

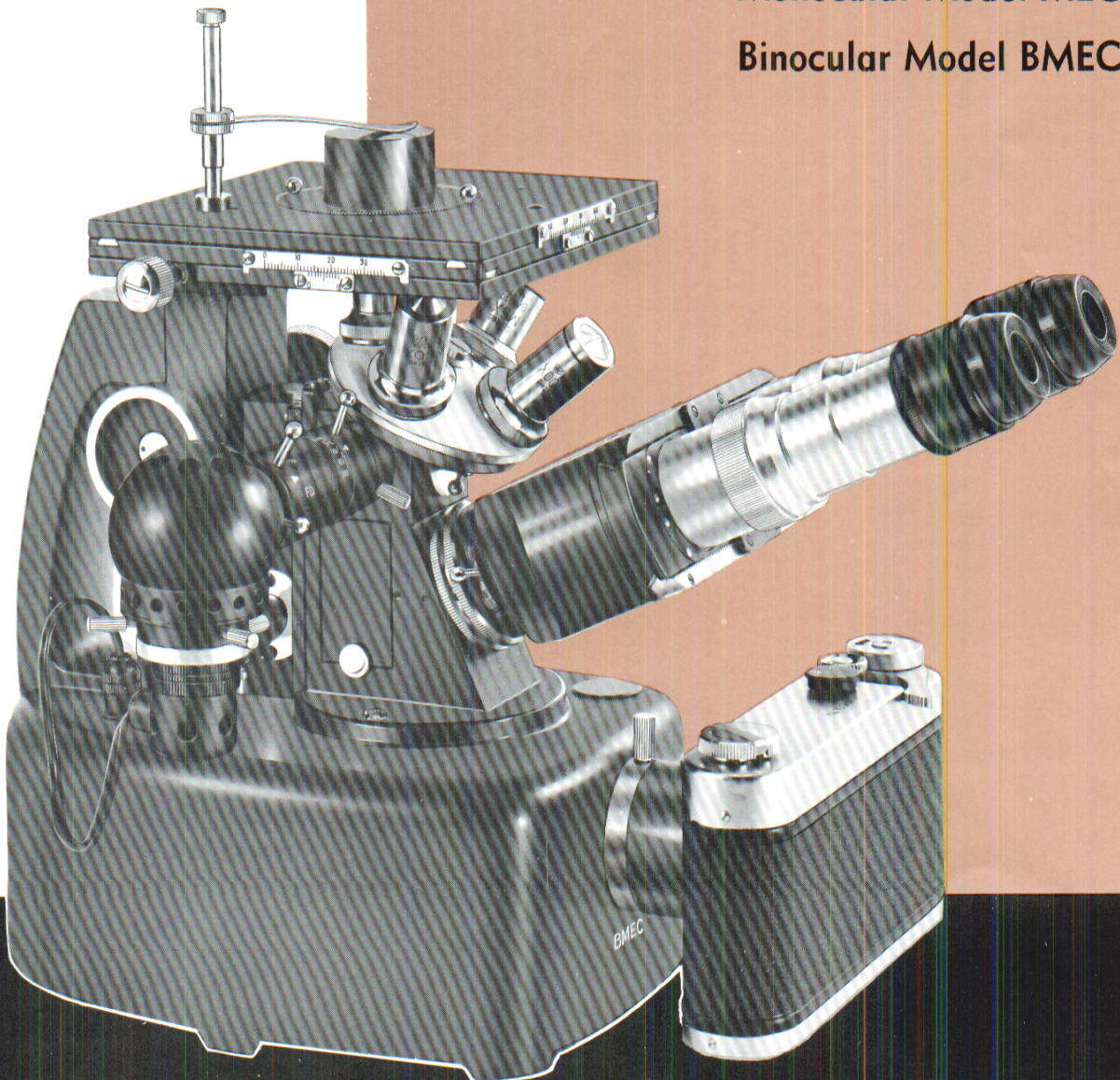
UNITRON

INVERTED

METALLURGICAL MICROSCOPES

Monocular Model MEC

Binocular Model BMEC



UNITRON INSTRUMENT CO. MICROSCOPE SALES DIVISION 66 NEEDHAM STREET, NEWTON HIGHLANDS 61, MASS.

FOR THE MODERN METALLURGIST

● BUILT-IN ILLUMINATION

Whether you choose the economy of the monocular model, or the convenience of the binocular, you get optimum lighting from the built-in illuminator. The transformer is built into the microscope base where it contributes to the stability of the stand rather than to the clutter of the work table. A switch on the microscope base provides an extra-high intensity for photography, visual examination of dark samples, and for work with polarized light. In the monocular model, the condenser is furnished with an aperture iris diaphragm to increase contrast and adjust for depth of field. The binocular model uses a high-intensity Koehler illuminator and has, in addition, a field diaphragm and bulb centering mechanism to achieve best results from the high-rated light source provided.

● CONVENIENT PHOTOGRAPHY

A built-in camera mechanism is furnished as standard equipment on all binocular models and is an optional extra on the monocular microscopes. The camera bodies, which readily connect to an opening in the microscope base, may be left attached to the stand, even when not in actual operation, always ready for instant use. For 35mm. photography, any camera back (without lens) with a "Leica-type" threading may be used. UNITRON'S Polaroid Land Camera Accessory offers the advantage of a finished print in a matter of seconds. For both 35mm. and Polaroid photography, focusing is done visually through the eyepiece mechanism, and the changeover to photography is practically instantaneous.

● COMPLETELY EQUIPPED

Buyers who are accustomed to finding separate listings for the microscope stand, optics, and accessories will be pleased to find that all of this equipment is included in UNITRON'S low price. In fact, there are really very few "extras" that you can specify. The complete set of coated optics includes four achromatic objectives: 5X, 10X, 40X, and 100X and widefield eyepieces of two magnifications: 10X, and 15X. The 10X eyepiece is of the measuring type with provision for rapid interchange of reticles. A focusing eye lens insures sharp images of the reticle pattern. Included as standard equipment is a linear, metric micrometer scale with divisions of 0.1mm. Other standard accessories include polarizer and analyzer, colored filters, stage clips, spare bulbs, a plastic dust cover, and fitted wooden cabinet.

● ADAPTS TO SPECIAL REQUIREMENTS

Even greater versatility for special applications is obtained by using the optional accessories offered for UNITRON Inverted Models. Using one of the handy camera attachments, photographs are easily made to supplement quality control records. Transparent objects can be examined using the Transmitted-Light Accessories; typical applications include the examination of particles suspended in fluids as well as the conventional glass slides used in biological studies. Both a special reticle and the more efficient turret eyepiece, are available for grain-size classification. Laboratories which enter the rapidly growing field of high-temperature microscopy can add the UNITRON Vacuum Heating Stage at any time without special adaption. Additional optics are offered to increase the total magnification to 2000X and provide extra intermediate powers for particular applications. Using the UNITRON Interference Accessories, interference microscopy can be done without the need for a special light source (request Technical Bulletin INT). For extremely accurate measurements, there are several types of Filari Micrometer Eyepieces from which to choose. In addition, a special version of the monocular model is offered as a Platers Microscope, equipped with accessories designed especially for the important application of measuring plating thickness.

● QUALITY, VALUE, AND ECONOMY

UNITRON inverted metallurgical microscopes offer features and versatility that you would expect to find only in the most expensive instruments. Yet, the realistic prices of these microscopes place them even within reach of the laboratory on a restricted budget. Educational institutions can now equip their laboratory with professional UNITRON Inverted Models for about the same prices they are accustomed to paying for routine student microscopes of other makes. Large organizations have found it economical to provide each metallurgist with one of these compact units for his own desk and, in this way, leave their larger metallographs free for special photographic projects. Like all UNITRON equipment, these models are sold with our standard guarantee for quality, workmanship, and performance. Before buying, convince yourself by accepting a free 10-day trial at our expense without any obligation. Try the instrument of your choice in your own laboratory, in connection with your own application, and you will see for yourself why UNITRON means . . . MORE MICROSCOPE FOR THE MONEY.

SPECIFICATIONS AND PRICE LIST

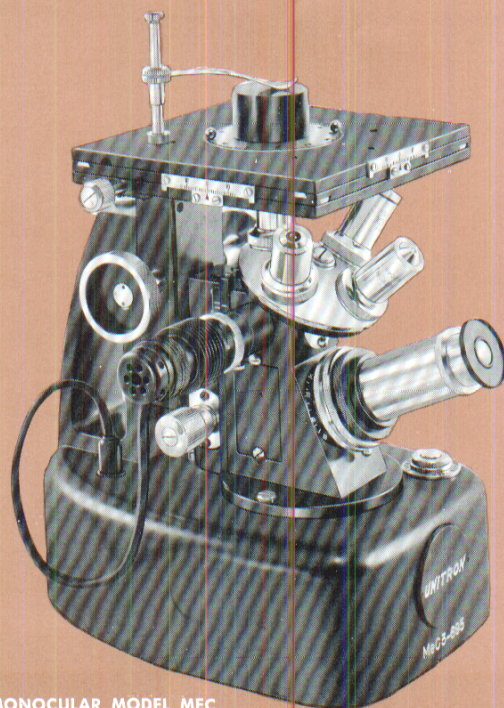
- **STAND:** Inverted design with handle-grip arm. Stage focusable by diagonal-cut rack and pinion. Objectives focusable by micrometer screw. Base transformer for 115 volts AC with on-off and two-intensity switch. Wear-resistant black finish.
- **STAGE:** Large 120x120mm stage with built-in graduated mechanical stage, 25x25mm rectangular motions reading to 0.1mm by vernier; rotating graduated stage plate; three additional insert plates with different sized apertures.
- **OPTICS:** Four coated, parfocal achromatic objectives on revolving nosepiece: M5X (0.10 N.A.), M10X (0.30 N.A.), M40X (0.65 N.A.), 100X oil (1.25 N.A.). Coated widefield, high-eyepoint eyepieces in two magnifications: WFH10XR (to accept reticles and with focusing eyelens) and WFH15X; with removable eyecaps. (Note: All models available with Plan-Achromatic flatfield objectives 10X, 20X, 40X, 80X at an additional cost of \$150.75.)
- **OTHER EQUIPMENT:** Vertical illuminating system with coated plane glass reflector, filter slot, 3 filters; polarizer and analyzer; micrometer reticle; large stage clip; 6 spare bulbs; plastic dustcover; fitted wooden cabinet.

MONOCULAR MODEL MEC: Monocular tube, standard illuminator with aperture diaphragm; other equipment per specifications above..... **\$416**

MONOCULAR MODEL MEC-CM: Same as Model MEC but with built-in camera mechanism* and accessories for 35mm photography..... **\$488**

BINOCULAR MODEL BMEC: Inclined binocular body with both interpupillary and diopter adjustments; deluxe illuminator with both aperture and field iris diaphragms; built-in camera mechanism* and accessories for 35mm photography; other equipment per basic specifications above **\$719**

*Camera mechanism includes deviating prism system and path selector slideway. Accessories for 35mm photography include camera coupling tube with 4X photo lens and "photo-printer" reticle (a camera back with "Leica-type" threading is needed). Polaroid photography requires the special attachment listed on the next page.



MONOCULAR MODEL MEC

● COMPACT, LOGICAL DESIGN

UNITRON Inverted Metallurgical Microscopes have been engineered to meet the requirements of the modern metallurgical laboratory. The time-tested inverted design—proven to be the most logical and practical for a metallurgical microscope—is the type adopted by all leading microscope manufacturers for their large research metallographs. Now, UNITRON offers the advantages of this same inverted design in a compact, budget-priced metallurgical microscope. Unnecessary bulk, space-wasting external transformers, and dangling components have been completely eliminated.

The novel design of Models MEC and BMEC incorporates many of the features of the larger UNITRON Metallograph. In fact, some of the basic components are identical in both types of instruments: for example, the large mechanical stage, the focusing mechanisms, the eyepiece assembly, and the system for changing from visual observation to photography.

Whether you choose a monocular or binocular model, the UNITRON, with its integral transformer and camera attachment, takes up no more space on your desk than a telephone.

● EASY TO OPERATE

Compared with conventional upright models, UNITRON'S Inverted Microscopes are much easier to operate and give faster results. Merely place the specimen face down on the stage, switch on the illuminator, rotate the required objective into position, and you are ready to observe or photograph. Thanks to the inverted design, the specimen face is always level with respect to the optical axis: there is no need for special levelling devices. All components of the illuminating system are completely built-in and remain permanently aligned. The revolving nosepiece offers rapid change of magnification. Parfocal objectives keep the image in focus from one power to the next with, at most, only a slight adjustment of the fine focus control. When viewing ordinary flat samples, there is actually no need ever to use the coarse focus knobs, even when changing specimens. All operating controls are within easy reach of the user to provide comfortable, relaxed operation. To photograph with models equipped with the built-in camera mechanism, merely push the slideway and release the camera shutter. In fact, the operating procedure is so straightforward that even unskilled personnel with a minimum of training cannot help but obtain perfect results.

● FOR A VARIETY OF APPLICATIONS

A wide magnification range of 50X-1500X provides for practically every observing problem which might arise in studies of the composition, crystalline structure, and grain size of metals, minerals, and ceramics under either ordinary or polarized light. UNITRON Models MEC and BMEC are ideal not only as general purpose metallurgical instruments, but for more specialized applications as well. Using the Filar micrometer eyepiece, plating thickness can be measured with an accuracy unobtainable by other methods. Adding the UNITRON Vacuum Heating Stage converts the instrument to a high-temperature microscope. With appropriate accessories, micro-hardness tests are easily made. Special reticles and eyepieces are available for ASTM grain-size classification, cleanliness rating and, point-counting methods. The compact design of these UNITRON microscopes also makes them ideal for use in the polishing laboratory to provide rapid checking of specimens.

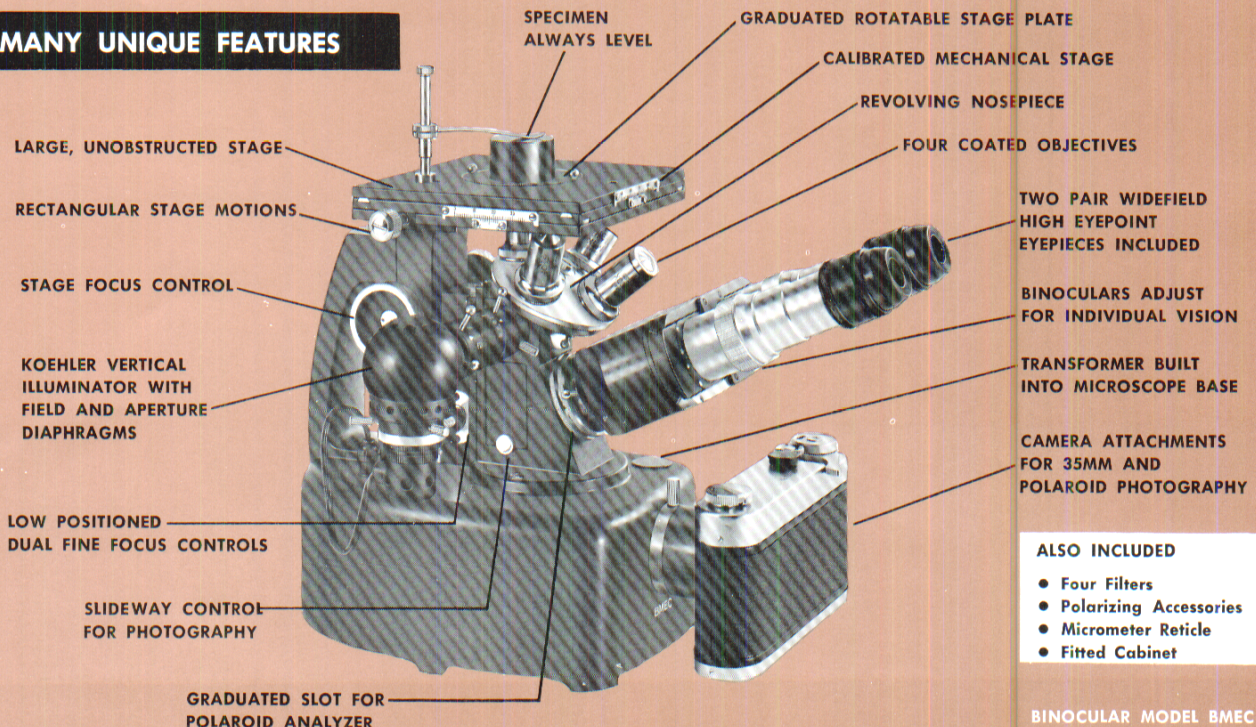
● CLEAR, GLARE-FREE IMAGES

UNITRON'S optical system has been designed with great care to guarantee full-contrast images, completely free from the glare which is often found in metallurgical microscopes of less efficient design. All optics and prisms are anti-reflection coated. In addition, the built-in plane glass reflector is treated with a special film to increase the intensity of the final image. The four achromatic objectives have high numerical aperture to insure maximum clarity and resolution. The newly designed WFH Series eyepieces provide wide, flat fields of view with comfortably high eye relief.

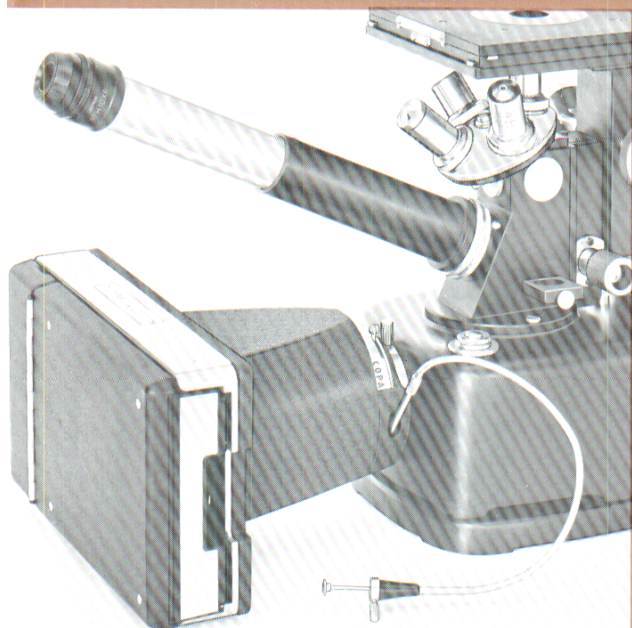
● LARGE UNOBSTRUCTED STAGE

A special feature of the inverted design is the flat, unobstructed stage surface which places no limitation on the size of the specimen. There are no protruding components to interfere with the use of accessories for high-temperature microscopy, micro-hardness testing, or similar applications. UNITRON'S large 120mm. square stage is of the research type with micrometric mechanical stage motions. These provide a travel of 25mm. in each direction with graduations reading to 0.1mm. by vernier. A set of interchangeable stage plates with apertures of varying diameters is included to accommodate samples of different sizes. One of these stage plates is rotatable and graduated for polarized-light applications.

MANY UNIQUE FEATURES



OPTIONAL ACCESSORIES for SPECIAL APPLICATIONS



for POLAROID PHOTOGRAPHY

- Produces a finished 3 1/4" x 4 1/4" print in seconds.
- Easy to attach to microscope base.
- Convenient focusing and composing of photograph while observing specimen through the eyepiece.
- Corrected 10X photo-lens gives film magnifications of 50X, 100X, 400X, 1000X.
- Built-in reticle "photo printer" superimposes a micrometer measuring scale on the finished photo.
- Compur-type shutter gives speeds from 1—1/250 sec., bulb and time.

MONOCULAR MODELS: Since the Polaroid Attachment extends outward beyond the regular monocular tube, an interchangeable longer tube is supplied for comfortable visual observation. This longer "Monocular Magnifying Tube" contains a special compensating lens which multiplies by 1.5 times the visual magnifications which would normally be obtained with a given eyepiece-objective combination. In addition to its use for Polaroid photography, the special Tube provides a useful means of obtaining higher magnification from dry objectives, in routine applications, where the use of oil immersion might be inconvenient.

BINOCULAR MODEL: With the binocular model, visual observations and focusing are made using the regular binocular eyepiece; the Monocular Magnifier is not required.

SPECIFICATIONS: POLAROID LAND CAMERA ATTACHMENT FOR UNITRON INVERTED MICROSCOPES: Equipment for all models includes 3 1/4" x 4 1/4" Land camera back, shutter, photo-projection lens, coupling tube; "photo-printer" reticle.

TYPE PRM: For Monocular Models MEC, PL-MEC (includes Monocular Magnifying Tube, deviating prism system and installation)* **\$215**

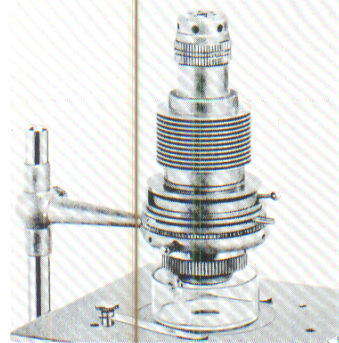
TYPE PM: For Monocular Models MEC-CM, PL-MEC-CM (includes Monocular Magnifying Tube) **\$166**

TYPE PB: For Binocular Model BMEC..... **\$136**

* NOTE: Type PRM requires factory installation.

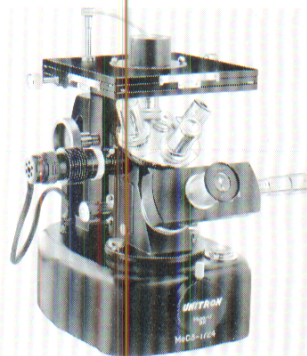
for TRANSMITTED LIGHT

Provides for examining transparent specimens. Installed or removed in a minute. Uses the standard M5X, M10X, and 100X objectives or the accessory 40X objective listed below. Equipment includes illuminator support with rod to attach to microscope, lamp to operate from microscope transformer, Abbe condenser (N.A. 1.2) with iris diaphragm, filter holder, 3 filters, accessory mirror, special slides and petri dishes, stage clips, bulbs..... **\$91.50**
Special 40X objective for transmitted light **\$23.50**



for PLATING MEASUREMENTS: Model PL-MEC

The plating of microwave components, parts for missiles and rockets, printed circuits, etc. must be held to close tolerances. To meet present day needs of the plating industry, UNITRON offers a special version of Model MEC modified to permit the most precise measurements possible with a microscope. In the Plating Microscope PL-MEC, a special type of 10X Wide-field Filar Micrometer eyepiece is used in place of regular oculars. The wide field of view—about one-third larger than obtained with standard filars—facilitates selection and orientation of the plated cross section to be measured. The design of this eyepiece provides especially high eye-relief even for wearers of eyeglasses. Unlike the usual filar, the micrometer drum of this special eyepiece is identical to the familiar one used by the machinist, with a scale calibrated in thousands and reading to tenths by vernier. When measuring with the 40X objective, each drum division represents a length on the sample equal to 0.000025"; using the vernier, direct readings to 0.0000025" can be made. With the 100X objective, the drum readings are in units of 0.00001", with the vernier providing estimations to a millionth of an inch. A stage micrometer, included as standard equipment, allows calibration for extremely accurate work. The ease with which photographs may be taken is of especial interest to platers and permanent records on 35mm. or Polaroid film, provide valuable legal protection.



MODEL PL-MEC: Same basic specifications as Model MEC but with the 10X Wide Field Filar Micrometer in place of standard eyepieces and with a special eyepiece tube for measurement application; with stage micrometer. (Polarizing accessories not supplied.)..... **\$468**

MODEL PL-MEC-CM: As above but with built-in camera mechanism* and coupling tube for 35mm. photography..... **\$540**

*NOTE: Polaroid photography requires the Type PM attachment listed on this page. For 35mm photography, a "Leica-type" camera back is needed.

ADDITIONAL ACCESSORIES INCLUDE —

- WFH12.5X Widefield, High-Eyepoint Eyepiece: for monocular models \$29.00
- BiWFH12.5X Eyepieces: as above, paired for Model BMEC..... 58.00
- WF20X Widefield Eyepiece: for 2000X with monocular models.... 16.00
- BiWF20X Widefield Eyepieces: for 2000X with Model BMEC..... 32.00
- M20X Objective: N.A. 0.40, coated, recommended for 200X..... 19.50
- M60X Objective: N.A. 0.80, coated, for high-dry magnifications.... 32.50
- MPI80X Objective: N.A. 0.90, Plan-Achromatic flatfield, coated..... 109.00
- Interference-Microscopy Accessories: (request Bulletin INT)..... 79.00
- Austenite Grain Size Reticle: fits standard WFH10X eyepiece..... 10.00
- Wooden Elevating Base: with inlaid rubber top, accessories drawer 12.50
- 35mm Camera Back: for BMEC, MEC-CM, PL-MEC-CM..... Price on request

Printed in U.S.A.

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