The METALLUX 3
A new LEITZ microscope for metallographic workshop tests and production control

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The METALLUX® 3 is the successor of the LEITZ METALLUX 2 metallographic microscope, which has been found reliable for many years. It is a microscope of high mechanical stability for metallographic structure investigations and for all microscopic tasks of production and raw materials control in incident light. The new METALLUX 3 can be extended for transmitted light investigations of transparent objects, of thin sections, of thin polished sections, and of powder samples in the plastics, glass, and ceramic fields. In addition it is suitable for investigations in combined incident and transmitted light illumination.

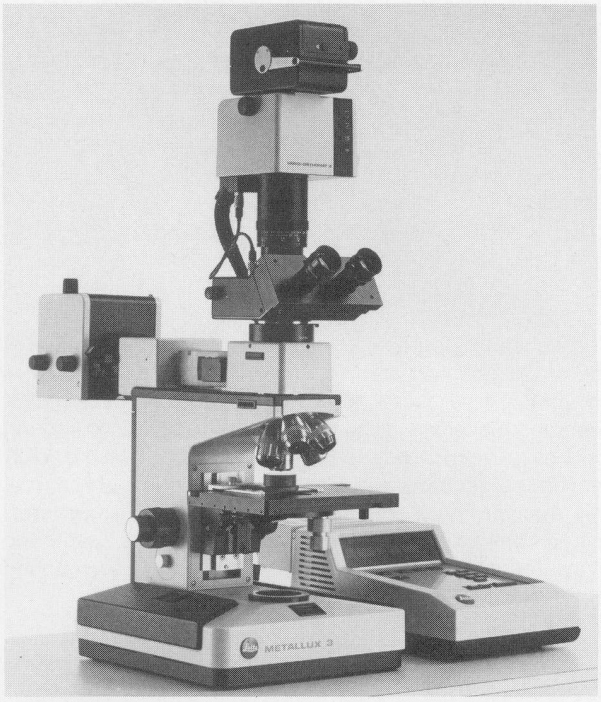
For the examination of large samples and workpieces the instrument has an interchangeable and vertically adjustable object stage with a free sample space of 65 mm. The object carriers with the samples are chucked in fixed object holders to that they can be moved precisely and free from backlash through a range of 76 × 46 mm in the x and y direction with low-level coaxial drive knobs.

The object stage can be rotated up to 90° in all positions and has a maximum load-bearing capacity of 4 kg.

The coaxial coarse- and fine-focusing knobs are arranged on both sides of the stand. The fine-drive knob has a drum division for height determinations in the surface of the object.

With the top vertical stop of the coarse drive the plane of sharpness can be fixed for accurate reproduction when objects of the same height are examined.

The illuminating device in the standard outfit of the microscope comprises a Lamp Housing 103Z with a 12V/100W tungsten halogen lamp, whose electronically-controlled current supply is built into the foot of the stand and wired for the incident-light and for the transmitted-light position. The 50 mm-diameter light filters are inserted in the filter holder of the lamp housing. There is space for three filters. To centre the lamp a centring aid with adjustment groundglass disc is swivelled into the optical path. The button for regulating the lamp brightness is arranged nearby at the side of the foot of the stand. The lamp voltage is digitally displayed on the voltmeter on the front of the foot of the stand. The Lamp Housing 103Z also accepts, besides the 12V/100W tungsten halogen lamp, the Hg 50W, Hg 100W, xenon 75W, and sodium spectral lamp. These lamps are supplied by external transformers. The Lamp Housing 250 is available for the METALLUX 3 for extremely bright gas discharge lamps



METALLUX 3, with VARIO-ORTHOMAT 2

up to xenon 150W, which are used particularly for projection and fluorescence microscopy.

The quintuple revolving nosepiece is interchangeable and can be temporarily pulled out of the stand with the set of objectives, for instance during preparations for heating stage experiments. When the micro-hardness tester, the interference attachments, or special objectives are to be used it is of advantage to keep these devices ready on a separate revolving nosepiece.

For the checking of metallographic polished specimens and general microscopic raw material tests in incident light a quick change of the observation methods of

brightfield	polarised light
darkground	interference contrast R

is often necessary. This task is executed by the MODULOPAK® with its variable diaphragme and illuminating modules. The MODULOPAK can be ordered with either

tube lens 0.8× or tube lens 1× and a module for image erection.

The image erector renders the object upright and right-way-round in the microscope tube and on the film and facilitates orientation in the specimen.

Extension of the METALLUX 3 equipment for the use of fluorescence techniques in material and production control is possible at any time. The 3-λ PLOEMOPAK® with a large number of filter blocks with filter combinations meeting these requirements is available for this purpose.

The METALLUX 3 is outstanding in its stability, great operating convenience, brilliant image quality and adaptability to tasks and specifications in microscopy. The problem of different viewing levels and angles for the operators, for instance, has been solved with the tubes of variable viewing angle from 0 to 40°, SV 20 and FSA-VR 20. These tubes already incorporate an image erector, so that the purchase of a separate module for image erection is unnecessary. Other variants of binocular phototubes for normal-field and large-field microscopy wholly depend on the tasks to be solved and on the preference of the customer.

With the appropriate combinations of viewing tube, eyepiece, and MODULOPAK variants the microscopic field-of-view indices of 20, 25 or 26 are achieved, and thereby the size of the object area to be surveyed is determined. The optical equipment of the METALLUX 3 comprises the new NPL FLUOTAR® incident-light objectives computed for image distance infinity, their semi apochromatic correction further increases resolution, contrast, flattening of field and free working distance.

Objectives for brightfield:

PL 2×/0.04
NPL FLUOTAR 5×/0.09
NPL FLUOTAR 10×/0.20
NPL FLUOTAR 20×/0.40
NPL FLUOTAR 50×/0.85
NPL FLUOTAR 100×/0.90

Objectives for brightfield/darkground:

NPL FLUOTAR 5×/0.09 DF
NPL FLUOTAR 10×/0.20 DF
NPL FLUOTAR 20×/0.35 DF
NPL FLUOTAR 50×/0.85 DF
L 50×/0.60 DF
NPL 100×/0.90 DF

Objectives for brightfield and interference contrast:

NPL FLUOTAR 5×/0.09 (P)
Intermediate piece with Wollaston prism
NPL FLUOTAR 10×/0.20 (P)
Intermediate piece with Wollaston prism
NPL FLUOTAR 20×/0.40 (P)
Intermediate piece with Wollaston prism
LL 20×/0.40 (P)
Intermediate piece with Wollaston prism
NPL FLUOTAR 50×/0.85 (P)
Intermediate piece with Wollaston prism
NPL FLUOTAR 100×/0.90 (P)
Intermediate piece with Wollaston prism
125×/1.30 Oel (P)
Intermediate piece with Wollaston prism

Oil immersion objectives for brightfield:

20×/0.40 Oel
32×/0.65 Oel
50×/0.85 Oel
125×/1.30 Oel
PL-APO 160/1.40 Oel

The PL 2×/0.04 low-power objective reproduces the sample at a ratio of 10 : 1 to 25 : 1 with surveyable object field sizes of up to 11.2 mm diameter.

Other objectives are listed in our catalogue. The choice of the eyepieces depends on the required tube equipment and the standard magnification series. The following accessory components and peripheral instruments can be integrated optically and mechanically with the stand system of the METALLUX 3:

- The magnification changer 1.25×, 1.6×, 2× with Bertrand lens for the checking of fine bores in printed-circuit boards, spinning nozzles, etc.
- Micro-hardness tester with indentation loads from 0.02N (2p) to 4N (400P) for hardness tests after Vickers and Knoop in the structure of a polished specimen, hardness of thin films, and electro-platings and hardness gradient investigation.
- Hardness measuring eyepiece with either analogue or digital display, computer and printer, which can be used for microscopical length measurement independently of the hardness testing procedure.
- Tracing device for the fading-in of an image and macrophotography at reproduction ratios from 0.5 : 1 to about 2.5 : 1.
- Interference attachment according to Michelson and Tolansky for peak-to-valley height measurement from 0.003 µm to 30 µm.
- Length-measuring eyepiece *digital*.
- Screw-micrometer eyepiece.
- Reticules for the determination of length, grain- and particle sizes.
- Heating Stages 1350 and 1750.
- Contrasting device.
- WILD MPS and LEITZ VARIO-ORTHOMAT® 2 photomicrographic outfits.
- Discussion and comparison tubes.
- TV adapters.
- Projection attachment.
- Outfits for transmitted-light microscopy (see contribution „DIAPLAN — a new LEITZ microscope", in this issue, pp 15—21).

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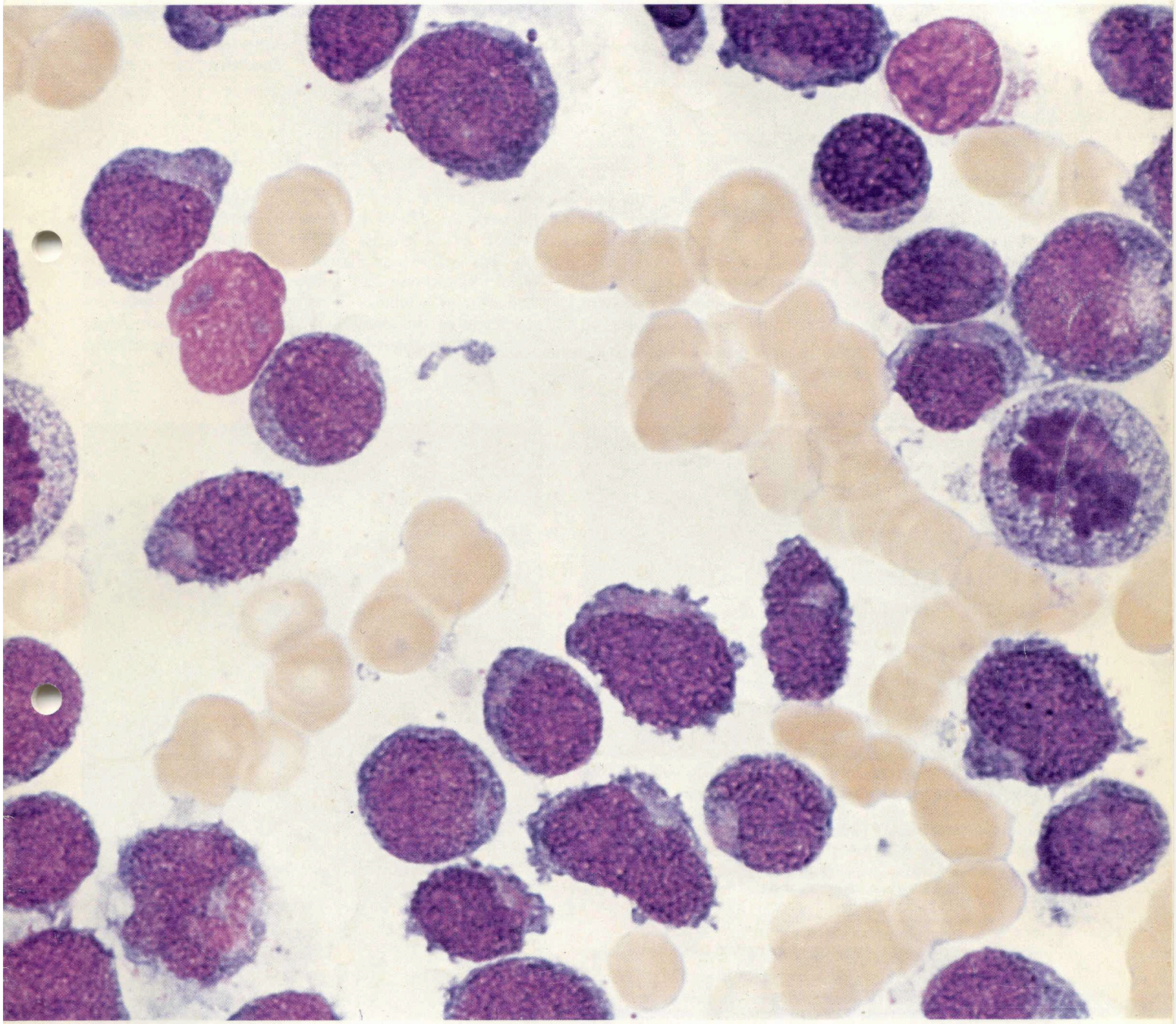
Scientific and Technical Information

Informations for ACHEMA 85



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