

OPTICS

Objectives

Based on the Leica principle of infinity distance correction of optics, the microscope objectives are infinity corrected for tube lens systems with 200 mm reference focal lengths. The calibration length is 45 mm for bright field.

The objectives are divided into different correction classes:

When selecting the objectives, consider the intended use with regard to specimen covering, etc.

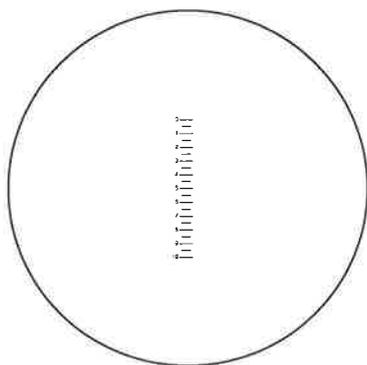
For more detailed explanations, please refer to:
<http://www.leica-microsystems.com/objectives>



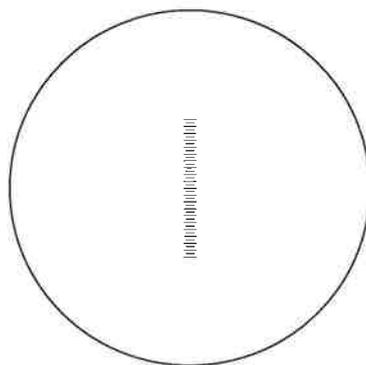
Fig. 54: HI PLAN objectives



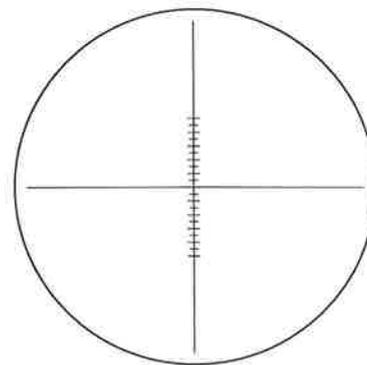
Fig. 55: PL APO objectives



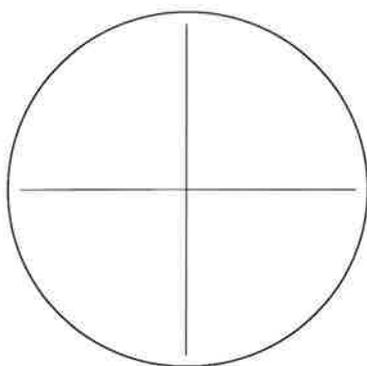
Graticule 11506950



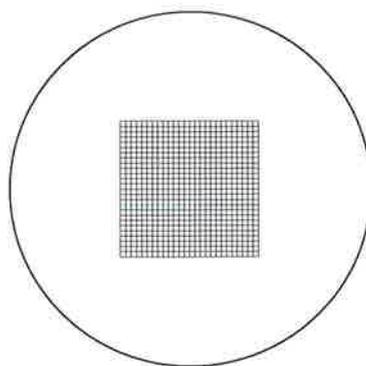
Graticule 11506951



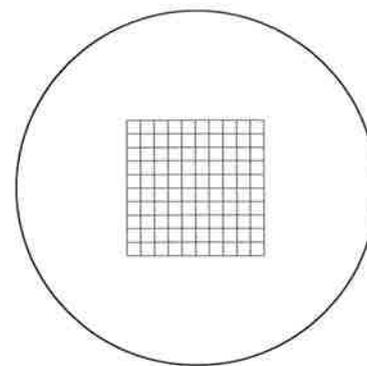
Graticule 11506952



Graticule 11506953



Graticule 11506954



Graticule 11506955

LEICA DM1000-3000 STANDS

The Leica DM1000-3000 Stands for Medical and Biological Applications

The stand is the foundation of the microscope. It includes the focusing system, objective turret, stage and accessories, transmitted light axis and power supply.

By selecting from a range of modules such as light sources, filters, transmitted-light and fluorescent components, tubes, eyepieces and objectives, it is possible to assemble a personal, application-specific microscope system.

The modular design, allows the user to modify and extend the system to suit changing requirements.

Ergonomics were given special consideration in the design of all stands.

Stands with halogen illumination

| Stand | Leica DM1000 | Leica DM2000 | Leica DM2500 | Leica DM3000 |
|--|---|---|---|---|
| Power Supply | Integrated, stabilized wide-range power supply 100–240 V AC for 12 V 30 W | Integrated, stabilized wide-range power supply 100–240 V AC for 12 V 30 W | Integrated, stabilized wide-range power supply 100–240 V AC for 12 V 100 W | Integrated, stabilized wide-range power supply 100–240 V AC for 12 V 30 W |
| Light Source Transmitted Light | Integrated illumination 12 V 30 W halogen (integrated in base) | Integrated illumination 12 V 30 W halogen (integrated in base) | 12 V 100 W halogen (lamp housing 107/2) | Integrated illumination 12 V 30 W halogen (integrated in base) |
| Light Filters Transmitted Light (optional) | Filter magazine attachment 3 pos. or single filter holder for 2 filters Ø 32 mm | Filter magazine attachment 3 pos. or single filter holder for 2 filters Ø 32 mm | Integrated filter magazine 3 pos. Ø 40 mm or 2-pos. filter holder (not in combination with polarizer ICT/P) | Filter magazine attachment 3 pos. or single filter holder for 2 filters Ø 32 mm |
| Light Sources Fluorescence | The following light sources can be adapted to all fluorescence illuminators: 12 V 100 W halogen, Hg 50 W, Hg 100 W, Xe 75 W (lamp housing series 106Z/106/107/2) Leica EL6000 (external light source), Leica SFL100, SFL4000 (Fluorescence LED Illumination) | | | |
| Focusing | 2-gear focusing (coarse/fine) with 1 µm scale, with upper focus stop | 2-gear focusing (coarse/fine) with 1 µm scale or 3-gear focusing coarse, (medium), fine with micron scale, 1 and 4 µm micron scale, coarse focus torque, adjustable stage height stop | 2-gear focusing (coarse/fine) with 1 µm scale or 3-gear focusing coarse, (medium), fine with micron scale, 1 and 4 µm micron scale, coarse focus torque, adjustable stage height stop | 2-gear focusing (coarse/fine) with 1 µm scale or 3-gear focusing coarse, (medium), fine with micron scale, 1 and 4 µm micron scale, coarse focus torque, adjustable stage height stop |
| Z Stroke per Turn of the Focus Knob | z fine: 0.35 mm z medium: – z coarse: 3.06 mm | z fine: 0.10 mm z medium: 0.40 mm z coarse: 14.137 mm | z fine: 0.10 mm z medium: 0.40 mm z coarse: 14.137 mm | z fine: 0.10 mm z medium: 0.40 mm z coarse: 14.137 mm |
| Z Travel Range | 20 mm | 25 mm | 25 mm | 25 mm |
| Stage | ErgoStage with L- and R-operation for 1 or 2 specimens, condenser holder, or rotating stage, for 2 specimens | ErgoStage with L- and R-operation for 1 or 2 specimens, condenser holder, or rotating stage, for 2 specimens | ErgoStage with L- and R-operation for 1 or 2 specimens, condenser holder, or rotating stage, for 2 specimens | ErgoStage with L- and R-operation for 1 or 2 specimens, condenser holder, or rotating stage, for 2 specimens |
| Objective Turret | manual, 5 pos. M25 | manual, 6 pos. M25 or 7 pos. M25 | manual, 6 pos. M25 or 7 pos. M25 | automated, 6 pos. M25 |

OBSERVATION AND PHOTO TUBES



Fig. 41: Standard Tube HC -/4/4



Fig. 42: Ergonomic 15° Tube HC -/0/4, short



Fig. 43: Ergonomic tilting tube HC -/0/4

The interpupillary distance range of 55 to 75 mm can be adjusted easily and precisely with all tubes. The specimen focus is retained during adjustment. When using intermediate systems (see below), the maximum permissible eyepiece field number of 25, 22 or 20 is a result of the total height of the intermediate systems; see p. 19.

HC Tube Program

The HC tubes, designed according to the Siedentopf principle (except for tube HC L 3TP), contain multilens tube optics that convert the infinity beam path coming from the objective to a converging beam path to depict the specimen in the intermediate image plane (eyepiece or TV adapter).

The elimination of residual aberrations is another task of the tube optics, together with the eyepieces.

The viewing angle of the ergonomic tubes can be adjusted easily without tools.

Changing the viewing angle several times over the course of the day provides variations in the user's sitting posture to prevent fatigue and backache.

This provides further benefits in the case of instruments with multiple users of different heights.

With the trinocular tube HC L 2TU4/5/7 with image correction, the image is upright and laterally correct.

Standard Tube HC -/4/4 (Fig. 41)

- Standard tube if photography or TV adaption are not planned 11505193

Ergonomic 15° Tube HC -/0/4, short (Fig. 42)

- With fixed, ergonomic 15° viewing angle 11505194

Ergonomic VarioTube HC -/0/4, short (Fig. 43)

- As 11 505 194 but with variable viewing angle 7.5–32.5° 11505195

Ergonomic VarioTube HC LVB 0/4/4, long

- With variable viewing angle 0–35° 11501504

Photo Tube HC L 1T 4/5/7, long

- With beam splitting, 50% to vertical port (photo or TV) and 50% to binocular eyepieces 11501500



Fig. 53: Eyepieces

EYEPIECES

A wide range of eyepieces with 10x, 12.5x, 16x or 25x magnification (for field numbers of up to 25 mm) are available for the tubes. Special eyepieces for eyeglass wearers are available, as are eyepieces with adjustable eyelenses (M eyepieces) designed to accommodate a variety of graticules. 10x eyepieces are standard; eyepiece magnifications of 16x and 25x are intended for special applications only.

All eyepieces have removable or fold-down eyecups and can be used with or without eyeglasses. Eyepieces identified with M are equipped with a focusing eyelens for dioptric equalization (from -6.8 to +4.2 or -6 to +5) and graticule holder.

The external diameter of the eyepieces is $D = 30$ mm.

The graticule diameter is $D = 26$ mm. Specifications are engraved on the eyepiece, e.g. HC PLAN 10x/20 $\overline{\text{BR}}$ M. HC PLAN = correction type, 10x = magnification/20 = field number FOV, $\overline{\text{BR}}$ = for eyeglass wearers (high exit pupil), M = dioptric adjustment/graticule holder.

Eyepieces with FOV 20

- Eyepiece HC PLAN 10x/20 BR. 11507801
- Eyepiece HC PLAN 10x/20 BR.M 11507802

Eyepiece with FOV 22

- Eyepiece HC PLAN S 10x/22 Br.M 11507820

Eyepiece with FOV 25

- Eyepiece HC PLAN S 10x/25 Br.M 11507808

Special eyepieces with high magnification

- Eyepiece HC PLAN 12.5x/16 BR.M 11506515
- Eyepiece 16x/14B, adjustable 10445301
- Distance ring for eyepieces 16x/14B and eyepiece 25x/9.5B 11506808

Focusing and framing graticules for length measurements, comparison and counting methods ($\varnothing = 26$ mm)

For HC PLAN eyepieces

- Graticule 10 mm = 100 parts 11506950
- Graticule 10 mm = 200 parts 11506951
- Crosshair graticule 11506953
- Crosshair graticule with graduation, 10 mm = 100 parts 11506952
- Graticule with grid 10 x 10 mm, 0.1 mm graduation 11506954
- Graticule with grid 10 x 10 mm, mm graduation 11506955

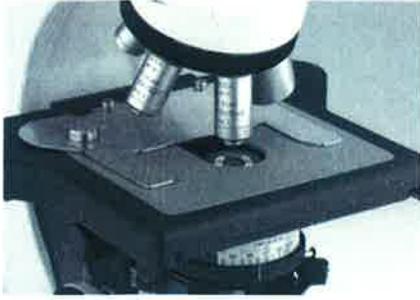


Fig. 10: Ultrahard ceramic stage plate



Fig. 11: Telescoping Coaxial Drive (X/Y)

STAGES LEICA DM2000/2500/3000

ErgoStage for Leica DM2000/2500/3000 for 1 slide (Fig. 10)

Right- and/or left-hand operation, with ultrahard ceramic stage plate
Travel range: 76 x 25 mm

11888186

- Single-hand specimen holder (for one specimen) 11505196
optional: Object clamp for oil immersion 11505218
- or
- Multifunctional specimen holder (e.g. for counting chambers) 11505254
optional: Brackets for KOVA slides 11 505 267
- or
- object guide BIO for mechanical stage right 11505156

(Note: object guide BIO 11505156 from DM4/6 B range is not applicable for vernier reading with ErgoStages for DM1000 11888185 and DM2-3000 11888186)

ErgoStage for Leica DM2000/2500/3000 for 2 slides

Right- and/or left-hand operation, with ultrahard ceramic stage plate
Travel range: 76 x 52 mm

11888189

-
- Single-hand specimen holder (for one or two specimen) 11505244
 - or
 - Multifunctional specimen holder (e.g. for counting chambers) 11505254
optional: Brackets for KOVA slides 11 505 267

Required for ErgoStages for 1 or 2 slides:

Coaxial drive (x/y) suitable for mounting on the left or right Fig. 11:

- Standard (with ergonomic low position for comfortable resting of hands on table) with removable rubber covers 11888153
- or
- Telescoping with adjustable torque and removable rubber covers 11888154
- or
- Stage lock 11888199

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Condenser Achr.apl. A 0.9 (P)

- With color coding for rapid adaptation of the aperture to the objective. For brightfield/darkfield, phase contrast and qualitative polarization. With movable condenser head, from objective magnification 1.25x Koehler illumination from objective magnification 10x 11501183

Automated Condenser Achr. apl. A 0.9 (P) (only with Leica DM3000) (Fig. 16)

- With automated switchable condenser top. With color coding for rapid adaptation of the aperture to the objective. For brightfield/darkfield, phase contrast and qualitative polarization. 11505272

Additional Accessories for Manual and Automated Condenser Achr. apl. A 0.9 (P)

(Note: only for use with ErgoStages and Rotating stage)

- Diffuser for low magnifications (not for POL). For use with 1.25x - 5x objectives to enhance the image quality in particular for H.E. stained samples. The diffuser will be automatically switched into the light path with the magnification below 10x. 11505219
- or
- Auxiliary lens for low magnifications (also for POL) For use with 5x and 2.5x objectives to enhance the image quality. The lens will be automatically switched into the light path with the magnification below 10x. 11505507

Accessories

For condensers CL/PH, CLP/PH, Achr. apl. A 0.9 (P) and automated Achr. apl. A 0.9 (P)

- λ-Plate for polarization (Fig. 18.5) 11555074
 - Light ring slider DF-CL (Fig. 18.6) 11501158
 - Light ring slider PH1-CL (Fig. 18.7) 11501155
 - Light ring slider PH2-CL (Fig. 18.8) 11501156
 - Light ring slider PH3-CL (Fig. 18.9) 11501157
 - Diffusion filter for 2.5x objective, not for Pol (Fig. 18.10) 11505091
- (Darkfield possible from 10x objective on)

Universal Condenser UCL 0.90/1.25 OIL (Fig. 17)

- As condenser CL/PH, but with 5-position light ring disk (Fig. 18.2) to accommodate light rings (Fig. 18.1) and auxiliary lens (11555040) for objective 2.5x (Fig. 18.3) 11501159

For Leica DM2500 a diffusion screen lens (11 555 040) is necessary for objectives below 10x with UCL condenser.



Fig. 16: Automated Condenser Achr. apl. A 0.9 (P) (only with Leica DM3000)



Fig. 17: Universal Condenser UCL 0.90/1.25 OIL

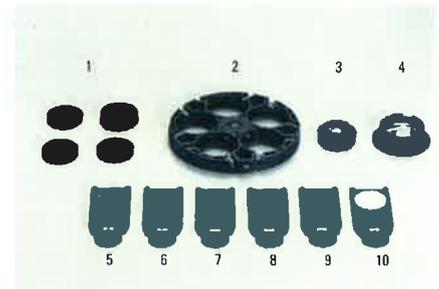


Fig. 18: Accessories for condensers UCL/UCLP and CL/PH
 1 Light rings
 2 Light ring disk
 3 Auxiliary lens for 2.5 x objective
 4 Adapter lens
 5 λ-Plate for polarization
 6 Light ring slider DF-CL
 7 Light ring slider PH1-CL
 8 Light ring slider PH2-CL
 9 Light ring slider PH3-CL
 10 Diffusion filter for 2.5x/1.25x objective

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LIGHT SOURCES AND POWER SUPPLIES

Leica DM1000/2000/3000 Stand:

Transmitted light illumination system integrated in base of stand, stabilized power supply, automatic 100–240 V AC power adaptation, including removable power plug. Halogen lamp, 12 V 30 W, easy replacement, no adjustment required. With reflector, microprism diffusion filter, aspherical collector, field diaphragm for Koehler illumination.

Leica DM1000 LED/DM2000 LED/DM3000 LED Stand

As above but with LED Illumination.

Leica DM2500 Stand:

With integrated transmitted light axis, field diaphragm, with or without filter magazine (40 mm diameter filters). Power supply/light source automatic power adaptation, 50/60 Hz, 100–240 V AC.

Output: for 12 V 100 W halogen lamp, stabilized, for attachable lamp housing 107/2 and 106.

Light Sources for Transmitted and Incident Light

Lamp housing 107/2 (Fig. 26)

- with 12 V 100 W halogen lamp, heat-absorbing filter, single-lens aspherical collector, microprism diffusion filter for enhanced brightness and homogeneity of the illuminated area.
- For TL (Leica DM2500)

11504080

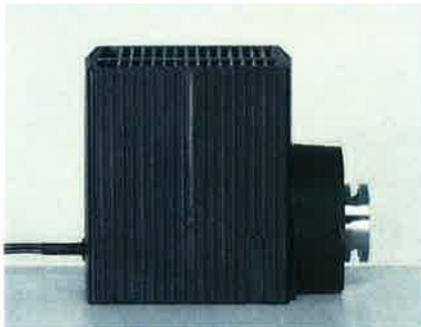


Fig. 26: Lamp housing 107/2 (single-lens)

Lamp housing 106 (Fig. 27)

spherically corrected, 2-lens collector, focusable, with heat-absorbing filter, with adjustable lamp mount for halogen lamp 12 V 100 W, microprism filter for enhanced brightness and homogeneity of the illuminated area.

- With connecting cable, 0.55 m
- With connecting cable, 2.00 m

11504058

11504059



Fig. 27: Lamp housing 106 (double-lens)

Lamps/burners:

- Halogen 12 V 30 W
- Halogen 12 V 100W lamp
- Hg 50 W burner
- Hg 100W burner
- Xe 75 W burner
- Lamp HXP R120/45C-Vis for Leica EL6000
- Hg 103 W/2* burner

11500317

11500974

11500137

11500138

11500139

11504120

11500321

* as Hg 100W, but with longer lifetime

Light Source for Transmitted Light for Leica DM2500 LED Stand

Lamp housing LH113 LED (Fig. 28)

Metal lamp housing with pre-centered LED, with constant color temperature at 4500 K, with cable 0.5 m. LED Power: 10 W

11504199



Fig. 28: LED lamp housing LH113 LED

Ergonomic Vario Photo Tube HC L 1VT 0/4/4, long

- 50% : 50% beam splitting and variable viewing angle 11501502

Tube BDTP 100/50/0 with fixed port 0/4/4 (Fig. 44)

- With 3 switching positions, 100% : 0%, 50% : 50%, 0% : 100%, fixed photo-TV port, viewing angle 30° 11551511

Photo Tube HC L 2TU 4/5/7

- With image erection, viewing angle 20°, beam splitting: 100% binocular eyepieces, 100% photo-TV port 11501598

Ergonomic Advanced Vario Tube AET22 –/3/7 (Fig. 45)

- Binocular ergonomic tube with variable viewing angle 5°–32° and variable eyepiece extension 0–30 mm. 11505148

All other tubes of the Leica DM4–6 series may also be used.

Intermediate Modules

The insertion of modules between the stand and tube may result in a reduction of the maximum permissible eyepiece field number.

The 3 numbers following the tube designation, e. g. 4/5/7, indicate the maximum permissible vertical index of the intermediate systems for field numbers 25/22/20. The vertical index is contained in the designations of all intermediate modules, e. g. 2 for Ergomodule L 2/25. When using this Ergomodule together with an HC B 0/3/4 tube, use only eyepieces with field number 22 or 20.

The number "0" in the tube designation 0/3/4 indicates that with a field number of 25, this tube should only be mounted directly on the stand (= vertical index 0). Failure to observe these values may result in vignetting (shading of the edges of the field of view) with some objectives. With some intermediate systems, e. g. fluorescence illuminators, field numbers of 25 and 22 are not possible as a rule, which is also reflected in the designations, e. g. 4/22 for maximum field number 22.

Imaging module 100/0 (C-mount 0.5x)

- With switching in positions: 100% : 0%, 0% : 100%
With fixed C mount (0.5x), centrable, with port to back (rotatable to side position possible) 11505300

Imaging module 0/100 50/50 (C-mount 0.5x) (Fig. 46)

- With switching in positions: 50% : 50%, 0% : 100%
With fixed C mount (0.5x), centrable, with port to back (rotatable to side position possible, 100% light to the camera) 11505299

Imaging module 100/0 (C-mount 0.7x)

- With switching in positions: 100% : 0%, 0% : 100%
With fixed C mount (0.7x), centrable, with port to back (rotatable to side position possible) 11505202

Imaging module 0/100 50/50 (C-mount 0.7x) (Fig. 46)

- With switching in positions: 50% : 50%, 0% : 100%
With fixed C mount (0.7x), centrable, with port to back (rotatable to side position possible, 100% light to the camera) 11505270



Fig. 44: Tube BDTP 25 100/50/0 with fixed port



Fig. 45: Ergonomic Advanced Vario Tube AET22

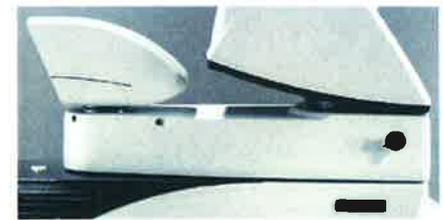


Fig. 46: Imaging module (here with Leica DFC camera and tube)

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Ergomodules adapt the viewing height to the size and sitting position of the user for an ergonomically sound, comfortable posture.

Ergomodule L 2/25

- raises the viewing position by 30 mm for the Leica DM1000 11505199

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ACCESSORIES

Specimen markers (Fig. 58)

- With objective thread M25, with diamond tip 11505059

Focusing telescope

- For phase contrast adjustment, interference contrast ICT 11505070

Stage micrometer

- Transmitted light 2 mm = 200T, glass carrier with scale
1 scale interval = 10 μ m 11513106
- Incident light 10mm = 100T for overview objectives (e.g. 1.25) 11519963

Immersion Oil

- Type F, ISO 8036, very low autofluorescence, highly recommended for
fluorescence applications and APO objectives, 10 ml 11513859
- Type N, ISO 8036, low autofluorescence, 20 ml 11513860
- Type N, ISO 8036, low autofluorescence, 250 ml 11513861

Dust covers

- For Leica DM1000/DM1000 LED 11501071
- With camera equipment or fluorescence light axis 11501072
- For Leica DM2000/2500/3000 11501073
- With camera equipment or fluorescence light axis 11501074

Antivibration

- Antivibration Platform for Leica DM2000-3000 11532708



Fig. 58: Specimen marker

Obj. N PLAN 10x/0.25 PH1

Datasheet

| | | |
|---------------------------------|--|---|
| Material Number: | 11506406 | |
| Objective Type: | N PLAN | |
| <u>Magnification:</u> | 10 | 7 |
| <u>Numerical Aperture:</u> | 0,25 | |
| Coverglass: | - | |
| Immersion: | Dry (without) | |
| <u>Free Working Distance:</u> | 17.7 | |
| Objective Thread: | M25 | |
| Corr. of Cover Glass Thickness: | No | |
| Iris Diaphragm: | No | |
| Spring Loaded: | No | |
| Methods: | Brightfield, Fluorescence, Polarisation, Transmitted Darkfield, DIC (Nomarski), Modulation/Integrated PH contrast, <u>Phase Contrast</u> | |

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Obj. N PLAN 100x/1.25 OIL PH3

Datasheet

| | |
|---------------------------------|---|
| Material Number: | 11506159 |
| Objective Type: | N PLAN |
| <u>Magnification:</u> | <u>100</u> |
| <u>Numerical Aperture:</u> | <u>1,25</u> |
| Coverglass: | - |
| <u>Immersion:</u> | <u>Oil</u> |
| <u>Free Working Distance:</u> | <u>0.15</u> |
| Objective Thread: | M25 |
| Corr. of Cover Glass Thickness: | No |
| Iris Diaphragm: | No |
| Spring Loaded: | Yes |
| Methods: | Brightfield, Fluorescence, Modulation/Integrated PH contrast, Polarisation, DIC (Nomarski), <u>Phase Contrast</u> |

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