

*Leitz  
Leica*

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*Scientific Instruments Division*

*Specifications and Prices*

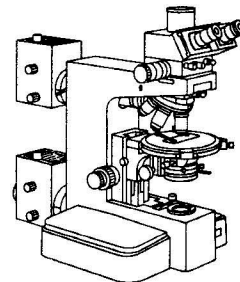
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# ORTHOPLAN-POL

## Polarizing Microscope



**POLARIZING MICROSCOPES**

**FEBRUARY 1, 1975**

TERMS: NET 30 DAYS. Prices & specifications are subject to change without notice. This price list supersedes all previous editions for this catalog.

**LEITZ UNIVERSAL RESEARCH POLARIZING MICROSCOPE, ORTHOPLAN-POL,  
EQUIPPED FOR: TRANSMITTED POLARIZED LIGHT WITH NPL-POL PLANO  
OBJECTIVES FOR MAXIMUM FLATNESS OF FIELD**

512 180	Functional stand, ORTHOPLAN, in modern form unitized construction, with built-into the base shock absorbers. The wide arc of the arm permits interchangeable use of many different object stages and allows for full vertical excursions for observations in transmitted or reflected light. Hand rests serve to support the observers arm during prolonged observations. Quick-change bayonet mounts for the reception of light sources for transmitted and reflected light. Built-in field diaphragm and swing-out collector lens for Koehler illumination. Dual coarse and fine focusing mechanism with graduations ( 1 interval = 0.001mm). Carrier with dovetail fittings for mechanical stages and substages. Dovetail for the reception of the object carrier. Precision 360 degree bayonet interchange fitting with push button release for the reception of microscope tubes	\$ 2,680.00	N01
512 173	Flexible plastic protective dust cover	11.00	N02
553 190	First order red compensator (Gypsum plate)	96.00	N03
553 189	Quarter wave compensator (Mica plate)	85.00	N04
552 162	Quintuple revolving objective nosepiece with intermediate optical system 1.25x, swing-in auxiliary lens for the observation of the conoscopic image of small object detail, individual objective centering device and two slots set at 90 degree angles to accept 20 x 6mm compensators; on interchange carrier 40.35.-	623.00	N05
512 174	Dovetail carrier for the interchange of condensers with rack and pinion for the adjustment in the height of condensers - . 16. -	161.00	N06
514 234	Lamp housing, model 100, with bayonet mounting device, filter holder, reflector and adjustable two lens collector; lamp socket with 12 volt 100 watt Halogen bulb, heat absorbing filter, daylight conversion filter CB 12, diffusion disc N and green filter- . . . . 100	607.00	N07
552 166	Combination, inclined binocular observation (23.2mm diameter) and straight monocular photographic tube FSA 50 with automatic focusing compensation for the adjustment of the interpupillary distance. Built-in filter analyser, rotatable 360 degree with vernier reading to 0.1 degree; centerable and focusing Bertrand lens permits observation of interference figures	2,328.00	N08
552 167	Rotating object stage No. 837, 150mm diameter, with scales and verniers reading to 0.1 degree, click stop at 45 degree intervals and locking device; on interchange carrier	859.00	N09
552 076	Swing-out condenser No. 702F, free from polarization, with aperture diaphragm, rotating filter polarizer indexed at 90 degree intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier	435.00	N10
	<b>LEITZ UNIVERSAL RESEARCH POLARIZING MICROSCOPE ORTHOPLAN-POL 40. 35. 16. 100 FSA 837/702F as described above</b>	<b>\$ 7,885.00</b>	
<b>Optical Equipment</b>			
559 058	Achromatic dry plano objective, free from polarization, NPL 6.3x/0.20 P, focal length 24mm, free working distance 2.0mm	\$ 383.00	XA08
559 059	Achromatic dry plano objective, free from polarization, NPL 16x/0.40 P, focal length 11mm, free working distance 0.50mm	391.00	XA09
559 060	Achromatic dry plano objective, free from polarization, NPL 25x/0.50 P, focal length 7mm, free working distance 0.38mm, with spring loaded mount	436.00	XA10
559 061	Achromatic dry plano objective, free from polarization, NPL 40x/0.65 P, focal length 4.5mm, free working distance 0.15mm, with spring loaded mount	519.00	XA11
559 062	Achromatic oil immersion plano objective, free from polarization, NPL Oil 100x/1.30 P, focal length 1.7mm, free working distance 0.26mm, with spring loaded mount	867.00	XA12
519 126	PERIPLAN widefield eyepiece, single GF 10xM with adjustable eyelens and mount for reticles, field of view 18mm	118.00	Z22
519 910	Eyepiece reticle 10mm = 100 divisions and crosslines, unmounted	53.00	Z88
559 070	PERIPLAN widefield eyepieces, paired GF 10x with adjustable eyelens, one with mounted crosslines, field of view 18mm	276.00	Z69
552 128	Interchangeable condenser top element No. 004P, free from polarization, A Oil 1.33	254.00	N12
513 106	Stage micrometer on glass, 2mm = 200 divisions, with photographic scale	62.00	N13
	<b>LEITZ UNIVERSAL RESEARCH POLARIZING MICROSCOPE, ORTHOPLAN-POL 40. 35. 16. 100 FSA 50 837/702F COMPLETE WITH OPTICAL EQUIPMENT FOR MAXIMUM FLATNESS OF FIELD</b>	<b>\$11,244.00</b>	
500 189	Regulating transformer with ammeter 12 volts, 100 watt for connection to 110/120 volts, 60 cycles A. C.	216.00	N14
		<b>\$11,460.00</b>	

**LEITZ Universal Research Microscope ORTHOPLAN  
with Microscope Photometer MPV I  
for REMISSION MEASUREMENTS in the spectral range 400 - 620nm**

512 180	Functional stand, ORTHOPLAN, in modern form unitized construction, with built-into the base shock absorbers. The wide arc of the arm permits interchangeable use of many different object stages and allows for full vertical excursions for observations in transmitted or reflected light. Hand rests serve to support the observers arm during prolonged observations. Quick-change bayonet mounts for the reception of light sources for transmitted and reflected light. Built-in field diaphragm and swing-out collector lens for Koehler illumination. Dual coarse and fine focusing mechanism with graduations (1 interval = 0.001mm). Carrier with dovetail fittings for mechanical stages and substages. Dovetail for the reception of the object carrier. Precision 360 degree bayonet interchange fitting with push button release for the reception of microscope tubes . . . . .	\$2,680.00	N01
513 257	Incident light 45 degree illuminator with deflecting mirror, two standard society objective threads and fine adjustment of the field diaphragm; on interchange carrier . . . . .	1,639.00	N15
514 234	Lamp housing, model 100, with bayonet mounting device, filter holder, reflector and adjustable two lens collector; lamp socket with 12 volt 100 watt Halogen bulb, heat absorbing filter, daylight conversion filter CB 12, diffusion disc N and green filter---100 . . . . .	607.00	N07
512 372	Combination, inclined binocular observation and straight monocular photographic tube "FSA-GW" with automatic focusing compensation for the adjustment of the interpupillary distance. Prism on slider can be switched in and out to direct 100% of the light into either the binocular observation tube or the monocular photographic tube . . . . .	1,360.00	N16
512 460	Large mechanical stage No. 660 with scales and verniers, 150 x 210mm, low set operating knobs on one axis traversing an area 75 x 50mm . . . . .	760.00	N17
	<b>LEITZ Universal Research Microscope ORTHOPLAN - 45. - 100 FSA-GW 660/- as described above . . . . .</b>	<b>\$7,046.00</b>	
500 189	Regulating transformer with ammeter 12 volts, 100 watt for connection to 110/120 volts, 60 cycles A. C. . . . .	216.00	N14
	<b>OPTICAL EQUIPMENT</b>		
559 002	Special objective UM 1, 3.2:1, with built-in iris diaphragm - two each required @ \$162.00 . . . . .	\$ 324.00	XA55
559 003	Special objective UM 2, 6.4:1, with built-in iris diaphragm - two each required @ \$162.00 . . . . .	324.00	XA56
559 004	Special objective UM 3, 13:1, with built-in iris diaphragm - two each required @ \$262.00 . . . . .	524.00	XA34
559 005	Special objective UM 4, 19.5:1, with built-in iris diaphragm - two each required @ \$262.00 . . . . .	524.00	XA35
513 262	Incident light single lens condenser system A 0.18 . . . . .	53.00	N18
513 263	Incident light two lens condenser system A 0.27 . . . . .	67.00	N19
513 169	Filter analyser . . . . .	127.00	N20
519 127	PERIPLAN widefield eyepieces, paired GF 10xM, one with adjustable eyelens and mount to accept reticles, field of view 18mm . . . . .	219.00	Z26
513 256	Pair of adapters to use standard diameter (23.2mm) eyepieces with large diameter tube . . . . .	70.00	N21
519 910	Eyepiece reticle 10mm = 100 divisions and crosslines, unmounted . . . . .	53.00	N11
563 011	Stage micrometer on metal 1mm = 100 divisions . . . . .	88.00	N22
513 352	Focusing magnifier . . . . .	138.00	N23

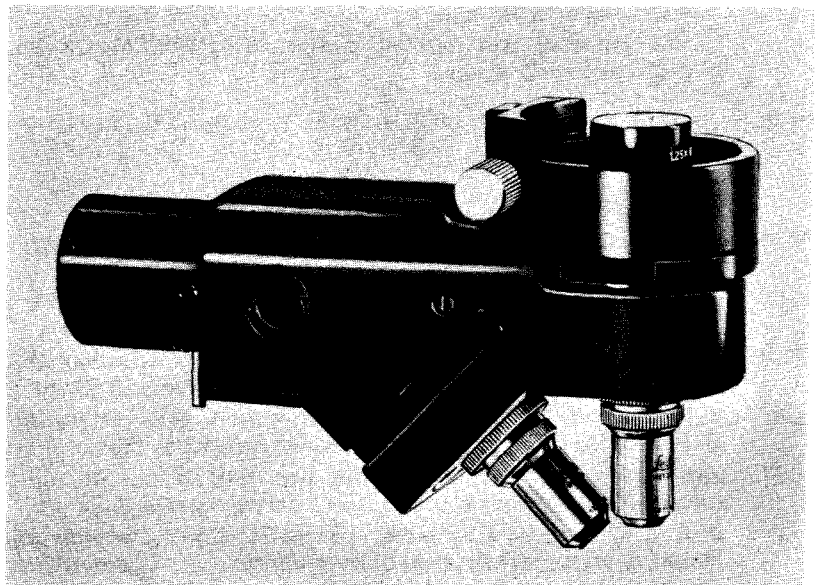
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**MICROSCOPE PHOTOMETER MPV I**

620 306	MPV-Housing with beam splitter and triple mirror, intermediate tube, diaphragm housing with iris diaphragm, adjustable rectangular diaphragm and low voltage lamp 6 volts 5 watts; micro mirror reflex housing with 5x focusing magnifier, interchangeable ground glass with crossline, cable release and bayonet mount to accept series M LEICA camera bodies. Horizontal slider for the reception of filters, clamping sleeve, PERIPLAN widefield eyepieces GF 10x and GF 16x with spacer ring, eyepiece holder 23. 2mm diameter, mounting tools and case . . . . .	\$ 4,228.00	N24
512 181	Camera carrier with two bayonet locks for attaching to the upright arm of the ORTHOPLAN microscope and adjustable prismatic bar (25 inch) . . . . .	311.00	N25
620 190	Holder to attach MPV housing to the prismatic bar . . . . .	105.00	N26
062 362	Light measuring device with high voltage supply, photomultiplier tube 6094 (S11) in housing and digital multimeter for measurements in the spectral range 400 - 620nm . . . . .	2,317.00	N27
620 330	Lamp holder for reflected light with dovetail slide fitting the prismatic bar of the camera carrier, centerable diaphragm holder, iris diaphragm, adjustable rectangular diaphragm, filter holder with adapter and mounting tools . . . . .	646.00	N28
620 334	Lamp housing, model No. 100Z with centering mount, filter holder and adjustable two lens collector; lamp socket with halogen filament bulb 12 volts 100 watts and heat absorbing filter 2mm, KG 1 . . . . .	555.00	N29
620 255	Current stabilizer power supply unit . . . . .	2,715.00	N30
620 192	Interference band filter 436nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N31
620 198	Interference band filter 500nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N32
620 193	Interference band filter 546nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N33
620 194	Interference band filter 589nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N34
620 199	Interference band filter 644nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N35
	<b>LEITZ Universal Research Microscope ORTHOPLAN -. 45. -. 100 FSA-GW 660/ - complete with Optical Equipment and Microscope Photometer MPV for Remission Measurements in the Spectral Range 400 - 620nm . . . . .</b>	<b>\$21,170.00</b>	

**OPTIONAL**

620 236	Large knurled knob, 30mm inside diameter, to slip over the operating knob of the No. 660 mechanical stage . . . . .	\$ 24.00	N36
620 237	Large knurled knob, 22mm inside diameter, to slip over the operating knob of the No. 660 mechanical stage . . . . .	24.00	N37
553 105	Interference band filter 25nm, VERIL B 200 (400-700nm) with graduated mount . . . . .	\$ 607.00	N38
620 268	Iris diaphragm adjustable in the X and Y axis (for fine adjustment of the measuring diaphragm especially for high magnifications and interference) . . . . .	\$ 254.00	N39



**45° Incident Light Illuminator**

**LEITZ Universal Research Microscope ORTHOPLAN-POL  
with Microscope Photometer MPV I  
for REFLECTION MEASUREMENTS in the spectral range 400-620nm**

512 180	Functional stand, ORTHOPLAN, in modern form unitized construction, with built-into the base shock absorbers. The wide arc of the arm permits interchangeable use of many different object stages and allows for full vertical excursions for observations in transmitted or reflected light. Hand rests serve to support the observers arm during prolonged observations. Quick-change bayonet mounts for the reception of light sources for transmitted and reflected light. Built-in field diaphragm and swing-out collector lens for Koehler illumination. Dual coarse and fine focusing mechanism with graduations (1 interval = 0.001mm). Carrier with dovetail fittings for mechanical stages and substages. Dovetail for the reception of the object carrier. Precision 360 degree bayonet interchange fitting with push button release for the reception of microscope tubes . . . . .	\$2,680.00	N01
553 227	Vertical illuminator with objective changing clutch, five objective centering collars. Berek compensating prism, beam splitting plate on slide, diffusion disc N, aperture and field diaphragm, slot to accept compensators and illumination changing slide with filter polarizer; on interchange carrier 56. 55. - . . . . .	2,193.00	N40
514 234	Lamp housing, model 100, with bayonet mounting device, filter holder, reflector and adjustable two lens collector; lamp socket with 12 volt 100 watt Halogen bulb, heat absorbing filter, daylight conversion filter CB 12, diffusion disc N and green filter---100 . . . . .	607.00	N07
552 166	Combination, inclined binocular observation (23. 2mm diameter) and straight monocular photographic tube FSA 50 with automatic focusing compensation for the adjustment of the interpupillary distance. Built-in filter analyser, rotatable 360 degree with vernier reading to 0. 1 degree; centerable and focusing Bertrand lens permits observation of interference figures . . . . .	2,328.00	N08
552 167	Rotating object stage No. 837, 150mm diameter, with scales and verniers reading to 0. 1 degree, click stop at 45 degree intervals and locking device; on interchange carrier . . . . .	859.00	N09
553 082	Attachable mechanical stage No. 42, with graduated vernier reading to 0. 1mm, traversing area 34 x 20mm . . . . .	395.00	N41
	<b>LEITZ Universal Research Microscope ORTHOPLAN-POL 56. 55. -. 100 FSA 50 837-42/- as described above . . . . .</b>	<b>\$9,062.00</b>	
500 189	Regulating transformer with ammeter 12 volts, 100 watt for connection to 110/120 volts, 60 cycles A. C. . . . .	\$ 216.00	N14
<b>OPTICAL EQUIPMENT</b>			
559 080	Achromatic dry plano objective, free from polarization, NPL 5x/0.09 P infinity corrected, focal length 50mm, free working distance 12.5mm . . . . .	\$ 312.00	YA21
559 109	Achromatic dry plano objective, free from polarization, NPL 10x/0.20 P infinity corrected, focal length 25mm, free working distance 14. 2mm . . . . .	300.00	YA22
559 083	Achromatic oil immersion objective, free from polarization, Oil 20x/0.40 P infinity corrected, focal length 12. 5mm, free working distance 0. 46mm . . . . .	425.00	YA31
559 086	Achromatic oil immersion objective, free from polarization, Oil 50x/0.85 P infinity corrected, focal length 5mm, free working distance 0. 35mm . . . . .	621.00	YA33
559 087	Achromatic oil immersion objective, free from polarization, Oil 125x/1.30 P infinity corrected, focal length 1. 99mm, free working distance 0. 28mm . . . . .	824.00	YA34
519 127	PERIPLAN widefield eyepieces, paired GF 10xM, one with adjustable eyelens and mount to accept reticles, field of view 18mm . . . . .	219.00	Z26
519 910	Eyepiece reticle 10mm = 100 divisions and crosslines, unmounted . . . . .	53.00	N11
563 011	Stage micrometer on metal 1mm = 100 divisions . . . . .	88.00	N22
513 352	Focusing magnifier . . . . .	138.00	N23

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**MICROSCOPE PHOTOMETER MPV I**

620 306	MPV-Housing with beam splitter and triple mirror, intermediate tube, diaphragm housing with iris diaphragm, adjustable rectangular diaphragm and low voltage lamp 6 volts 5 watts; micro mirror reflex housing with 5x focusing magnifier, interchangeable ground glass with crossline, cable release and bayonet mount to accept series M LEICA camera bodies. Horizontal slider for the reception of filters, clamping sleeve, PERIPLAN widefield eyepieces GF 10x and GF 16x with spacer ring, eyepiece holder 23. 2mm diameter, mounting tools and case . . . . .	\$ 4,228.00	N24
512 181	Camera carrier with two bayonet locks for attaching to the upright arm of the ORTHOPLAN microscope and adjustable prismatic bar (25 inch) . . . . .	311.00	N25
620 190	Holder to attach MPV housing to the prismatic bar . . . . .	105.00	N26
062 362	Light measuring device with high voltage supply, photomultiplier tube 6094 (S11) in housing and digital multimeter for measurements in the spectral range 400 - 620nm . . . . .	2,317.00	N27
620 330	Lamp holder for reflected light with dovetail slide fitting the prismatic bar of the camera carrier, centerable diaphragm holder, iris diaphragm, adjustable rectangular diaphragm, filter holder with adapter and mounting tools . . . . .	646.00	N28
620 334	Lamp housing, model No. 100Z with centering mount, filter holder and adjustable two lens collector; lamp socket with halogen filament bulb 12 volts 100 watts and heat absorbing filter 2mm, KG 1 . . . . .	555.00	N29
620 255	Current stabilizer power supply unit . . . . .	2,715.00	N30
620 355	Reflection standard, approx. 4% . . . . .	62.00	N42
620 314	Reflection standard, approx. 9% . . . . .	202.00	N43
620 313	Reflection standard, approx. 17% . . . . .	556.00	N44
620 192	Interference band filter 436nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N31
620 193	Interference band filter 546nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N33
620 194	Interference band filter 589nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N34
620 199	Interference band filter 644nm, half width approx. 20nm, transmittance approx. 60% . . . . .	104.00	N35
	<b>LEITZ Universal Research Microscope ORTHOPLAN-POL 56.55. - 100 FSA 50 837-42/- complete with Optical Equipment and Microscope Photometer MPV for Reflection Measurements in the Spectral Range 400 - 620nm . . . . .</b>	<b>\$24,371.00</b>	

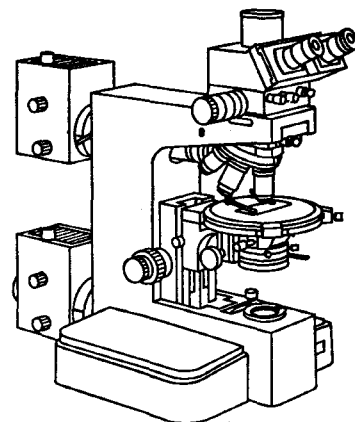
**OPTIONAL**

620 279	Specimen aligning stage for opaque specimens with three interchangeable aperture stops (5, 10 and 20mm) and three interchangeable magnets . . . . .	\$ 589.00	N45
553 105	Interference band filter 25nm, VERIL B200 (400 - 700nm) with graduated mount . . . . .	607.00	N38
620 202	Precision interference line filter 480nm (Hg), half width approx. 12nm, transmittance approx. 30% . . . . .	\$ 150.00	N46
620 204	Precision interference line filter 525nm, half width approx. 12nm, transmittance approx. 30% (for coal petrography) . . . . .	150.00	N47
620 268	Iris diaphragm adjustable in the X and Y axis (for fine adjustment of the measuring diaphragm especially for high magnifications and interference) . . . . .	\$ 254.00	N39

For additional filters, monochromator, light sources etc., refer to sales publication No. 620-18c "Microscope Photometer - LEITZ MPV System"

## ORTHOPLAN POL MICROSCOPE

### Interchangeable and Supplementary Equipment



#### ATTACHABLE MECHANICAL STAGES

553 082	Attachable mechanical stage No. 42, with graduated vernier reading to 0.1mm; traversing area 34 x 20mm . . . . .	\$ 359.00	N41
553 083	Attachable mechanical stage No. 40 for point counting with seven pairs of interchangeable pinion heads to advance the slide at intervals of 0.1mm, 0.2mm, 0.3mm, 0.4mm, 0.5mm, 1.0mm and 2.0mm; traversing area 34 x 20mm . . . . .	692.00	N48

#### SPECIMEN ALIGNING STAGE

620 279	Specimen aligning stage for opaque specimens with three interchangeable aperture stops (5, 10 and 20mm) and three interchangeable magnets . . . . .	\$ 589.00	N45
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#### MICROSCOPE CONDENSERS

552 078	Condenser base free from polarization, A. 0.25, with aperture diaphragm, rotating filter polarizer indexed at 90 degree intervals, slot to accept quarter wave length plate and centering mount; on interchange carrier No. 700F . . . . .	\$ 307.00	N49
552 079	Interchangeable condenser top element No. 002P, free from polarization, Achr. 0.90 . . . . .	<u>128.00</u>	N50
552 076	Swing-out condenser No. 702F, free from polarization, with aperture diaphragm, rotating filter polarizer indexed at 90 degree intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier . . . . .	\$ 435.00	N10
552 169	Condenser base free from polarization, A. 0.25, with aperture diaphragm, rotating prism polarizer indexed at 90 degree intervals, slot to accept quarter wave length plate and centering mount; on interchange carrier No. 700P . . . . .	\$1,481.00	N51
552 079	Interchangeable condenser top element No. 002P, free from polarization, Achr. 0.90 . . . . .	<u>128.00</u>	N50
552 170	Swing-out condenser No. 702P, free from polarization, with aperture diaphragm, rotating prism polarizer indexed at 90 degree intervals, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier . . . . .	\$1,609.00	N52
552 178	Swing-out condenser No. 702Fv free from polarization with aperture diaphragm, rotating filter polarizer indexed at 90 degree intervals, pre-polarizer, slot to accept quarter wave length plate, centering mount and interchangeable top element Achr. 0.90; on interchange carrier . . . . .	\$ 637.00	N53
513 090	Quarter wave length plate in mount, 32mm diameter . . . . .	94.00	N54
552 128	Interchangeable condenser top element No. 004P, free from polarization, Oil 1.33 . . . . .	254.00	N12

#### OBJECTIVE CARRIERS - TRANSMITTED LIGHT

552 162	Quintuple revolving objective nosepiece with intermediate optical system 1.25x, swing-in auxiliary lens for the observation of the conoscopic image of small object detail, individual objective centering device and two slots set at 90 degree angles to accept 20 x 6mm compensators; on interchange carrier 40.35 . . . . .	\$ 623.00	N05
552 182	Quintuple revolving objective nosepiece as described above, however, equipped with intermediate optical system 1x 48. 35. - . . . . .	901.00	N55
552 159	Objective changing clutch with intermediate optical system 1.25x, four objective centering collars and two slots set at 90 degree angles to accept 20 x 6mm compensators; on interchange carrier 40. 74. - . . . . .	\$ 579.00	N56
552 180	Objective changing clutch as described above, however, equipped with intermediate optical system 1x 48. 74. - . . . . .	853.00	N57

Refer to table on page No. 11 for transmitted light objectives.

**OBJECTIVE CARRIERS - REFLECTED LIGHT**

553 215	Polarized light vertical illuminator with infinity corrected optical system, plane glass plate and compensating prism on common axis, diffusion disc N and interchangeable prism polarizer rotatable through 90 degrees; objective changing clutch with five objective centering collars, slot to accept 20 x 6mm compensators and light entrance tube with field diaphragm, decentering aperture diaphragm and half stop for oblique illumination; on interchange carrier 54. 53. - . . . . .	\$1,876.00	N58
553 214	Polarized light vertical illuminator, as described under catalog No. 553 215, however equipped with interchangeable filter polarizer 53. 55. - . . . . .	1,412.00	N59
553 167	Pair of objective centering keys (required if microscope is not equipped for transmitted light) . . . . .	\$ 14.00	N60
553 179	Objective centering collar (as replacement) . . . . .	29.00	N61

Refer to table on page No. 12 for reflected light objectives.

**INTERFERENCE FILTER ATTACHMENT**

553 097	Interference line filter 12.5nm , VERIL S 200 (400-700 nm) with graduated mount and diaphragm housing . . . . .	\$ 735.00	N62
553 099	Interference band filter 25nm , VERIL B 200 (400-700 nm) with graduated mount and diaphragm housing . . . . .	735.00	N63

**MISCELLANEOUS ACCESSORIES AND REPLACEMENT PARTS**

552 175	Fitted accessory case . . . . .	\$ 179.00	N64
512 173	Flexible plastic protective dust cover . . . . .	11.00	N02
514 027	Heat absorbing filter, unmounted . . . . .	\$ 22.00	N65
514 093	Daylight conversion filter CB 12, mounted . . . . .	23.00	N66
514 042	Diffusion disc N, mounted . . . . .	22.00	N67
542 131	Panchromatic green filter, mounted . . . . .	21.00	N68
500 974	Halogen bulb 12 volt, 100 watt . . . . .	6.00	P35
514 220	Lamp socket for 12 volt, 100 watt bulb . . . . .	47.00	P34

**SODIUM VAPOR LAMP**

563 073	Lamp housing with bayonet mounting device, lamp socket and Na 4 watt bulb . . . . .	\$ 293.00	N71
500 116	Power unit for sodium spectral lamp 4 watt, 220 volts, 60 cycles A.C. . . . .	244.00	N72
500 161	Step-down transformer for 110 volts, 60 cycles A.C. . . . .	134.00	N73
		<b>\$ 671.00</b>	
500 032	Na bulb 4 watt . . . . .	\$ 43.00	N74

**ALTERNATE ILLUMINATION SYSTEM**

**Note:**

When using light sources of high intensity, (Halogen 100W, Xenon, etc.) the microscope should be equipped with a condenser with pre-polarizer or prism polarizer.

**Caution:** Excessive heat from the illumination system will damage filter polarizers.

**LAMP HOUSING NO. 100 Z - HALOGEN 100 WATT**

514 309	Lamp housing, model No. 100 Z, with bayonet mounting device, centering mount, filter holder and adjustable two lens collector; lamp socket with halogen filament bulb 12 volt, 100 watt, heat absorbing filter KG 1, daylight conversion filter CB 12, diffusion disc N and green filter . . . . .	\$ 623.00	P58
500 189	Regulating transformer with ammeter 12 volt, 50-100 watt for connection to 110/120 volts, 60 cycles A.C. . . . .	216.00	P08
500 974	Halogen bulb 12 volts, 100 watts . . . . .	\$ 6.00	P35
514 027	Heat absorbing filter KG 1 . . . . .	22.00	P26
514 093	Daylight conversion filter CB 12, mounted . . . . .	23.00	P49
514 042	Diffusion disc N . . . . .	22.00	P21
542 131	Green filter . . . . .	21.00	P50
514 220	Lamp socket for 12 volt, 100 watt bulb . . . . .	47.00	P34
514 197	Two lens collector, 50mm diameter . . . . .	80.00	P54

**LAMP HOUSING NO. 250 - XENON 150 WATT**

514 155	Universal Lamp Housing Model No. 250 with filter changing device, reflector and two lens collector. Lamp socket, high intensity xenon burner XBO 150W and pair of protective goggles for use when adjusting the burner. Mirror housing No. 250S with bayonet mounts to accept the low voltage lamp and the model No. 250 lamp housing (514 025), beam splitter and swing-out deflecting mirror permitting rapid change from the low voltage lamp to the xenon XBO 150W lamp; including flexible plastic protective dust cover . . . . .	\$1,560.00	P77
514 040	Heat absorbing filter B1/K2, unmounted . . . . .	53.00	P16
514 031	Neutral density filter 0.2%, mounted . . . . .	32.00	P17
514 036	Neutral density filter 5%, mounted . . . . .	31.00	P18
514 041	Green contrast filter 1.5mm, VG 9, mounted . . . . .	31.00	P19
514 028	Diffusion disc R (grooved), mounted . . . . .	27.00	P20
514 042	Diffusion disc N (normal), mounted . . . . .	22.00	P21
514 416	Case for filters . . . . .	46.00	P22
050 230	Power supply for XBO 150W xenon lamp, regulated to supply constant current, maintaining light output +/- 1%; for connection to 100/130 volts, 60 cycles A.C. . . . .	782.00	P23
		<u>\$2,584.00</u>	
514 441	Paired neutral density eyepiece filters, NG 3 (for 30mm diameter eyepieces) . . . . .	\$ 41.00	P78
500 008	Xenon bulb XBO 150W . . . . .	\$ 94.00	P43
514 038	Lamp socket for xenon bulb XBO 150 . . . . .	161.00	P42
514 039	Pair of protective goggles . . . . .	\$ 5.00	P64
512 040	Protective dust cover . . . . .	10.00	P75

**LAMP HOUSING NO. 500 - XENON 450 WATT**

514 271	Lamp housing model No. 500 with filter changing device, diffusion disc N, lamp holder, centering reflector and collector with cooling device; ignition device, lamp socket, high pressure xenon burner XBO 450W and pair of protective goggles for use when adjusting the burner. Mirror housing 500 with built-in beam splitter for mixed light, three swing-out mirrors for mixed light and combined transmitted-reflected light illumination with the gas discharge lamp and bayonet mount for the reception of the lamp housing No. 100; flexible plastic protective dust cover for the lamp housing and ORTHOPLAN microscope . . . . .	\$2,808.00	PA01
514 261	Filter set for XBO 450W xenon lamp consisting of: Heat filter B1/K2, neutral density filter 0.2%, neutral density filter 5%, diffusion disc N (normal), diffusion disc R (grooved) and panchromatic green filter . . . . .	194.00	PA02
050 245	Rectifier 110 volts, 60 cycles A.C. with 17 and 25 amp settings . . . . .	1,241.00	PA03
		<u>\$4,243.00</u>	
514 210	Stray light shielding device . . . . .	\$ 73.00	PA04
514 441	Paired neutral density eyepiece filters NG 3 (for 30mm diameter eyepieces) . . . . .	41.00	PA05
500 031	High pressure xenon burner XBO 450W . . . . .	213.00	PA06
514 265	Lamp socket for XBO 450W xenon burner . . . . .	59.00	PA07
514 262	Diffusion disc N (normal), mounted (as included with basic equipment) . . . . .	30.00	PA08
514 040	Heat filter B1/K2, unmounted . . . . .	53.00	PA09
514 031	Neutral density filter 0.2%, mounted . . . . .	32.00	PA10
514 260	Neutral density filter 5%, mounted . . . . .	30.00	PA11
514 042	Diffusion disc N (normal), mounted . . . . .	22.00	PA12
514 028	Diffusion disc R (grooved) mounted . . . . .	27.00	PA13
514 259	Panchromatic green filter, mounted . . . . .	29.00	PA14
514 039	Pair of protective goggles . . . . .	5.00	PA15

**OPTICAL EQUIPMENT FOR LEITZ POLARIZING MICROSCOPES  
 ORTHOPLAN-POL - ORTHOLUX II POL - SM-LUX POL - HM-LUX POL**

**OBJECTIVES FOR TRANSMITTED LIGHT - FREE FROM POLARIZATION**

**CORRECTED FOR 170MM TUBE LENGTH**

TYPE OF OBJECTIVE	MAGNIFICATION/ APERTURE	Adjustment Length MM	Focal Length MM	Free Working Distance MM	Type of Eyepiece	Cover Glass Correction	Catalog Number	Price \$
Achromatic Dry Objectives	P 4x/0.12	45	32	24	P	DO	559 079	99.00
	P 10x/0.25	45	17	6.8	P	DO	559 054	133.00
	P 25x/0.50	45	7.2	0.44	P	D	559 130	224.00
	P 40x/0.65	45	4.6	0.42	P	D	559 110	275.00
Achromatic Immersion Objective	P Oil 100x/1.30	45	1.9	0.11	P	D	559 057	285.00
Fluorite Dry Objective	FI P 63x/0.85	45	3.0	0.15	P	D	559 097	400.00
Achromatic Plano Objectives PI P Series	PI (P) 1x/0.04	65.6	33	30	P	DO	559 065	553.00
	PI (P) 2.5x/0.08	45	56	11	P	DO	559 071	244.00
Achromatic Dry Plano Objectives NPL P Series	NPL P 6.3x/0.20	45	24	2.0	P	DO	559 058	383.00
	NPL P 16x/0.40	45	11	0.50	P	D	559 059	391.00
	NPL P 25x/0.50	45	7	0.38	P	D	559 060	436.00
	NPL P 40x/0.65	45	4.5	0.15	P	D	559 061	519.00
Achromatic Immersion Oil Objectives NPL P Series	NPL P Oil 100x/1.30	45	1.7	0.25	P	D	559 062	867.00

**NOTE:**

All objectives for transmitted light are corrected for a tube length of 170mm. These objectives are supplied with two different adjustment lengths of 37mm and 45mm. To achieve parfocality when combining objectives of 37mm and 45mm on the same objective carrier, it is required that all objectives with 37mm adjustment length be equipped with the following:

559 064	Intermediate adapter with negative lens	\$ 38.00	N75
512 027	Dust cap for unused positions of nosepiece	0.80	N76

**FOR COMPENSATORS PLEASE REFER TO SPECIAL PRICE LIST.**

**OBJECTIVES FOR REFLECTED LIGHT - FREE FROM POLARIZATION**

**CORRECTED FOR INFINITY**

TYPE OF OBJECTIVE	MAGNIFICATION/ APERTURE	Adjustment Length MM	Focal Length MM	Free Working Distance MM	Type of Eyepiece	Cover Glass Correction	Catalog Number	Price \$
Achromatic Dry NPL Plano Objectives	NPL 5x/0.09 P	40	50	12.5	P	DO	559 080	312.00
	NPL 10x/0.20 P	30	25	14.2	P	DO	559 109	300.00
	NPL 20x/0.40 P	30	12.5	0.86	P	DO	559 111	519.00
	NPL 50x/0.85 P	30	5	0.38	P	O	559 085	619.00
	NPL 100x/0.90 P	30	2.48	0.10	P	O	559 112	722.00
Achromatic Oil Immersion Objectives	Oil 20x/0.40 P	30	12.5	0.46	P	DO	559 083	425.00
	Oil 32x/0.65 P	30	7.8	0.30	P	O	559 084	436.00
	Oil 50x/0.85 P	30	5	0.35	P	O	559 086	621.00
	Oil 125x/1.30 P	30	2	0.28	P	O	559 087	824.00
*A Achromatic Oil Immersion Contrast NPL Plano Objectives	NPL Oil 5x/0.09 P	40	50	0.35	P	O	559 088	389.00
	NPL Oil 10x/0.20 P	30	25	0.19	P	O	559 089	361.00
	NPL Oil 20x/0.40 P	30	12.5	0.23	P	O	559 090	795.00
	NPL Oil 50x/0.65 P	30	5	0.22	P	O	559 091	929.00
*B Achromatic Methylene Iodine Immersion Contrast NPL Plano Objectives	NPL Meth Iod 5x/0.09 P	40	50	0.35	P	O	559 092	381.00
	NPL Meth Iod 10x/0.20 P	30	25	0.20	P	O	559 093	361.00
	NPL Meth Iod 20x/0.40 P	30	12.5	0.34	P	O	559 094	795.00
	NPL Meth Iod 50x/0.65 P	30	5	0.23	P	O	559 095	929.00

553 303 Intermediate ring 10mm (to parfocalize objectives of 30mm adjustment length with 40mm adjustment length objectives) . . . . . \$ 8.00 N77

- D: With cover glass D = 0.17 (cover glass thickness should be observed to within +/- 0.05mm)
- O: Without cover glass
- DO: Can be used with or without cover glass
- D1: Cover glass thickness 0.17mm should be observed accurately to within +/- 0.01mm, or should be accurately set with the correction mount where it varies from this value.
- H: Use HUYGENS eyepieces
- P: Use PERIPLAN eyepieces

\*These objectives are fitted with a rotating crystal plate in front of the front lens for:  
 A) Increase of contrast  
 B) Correction of reflectance

**OPTIONAL EQUIPMENT**

553 027 Set of six metal object slides, format 48 x 28mm . . . . . \$ 36.00 N78  
 563 035 Hand press with adjustable stop for levelling specimens . . . . . 136.00 N79

## EYEPIECES FOR LEITZ POLARIZING MICROSCOPES

Type	Magnification	Field of View MM	CATALOG NUMBER AND PRICE					
			Single	Price	Single for Pair	Price	Pair	Price
PERIPLAN	GF 10x <sup>+</sup>	18	559 034	162.00	*519 137	104.00	559 035	266.00
PERIPLAN	GF 10xM	18	559 034	162.00	519 126	118.00	559 070	284.00
PERIPLAN	GF 10xM	18	519 126	118.00	*519 137	101.00	519 127	219.00
PERIPLAN	GF 10xMM	18	519 126	118.00	519 126	118.00	519 281	236.00
PERIPLAN with 10 Point Counting Reticle	GF 10xM	18	519 313	172.00				
PERIPLAN with 20 Point Counting Reticle	GF 10xM	18	519 312	172.00				
PERIPLAN High Eyepoint	10xM	15	519 414	138.00	*519 413	121.00	519 415	259.00
PERIPLAN	GF 12.5xM	18	519 463	125.00	*519 462	108.00	519 453	233.00
PERIPLAN	GF 25 xM	10	519 141	163.00	*519 140	140.00	519 130	303.00
PERIPLAN with Reticle OM2 for ORTHOMAT W	GF 12.5xMF	18	519 467	190.00	519 463	125.00	519 458	315.00
PERIPLAN with Reticle for System Camera	GF 12.5xMF	18	519 465	190.00	519 463	125.00	519 456	315.00
Screw Micrometer (Metric)	16x	8.8	500 932	700.00				
Screw Micrometer (Inch)	16x	8.8	500 933	700.00				
Screw Micrometer (Metric) for Monochromatic Light	16x	8.8	500 938	726.00				

+ } = Adjustable eyelens and fixed crosslines (eyepiece reticles cannot be used with these eyepieces)

M = Adjustable eyelens and mount to accept reticles

\* = Fixed eyelens

### EYEPIECE RETICLES FOR M EYEPIECES 23.2MM DIAMETER

519 906	Eyepiece micrometer, 5mm = 100 divisions	\$ 53.00	Z83
519 905	Eyepiece micrometer, 10mm = 100 divisions	53.00	Z84
519 907	Eyepiece micrometer, 10mm = 200 divisions	53.00	Z85
519 932	Eyepiece micrometer, 0.4mm = 40 divisions	53.00	Z86
519 904	Crossline plate	\$ 53.00	Z87
519 910	Eyepiece micrometer, 10mm = 100 divisions and crosslines	\$ 53.00	Z88
519 903	Eyepiece net micrometer, 5 x 5mm divided into squares 0.5mm	\$ 53.00	Z89
519 912	Eyepiece net micrometer, 10 x 10mm divided into squares 0.075mm	53.00	Z90
519 914	Eyepiece net micrometer, 10 x 10mm divided into squares 0.2mm	53.00	Z91
519 900	Eyepiece net micrometer, 10 x 10mm divided into squares 0.5mm	53.00	Z92
519 901	Eyepiece net micrometer, 10 x 10mm divided into squares 1.0mm	53.00	Z93
519 902	Eyepiece net micrometer, 10 x 10mm divided into squares 2.0mm	53.00	Z94

### STAGE MICROMETERS

#### A) Transmitted Light

513 106	Stage micrometer on glass 2mm = 200 divisions with photographic scale	\$ 62.00	N13
513 107	Stage micrometer on glass with scale ruled on glass 1mm = 100 divisions	83.00	N80

#### B) Reflected Light

563 011	Stage micrometer on metal 1mm = 100 divisions	\$ 88.00	N22
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**NEW IMMERSION OIL nD 1.518 FOR USE IN FLUORESCENCE WORK AS WELL  
AS NORMAL INVESTIGATIONS**

513 449	Immersion oil nD - 1.518, 10 gram bottle . . . . .	\$ 3.50
513 445	Immersion oil nD - 1.518, 100 gram bottle . . . . .	6.00
513 447	Immersion oil nD - 1.518, 500 gram bottle . . . . .	27.00
513 448	Immersion oil nD - 1.518, 1000 gram bottle . . . . .	45.00

**IMPORTANT NOTE:**

Until further notice objectives:

- 519 383 PL APO 100/1.32 Oil
- 519 349 PL APO PHACO 100/1.32 Oil
- 519 160 PL APO 100/1.32 Oil

Still have to be used with the previously supplied oil as per catalog No. 513 363 (10 gram bottle) \$2.50, as the application of the new immersion oil would cause a considerable deterioration of the microscope image with the above mentioned objectives.

**PLEASE NOTE THAT THE NEW OIL MUST NOT BE MIXED WITH THE  
PREVIOUS TYPE**

Starting immediately, a bottle of immersion oil will no longer be automatically included with oil immersion objectives, but will have to be ordered as a separate item at a separate price.

# Interference contrast device T for transmitted light

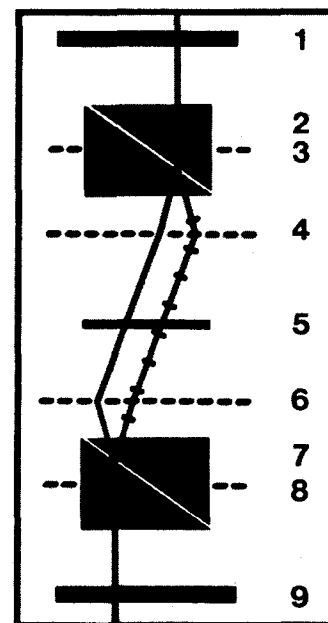
## Principles and Function

To keep the background of the image homogeneous, the cross-section of the bundle of rays must be made very narrow, i.e. parallel light must be used. Parallel light, i.e. a very small condenser aperture, however, is not welcomed by the microscopist, because this reduces resolving power considerably. In practice, therefore, an arrangement according to Fig. A is used, in which the condenser aperture is not reduced and the ability of the part rays to interfere nevertheless ensured.

The natural light emitted by the light source is linearly polarized by the polarizer 9. From there it passes to the Wollaston prism 7, which is arranged diagonally to the polarizer. In this position the linearly polarized ray is split into two part-rays vertically polarized to each other and of the same intensity, which diverge from each other. Since the point of divergence is situated in the focal plane 8 of the condenser 6, the angle split in the Wollaston prism becomes lateral in the object space. The part-rays therefore pass through the object 5 at two different points where their phase, too, is differently affected. The magnitude of the split has been chosen so that it is below the resolving power of the microscope. No visible double image is therefore produced in the microscope. The objective 4 recombines both part-rays in the rear focal plane 3. This is where the second Wollaston prism\* 2 is situated, which recombines the two part-ray bundles in space. They now pass through the analyser 1 and, brought to a common vibration direction, can now interfere. The interference color or intensity in each point of the image field depends on the phase difference of the two part-ray bundles and thereby on the thickness and refractive index of the two object points.

### Function of $\lambda$ - and $\lambda/4$ -plates

The  $\lambda/4$ -plate situated below the Wollaston prism, in combination with the rotating polarizer P, acts as a phase-advancing compensator. Together with the  $\lambda$  -plate which can additionally be inserted in the beam, brightness and color differences between surrounding field and object can be varied.



### TRANSMITTED LIGHT INTERFERENCE SYSTEM T

Interference contrast condenser T, with aperture diaphragm, centering mount and interchange carrier; rotating polarizer indexed at 90 degree intervals, revolving disc with three beam splitting prisms for the special objectives 25/0.50, 40/0.65 and Oil 100/1.30. The condenser has in one position, an additional light ring for the objectives PHACO NPL 10/0.25 and PHACO NPL 16/0.40.

Quintuple revolving and centerable nosepiece on interchange carrier and three permanently attached interference objectives with built-in Wollaston prism 25/0.50, 40/0.65 and Oil 100/1.30.

553 208	Transmitted light interference system T complete as described above for ORTHOPLAN-POL microscope . . . . .	\$4,957.00	XA16
553 271	Transmitted light interference system T complete as described above for ORTHOLUX II POL BK-MK microscope . . . . .	5,053.00	XA15
553 206	Transmitted light interference system T complete as described above for LABOLUX-POL and DIALUX-POL microscope . . . . .	4,774.00	XA13
553 207	Transmitted light interference system T complete as described above for ORTHOLUX-POL and PANPHOT-POL microscope . . . . .	4,922.00	XA14

### TRANSMITTED LIGHT INTERFERENCE SYSTEM T WITH PRE-POLARIZER

(Required when high intensity light sources are used)

553 272	Transmitted light interference system T complete as described above, however, equipped with pre-polarizer for ORTHOPLAN-POL microscope . . . . .	\$5,071.00	XA23
553 274	Transmitted light interference system T complete as described above, however, equipped with pre-polarizer for ORTHOLUX II POL BK-MK microscope . . . . .	5,174.00	XA25

**REFLECTED LIGHT INTERFERENCE SYSTEM R  
FOR LEITZ POLARIZING MICROSCOPES**

**Vertical Illuminators and Interference Polarizer - Pre-Polarizer**

**A) ORTHOPLAN-POL MICROSCOPE**

553 214	Polarized light vertical illuminator with infinity corrected optical system, plane glass plate and compensating prism on common axis, diffusion disc N and interchangeable filter polarizer rotatable through 90 degrees; objective changing clutch with five objective centering collars, slot to accept 20 x 6mm compensators and light entrance tube with field diaphragm, decentering aperture diaphragm and half stop for oblique illumination; on interchange carrier 54, 55. . . . .	\$1,412.00	N59
553 235	Polarizer with pre-polarizer for interference contrast . . . . .	814.00	W11
553 282	Case for interference contrast equipment . . . . .	63.00	W12

**B) ORTHOLUX II POL BK-MK MICROSCOPE**

553 249	Polarized light vertical illuminator with infinity corrected optical system, plane glass plate and compensating prism on common axis, diffusion disc N and interchangeable filter polarizer rotatable through 90 degrees; objective changing clutch with five objective centering collars, slot to accept 20 x 6mm compensators and light entrance tube with field diaphragm, decentering aperture diaphragm and half stop for oblique illumination; on interchange carrier . . . . .	\$1,437.00	W13
553 236	Polarizer with pre-polarizer for interference contrast . . . . .	814.00	W14
553 282	Case for interference contrast equipment . . . . .	63.00	W12

**C) SM-LUX POL MICROSCOPE**

553 233	Reflected light interference contrast vertical illuminator with aperture and field diaphragm, swing-out polarizer and quarter wave plate for contrast adjustment as well as swing-out Lambda plate for color interference contrast: built-in low voltage lamp 6 volts 15 watts . . . . .	\$1,176.00	W15
500 124	Regulating transformer with voltmeter for 6 volt 15 watt, 8 volt 5 watt or 6 volt 5 watt lamps; for connection to 110/120 volts, 60 cycles A.C. . . . .	174.00	W16

**OBJECTIVES FOR REFLECTED LIGHT INTERFERENCE CONTRAST**

**FREE FROM POLARIZATION - INFINITY CORRECTED**

TYPE OF OBJECTIVE	Magnification/ Aperture	Adjustment Length MM	Focal Length MM	Free Working Distance MM	Type of Eyepiece	Cover Glass Correction	CATALOG NUMBER	PRICE \$
ACHROMATIC DRY NPL PLANO OBJECTIVES	NPL 5x/0.09P	40	50	12.5	P	DO	559 080	312.00
	NPL 10x/0.20P	40	25	14.2	P	DO	559 109	300.00
	NPL 20x/0.40P	30	12.5	0.86	P	DO	559 111	519.00
	NPL 50x/0.85P	30	5	0.38	P	O	559 085	619.00
	NPL 100x/0.95P	30	2.48	0.10	P	O	559 112	722.00
ACHROMATIC OIL IMMERSION OBJECTIVE	Oil 125x/1.30P	30	2	0.28	P	O	559 087	824.00

**WOLLASTON PRISM - Required for Interference Contrast**

WOLLASTON PRISM	SM-LUX POL	PRICE \$	ORTHOLUX II POL ORTHOPLAN POL	PRICE \$
Intermediate adapter with Wollaston prism for NPL 5x	553 238	352.00	553 243	382.00
Intermediate adapter with Wollaston prism for NPL 10x	553 296	352.00	553 244	361.00
Intermediate adapter with Wollaston prism for NPL 20x	553 308	352.00	553 245	382.00
Intermediate adapter with Wollaston prism for NPL 50x	553 241	480.00	553 246	510.00
Intermediate adapter with Wollaston prism for NPL 100x	553 295	480.00	553 291	510.00
Intermediate adapter with Wollaston prism for Oil 125x	553 242	480.00	553 247	510.00