

Living up to Life

*Leica*  
MICROSYSTEMS

# Leica DM4500 P LED, DM2700 P, DM750 P

Breaking New Ground in Polarizing Microscopy



Brilliance  
Reliability  
Flexibility  
Documentation

Simply Precise

## Polarizing microscopes for geosciences and industry

### The Leica polarization microscope series

is designed for all polarizing examinations: petrography, mineralogy, structure characterization, asbestos analysis, coal analysis (vitinite reflection), and examination of liquid crystals. Leica's polarizing microscopes are ideal for a wide range of applications.

With versatile instrument options, Leica polarizing microscopes are also an ideal match for industrial analysis and quality control, such as analyzing glass, plastics and polymers, textiles and fibers or testing displays in the semiconductor industry. Leica microscopes always provide the most accurate and reliable results.

### Specifically designed for your application:

- Leica DM4500 P LED for research and development
- Leica DM2700 P for routine polarization applications
- Leica DM750 P for university and other instructional use

### Accurate results:

The Leica polarizing microscopes will show you how easy and reliable microscopy can be. Leica's convenient operating concept allows you to improve your workflow and concentrate entirely on the task at hand.

### Advantages that speak for themselves:

- Ultra-bright LED illumination on all Leica polarization microscopes for constant colour temperature at all illumination intensity levels
- 4fold, 5fold or 6fold centerable nosepiece
- Different conoscopic equipment that fits customer needs
- Comprehensive polarisation equipment to full fill special tasks
- Improved polarization contrast to obtain more information from a sample
- Easy operation for accurate sample evaluation in both orthoscopy and conoscopy
- Ergonomic design for user comfort
- Camera and software modules can be integrated for fast, easy, and reproducible documentation





# Leica DM4500 P LED

## The Microscope that Guides You

### • Your advantages at one glance!

- Coded 6 fold centerable Nosepiece for calibrated images
- Coded coded centerable and focussable bertand lense module.
- Build in 1.6x mag changer
- Automatic diaphragm setting and light intensity
- Constant Color Intensity by advanced LED technology
- Condenser cap swings in and out automatically



Designed for use in research and development: the new Leica DM4500 P LED – polarizing microscopy has never been easier.



For the most precision: the Leica DM4500 P LED's rotating stage

### The right diaphragm – automatically

The Leica DM4500 P LED automatically detects which contrast method and objective are being used. This provides valuable consistency and reproducibility for your research. Manual diaphragm setting is no longer required, either in the transmitted light or incident light method. You can concentrate on your work – the Leica DM4500 P LED takes care of the rest for you.

### Always in the right light

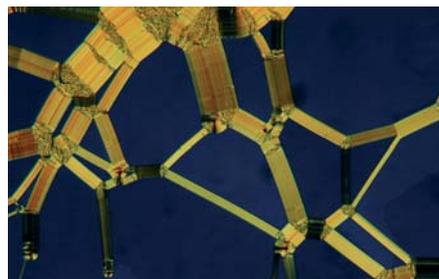
Light intensity automatically adjusts to the objective. Image brightness remains constant when switching objectives, which eliminates glare. You can always adjust the light intensity manually as well.

### Constant color temperature

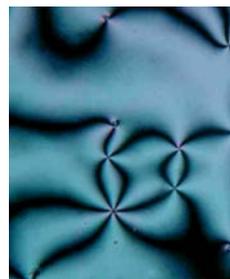
The Leica DM4500 P LED transmitted and incident light axis are now equipped with state of the art high-power LED illumination, contrastable to 100 W halogen lamp. The long lifetime LED with at least 50.000 h is suitable for all incident and transmitted light contrasting methodes. By the constant colour temperature at all light intensity levels the object appears always at its real colour. Permanent white balancing on camera is not longer required.

### The correct condenser setting – immediately

All condensers are designed with condenser heads that are perfectly matched optically and automatically swing in and out depending on the objective magnification. They are effective from 1.25x–100x magnification.



Oily strikes of a cholesteric liquid crystal mixture. Crossed polarizers, magnification 10x.



Defective texture in planar liquid crystal. Crossed polarizers, magnification 10x.

Images courtesy of Dr. Toralf Scharf, Institute of Microtechnology (IMT), University of Neuchâtel

### All settings at a glance

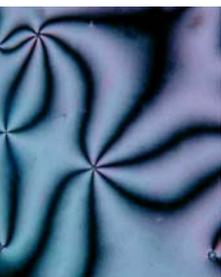
You can see all microscope settings at a glance on the easy-to-read, integrated display: information such as contrast method, orthoscopic or conoscopic mode, objective, diaphragm setting, and light intensity are clearly indicated. With this feedback, results can easily be reproduced.

### Easily assign function buttons

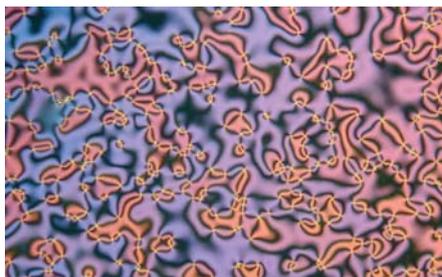
You can assign the function buttons to any function you want – no programming skills are required. Six conveniently located buttons behind the focus knobs provide fast and easy access to the functions you use most.

### Perfect interaction of all functions

The interaction between the display and coding of the individual modules allows the microscope to guide your work. With just one look at the display, all relevant information is at your fingertips. For example, the display indicates when to swing the conoscopy module into or out of the beam path. You have the ability to adjust the light and diaphragm values to obtain the best conoscopic image at any time.



Well aligned liquid crystal sample. Magnification 10x.



Liquid crystal, defective texture in a hybrid aligned cell. Crossed polarizers, magnification 5x.

- **Conveniently arranged functions:**
  - Convenient display
  - Variable, programmable function buttons
- **Great optical quality for crystal-clear results:**
  - Improved conoscopy module
  - Precise orthoscopy
- **State-of-the art functions:**
  - Microscope guides you to the next work step
  - Displays current operation status



Everything seen on the display of the Leica DM4500 P LED is saved automatically. This allows you to reproduce the settings at any time.



The long lifetime LED with at least 50.000 h is suitable for all incident and transmitted light contrasting methods.

# Leica DM2700 P

## The Microscope that Adapts to Each User

- **Your advantages at one glance!**

- Constant colour temperature by advanced LED technology
- Build-in incident light oblique illumination
- Height-adjustable focus knobs
- Color-coded objectives and condenser diaphragms match lenses
- Integrated focus stop prevents objective/sample collisions

### **Comfortable and relaxed work**

No two people are alike. The Leica DM2700 P ensures that every user can work at the microscope in a relaxed manner. The height of the microscope's focus knobs can be individually adjusted to fit each user's exact hand size, which prevents hand, arm, and shoulder tension and ensures a comfortable and fatigue-free posture.

### **Efficient and reproducible microscopy**

Color-coded lenses match the color-coded field and aperture diaphragm adjustment (CDA), to ensure that the illumination conditions are always matched to the objective. Using a manual microscope has never been easier. With CDA, the Leica DM2700 P offers a level of reproducibility that is one-of-a-kind in its class.

### **Reliably and accurately adjusts to your sample**

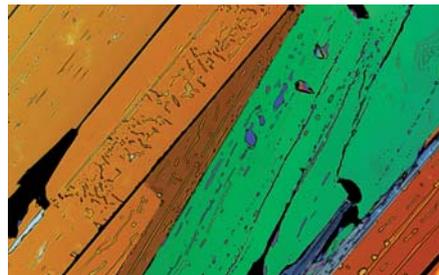
The built-in focus stop protects your samples and the front lens of the objective. For samples of equal height, the focus stop makes the focusing plane easier to reconstruct so you can concentrate entirely on your application.



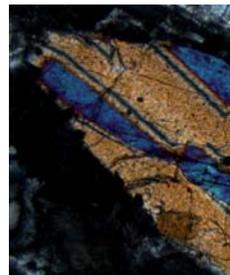
The Leica DM2700 P will show you how easy and reliable polarizing microscopy can be.



Ergonomically designed to the last detail: you can adjust focus knob height to match your hand size.



DMT, crossed polarizers, magnification 20x.



Orthopyroxine, crossed polarizers, magnification 20x.

Images courtesy of Kay Scheffler, Leica Microsystems

### Versatile and adaptable

You have a choice of two conoscopy modules to supplement the Leica DM2700 P. The advanced conoscopy module with a centerable, focusable Bertrand lens and extended field of view has been designed for advanced requirements in conoscopy. As an economical alternative, Leica offers the standard conoscopy module with a pre-focused, centerable Bertrand lens, built-in analyzer, and integrated pinhole for examining small grains.

The 4-position polarization incident light axis is ideally suited to research applications. Reflected light contrast methods such as brightfield according to Smith, oblique illumination, quantitative polarization (POL) or fluorescence (Fluo) – provide ideal imaging conditions for mineralogical or geological examinations. A centerable Bertrand lens module is also available for conoscopy.

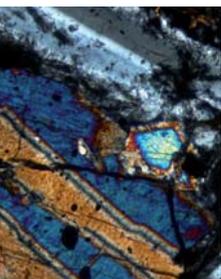
The 5-position objective nosepiece provides individual centration for each objective, and two rotating stages are available. A 45° stage rotation with click stop is optional.

### Flexibility to meet your needs:

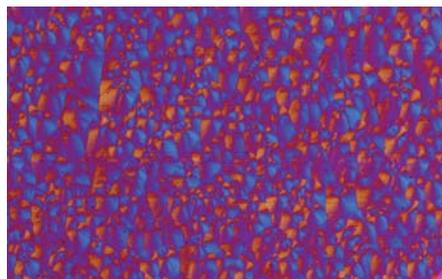
- Choice of Bertrand lens modules
- Orthoscopy
- 4-position Pol incident light axis
- 5-position, centerable objective turret



A first on the world market: build-in oblique illumination and correct diaphragm setting at all times – the Color-coded Diaphragm Assistant helps set the diaphragm values needed.



polarizers,



Polyaethylen foil, crossed polarizers with lambda plate, magnification 20x.



Developed for everyday use on the Leica DM2700 P – the new POL rotating stage with 45° click stop to indicate the illumination positions.

# Leica DM750 P

## The Microscope for Teaching

- **Your advantages at one glance!**

- Conoscopy modules
- Constant colour temperature by LED technology
- Large 178 mm diameter stage with 360° scale
- Sturdy, compact design with Handle and cord wrap allows easy carrying, easy lifting, and protection against microscope component damage
- Polarizer with notch markings
- 4-position objective turret, centerable
- Easy-to-access control functions
- Ergonomic viewing angle
- Accurate angular measurement with verniers on the rotating stage

### **Accurate and versatile for teaching**

The Leica DM750 P is the ideal polarizing microscope for university and other instructional use, offering a standard and an advanced Bertrand lens module for unsurpassed ease of operation. With a wide range of accessories and Leica's renowned optics, the Leica DM750 P is exceptional not only for its compact, durable design, but also for its efficiency and ease of operation.

### **Designed for optical brilliance and long life illumination**

LED illumination provides cool, white light with a life-time of over 20 years average use. No longer need to change lamps during lab time and save the expense of replacement lamps. The standard Köhler field diaphragm for optimum illumination and contrast provide vivid, pin-sharp images. Patented time delay shutoff saves energy by automatically turning off the illumination after 2 hours of no use. Based on the same optical platform as Leica Microsystems' research microscope line, students enjoy outstanding optical performance and full access to virtually all accessories from the Leica Microsystems microscope product line.



Developed for college teaching and research use: the Leica DM750 P.



Maximum ease of use and high optical brilliance are the outstanding features of the Leica DM750 P.

# Camera and Software Modules Complete the System

## **Ready to expand at any time**

To seamlessly interface with the new Leica polarizing microscopes, Leica offers a comprehensive camera and software solution for fast, convenient documentation of your work. You can expand your system at any time using Leica's cameras and application-specific software modules. All future software and hardware components from Leica will operate on a uniform interface.

## **Archiving and documentation is easy**

The basic core functionality of the Leica Application Suite (LAS) is provided with every Leica microscope and digital camera as part of an integrated system solution. Together, the combined system provides an intelligent, automated microimaging environment. LAS is the basic software for microscope configuration and control, and provides a platform for acquiring, analyzing, and processing the highest quality digital images.

## **LAS Reticule for comparison and measurement**

The LAS Reticule application provides electronic tools for displaying live images and overlaying different types of measuring reticules. LAS Reticule provides visual feedback about the approximate size of the field of view. In this way, object size comparisons and distribution measurements can be carried out quickly and effortlessly.

## **Advanced interactive measurement**

The Interactive Measurement module of the Leica Application Suite has been designed for particularly difficult measurements. Using this module, samples can be individually counted and assigned to an identified class as well.

## • **Leica's complete polarizing microscope systems integrate the following components:**

- Leica polarizing microscope
- Leica Digital FireWire Camera (DFC)
- Leica MC Cameras (USB)
- Leica Application Suite (LAS) software



# Modular, Customized Configurations – Microscopes Designed for You

- **Flexibility that gives the freedom you need for qualitative and quantitative polarization:**
  - Wide selection of POL objectives
- **Special objective series for:**
  - Asbestos analysis according to NIOSH Methode 9002 (PLM) and 7400 (PCM)
  - Coal inspection (Vitrinite reflection)
- **Compatibility that knows no bounds:**
  - Fully compatible components across Leica's polarizing microscope product line
  - Wide selection of analyzers, polarizers, and compensators
  - Full wave & quarter wave plates are available
  - Wide selection of POL observation tubes



The result of combining maximum precision and optimum ergonomic design – the 360° analyzer.



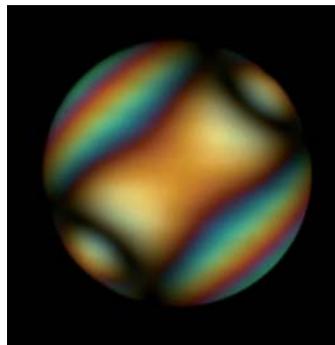
Flexibility is key. All of Leica's rotating stage polarizing microscopes feature attachable, interchangeable mechanical stages.

## Flexibility – Designed for you

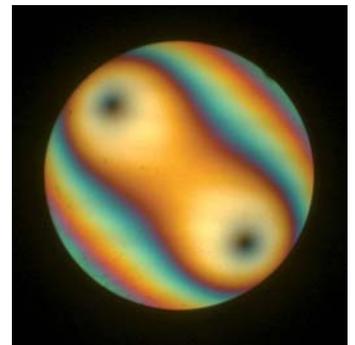
Flexible to the last detail. All Leica polarizing microscope components can be configured for all microscopes in the polarizing line. For example, you can choose from over twenty POL objectives for the Leica DM4500 P LED, DM2700 P or DM750 P. The optical possibilities are unlimited. You will enjoy the benefits provided by this complete system when choosing the equipment that fits to your needs out of more than 10 different polarizers and analyzes designed for special tasks. All components can be used for classroom teaching, everyday routine work, and research.

Leica's entire line of DIN standard compensators can be used in all Leica polarizing microscopes, as can the attachable mechanical stage for accurate sample positioning. This always ensures flexible interchange and replacement of parts.

3rd party equipment like heating stages for industrial (melting point determination) or geoscientific research (fluid inclusion rating) application can be easily attached to the microscope. For detailed investigation of coal quality, pigment analysis or hair and fiber analysis dedicated photometer or spectrometer equipment can be retrofitted also to existing microscope configuration. Please ask your local Leica representative for further information.



Muscovite, conoscopic image, linear polarized light



Muscovite, conoscopic image, circular polarized light

# Technical Data

	Leica DM750 P	Leica DM2700 P	Leica DM4500 P LED
• <b>Objective turret</b>	4x (M25), centerable	5x (M25), centerable	6x (M25), centerable, absolute encoded
• <b>Objectives</b>	HI Plan POL N Plan POL  Immersion objectives	HI Plan POL N Plan POL PL Fluotar POL Immersion objectives	HI Plan POL N Plan POL PL Fluotar POL Immersion objectives
• <b>Usable field of view</b>	20 mm	25 mm	25 mm
• <b>Contrast method Changeover Color reproduction</b>	Manual	Manual	Motorized CCIC: Constant Color Intensity Control
<b>Transmitted light</b>	Polarization contrast Orthoscopy Conoscopy Brightfield Phase contrast Darkfield	Polarization contrast Orthoscopy Conoscopy Brightfield Phase contrast DIC Darkfield	Polarization contrast Orthoscopy Conoscopy Brightfield Phase contrast DIC Darkfield
<b>Incident light</b>	Polarization contrast Brightfield Oblique illumination	Polarization contrast Brightfield Darkfield* DIC Fluorescence Oblique illumination	Polarization contrast Brightfield Darkfield* DIC Fluorescence
• <b>Conoscopy</b>	Bertrand lens cube in new IL axis Bertrand lens module (AB module) Advanced conoscopy module	Bertrand lens cube Bertrand lens module (AB module) Advanced conoscopy module (manual)	Fully integrated conoscopy beam path, additional 1.6x mag. changer, coded User guidance with display feedback Advanced conoscopy module (manual)
• <b>Transmitted light axis illumination</b>	Build-in LED illumination 2 hour Auto off (can be disabled or enabled)	High power LED	High power LED
<b>Operation</b>	Manual User guidance with CDA	Manual User guidance with CDA	Motorized Integrated illumination manager
• <b>Incident light axis</b>	Manual 4-segment LED illumination for BF, Pol and oblique contrast User guidance with CDA	Manual, High power LED User guidance with CDA	Motorized, High power LED Integrated illumination manager, round and rectangular field diaphragms for ocular or camera observation
• <b>Condensers</b>	Manual changeover User guidance with CDA	Manual changeover User guidance with CDA	Motorized changeover of condenser head, 7x condenser disc, polarizer
• <b>Focus drive</b>	Manual, 2-gear gearbox	Manual, height-adjustable, Focus stop, 2 or 3-gear gearbox Motorization on request	Manual, 2-gear gearbox Motorization on request

\* on request

The statement by Ernst Leitz in 1907, “*With the User, For the User,*” describes the fruitful collaboration with end users and driving force of innovation at Leica Microsystems. We have developed five brand values to live up to this tradition: Pioneering, High-end Quality, Team Spirit, Dedication to Science, and Continuous Improvement. For us, living up to these values means: **Living up to Life.**

Leica Microsystems operates globally in three divisions, where we rank with the market leaders.

#### LIFE SCIENCE DIVISION

The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement, and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems’ customers at the leading edge of science.

#### INDUSTRY DIVISION

The Leica Microsystems Industry Division’s focus is to support customers’ pursuit of the highest quality end result. Leica Microsystems provide the best and most innovative imaging systems to see, measure, and analyze the microstructures in routine and research industrial applications, materials science, quality control, forensic science investigation, and educational applications.

#### MEDICAL DIVISION

The Leica Microsystems Medical Division’s focus is to partner with and support surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

Leica Microsystems – an international company with a strong network of worldwide customer services:

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Denmark · Ballerup	+45	4454 0101	4454 0111
France · Nanterre Cedex	+33	811 000 664	1 56 05 23 23
Germany · Wetzlar	+49	64 41 29 40 00	64 41 29 41 55
Italy · Milan	+39	02 574 861	02 574 03392
Japan · Tokyo	+81	3 5421 2800	3 5421 2896
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