

# OLYMPUS<sup>®</sup>

## BHM SERIES

Metallurgical  
Microscopes



## **Introducing LBM Infinity-Corrected Optics For a New Level of Optical Performance**

*In recent years, the requirements of microscopic research and product inspection in industry have become increasingly demanding and uncompromising. This necessitated the development of microscopes offering greater sophistication and improved optical performance. To meet these highly critical demands, Olympus introduces LBM infinity-corrected optics together with optimum performance incident light microscopes—opening up a whole new range of possibilities in the fields of research and inspection. By offering superior optical quality, these microscopes will make a significant contribution to scientific and industrial development.*

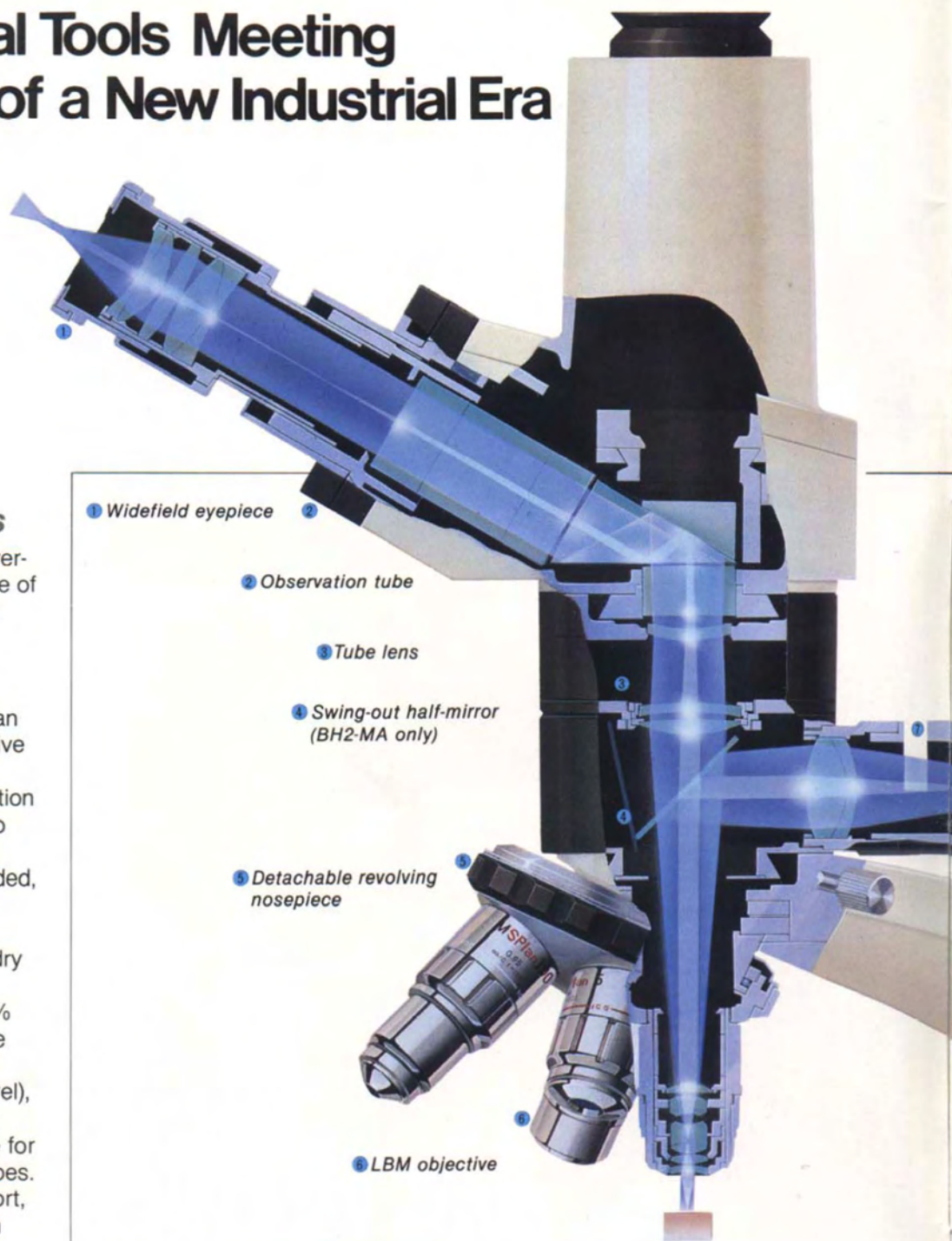




# Precision Optical Tools Meeting the Challenges of a New Industrial Era

## Features of Infinity-Corrected LBM Objectives

- Improved resolution, due to a 20% average increase in the numerical aperture of all high performance objectives in the series.
- Better contrast, for a clearer, more distinct image.
- Improved image field flatness. The Plan objective series offers a 100% effective field of view for both observation and photography. Super widefield observation is possible with the M S Plan and Neo S Plan series.
- Working distance is appreciably extended, for easier marking and handling of specimens.
- Easier operation with the addition of dry high power objectives.
- Visual field diameter increased by 23% using the WHK 10X standard eyepiece (F.N. 20).
- Adjustment length of 45mm (long barrel), for parfocality from ultra-low power to high power objectives, is now possible for the first time in incident light microscopes. The result is improved operator comfort, without the necessity to refocus when changing from ultra-low to high power objectives or vice-versa.
- The utilization of infinity-corrected LBM optics results in the complete elimination of ghost images and astigmatism produced by the half-mirror of the vertical illuminator. This advantage, combined with better correction of lens aberrations and improved lens coating, makes it possible to obtain a clearer and sharper image than ever before.



1 Widefield eyepiece

2 Observation tube

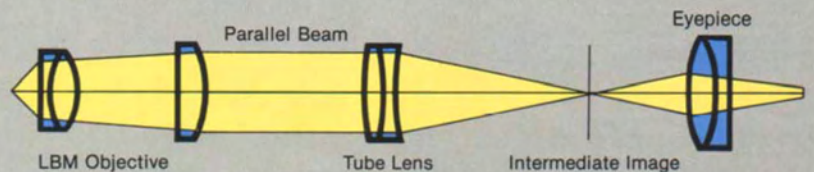
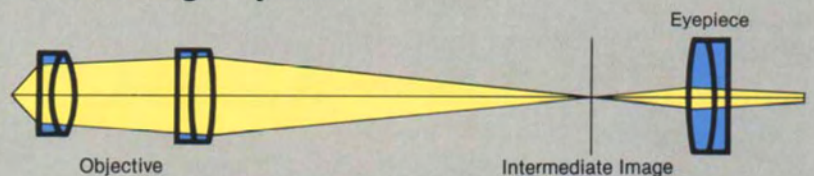
3 Tube lens

4 Swing-out half-mirror (BH2-MA only)

5 Detachable revolving nosepiece

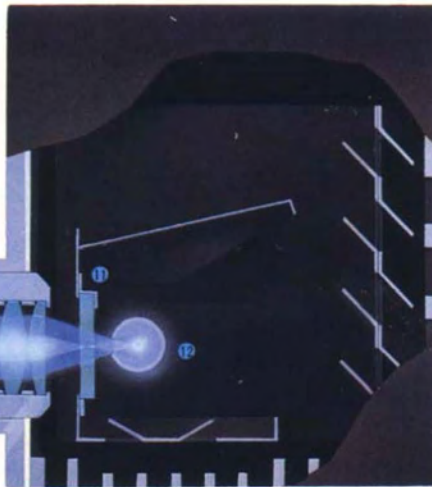
6 LBM objective

### Finite Tube Length System



### Infinity Corrected System

- ⑦ Polarizer receptacle
- ⑧ Field diaphragm (BH2-MA only)
- ⑨ Aperture diaphragm
- ⑩ Filter receptacle



- ⑪ Heat absorbing filter
- ⑫ 12V-50W long-life halogen lamp

## New Easier-to-Use Observation Tube

### Constant Tube Length Adjustment

Interpupillary distance is adjustable without loss of focus or parfocality. Using a framing eyepiece, focusing for photomicrography is done with the binocular observation tube.

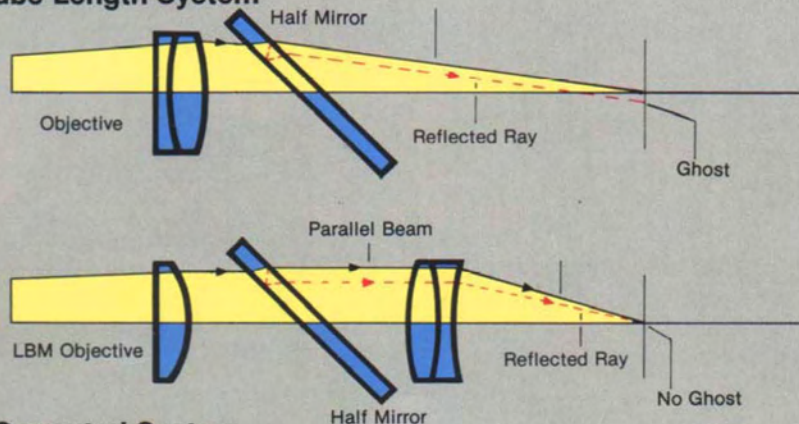
### 3-Step Light Path Selection (BH2-TR30 only)

The BH2-TR30 trinocular tube provides a light path which either passes 100% of the light to the camera, 100% of the light to the eyepieces, or 20% to the eyepieces and 80% to the camera. This design facilitates photomicrography of materials with low reflectivity.

## Detailed Attention to Objective Change

Improvements have been made to those parts of the revolving nosepiece and objectives which come in contact with the operator when changing magnification, making it more difficult for debris and dust—the cause of fatal flaws in the manufacture of semiconductors—to fall onto the specimen.

### Finite Tube Length System



### Infinity Corrected System

# Infinity-Corrected Optical Design Improves Performance of Incident Light Microscopes

## **Equipment for Brightfield Observation**

The BH2-MA brightfield vertical illuminator is used in conjunction with brightfield objectives for observations in brightfield. This system permits work with both incident and transmitted light, allowing continuous observation from low to high magnifications without change of illumination.

### **BH2-MA Brightfield Vertical Illuminator**

The BH2-MA illuminator is equipped with field and aperture diaphragms, and has provisions for insertion of polarizer, analyzer and filters. The polarizer (BH2-MPO) and analyzer (BH2-MAN45) are standard equipment. The half-mirror may be swung out to double the light intensity for transmitted light observations. The light source uses a 12V-50W long-life halogen bulb, considerably simplifying time-consuming bulb-replacement.





### Brightfield Objectives

Three series of objectives for brightfield observation are available: M S Plan, M D Plan and M D Ach.

The M S Plan series design features particularly high numerical apertures and provides very high image resolution and contrast. Super widefield observation is possible with this series, making it ideally suited for research applications. The M D Plan series is a high performance plan objective, the cost of which has been kept down by omitting the super widefield feature, making it ideal for general and routine work. The M D Ach series of objectives is especially economical and is ideally suited for routine work and scientific education purposes.

#### Specifications

	Magnification	N.A.	W.D. (mm)
M S Plan	5X (dry)	0.13	21.10
	10X (dry)	0.30	9.00
	20X	0.46	3.00
	(Spring, dry)		
	50X	0.80	0.47
LWD M S Plan	(Spring, dry)		
	100X (Spring, dry)	0.95	0.30
LWD M S Plan	20X (dry)	0.40	7.00
	50X (dry)	0.60	3.00
M D Plan	5X (dry)	0.10	19.00
	10X (dry)	0.25	7.00
	20X	0.40	1.00
	(Spring, dry)		
	50X	0.75	0.38
M D Plan	(Spring, dry)		
	80X (Spring, dry)	0.90	0.20
M D Ach	10X (dry)	0.25	6.77
	20X	0.40	1.10
	(Spring, dry)		
	50X	0.70	0.45
	(Spring, dry)		
M D Ach	100X (Spring, oil)	1.25	0.32

## Equipment for Brightfield/ Darkfield Observation

The brightfield/darkfield vertical illuminator BH2-RLA is used in conjunction with brightfield/darkfield objectives for darkfield or brightfield observations. Brightfield/darkfield incident light observation and transmitted light observation are possible, without having to change the illumination when switching between low and high magnifications.

### BH2-RLA Brightfield/Darkfield Vertical Illuminator

The BH2-RLA illuminator is equipped with an aperture diaphragm and has provisions to accept for polarizer, analyzer and filters. The polarizer (BH2-MPO) and analyzer (BH2-NAN) are standard equipment. A single lever makes changeover from brightfield to darkfield observation simple and the aperture diaphragm can be used in both observation modes. An ND filter is automatically inserted when the illuminator is changed from darkfield to brightfield so that brightfield observation is possible at virtually the same light intensity as darkfield. The ND filter may be removed from the light path when required, even when in the brightfield mode. e.g., for photomicrography. The light source uses a 12V-50W long-life halogen bulb.







### Brightfield/Darkfield Objectives

Two series of brightfield/darkfield objectives are available: Neo S Plan and Neo D Plan. The Neo S Plan series offers all the performance characteristics of the M S Plan lenses with the additional function of incident light darkfield observation, and may be used for super widefield observation. The Neo D Plan series consists of high performance plan objectives designed primarily with cost-performance in mind.

#### Specifications

	Magnification	N.A.	W.D. (mm)
Neo S Plan	5X (dry)	0.13	10.00
	10X (dry)	0.30	4.00
	20X (Spring, dry)	0.46	3.00
	50X (Spring, dry)	0.80	0.50
	100X (Spring, dry)	0.90	0.30
Neo D Plan	5X (dry)	0.10	11.20
	10X (dry)	0.25	6.00
	20X (Spring, dry)	0.40	1.00
	50X (Spring, dry)	0.57	0.34
	80X (Spring, dry)	0.90	0.18

### Eyepieces for LBM Objectives

	F.N.	Remarks
NK 5X	21	
WHK 8X	20	
WHK 10X	20	
WHK 10X-H	20	Diopter adjustment
WHK 15X	14	
Micro-WHK 10X	20	Built-in 10/100 micrometer reticle
Cross-WHK 10X	20	Built-in cross 10/100 micrometer reticle
NK 20X	10	
35-WHK 10X	20	With built-in 35mm mask
P-WHK 10X	20	With built-in 3 1/4" x 4 1/4" mask
4 x 5-WHK 10X	20	With built-in 4" x 5" mask
MH-WHK 10X	20	With built-in 16mm cine mask

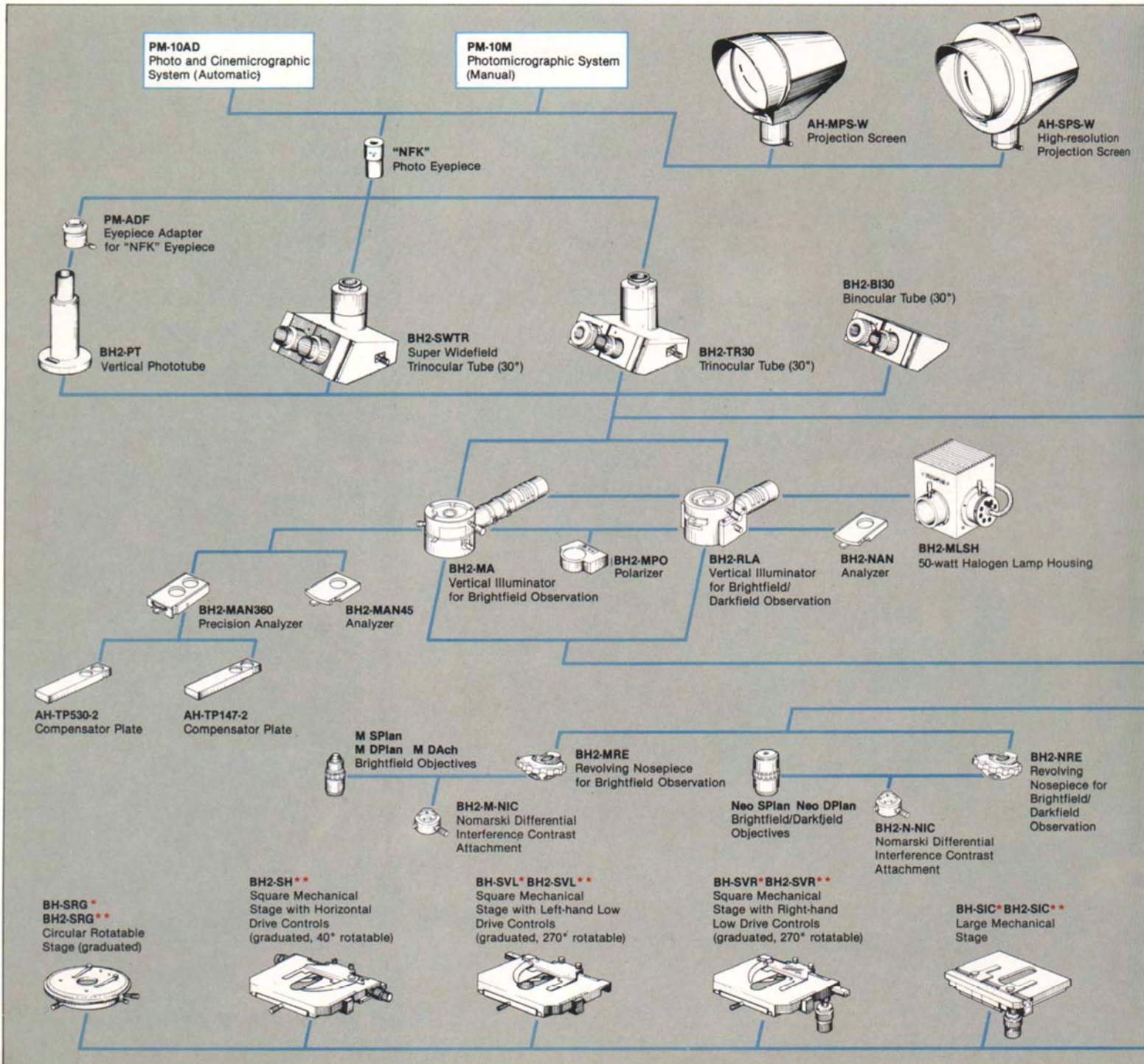
# Olympus Upright Metallurgical System Microscopes... Flexibility for a Wide Variety of Applications

*The Olympus Metallurgical Microscope System features five basic models—BHM, BHSM, BHT-M, BHMJ and BHMJL—offering a selection of models to match the user's specific requirements. These models are all components of a modular system with wide range of interchangeable accessories, including illuminators, observation tubes, objectives and eyepieces, as well as revolving nosepieces, which may be used on all models. Being part of such an integrated system permits the use of these models in a wide range of microscopic applications, ranging from sophisticated research to on-line inspection.*

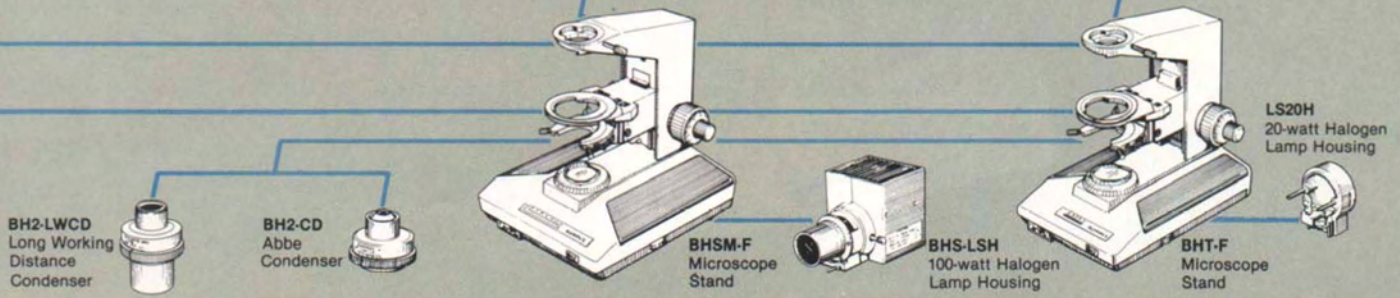
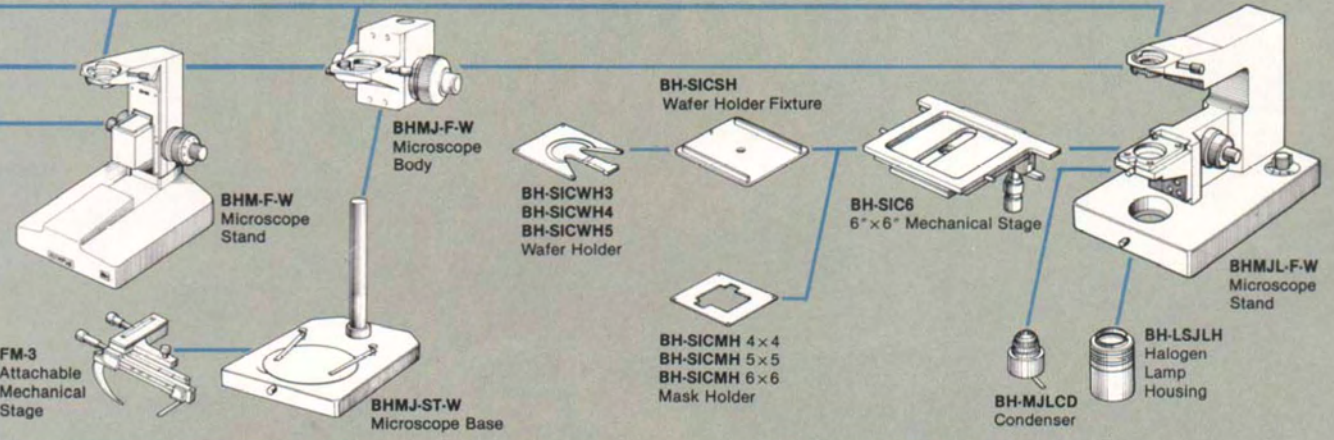
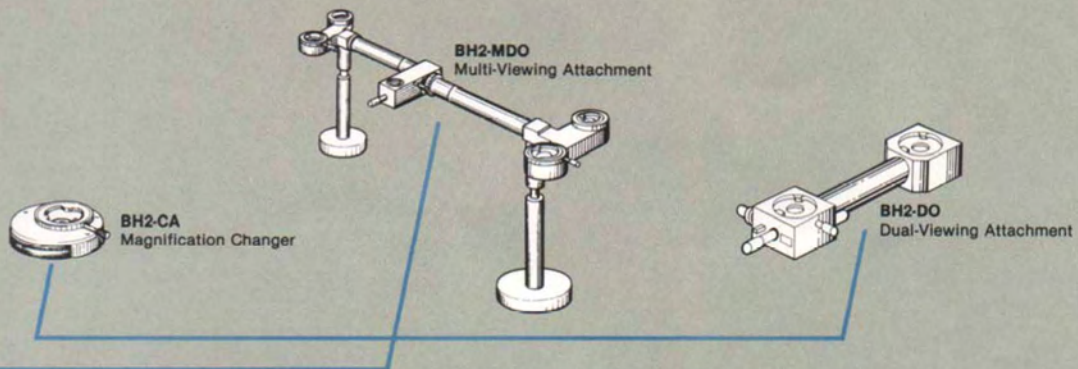




# System Diagram of Olympus Upright Metallurgical Microscopes



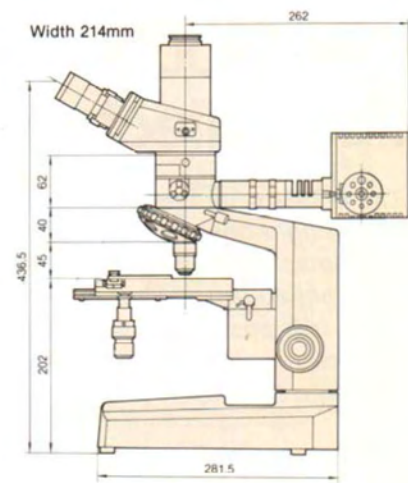
\*for BHM-F-W  
 \*\*for BHSM-F, BHT-F



# The Model BHM. For Reflected Light Observation

*This is the most widely used model for a diverse range of research and inspection applications in the fields of metallurgy, mineralogy and precision electronic engineering.*





Standard Outfits

Module	Description	BHM-L								BHM-NL							
		113	163	313	363	112	162	312	362	113	163	313	363	112	162	312	362
Microscope stand	BHM-F-W	Focusing adjustment range 25mm plus extra 27.5mm by stage height locking position adjustment.															
Observation tube	BH2-BI30	Binocular, inclined 30°, constant tube length adjustment.															
	BH2-TR30	Trinocular, inclined 30°, constant tube length adjustment.															
Vertical illuminator	BH2-MA	For brightfield observation.															
	BH2-RLA	For brightfield/darkfield observation.															
Analyzer	BH2-MAN45	For BH2-MA.															
	BH2-NAN	For BH2-RLA.															
Polarizer	BH2-MPO	For BH2-MA and BH2-RLA.															
Halogen lamp housing	BH2-MLSH	With built-in heat absorbing filter.															
Halogen bulb	JC12V 50W HAL-L	12V 50W, long-life. (2 pcs.)															
Transformer	TGH																
Power cord	UYCP																
Revolving nosepiece	BH2-MRE	Quintuple, for brightfield objectives.															
	BH2-NRE	Quadruple, for brightfield/darkfield objectives.															
Mechanical stage	BH-SV	142mm x 140mm, traversing 52mm x 76mm.															
Large mechanical stage	BH-SIC	200mm x 161mm, traversing 110mm x 100mm.															
Metal slide plate	AA1276	(5 pcs.)															
Standard mirror	M-SM2	For color temperature calibration.															
Objective	MSPL	M S Plan 5x, 10x, 20x, 50x, 100x															
	NEOSPL	Neo S Plan 5x, 10x, 20x, 50x															
	MDPL	M D Plan 5x, 10x, 20x, 50x, 80x															
	NEODPL	Neo D Plan 5x, 10x, 20x, 50x															
Eyepiece	WHK10X	Widefield (F.N. 20), high eyepoint. (2 pcs.)															
Photo eyepiece	NFK3.3X-LD																

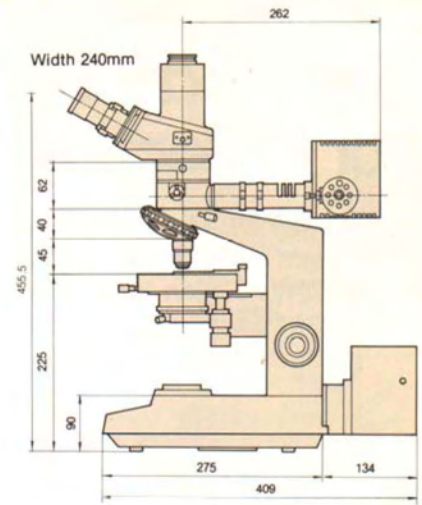
# The Model BHSM. For Reflected/Transmitted Light Observation

*The BHSM offers all the features of the BHM microscope plus transmitted light observation capability, making it ideal for observation of photomasks and powdered specimens, etc.*

*The light source for transmitted light observation is a 12V 100W halogen lamp. It is possible to alternate between reflected light and transmitted light observation at a flick of the switch which controls the transformer built into the base.*







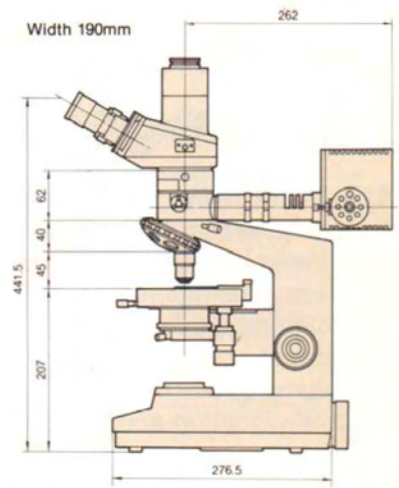
Standard Outfits

Module		Description	BHS-M-L								BHS-M-NL							
			113	163	313	363	112	162	312	362	113	163	313	363	112	162	312	362
Microscope stand	BHSM-F	Focusing adjustment range 26mm plus extra 25mm by stage height locking position adjustment. Built-in transformer 3V—12V for transmitted and reflected light illumination.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Power cord	UYCP	For BHS-M-F.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Observation tube	BH2-BI30	Binocular, inclined 30°, constant tube length adjustment.	•	•			•	•			•	•			•	•		
	BH2-TR30	Trinocular, inclined 30°, constant tube length adjustment.			•	•			•	•		•	•			•	•	
Vertical illuminator	BH2-MA	For brightfield observation.	•	•	•	•	•	•	•									
	BH2-RLA	For brightfield/darkfield observation.								•	•	•	•	•	•	•	•	
Analyzer	BH2-MAN45	For BH2-MA.	•	•	•	•	•	•	•									
	BH2-NAN	For BH2-RLA.								•	•	•	•	•	•	•	•	
Polarizer	BH2-MPO	For BH2-MA and BH2-RLA.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen lamp housing	BHS-MLSH	With built-in heat absorbing filter.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen bulb	JC12V 50WHAL-L	12V 50W, long-life. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Revolving nosepiece	BH2-MRE	Quintuple, for brightfield objectives.	•	•	•	•	•	•	•									
	BH2-NRE	Quadruple, for brightfield/darkfield objectives.								•	•	•	•	•	•	•	•	
Mechanical stage	BH2-SVR	180mm x 135mm, traversing 76mm x 50mm, rotatable 270°.	•	•			•	•			•	•			•	•		
Large mechanical stage	BH2-SIC	200mm x 161mm, traversing 110mm x 100mm.		•		•		•	•		•	•		•	•		•	
Abbe condenser	BH2-CD	For use with standard stage BH2-SVR.	•	•			•	•			•	•			•	•		
Long working distance condenser	BH2-LWCD	For use with large mechanical stage BH2-SIC.		•		•		•	•		•	•			•	•		
Halogen lamp housing	BHS-LSH	For transmitted light.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen bulb	JC12V 100WHAL-L	Used with BHS-LSH. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Metal slide plate	AA1276	(5 pcs.)	•		•		•							•		•		
Standard mirror	M-SM2	For color temperature calibration.			•	•							•	•			•	
Objective	MSPL	M S Plan 5x, 10x, 20x, 50x, 100x	•	•	•	•												
	NEOSPL	Neo S Plan 5x, 10x, 20x, 50x								•	•	•	•					
	MDPL	M D Plan 5x, 10x, 20x, 50x, 80x					•	•	•									
	NEODPL	Neo D Plan 5x, 10x, 20x, 50x												•	•	•	•	
Eyepiece	WHK10X	Widefield (F.N. 20), high eyepoint. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Photo eyepiece	NFK3.3X-LD				•	•		•	•			•	•			•		

# The Model BHT-M. For Reflected/ Transmitted Light Observation

*As with the BHSM, this microscope is for both reflected light and transmitted light observation. The light source for transmitted light observation is a 6V 20W halogen lamp. The transformer built into the base is for transmitted light illumination only.*





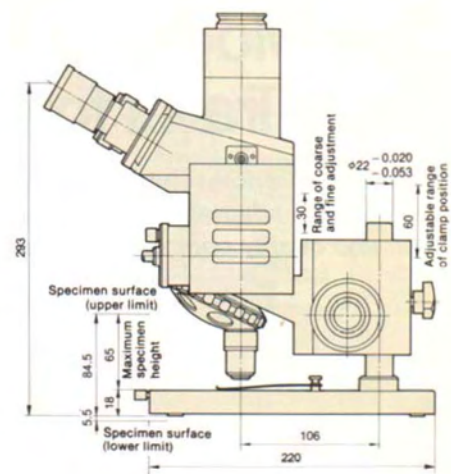
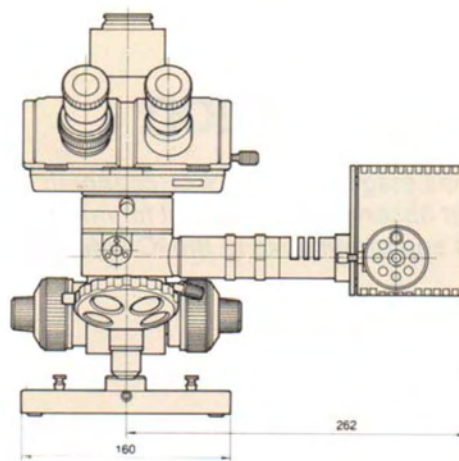
Standard Outfits

Module		Description	BHT-ML								BHT-NL							
			113	163	313	363	112	162	312	363	113	163	313	363	112	162	312	363
Microscope stand	BHT-F	Focusing adjustment range 26mm plus extra 25mm by stage height locking position adjustment. Built-in transformer 0V—6V for transmitted light illumination.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Power cord	UYCP	For BHT-F.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Observation tube	BH2-BI30	Binocular, inclined 30°, constant tube length adjustment.	•	•			•				•	•			•	•		
	BH2-TR30	Trinocular, inclined 30°, constant tube length adjustment.			•	•				•	•		•	•		•	•	
Vertical illuminator	BH2-MA	For brightfield observation.	•	•	•	•	•	•	•									
	BH2-RLA	For brightfield/darkfield observation.								•	•	•	•	•	•	•	•	
Analyzer	BH2-MAN45	For BH2-MA.	•	•	•	•	•	•	•									
	BH2-NAN	For BH2-RLA.								•	•	•	•	•	•	•	•	
Polarizer	BH2-MPO	For BH2-MA and BH2-RLA.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen lamp housing	BH2-MLSH	With built-in heat absorbing filter.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen bulb	JC12V 50WHAL-L	12V 50W, long-life. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Transformer	TGH		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Power cord	UYCP		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Revolving nosepiece	BH2-MRE	Quintuple, for brightfield objectives.	•	•	•	•	•	•	•									
	BH2-NRE	Quadruple, for brightfield/darkfield objectives.								•	•	•	•	•	•	•	•	
Mechanical stage	BH2-SVR	180mm × 135mm, traversing 76mm × 50mm, rotatable 270°.	•				•							•		•		
Large mechanical stage	BH2-SIC	200mm × 161mm, traversing 110mm × 100mm.		•		•		•			•		•		•			
Abbe condenser	BH2-CD	For use with standard stage BH2-SVR.	•				•				•		•		•			
Long working distance condenser	BH2-LWCD	For use with large mechanical stage BH2-SIC.		•		•		•			•		•		•			
Halogen lamp housing	LS-20H	For transmitted light.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Halogen bulb	6V20WHAL	Used with LS-20H. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Metal slide plate	AA1276	(5 pcs.)	•				•				•				•			
Standard mirror	M-SM2	For color temperature calibration.			•	•			•			•	•			•	•	
Objective	MSPL	M S Plan 5x, 10x, 20x, 50x, 100x	•	•	•	•												
	NEOSPL	Neo S Plan 5x, 10x, 20x, 50x								•	•	•	•					
	MDPL	M D Plan 5x, 10x, 20x, 50x, 80x					•	•	•									
	NEODPL	Neo D Plan 5x, 10x, 20x, 50x												•	•	•	•	
Eyepiece	WHK10X	Widefield (F.N. 20), high eyepoint. (2 pcs.)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
Photo eyepiece	NFK3.3X-LD				•	•			•			•	•		•	•		

# The Model BHMJ. Lightweight, Compact Microscope

*As with the BHM, this microscope is specifically designed for reflected light observation. It is distinguished for its few restrictions on the type of specimens which may be inspected. It can be set up directly on top of the object to be examined and can be used anywhere to examine anything. It is ideal for a wide range of applications including industrial inspection and process control. Because the microscope body can be removed from its column and attached to other equipment, it can also be used for precisely locating and positioning specimens.*





Standard Outfits

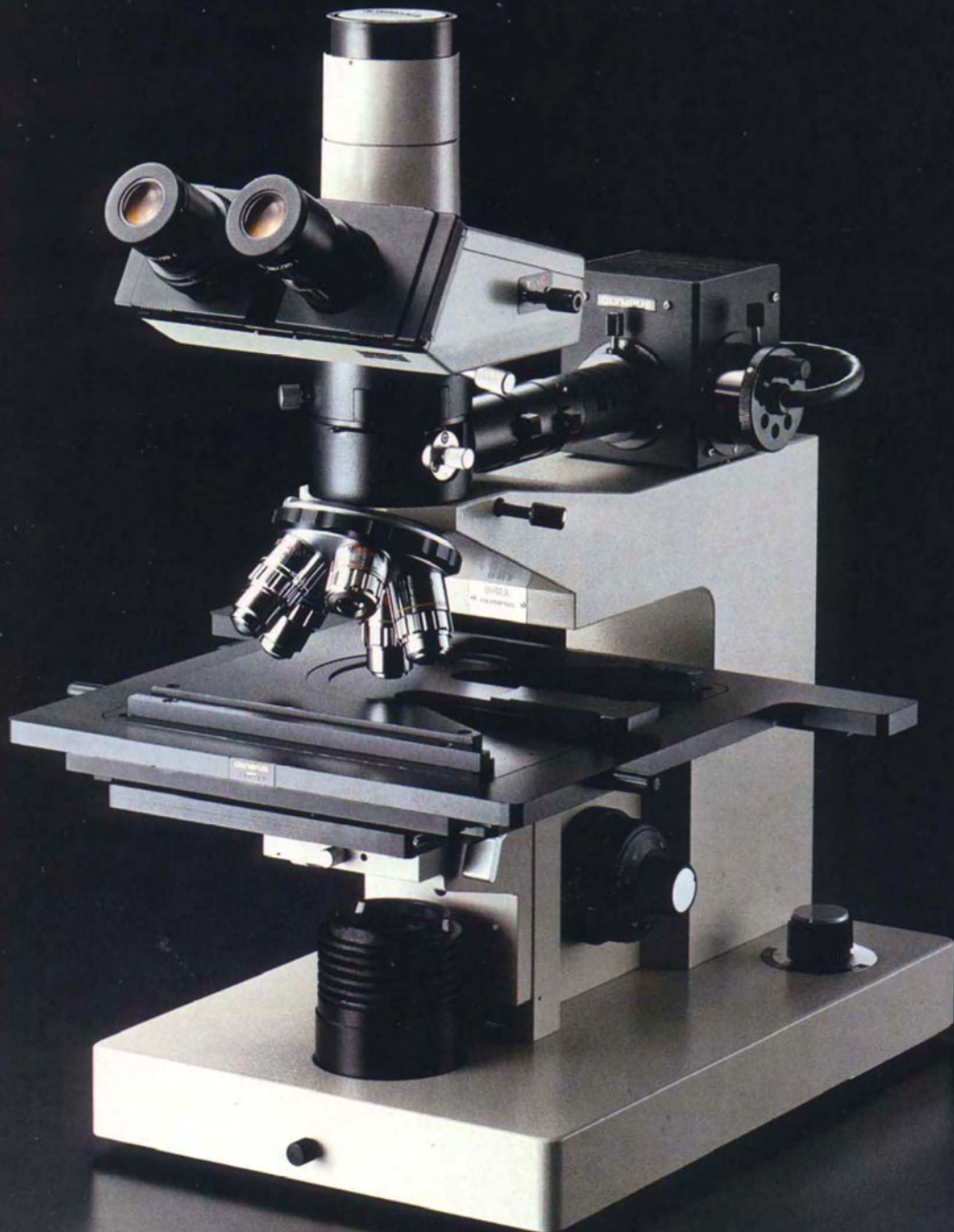
Module		Description	BHMJ							
			13L	33L	12L	32L	13NL	33NL	12NL	32NL
Microscope body	BHMJ-F-W	Focusing adjustment range 30mm, body clamping range 60mm.	•	•	•	•	•	•	•	•
Microscope base	BHMJ-ST-W	Base, pillar, stage plate (detachable) and stage clips.	•	•	•	•	•	•	•	•
Observation tube	BH2-BI30	Binocular, inclined 30°, constant tube length adjustment.	•		•				•	
	BH2-TR30	Trinocular, inclined 30°, constant tube length adjustment.		•		•				•
Vertical illuminator	BH2-MA	For brightfield observation.	•	•	•	•				
	BH2-RLA	For brightfield/darkfield observation.					•	•	•	•
Analyzer	BH2-MAN45	For BH2-MA.	•	•	•	•				
	BH2-NAN	For BH2-RLA.					•	•	•	•
Polarizer	BH2-MPO	For BH2-MA and BH2-RLA.	•	•	•	•	•	•	•	•
Halogen lamp housing	BH2-MLSH	With built-in heat absorbing filter.	•	•	•	•	•	•	•	•
Halogen bulb	JC12V 50W HAL-L	12V 50W, long-life. (2 pcs.)	•	•	•	•	•	•	•	•
Transformer	TGH		•	•	•	•	•	•	•	•
Power cord	UYCP		•	•	•	•	•	•	•	•
Revolving nosepiece	BH2-MRE	Quintuple, for brightfield objectives.	•	•	•	•				
	BH2-NRE	Quadruple, for brightfield/darkfield objectives.					•	•	•	•
Standard mirror	M-SM2	For color temperature calibration.		•				•		•
Objective	MSPL	M S Plan 5x, 10x, 20x, 50x, 100x	•	•						
	NEOSPL	Neo S Plan 5x, 10x, 20x, 50x					•	•		
	MDPL	M D Plan 5x, 10x, 20x, 50x, 80x			•	•				
	NEODPL	Neo D Plan 5x, 10x, 20x, 50x							•	•
Eyepiece	WHK10X	Widefield (F.N. 20), high eyepoint. (2 pcs.)	•	•	•	•	•	•	•	•
Photo eyepiece	NFK3.3X-LD			•	•		•	•		•

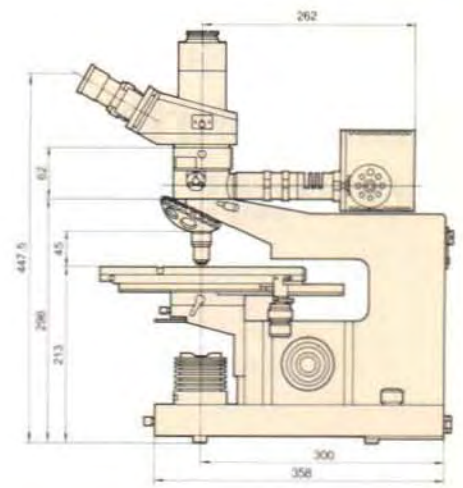
Optional Accessories

- FM-3 Attachable mechanical stage.

# The Model BHMJL. 6×6 Travel for IC Inspection

*The BHMJL microscope features a cross stage with a 6"×6" scanning area and an adapter for transmitted light observation. It is ideal for inspection and quality control of large wafers and photomasks in the IC industry.*





Standard Outfits

Module		Description	BHMJL								
			13L	33L	12L	32L	13NL	33NL	12NL	32NL	
Microscope stand	BHMJL-F-W	Focusing adjustment range 30.5mm, built-in transformer, two secondary outlets for 6V and 12V.	•	•	•	•	•	•	•	•	•
Power cord	UYCP		•	•	•	•	•	•	•	•	•
Observation tube	BH2-BI30	Binocular, inclined 30°, constant tube length adjustment.	•		•			•		•	
	BH2-TR30	Trinocular, inclined 30°, constant tube length adjustment.		•		•			•		•
Vertical illuminator	BH2-MA	For brightfield observation.	•	•	•	•					
	BH2-RLA	For brightfield/darkfield observation.					•	•	•	•	•
Analyzer	BH2-MAN45	For BH2-MA.	•	•	•	•					
	BH2-NAN	For BH2-RLA.					•	•	•	•	•
Polarizer	BH2-MPO	For BH2-MA and BH2-RLA.	•	•	•	•	•	•	•	•	•
Halogen lamp housing	BH2-MLSH	With built-in heat absorbing filter.	•	•	•	•	•	•	•	•	•
Halogen bulb	JC12V 50WHAL-L	12V 50W, long-life. (2 pcs.)	•	•	•	•	•	•	•	•	•
Revolving nosepiece	BH2-MRE	Quintuple, for brightfield objectives.	•	•	•	•					
	BH2-NRE	Quadruple, for brightfield/darkfield objectives.					•	•	•	•	•
6" x 6" mechanical stage	BH-SIC6	260mm x 247mm, traversing 150mm x 150mm, Y movement lock mechanism.	•	•	•	•	•	•	•	•	•
Wafer holder fixture	BH-SICSH		•	•	•	•	•	•	•	•	•
Wafer holder	BH-SICWH3	3" wafer holder.	•	•	•	•	•	•	•	•	•
	BH-SICWH4	4" wafer holder.	•	•	•	•	•	•	•	•	•
	BH-SICWH5	5" wafer holder.	•	•	•	•	•	•	•	•	•
Standard mirror	M-SM2	For color temperature calibration		•		•			•		•
Objective	MSPL	M S Plan 5x, 10x, 20x, 50x, 100x	•	•							
	NEOSPL	Neo S Plan 5x, 10x, 20x, 50x					•	•			
	MDPL	M D Plan 5x, 10x, 20x, 50x, 80x			•						
	NEODPL	Neo D Plan 5x, 10x, 20x, 50x								•	•
Eyepiece	WHK10X	Widfield (FN20), high eyepoint (2 pcs.)	•	•	•	•	•	•	•	•	•
Photo eyepiece	NFK3.3X-LD			•		•		•		•	•

Optional Accessories

- Mask Holder  
BH-SICMH4 x 4, BH-SICMH5 x 5 and BH-SICMH6 x 6.
- Transmitted Illumination Attachment  
Consisting of BH-LSJ-LH halogen lamp housing, 6V10WHALCH halogen bulb and BH-MJLCD condenser.

# BH2-M-NIC/BH2-N-NIC

## Nomarski Differential Interference Contrast Attachment

The Nomarski Differential Interference Contrast Attachment permits the examination and metallography of unetched opaque specimens. By providing relief-like images, it enables the examination of scratches, flaws, stacking faults, slip-lines and other minute surface differences not detectable in brightfield, darkfield or phase contrast. Examination can be made in various interference colors. It is highly suited for the inspection of integrated circuits, wafers, chips, plastics and related products. An essential tool in microscopic examination of opaque surface contrast.

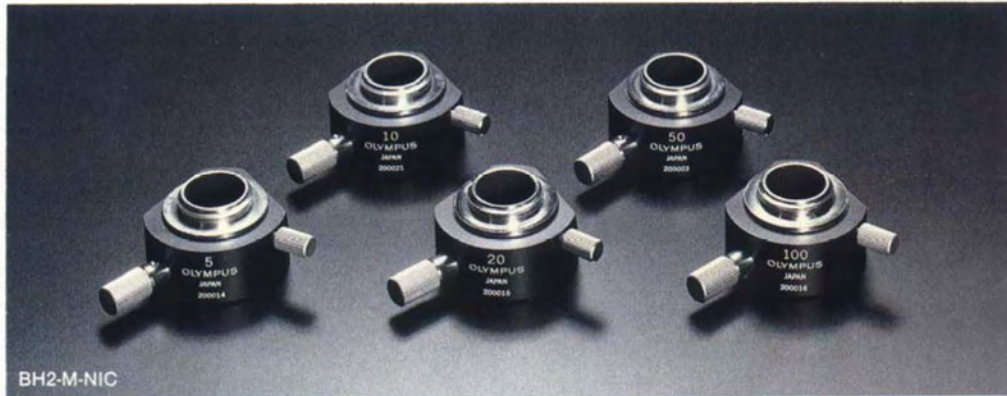
- May be used with all five models.
- Magnification factor 1X.
- Objectives with magnifications of 5X, 10X, 20X, 50X and 100X can be used.
- Standard polarizers and analyzers may be used.

### Standard Outfits

Module		BH2-M-NIC		
		1	2	4
Nomarski Prism	BH2-NIC5-M, BH2-NIC10-M, BH2-NIC20-M, BH2-NIC50-M, BH2-NIC100-M	•	•	•
M S Plan Objective	MSPL5X, 10X, 20X, 50X, 100X	•	•	
Analyzer	BH2-MAN45	•		
Polarizer	BH2-MPO	•		
Screwdriver	AA7213	•	•	•

Module		BH2-N-NIC		
		1	2	4
Nomarski Prism	BH2-NIC5-N, BH2-NIC10-N, BH2-NIC20-N, BH2-NIC50-N, BH2-NIC100-N	•	•	•
M S Plan Objective	MSPL5X, 10X, 20X, 50X, 100X	•	•	
Analyzer	BH2-NAN	•		
Polarizer	BH2-MPO	•		
Screwdriver	AA7213	•	•	•

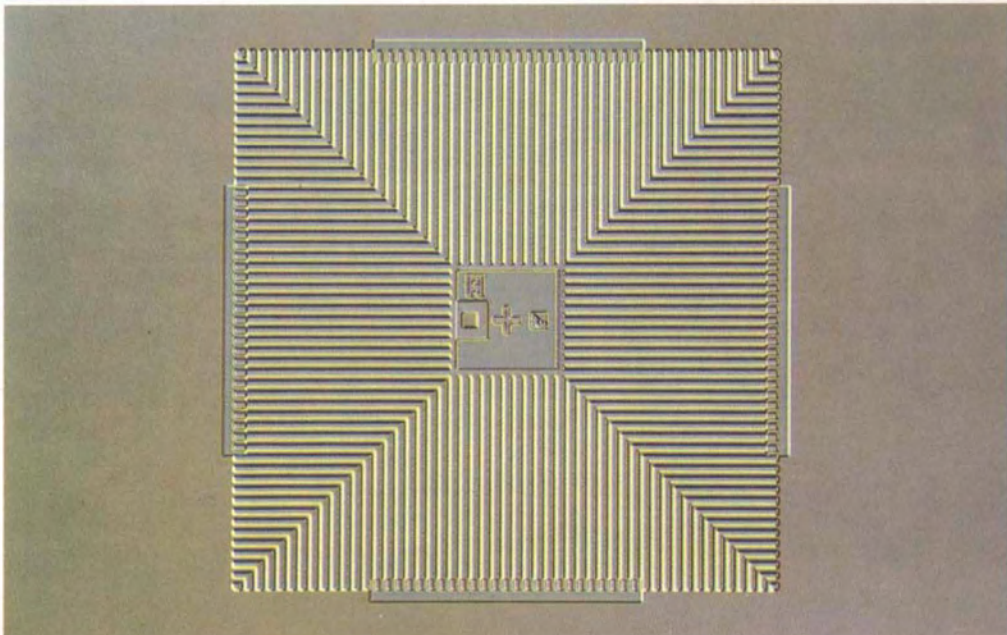
Note: The BH2-M-NIC is used with the brightfield vertical illuminator, and the BH2-N-NIC with the brightfield/darkfield vertical illuminator, for differential interference contrast observation. Each of them requires the M S Plan objectives, analyzer and polarizer. You can choose a type of attachment from these standard outfits that fits your microscope modules.



BH2-M-NIC



BH2-N-NIC



M S Plan 10x, NFK 3.3x



# BH2-SW Super Widefield Attachment

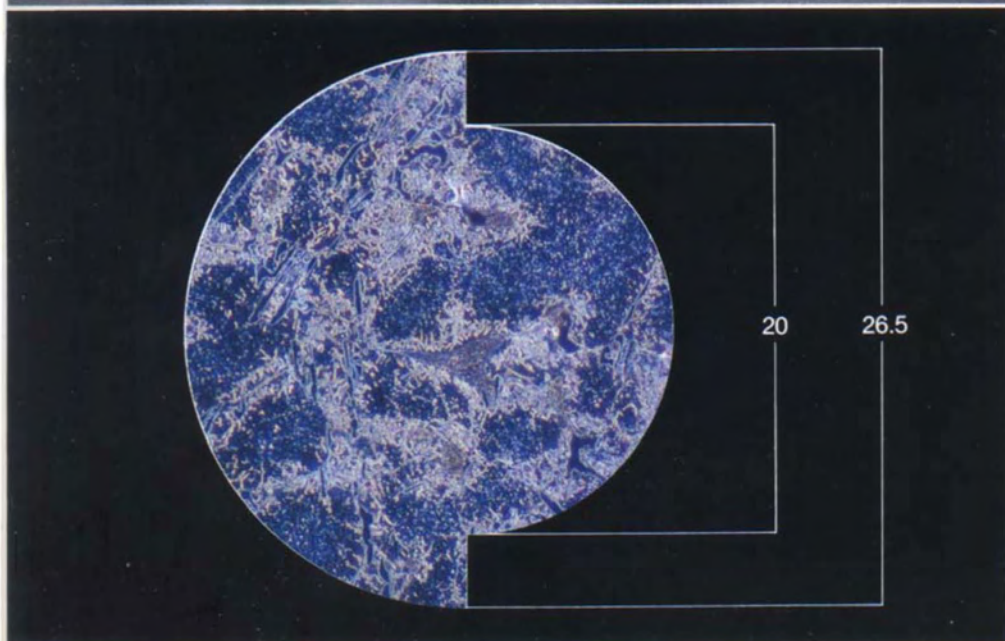


When used in conjunction with the SWK 10X super widefield eyepieces, the super widefield tube permits observation of approximately twice the area of a normal field, reducing the need to move the specimen and improving work efficiency. M S Plan or Neo S Plan objectives should be used with the super widefield tube.

- Offers a super widefield with a field number of 26.5, permitting flat image observation to the full extent of the field of view.
- Can be mounted on any of the five models in the BHM Series.
- Constant tube length adjustment means focus is maintained when the interpupillary distance is adjusted. For photomicrography, focusing by means of the binocular eyepiece tube is possible with a suitable framing eyepiece.
- 3-step light path selection: 100% of the light for photomicrography, 80% for photomicrography and 20% for observation, or 100% for observation.

#### Standard Outfits

	Module	BH2-SW-2
SW Trinocular Tube	BH2-SWTR	•
SW Eyepiece	SWK 10X	2
Photo Eyepiece	NFK 3.3X-LD	•



# PM-10AD

## Fully Automatic Photomicrographic System

The Model PM-10AD is a universal, fully modular multifformat camera system with automatic controls. A built-in microcomputer assures precision exposure and readout, reciprocity failure correction, compensation for varying film and specimen characteristics, and color temperature. Its versatility is further increased by manual override and time exposure capability to supplement the automatic exposure range. Available in a choice of 35mm, 3 $\frac{1}{4}$ " x 4 $\frac{1}{4}$ " Polaroid® and 4" x 5" formats, plus 16mm cine and 35mm time lapse.

The Model PM-10M Manual Photomicrographic System permits manual photography with 35mm and large-format cameras.

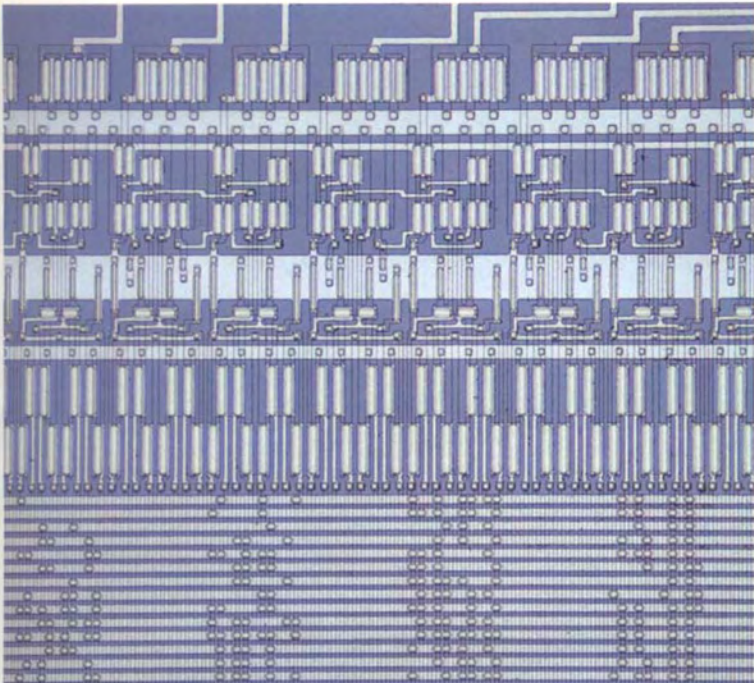
### NFK Eyepieces For Photomicrography

- A series of eyepieces specifically optimized for photography with a microscope.
- Deliver the full optical capabilities of the LMB series objectives.
- Available in four magnifications: 2.5X, 3.3X, 5X and 6.7X.

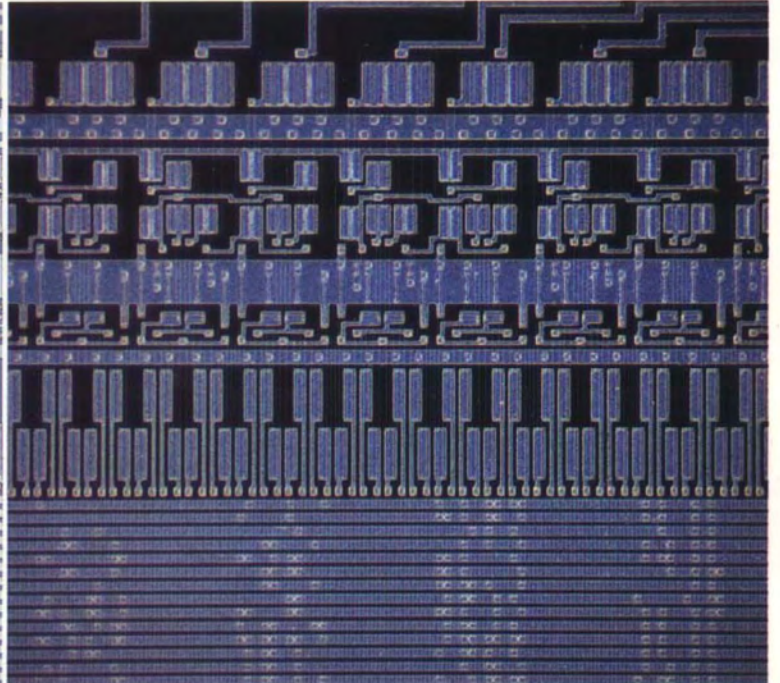
### Standard Outfits

Moduel		PM-10		
		35AD-1	L1AD-1	L2AD-1
Automatic Exposure Body	PM-PBS	•	•	•
Automatic Expsoure Control Unit	PM-CBAD	•	•	•
Power Cord	UYCP	•	•	•
Adapter for 35mm Camera Back	PM-D35A	•		
Adapter for Large Format Film Back	PM-DL-W		•	•
35mm Camera Back	C-35AD	•		
4" x 5" Intermediate Adapter	PM-C4 x 5-W		•	
3 $\frac{1}{4}$ " x 4 $\frac{1}{4}$ " Polaroid® Back	PM-CP-W			•
Color Temperature Compensation Filter	45LBD2	•	•	•
	45LBT	•	•	•
Neutral Density Filter	43ND6-W45	•	•	•
	43ND25-W45	•	•	•

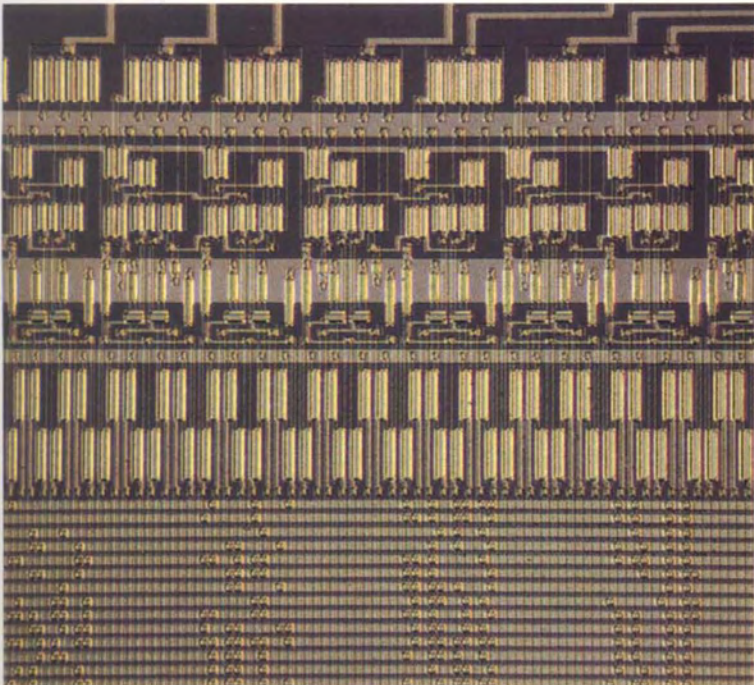




LSI Bright field M SPlan 10x, NFK 2.5x



LSI Dark field Neo SPlan 10x, NFK 2.5x

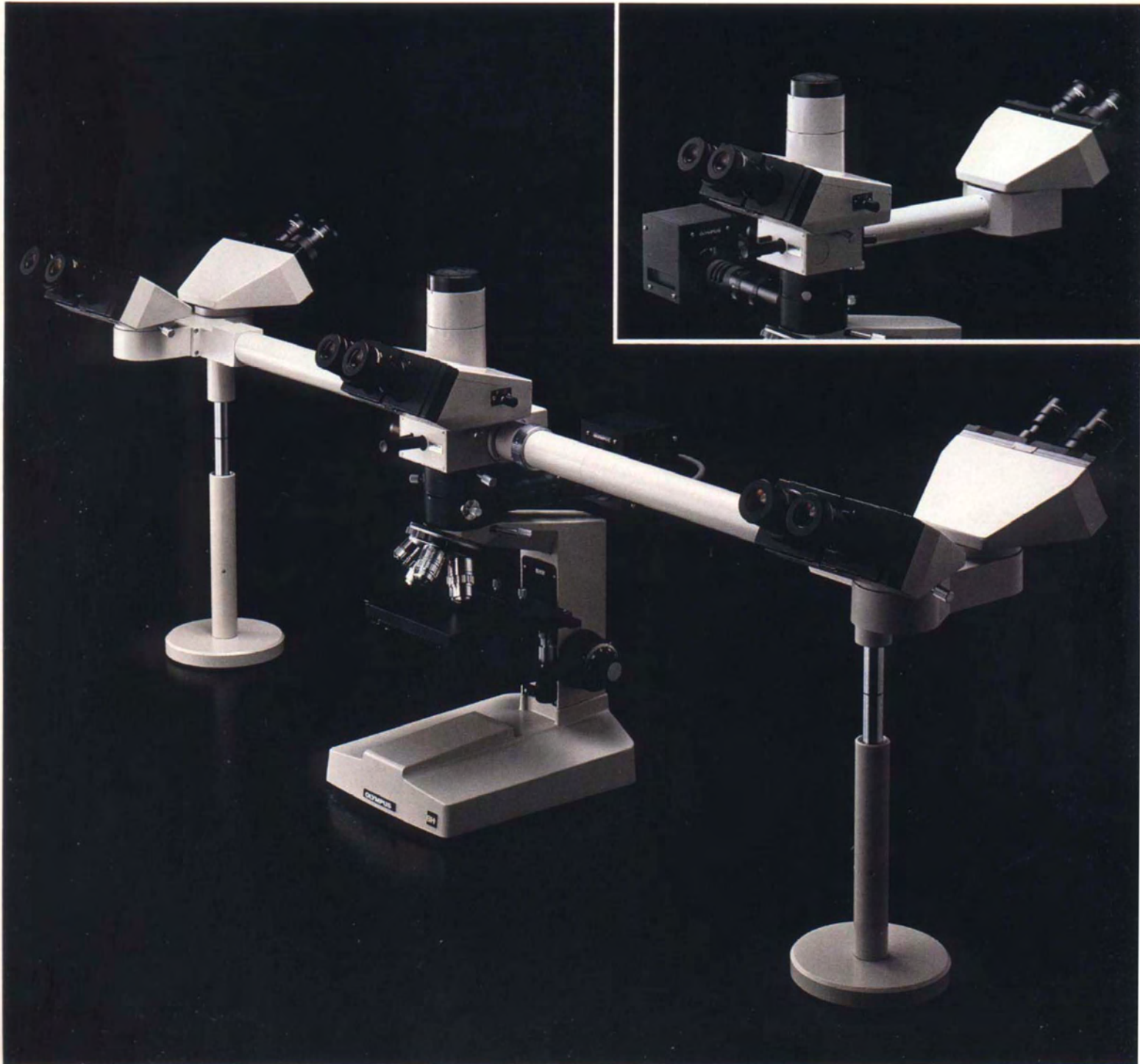


LSI Nomarski DIC. M SPlan 10x, NFK 2.5x



Silver Brazing Filler Metal. Brazing Structure. M SPlan 20x, NFK 2.5x

# Attachments for Group Observation





### **BH2-MDO Multi-Viewing Attachment**

- Permits 3 or 5 persons to simultaneously observe the specimen at the same magnification and orientation.
- Pointer color may be set to orange or green, according to the specimen colors.
- The design allows ample room between adjacent observers for comfortable viewing.
- Maximum field of view; 21.

Standard Outfits

	Module	BH2-MDO	
		1	2
Multi-Viewing Body	BH2-MDO-B	•	•
Optical Relay Unit	BH2-MDO-SV	2	•
Binocular Tube	BH2-BI30	4	2
Transformer for Pointer Illumination	T-DO	•	•
Widfield Eyepiece	WHK 10X	4	2
	WHK 10X-H	4	2



### **BH2-DO Dual-Viewing Attachment**

- For simultaneous observation by two people.
- Offers the same basic features as the BH2-MDO. In addition, the dual-viewing model permits either observer to operate the pointer.
- Ample distance between the observer positions allows comfortable viewing.

Standard Outfits

	Module	BH2-DO-1
Dual-Viewing Body	BH2-DO-B	•
Binocular Tube	BH2-BI30	•
Transformer for Pointer Illumination	T-DO	•
Widfield Eyepiece	WHK 10X	•
	WHK 10X-H	•
Heat Screen*	BH2-DO-HPS	•

\*The heat screen may be omitted except when this attachment is used in combination with the Model BHS-M microscope.

### **AH-MPS Projection Screen**

- Ideal for small group viewing and discussion.
- Attaches to the trinocular observation tube or the vertical photo tube.
- Screen diameter 155mm. Screen magnification is equal to objective power x NFK lens power x 3.

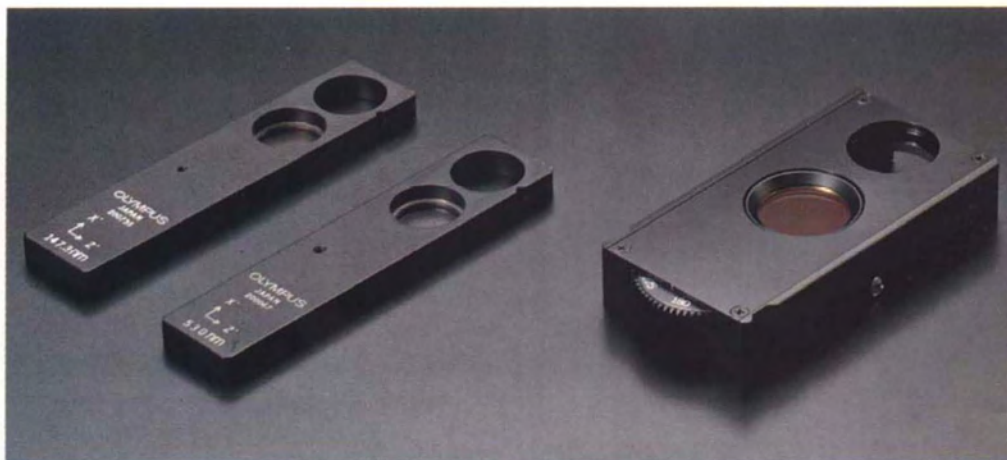
### **AH-SPS High Resolution Projection Screen**

- High resolution screen makes the AH-MPS image ever easier to view.
- Permits prolonged observation without eye-strain.
- Screen diameter 155mm. Screen magnification is equal to objective power x NFK lens power x 3.

# Application Extending Accessories

## **BH2-MAN360** **Simple Polarizing Analyzer**

- Used together with the BH2-PO polarizer for the inspection of birefringent materials, as well as for differential interference contrast; 360° rotation, 45° scale markings, equipped with depolarizer.
- Can be used with tint plate (530nm, gypsum red), 1/4-wavelength retardation plate (147.3nm, mica) and Berek compensator.



## **Filters**

### **LBD-3 Light Balancing Filter**

Supplied as standard with vertical illuminators. Used for color correction for observation and photomicrography with daylight color film.

### **LBT-2 Light Balancing Filter**

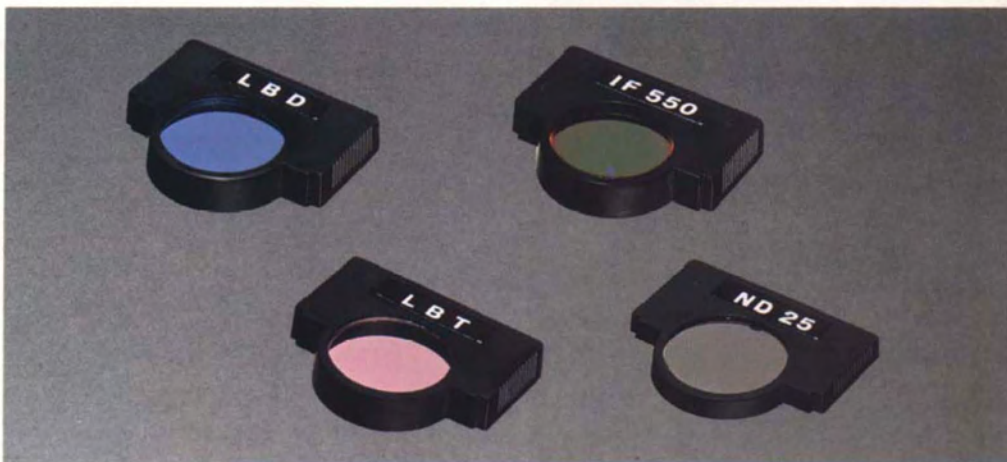
Used for color correction in photomicrography with tungsten color film.

### **IF550 Contrast Filter**

Improves contrast for observation and photomicrography with black and white film.

### **ND6, ND25 Neutral Density Filters**

High quality neutral density filters which reduce the intensity of light without disturbing the color balance. The filter numbers indicate % of light transmission.



## **BH2-CA** **Magnification Changer**

Permits change of total magnification without changing objectives or eyepieces. Useful for trimming in photomicrography, and other purposes.

## **HP Hand Press**

Used to align the specimen surface parallel with the stage surface.





**OSM-D2  
Digital Micrometer Eyepiece**

- Counter display of magnification; when calibrated with a specific objective power it provides a digital read-out of the specimen's true dimensions.
- Minimum read-out increments of  $0.1\mu$  (when used with the 100X objective).
- Eyepiece magnification 10X.



**OSM  
Filar Micrometer Eyepiece**

- Eyepiece magnification 10X, 8mm scale divided into 8 increments.
- Minimum read-out is  $0.1\mu$  (when used with 100X objective).



**OB-MM Objective Micrometer  
(for metallurgical specimens)**

- Used to determine the calibration of the eyepiece micrometer scale.
- 1mm scale divided into 100 divisions, on a 26mm x 76mm slide.

**OC-M Micrometer Reticles**

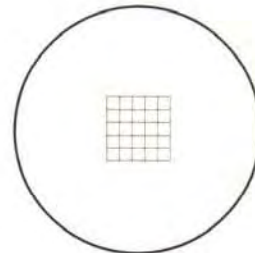
- 20.4mm diameter; for use with WHK 10X-H or WHK 10X eyepiece.
- Available in types indicated below to match different measuring purposes:



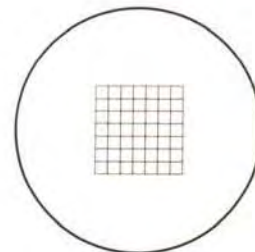
a) 10/100: 10mm in 100 divisions



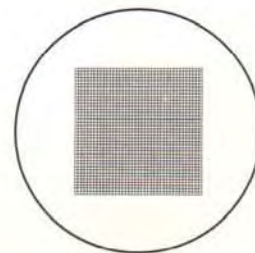
b) Cross 10/100: 10mm in 100 divisions on crosslines



c) H5/5: 5mm in 5 divisions in grid pattern



d) H7/7: 7mm in 7 divisions in grid pattern



e) H10/100: 10mm in 100 divisions in grid pattern

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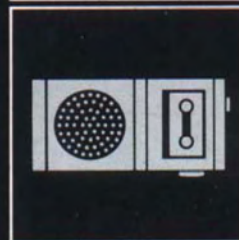
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**OLYMPUS OPTICAL CO. (EUROPA) GMBH.**

Postfach 104908, Wendenstrasse 14-16, 2 Hamburg 1, West Germany

**OLYMPUS CORPORATION OF AMERICA**

4 Nevada Drive, New Hyde Park, N.Y. 11042, U.S.A.

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