addition, the major Semi-apochromatic UIS2 objective lenses are lightened by approximately 2/3. This contributes to prevention of environmental pollution, improvement of operability of objective lenses replacement, etc.

*Some UIS2 objective lenses are the same weight as conventional objective lenses
Improved efficiency with the motorized revolving nosepiece.

Various revolving nosepieces including motorized ones which can be directly operated by blind-touch control pad are offered. The motorized nosepieces improve observation efficiency and eliminate particle shedding (type C). The motorized revolving nosepiece can be attached to all reflected light illuminators and microscope frames.

Reflected light illuminators are compatible with a variety of light sources.
For flexibility in high intensity and long lifetime illumination, Olympus lamphouses offer Halogen, Xenon and Mercury bulb options. The apochromatic collector lens system for halogen, xenon and mercury light sources compensates for chromatic aberrations from the visible to near-infrared light.

Diverse manual-type revolving nosepiece including perfect parcentricity type.

The quintuple BD revolving nosepiece U-P5BDRE and sextuple revolving nosepiece with centering mechanism U-P6RE enables perfect parcentricity between three objective lenses. There is no image center displacement, even when switching from low to high magnifications, an added convenience.

Fiber illumination system for all reflected light illuminators.

Cold light illumination, using fiber light guides, is available for all reflected light illuminators. Fiber light illumination systems such as the LG-P52 utilize a bright 12V100W halogen lamp.

Filter sliders for flexible illumination.

A variety of filter sliders are provided for such filters as UV-cut, color temperature change and color enhancement.

Stage selection and adapter plates.

Various special stages and adapter plates are provided:
- a 100 x 100 mm stage plate (U-MSSP4), a wafer holder plate (U-WHP2) for 3- and 4-inch wafers and extra-large stages (U-SIC4R2 and U-SIC4L2), allowing the use of a glass plate (U-MSSPG) for transmitted light observations.

The MX51 accommodates a 6 inch wafer holder and a glass plate in combination with 150 mm stage, MX-SIC4R2 and also offers more versatile holders and plates with 100 mm stage, U-SIC4R2.

Observation of thick specimens.

BX41M-LED/BX51M Upright Incident Microscope System accommodates up to 65mm high specimen as a standard. Besides, the reflected light Illuminator, integrated into the microscope arm gives them an extra height degree of flexibility, by inserting an arm adapter between the microscope and the illuminator.

The standard maximum specimen thickness is 30mm. Insert the intermediate attachment to accommodate thicker specimens.

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SYSTEM VERSATILITY
Wide choice of handy accessories to meet the full range of microscopy inspection needs.

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Filter sliders for flexible illumination.

A variety of filter sliders are provided for such filters as UV-cut, color temperature change and color enhancement.
Improved design signals new advance in ergonomics.

Easy focusing and convenient “either-side” attachment of the fine focusing knob.

The fine focusing knob can be removed and attached to either side of the microscope to suit right/left-handed operators. The control knob’s tactile cover allows light-touch fingertip operation, while the fine focus mechanism is extremely accurate, even at high magnifications.

Agile stage movement and coarse/fine movement interchange.

Two stage sizes are selectable, 150mm (MX-SIC6R2) and 100mm (U-SIC6R2). The 150mm stage has a built-in clutch lever, which enables quick location of specimens on the stage without diverting the operator’s view, allowing quick, easy inspections.

Repositioned optical controls for smoother performance.

Controls for focusing and light intensity adjustment are placed closer together, so that both can be operated with one and the same hand.

Anti-static treatment prevents dust contaminating the specimen.

The frame and 6-inch stage are coated to prevent static build-up.

Nomarski DIC system provides an optimum image suited to the specimen.

Olympus Nomarski DIC observation uses a simple observation switching slider type single prism system. Three different DIC prisms are provided: the U-DICR for all imaging applications, high resolution U-DICRH, and high contrast U-DICRHC, so that the best resolution and contrast matched to the state of the specimen are obtained. Since the exit pupil position of the objective lens is standardized by the series, the position of the DIC prism does not have to be switched when the magnification was changed by switching the objective lens, e.g. MPLFLN series 5x through 150x.

Polarizer/analyzer plates are interlocked for easy slide IN/OUT.

The interlocked polarizer/analyzer slide IN/OUT on the optical axis by one action so that the switching between Nomarski DIC/POL and other observation methods is performed speedily. In addition, the polarizer and analyzer are designed so that the reflected light illuminator slide-in and slide-out operations can be performed from either the left or right side.

Integrated ND filter for more comfortable switching between brightfield/darkfield observation methods.

The brightfield/darkfield reflected light illuminator features an integrated ND filter that protects the operator’s eye by preventing sudden, drastic changes in brightness. This integrated function can be disengaged manually.

Simultaneous attachment of digital camera and video camera.

The intermediate trinocular unit U-TRU, combined with the tilting observation tube U-TBI-3 makes simultaneous attachment of digital and video documentation equipment possible.

Convenient magnification changer.

The magnification changer applies an additional 2x magnification to the image, ideal for observation at highest magnifications without changing objective lenses, for maintaining working distance and for framing of the smallest specimen detail.

Range of tilting observation tubes to assist operator comfort.

U-TBI-3 tilting tube is provided for binocular observation, and the U-SWETTR-5, MX-SWETTR observation tubes for documentation. This range of choice lets each operator achieve the most suitable eyepoint and an ergonomic posture, resulting in greatly reduced fatigue for long-duration observations.
**MICROSCOPE LINEUP**

A full product line-up for every purpose — even for special applications.

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### BX61

**Advanced features with motorized operation**

The motorized BX61 microscope is provided with automatic focus and automatic switching between reflected and transmitted light. Image analysis software AnalySIS series enables a range of microscope operations to be performed via keypad or a personal computer.

- Complicated operation procedures can be macro-programmed to special function keys, either on the keypad or on the PC keyboard. This makes it possible to recall/reproduce specific observation conditions at the touch of a single button.
- Various motorized modules are provided, including high-speed revolving nosepieces and a powered mode-select illuminator.
- Multiple-spot laser-active-type auto focus unit U-AFA2M-VIS capable of up to 150x objective lens is mountable with high stability and broad Z range in focus capturing.

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### BX51/BX51M

**Multiple observation modes in VIS (visible reflected/transmitted)**

The BX51 microscope model offers reflected and transmitted light illumination, while the BX51M model offers reflected light illumination only. Both frames can accept the universal illuminator BX-URA2 which includes fluorescence capability, or the reflected light brightfield/darkfield illuminator BX-RLA2.

**BX51 (reflected/transmitted light illumination model)**
- Quick changeover between reflected light illumination and transmitted light illumination.

**BX51M (reflected light illumination model)**
- Accommodates specimens up to 65mm in thickness as a standard. Specimens thicker than 65 mm can also be observed by inserting an arm adapter between the microscope and the illuminator.
The BX41M-LED with built-in bright and super long-life LED illumination has ESD capability to protect the device from electrostatic discharge.

- LED illumination keeps natural color reproduction and a constant brightness during light adjustment or over lamp life span.
- LED illumination provides improvement in throughput and reduction in running costs as optical adjustment is unnecessary and work does not have to be interrupted due to lamp burn-out.
- LED illumination consumes less energy, 1/7 of that consumed by a 30W halogen lamp. Low power consumption also contributes to reduced CO2.

- Equipped with 2 types of reflected light illuminators, BX-AKMA-LED (has an aperture stop and oblique illumination function) and BX-KMA-LED: oblique illumination with the BX-AKMA-LED provides high-contrast images in a simple process.
- ESD performance: surface resistance of 10^8 ohm or less, discharge time of 0.2 sec or less.* When charged to 1000V and then discharged to 100V

Two focusing units for combination with the latest Olympus microscope system. The BXFM-S unit incorporates a unique compact reflected light brightfield illuminator. The BXFM unit accommodates the reflected light brightfield/darkfield and fluorescence illuminators. Fiber illumination, with the option of external control, can be used with both models.

- The illuminator, integrated into the microscope arm helps to facilitate installation into the system or mounting onto the exclusive stand.
- An external light source (TH4-100/200) allows remote control of light intensity adjustment and turning ON/OFF of the 100W halogen illumination via an external signal.

Control options include:
- the motorized revolving nosepiece.
- the motorized BF/DF Mode select and AS Open/Close via BX-RLAA. Those controls are made via the hand switch (U-HSTR2) or directly from the computer via RS232C format.
Near infrared (IR) light imaging

The BX51-IR allows non-destructive inspection and analysis of regions not visible to the naked eye. It facilitates non-destructive observation of specimens such as internals of silicon wafers and on the back of packages and CSP bumps.

- Lineup of 5x to 100x IR objective lenses which compensate for aberrations visible to near infrared light observation model and reflected near infrared light observation model.
- Provides reflected and transmitted near infrared light observation capability.

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- Lineup of 5x to 100x IR objective lenses which compensate for aberrations visible to near infrared light observation model and reflected near infrared light observation model.
- Provides reflected and transmitted near infrared light observation capability.

MX51

Offers the stage of 150 x 150mm travel area

The MX51 can be installed in the MX-SIC6R2 150 x 150mm stage, which copes with larger and larger industrial field specimens. It also accepts the universal illuminator BX-URA2 which includes fluorescence capability, or the reflected light brightfield/darkfield illuminator BX-RLA2.

- Since coarse/fine movement can be switched using the stage grips of the bulk in clutch of the MX-SIC6R2, the microscope delivers extremely comfortable operational environment.
- SEMI 52/58 compliance enhances safety and ergonomics.
- Olympus’ front operation design concept guarantees high operability and reliability.

UIS2 OBJECTIVE LENSES

Diverse lineup allows selection according to the purpose.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Magnification</th>
<th>NA</th>
<th>WD</th>
<th>Working Distance</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPLAPON 50x Oil</td>
<td>0.95</td>
<td>1.35</td>
<td>0</td>
<td>—</td>
<td>0.84</td>
</tr>
<tr>
<td>MPLAPON 100xOil</td>
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<td>0</td>
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- *1 Strehl ratio: When the light condensing ratio (central intensity) on the image field of an ideal aplanatic optical system is assumed as 100%, a light condensing ratio in % that an actual optical system can condense is known as Strehl ratio. The greater is this numeric value, the better the optical system.
- *2 Applicable to the use of specimens without a cover glass.
- *3 Specified oil: IMMOIL-F30CC
- *4 The MPLFLN40x objective lens is not compatible with the differential interference contrast microscopy.
- *5 BD: Brightfield/darkfield objective lenses
- *6 Resolutions calculated with aperture iris diaphragm wide open.
- *7 Objective lens series exclusive for the near-infrared microscopy largely
- *8 Diverse lineup allows selection according to the purpose.
- *9 BD objective lenses cannot be combined with BX41M-LED.
- *10 BD: Brightfield/darkfield objective lenses
- *11 BM: Brightfield objective lenses
- *12 BD objective lenses cannot be combined with BX41M-LED.
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- SIMPLFLN series
- Short working distance Plan CFI objective lenses provide more free space between the objective lens and the specimen so that it can prevent non-uniformity between objective lenses with the angled specimen. Specimen will pass through 5x-100x. The integrated optical system of the BX-CPF phase position is to ensure the objective lens is free of change, and to see the BD series of brightfield and darkfield microscopy.

- MFLU-NIR series
- The Plan Apochromat objective lenses series is for brightfield darkfield, fluorescence, Nomarski DIC and simple polarized observation. All 50x or higher objective lenses for high power observation with chromatic aberration corrected at high level, which is perfect for a wide range of microscopic methods including brightfield, darkfield, Nomarski DIC and simple polarized observation. All 50x or higher objective lenses have 3mm working distance to full size objective to the specimen. Since exit pupil positions from 5x through 150x are standardized, no switching of the DIC prism lever position is necessary when the objective lens power changes.

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DIGITAL IMAGING SOLUTION

Greater efficiency up from observation to image capture and data analysis.

Microscope digital cameras

DP72

With super-high, 12.8 megapixel resolution, the DP72 offers top-of-the-line image clarity, detail and color depth. Advanced on-board cooling ensures the high sensitivity needed to capture clear images of any kind of specimen, even dark ones.

Key features:
- 12.8 megapixels
- Peltier cooling for high-sensitivity performance with low noise
- Superb color reproduction and high resolution provide top-of-the-line image quality
- 15 fps frame rate for fast, easy focusing and framing

DP25

This outstanding, high-resolution 5 megapixel color CCD camera includes accurate color reproduction and advanced color control among a wealth of features. It’s also versatile enough for work with all types of specimens. Olympus analySIS software is separately required to capture images.

Key features:
- 5 megapixels
- Images in true color and accurate detail
- Trimming the live image in a high resolution at high frame rates

DP21

The DP21 provides fast (15fps) motion imaging for precise color reproduction quality and highly efficient image acquisition in production line inspections. Even very fine structures are accurately captured and displayed with outstanding clarity.

Key features:
- 2 megapixels
- Images are stored in the PC’s required space
- Fast (15fps) frame rate for quick, easy focusing and framing
- Equipped with measurement functions for 3 points, polygon area and distance between 2 circle centers as standard

Olympus analySIS software

Seamless operation from image processing, measurement and analysis to database and report generation

As one of the world leading microscope manufacturers, Olympus now offers the ideal software for analyzing digital images. Highly sophisticated — yet remarkable easy to use — the Olympus software is modular in form and adjustable to meet the needs of diverse applications. The integrated database is extremely powerful as it archives images along with all associated data.

In addition to other standard features such as image acquisition, measurement/analysis and report generation, image stitching, focal imaging and many specialized materials characterization modules such as grain size and filter residue are available.

Measurement

Counting particles...measuring dimensions...calculating the distance between two lines...analySIS software handles tasks like these with ease. Results can also be saved/output together with the images.

Stitching Images

Multiple adjacent images can be seamlessly and naturally stitched together into one — an easy, effective way of observing areas too large to be viewed as one image through the microscope.

Extended Focal Image

Multiple versions of the same image, each focused at a different position, can be combined to produce a single, wholly-focused image. This function allows clear imaging of specimens with different height levels on the surface, which cannot be observed all together at the same time conventionally.

Particle Analysis

The separator function enables automatic separation of particles within an image, while threshold levels and detection areas are set though the ROI (region of interest). All particles are measured automatically, using a range of measurement parameters. The measurement data is statistically processed to enable high-level particulate analysis.

3D Image

A uniformly focused image, obtained using the extended focal point function, can be used to construct 3D images and create real 3D animation. Magnification, reduction, pan, and rotation can be performed freely, allowing the specimen to be seen as a whole and examined from any angle.

DIGITAL IMAGING SOLUTION

Greater efficiency up from observation to image capture and data analysis.
BX61/BX51/BX51M/BX41M-LED specifications

**Optical system**

- BX61 optical system (refractively corrected)
- BX51/BX51M/BX41M-LED

**Microscope carriage**

- External 12 v 100 W light source
- LED voltage indicator
- Reflected/transmitted changeover switch
- Built-in 12 v 100 W light source
- LED voltage indicator
- Reflected/transmitted changeover switch
- Built-in 8 power supply for 3 w white LED
- Light switch

**Focus**

- Internal focusing
- Stroke 25 mm
- Minimum graduation 0.01 µm
- Stroke 25 mm
- Fine stroke per rotation 100 µm
- Minimum graduation 1 µm
- With upper limit stopper, torque adjustment for coarse handle

**Dimensions**

- Approx. 430(W) x 591(D) x 495(H) mm
- Weight: Approx. 26 kg (standard combination)

**BX61/BX51/BX51M/BX41M-LED specifications**

- BX51/BX51M/BX41M-LED
- BX-RLA2 U-KMAS
- Reflected light BF etc.
- 100 W halogen (high intensity burner, fiber illuminator mountable)
- BF: 100 W halogen fiber illumination

**Dimensions/weight**

- Dimensions: Approx. 430(W) x 591(D) x 495(H) mm
- Weight: Approx. 26 kg (standard combination)

<table>
<thead>
<tr>
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<th>BX51M</th>
<th>BX41M-LED</th>
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<tbody>
<tr>
<td>Optical system</td>
<td>BX61 optical system (refractively corrected)</td>
<td>BX51/BX51M/BX41M-LED</td>
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<tr>
<td>Microscope carriage</td>
<td>External 12 v 100 W light source</td>
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<td></td>
<td>LED voltage indicator</td>
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**BXF specifications**

**Optical system**

- BXF specifications
- BXFM-S

**Microscope frame**

- BXFM
- BXFM-S

**Microscope carriage**

- BXFM specifications
- BXFM-S

**Focus**

- BXFM
- BXFM-S

**Dimensions**

- BXFM
- BXFM-S

**Weight**

- BXFM
- BXFM-S

**BXF specifications**

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</tr>
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<tbody>
<tr>
<td>Optical system</td>
<td>BXF specifications</td>
</tr>
<tr>
<td></td>
<td>BXFM-S</td>
</tr>
<tr>
<td>Microscope frame</td>
<td>BXFM</td>
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<tr>
<td></td>
<td>BXFM-S</td>
</tr>
<tr>
<td>Microscope carriage</td>
<td>BXFM specifications</td>
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<tr>
<td></td>
<td>BXFM-S</td>
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<tr>
<td>Focus</td>
<td>BXFM</td>
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<tr>
<td></td>
<td>BXFM-S</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Approx. 430(W) x 591(D) x 495(H) mm</td>
</tr>
<tr>
<td></td>
<td>Approx. 334(W) x 276(H) mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 6.2 kg (standard combination)</td>
</tr>
</tbody>
</table>