More than routine – the BX2 clinical microscopes
THE BX2 WITH NOVEL UIS2 OPTICS

All-around efficiency

With the introduction of the infinity-corrected UIS2 optics, Olympus is setting new standards in clinical microscopy. The combination of high contrast, optimal colour fidelity, and even illumination of the entire field of view makes all routine operations faster, less complicated and more efficient than ever. Moreover, the outstanding image quality together with the perfect ergonomic layout prevents premature fatigue during long-term routine tasks.

As a result, your demanding work will become enjoyable: allowing you to focus on the examination of your specimens and get reliable results faster.

The solid construction of the microscopes is matched by the high quality of the materials used, which ensures that they will withstand the rigours of permanent use. Therefore the problems associated with other microscopes don’t exist and you will achieve the highest level of reliability for your work.

BX2 CLINICAL MICROSCOPES
MODULAR BX2 MICROSCOPES AND INFINITY-CORRECTED OPTICS

Ultimately adaptable to any environment

Routine laboratory microscopy requires the fast and accurate examination of large numbers of specimens over extended periods of time. This application places high demands on microscope handling and functionality. BX2 microscopes are precisely tailored for these requirements and have excelled at proving themselves in routine clinical applications already. Due to their effortless, straightforward operation and modular construction, the BX2 series is an effective suite of tools for screening applications as well as the evaluation of all kinds of clinical specimens. The capabilities of the BX2 series are extended by the novel infinity-corrected UIS2 optics. Therefore, the convenient operation you are accustomed to, combined with outstanding optics, will allow you to work more efficiently, getting nothing but the best results possible.

The fundamentals

Optics are the core of each and every microscope and, with the development of the UIS2 optics, Olympus has redefined the standard. Improved and perfectly matched optical components yield clearer, brighter, and more contrast-rich images with optimised colour fidelity, even in the smallest details. In addition, the BX2 series can offer a set of ergonomically designed components such as special stages and ergo tubes, which increase the flexibility of your microscope, thus allowing a much more efficient assessment of your specimens.

The microscopes

The BX2 microscopes have been designed from a user’s perspective and therefore have a compact ergonomic design with carefully positioned controls. The use of high-quality materials ensures reliable long-term functioning coupled with easy and comfortable operation – putting you in the driving seat. The flexibility of the BX2 microscopes enables them to be used as ‘optical benches’ where many modular components can be added to adapt the system to a plethora of special applications. Ultimately, the microscopes can be integrated with advanced software and hardware components to create complete imaging stations.

The accessories

Whether you are looking for a teaching, screening or research clinical microscope, the extensive range of accessories available for the BX2 series makes them the optimal choice.
THE FUNDAMENTALS
Outstanding optics and easy operation

Do you long for a microscope offering outstanding optics as well as easy and convenient operation? In that case, the BX2 series is for you, because as well as the careful ergonomic design, facilitating efficient and comfortable operation, the UIS2 optics set a new standard in image quality. Our engineers have developed this new series of optical components with the most advanced technologies and materials, in order to meet the diverse and exacting demands of microscope users – both today and in the future.

As a result, you will have unbeatable image contrast and resolution so that you don’t need to compromise on any part of your work.
UIS2: INFINITY-CORRECTED – INFINITELY CAPABLE

The new UIS2 optical components from Olympus enable increased efficiency and more reliable results. The UIS2 system is based on infinity-corrected optics and therefore offers ultimate flexibility in the architecture of the entire optical system. The quality of the UIS2 optics means that further components can be added to the light path without detrimental effects. Therefore, the microscope can be optimally customised to your needs.

Plan objectives for clear images
Olympus has an extensive range of objectives to cover every demand and application. For specimens with or without coverslips, for observations using or not using immersion oil, or for brightfield or fluorescent observations. In addition to their applicability to different observation methods, there are other differences in the extent of colour correction between the individual series of objectives. All UIS2 objectives are plan-corrected, and therefore yield bright, crisp and very flat images across the entire field of view, thus allowing faster screening of any specimen.

Improved visual contrast
All the components of the UIS2 system are carefully matched to work together – from the objectives all the way through to the new WHN series eyepieces with outstanding colour fidelity. This results in optimised contrast and therefore stained specimens are visualised in front of a bright, natural background.

Even illumination of the entire field of view
By designing the illumination system from scratch, Olympus has achieved the perfect result: bright and even lighting throughout the entire field of view at all magnifications.

Colour fidelity in digital imaging
The peerless chromatic fidelity of the UIS2 optics yields images with natural, pristine colours, whether using the eyepiece or a camera.

Environmentally friendly UIS2 optics
The reduction of environmental pollution is an important part of our company ethos. For Olympus, progress does not end with the development of high-quality products, but also means that we must treat our environment responsibly. Therefore, all UIS2 objectives and eyepieces are produced from glass which is free from heavy metals.

OUTSTANDING – AT ALL LEVELS

No detail too small
The mechanical stages used on the BX2 series feature rackless drives, which eliminate protruding parts and thus reduce accidental movement or damage to the specimen or user. The stages are available for both left and right-handed operation, and are coated with ceramic for maximal durability and smooth specimen movement. The low-friction stage controls allow fast and effortless navigation to the desired area of the specimen.

Ergonomics at your fingertips
The ease of stage movement can be adjusted to each user’s requirements, so that with the ergo grips, specimen positioning is carried out with the greatest precision possible. The illumination intensity control and focusing knobs also allow effortless operation without the need to lift the arms off the bench surface. Furthermore, the power switch for the lamp is easily accessible and the detachable fine focusing drive can be mounted on either side to suit left or right-handed operators.

Total visual comfort
A range of observation tubes allow you to find the most comfortable position, reducing fatigue and enabling full concentration at all times, whatever your application. For example, the U-TBI-3 standard tube can be tilted to the correct angle, whereas the U-TBBI ergonomic tube can be moved in and out as well as tilted, essentially adjusting the microscope to your posture and not vice versa. In addition, fitting the U-EPA2 intermediate tube will further extend the range of viewing heights for the observation tubes.

High-grade, durable materials
All Olympus microscopes are composed of high-grade materials and are manufactured to the highest precision. With this attention to detail, Olympus microscopes have long service lives and therefore offer the utmost reliability for your work, day after day and year after year. The microscope body is made from a special aluminium alloy in order to provide maximum mechanical stability for the microscope and to avoid interfering vibrations.
CHAPTER II

THE MICROSCOPES
Convenience and high performance – from routine applications to full imaging system solutions

The choice is yours! From transmitted light to fluorescence, from a basic microscope for routine applications to a completely equipped imaging station for research – everybody will find their solution. Moreover, with the new UIS2 optics, a BX2 microscope will see you completely prepared for the future.
STRENGTH IN DEPTH – THE BX41

The BX41 can be used for a comprehensive range of standard and contrast techniques such as brightfield observation and DIC, making it ideal for all routine imaging requirements. Furthermore, with the introduction of the UIS2 optics, the BX41 offers a new standard in laboratory microscopy, making it a very cost-efficient purchase.

Compact shape

A The compact Y-shaped body of the Olympus BX2 series offers significant advantages over other designs. Due to the exceptional stability, the frames are very compact with depths of only 326 mm, offering amazing space savings. The stage is also highly accessible and can be reached freely from a full 270°. The integrated handle and excellent load distribution enable easy and safe transportation.

Flexible tilting tube

The U-CTBI economical binocular tube can be adjusted to the requirements of every user over a range of 5°–35°. Combined with its field number of 18, the U-CTBI offers excellent value for money.

Wide magnification range with just one condenser

U For continuous observations of specimens using 1.25x to 100x objectives, the U-SC3 swing-out condenser can be used. With the swing-out lens in place, the condenser is perfect for 10x to 100x magnification. For imaging below 10x, the front lens is swung out of the light path. The dedicated ultra low magnification condenser (U-ULC-2) is available for image capture when using the 1.25x objective.

Highly versatile

D For any application from brightfield to polarisation microscopy, Olympus has a range of suitable objective nosepieces and condensers to offer. The removable nosepiece enables quick objective change and facilitates lens cleaning. The optional U-UCD8 eight-position universal condenser enables a variety of observation modes. In combination with suitable objectives, it accommodates brightfield, darkfield, phase contrast, Nomarski DIC and simple polarisation observations.

OPTIMAL SOLUTIONS FOR ANY OBSERVATION METHOD

Getting your objectives right

E Olympus produces a number of different objective ranges to cover the wide-ranging requirements of users. For screening of histochemically stained specimens, the PLN series objectives are ideally suited, whereas for applications demanding a higher degree of chromatic correction, e.g. pathology, the UPLFN objectives are available. For the most advanced clinical procedures placing especially high demand on microscope resolution, such as liquid-based cytology (LBC), Olympus offers the UPLSAPO objectives.

Excellent darkfield effect from low to high magnifications

F Olympus produces two specialised condensers for darkfield microscopy: the U-DCD 10x–100x dry darkfield condenser and the U-DCW 20x–100x oil immersion darkfield condenser. The U-PCD2 universal condenser can also be used for darkfield observations.

High-resolution visualisation of birefringent structures

G Many cells and structures can be imaged without the need for contrast media such as dyes, by using polarised light microscopy. For example tooth, bone, muscle and nerve tissue, as well as actomyosin fibres and mitotic spindles can all be observed in amazing detail. To cover all possible polarisation techniques, Olympus produces a complete set of accessories for orthoscopic and conoscopic applications. This includes special objectives and nosepieces, intermediate tubes, condenser, rotating stage, polarisers and analysers as well as compensators for the differing phase shifts.

High-contrast, clear images with phase contrast

H Phase contrast is a widely used technique for the detailed observation of fine structures in live cells not visible in simple brightfield microscopy. The Olympus UPLFN-PH or PLN-PH series objectives enable phase contrast observations from 10x to 100x. With the universal U-PCD2 condenser, you can observe specimens in phase contrast, brightfield and darkfield, depending on the combination of optical components.

Digital imaging: advanced technology

I In clinical microscopy, digital imaging is becoming ever more important and with Olympus, the world market leader in digital photography, you can take advantage of their extensive knowledge. Olympus can provide you with the perfect camera model for every type of application. The choices range from plain cameras without the need for a PC up to high-end cameras which can be used for all applications from brightfield to fluorescence. In conjunction with the cell* software, Olympus offers the perfect solution for all imaging applications, from capture all the way to processing and analysis.
THE MICROSCOPES

UNEQUALLED ERGONOMICS – THE BX45

The BX45 was specifically designed to meet the rigorous demands of repetitive routine microscopy. In contrast to conventional microscopes where samples are focused using a moving stage, the BX45 has a moveable objective nosepiece. This allows the stage to be placed closer to the desk, reducing the movement required to position and retrieve specimens. Moreover, the stage is fixed in the Z-plane and is therefore in the same place relative to the user’s hand at all times. Both these design features show the attention to detail used in the construction of the BX45 and offer the highest comfort. As a result, the BX45 is the ultimate microscope for long-term fatigue-free operation.

Low-level stage facilitates specimen change

The mechanical stage is positioned only 128 mm above the desk surface, lower than any other microscope in this class. With the focus control also placed within easy reach, specimen change and focusing require minimal effort and can be completed without lifting your hands off the desktop.

Universal condenser for a variety of applications

A The built-in universal condenser allows brightfield, darkfield, phase contrast and simple polarisation observation. PH1, PH2, PH3 and DFA contrast inserts as well as ø32 ND, LBD and IF550 filters can be inserted easily into one of the three positions of the condenser’s filter wheel. The aperture diaphragm can be shifted for oblique illumination, facilitating the observation of thick, transparent specimens due to the shadow effect this generates.

No condenser changes for 4x to 100x magnification

Continuous observation using objective magnifications from 4x to 100x is possible without the need to swing the condenser’s front lens out of the light path. Since it is also important to find areas of interest using low-power observation, 1.25x or 2x objectives can be used with the same condenser by swinging the front lens out.

Ergonomic observation tubes

Creating the perfect, upright and comfortable posture during microscope operation is not only essential, but dependent on the user. With the ergonomically perfected ergo tube observation tube, the inclination angle and the tube extension can be adjusted, allowing very flexible set-up. The ergo tube is available in two different versions. One model generates the conventional inverted observation image, whereas the other produces an erect observation image moving in the same direction as the specimen; this makes it easier to find a specific area in the specimen.

Optimised objectives

For the observation of unstained cells by phase contrast microscopy, Olympus offers the PLN-PH and PFLN-PH objectives series. The objectives PLN10xCY and PFLN10xCY have been developed especially for cytology, since the observation of smear preparations does not require any correction for coverslips. Furthermore, due to the integrated ND25 filter, there is no change in image brightness when changing to a 40x objective. This allows the observer to change magnification quickly and effortlessly. In addition, the PFLN10xCY objective produces the largest field of view – FN of 26.5 – on the market.

Easy gout inspection

The microscope can very easily and quickly be adapted for the use in the detection of gout, since the gout analyser inserts directly into the nosepiece. For routine gout screening, a rotating stage can be mounted instead of the standard mechanical stage.
EXPLORING NEW TERRITORY – THE BX51

With the changing requirements of your work comes the need to adapt your equipment. With the versatile BX51, your microscope is more of an imaging platform and can therefore be tailored to your exact requirements. With its modular design, the BX51 offers you the maximum freedom to build the system that you really require.

If you want to make new applications accessible in the future, you do not need a new microscope: simply add to your existing BX51. This will not only substantially expand your imaging capabilities, but also save space and time. For instance, the standard light arm can be replaced by a reflected light condenser, providing you with an advanced fluorescence microscope.

Simple filter handling

The BX51 body comes with three filters – ND6, ND25 and LBD – with the option to add a fourth filter of your choice. Using sliders mounted low on the body and moving filters into and out of the light path is effortless.

Create your own microscope

Observations from 1.25x to 100x with just one condenser

For continuous observations of specimens using 1.25x to 100x objectives, the U-SC3 swing-out condenser can be used. With the swing-out lens in place, the condenser is perfect for 10x to 100x magnification. For imaging below 10x, the front lens is swung out of the light path. The dedicated ultra low magnification condenser (U-UUC-2) is available for image capture when using the 1.25x objective.

Imaging

The DP70 high-resolution digital camera with peerless colour fidelity

The DP70 digital camera allows the fast capture of high-resolution images of up to 12.5 million pixels. Clear, crisp images can be obtained at high sensitivity (up to ISO 1600) with reduced noise. The camera is controlled from a PC with the Olympus cell* software, allowing fast and easy capture, processing and storage of digital images in all applications.

Fluorescence

Bright and brilliant

For fluorescence applications, the BX-URA2 and BX-RFA reflected light illuminators with integrated condensers are available. The BX-RFA allows the insertion of additional optical elements, for example special filters to colour-balance the excitation light in multiple fluorescence applications. Both illumination arms possess a filter wheel for six filter cubes. The filter numbers with the filter wheel are clearly marked on the outside and are even visible in dark rooms due to the luminescent labelling. This makes choosing the next filter simple and intuitive.

Nomarski DIC

Highest DIC quality with any specimen

Olympus has the complete set of accessories for Nomarski differential interference contrast (DIC) observations. Olympus DIC prisms are individually optimised for different types of specimen. The high-contrast (HC) prism enhances contrast in thin specimens allowing identification of very fine structures, whereas the high-resolution (HR) prism will produce clear images of thicker specimens, free from glare and noise. For specimens of variable thickness, two universal prisms are available, which generate images with optimal contrast-to-resolution ratios.
CHAPTER III

ACCESSORIES
Perfect solutions for every requirement
Discover all the possibilities: whether you are carrying out clinical screening, research or teaching, the BX2 microscope range provides the perfect platform for expansion. Different accessories enable your microscope to be used for a range of contrast methods or fluorescence imaging, making the microscope optimally tailored to any requirement.
SMALL EXTRAS, BIG EFFECTS

Observation tubes

The large range of observation tubes available not only offers the ultimate in comfort with the ergo tubes, but also enables both widefield and super widefield viewing. Standard binocular and camera trinocular tubes are available, and the U-ETBI and U-SWTR erect image tubes allow the observed image to be moved in the same direction as the specimen.

Eyepieces

Widefield eyepieces

The WHN series of widefield eyepieces has outstanding colour fidelity, yielding clear, high-contrast images with excellent colour fidelity.

Super widefield eyepieces

Compatible with field number (FN) 26.5

<table>
<thead>
<tr>
<th>Type</th>
<th>Name</th>
<th>Field number (FN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widefield</td>
<td>WHN10x</td>
<td>22</td>
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<tr>
<td></td>
<td>WHN10x-M</td>
<td>22</td>
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<tr>
<td></td>
<td>WHN15x</td>
<td>14</td>
</tr>
<tr>
<td>Super widefield</td>
<td>SWH15x</td>
<td>26.5</td>
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<tr>
<td></td>
<td>SWH15x-M*</td>
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<tr>
<td></td>
<td>CROSS SWH10x</td>
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<tr>
<td></td>
<td>CROSS SWH10x</td>
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</tr>
<tr>
<td>Finder eyepiece</td>
<td>35WHN10x</td>
<td>22</td>
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<tr>
<td></td>
<td>35SWH10x</td>
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<tr>
<td></td>
<td>PSWH10x</td>
<td>26.5</td>
</tr>
</tbody>
</table>

Magnification changers

These intermediate tubes allow quick magnification without the need to change the objective lens: U-ECA 1x/2x; U-CA 1.6x/1.6x/1.6x/1.6x/2x.

Camera adapters

Maximise the image capture potential of your Olympus microscope by adding a camera. A range of adapters is available for different cameras, offering various magnification levels from 0.25x to 1x.

Revolving nosepieces

Five, six, or seven-position revolving nosepieces are available for the BX41/51 microscopes. The U-P6RE sextuple revolving nosepiece allows centring of three objectives. The U-P6RE and the seven-position U-D7RE have slider slots for a DIC prism or an analyser for Nomarski DIC or polarisation observations.

Stages

As an alternative to standard mechanical stages, Olympus offers grooved stages which prevent the slide from sticking to the stage when immersion oil is used. One or two-place specimen holders are available for all mechanical stages, allowing specimens to be exchanged easily with one hand. They are available in right and left-handed versions and the controls can be fitted with ergo grips to enable fine control of the stage. In addition, plain and rotatable stages are available for polarisation microscopy.
**Group observation systems**

Multiple-observation tubes/BX2-DO, BX2-SDO, BX2-MDO-5, BX2-MDO-10

Olympus offers customisable multi-head solutions for laboratory discussions and training courses which are much more efficient if the entire group can see the discussion specimen through an individual eyepiece.

**Observation aid**

Olympus offers an electronic observation aid which projects a luminous moveable arrow into the field of view. This arrow is also visible for other observers at a group observation unit or on a monitor.
**BX41/BX51 specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>BX41</th>
<th>BX51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscope body</td>
<td>Optical system</td>
<td>Ultra</td>
</tr>
<tr>
<td></td>
<td>Focusing</td>
<td>Vertical stage movement: 25 mm stage stroke with front stopper for coarse drive, torque adjustment for coarse drive control. Variable stage mounting position, high-variability fine drive (minimum adjustment step 1.0 μm)</td>
</tr>
<tr>
<td></td>
<td>Illumination</td>
<td>Built-in Köhler illumination for transmitted light. 100, 200, and 400 W halogen lamps (pre-centred)</td>
</tr>
</tbody>
</table>

**Revolving nosepiece**

- Interchangeable revolving quadruple tube/tube/multipurpose nosepiece
- Stage
- Linescale-ruled scale stage with left- or right-hand low drive control with rotating mechanism and torque adjustment (plain stage and rotatable stages also available)
- Condenser
- Condenser
- Interchangeable nosepiece focusing, fixed low stage
- Super-ruled scale stage with left- or right-hand low drive control with rotating mechanism and torque adjustment (plain stage and rotatable stages also available)
- Condenser
- Condenser

**BX45 specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>BX45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microscope body</td>
<td>Objective system</td>
</tr>
<tr>
<td></td>
<td>Focusing</td>
</tr>
<tr>
<td></td>
<td>Illumination</td>
</tr>
</tbody>
</table>

**Revolving nosepiece**

- Fixed, revolved quadruple nosepiece
- Observation tube
- Fixed, revolved quadruple nosepiece
- Stage
- Condenser
- Condenser

**BX41 dimensions (in mm)**

- Weight: 12 kg, power consumption: 45 W - This dimension may vary according to the interpupillary distance. The measurements given pertain to a distance of 62 mm.

**BX51 dimensions (in mm)**

- Weight: 18 kg, power consumption: 148 W - This dimension may vary according to the interpupillary distance. The measurements given pertain to a distance of 62 mm.

**BX45 dimensions (in mm)**

- Weight: 16 kg, power consumption: 45 W - This dimension may vary according to the interpupillary distance. The measurements given pertain to a distance of 62 mm.

**Group observation attachments**

- U-ODS Dual observation attachment
- U-MDO3 Side by side observation attachment
- U-MDS3 Multi observation side viewing attachment

**Observation and intermediate tubes**

- U-EDT1 Ergonomic tube
- U-ETB2 Emtical image tube
- U-TRIB Ergonomic binocular tube
- U-TIBI Ergonomic binocular tube with tilting eyepieces
- U-TRIBI Ergonomic binocular tube with tilting eyepieces
- U-IBA2 Goniometer adapter for U-EDP
- U-EC1 Magnification changer 2x
- U-EC1,6x Magnification changer 1.6x
- U-CAL Magnification changer
- U-A3L Luminous arrow pointer
- U-EFA2 Eye point adjustor
- U-TRIB Interchangeable intermediate tube with camera port
- U-EUS2 Interchangeable intermediate tube with camera port
- U-DA Drawing attachment

**Eyeswieces**

- **WHN10x**
- **WHN10x-H**
- **CROSS WHN10x**
- **35WHN10x**
- ****Centring telescopic eyepiece U-CT30
- **U-DFP Power magnification incidental lens with camera port
- **U-TRIB Interchangeable intermediate tube with camera port**
- **U-DA Drawing attachment**

**Counting observations attachments**

- U-ODS Dual observation attachment
- U-MDO3 Side by side observation attachment
- U-MDS3 Multi observation side viewing attachment

**Notes**

- *1 Mounted on BX45TF. *2 ... observation beam splitter body
- *3 Multi observation side viewing attachment
- *4 Stand
- *5 Attachments

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**References**

- BX45 System Diagram
- BX41/BX51 Specifications
- BX45 Specifications
- BX41 Dimensions (in mm)
- BX51 Dimensions (in mm)
- BX45 Dimensions (in mm)

*All dimensions are approximate. Refer to the specifications for exact measurements.*