



# Leica M205 A, M205 C, M165 C & M125

Experience another dimension in stereomicroscopy with the new, high performance stereomicroscopes from Leica.

Living up to Life

**Leica**  
MICROSYSTEMS



Leica

LEICA M205 A

Leica

Overview | Position | Back | Load | Policy

Focus

Speed | Auto

Zoom

Settings

FOV 144mm

DOF 34mm

Autofocus 100µm

30x 200x

KL: auto | KL: 45 | Fokus: inf | Fokus: 0

OB4.6x



# A Step Towards Infinity



Ever since their introduction by Horatio S. Greenough, stereomicroscopes have worked according to the optical principles based primarily on Ernst Abbe's research. For over a century, ingenious optics designers and engineers have worked to push magnification, resolution and image fidelity to the limit permitted by optics. In doing so, they have always been constrained by the interrelation between three factors: the higher a microscope's resolution, the lower the available working distance. If one increases the distance of the optical axes, the three-dimensional image seen by the observer becomes distorted a cube then becomes a tower, a flat surface curves towards the observer.

## **Limits are made to be broken.**

LeicaM205A and M205 C are the first stereomicroscopes in the world that can offer a 20.5:1 zoom. This accomplishment, however, was not enough for Leica's engineers. With the new FusionOptics™, they have succeeded in taking yet another step beyond previous limits. Besides the greater magnification, they have also increased the resolution to 1050lp/mm, which corresponds to a resolved structure size of 476nm.

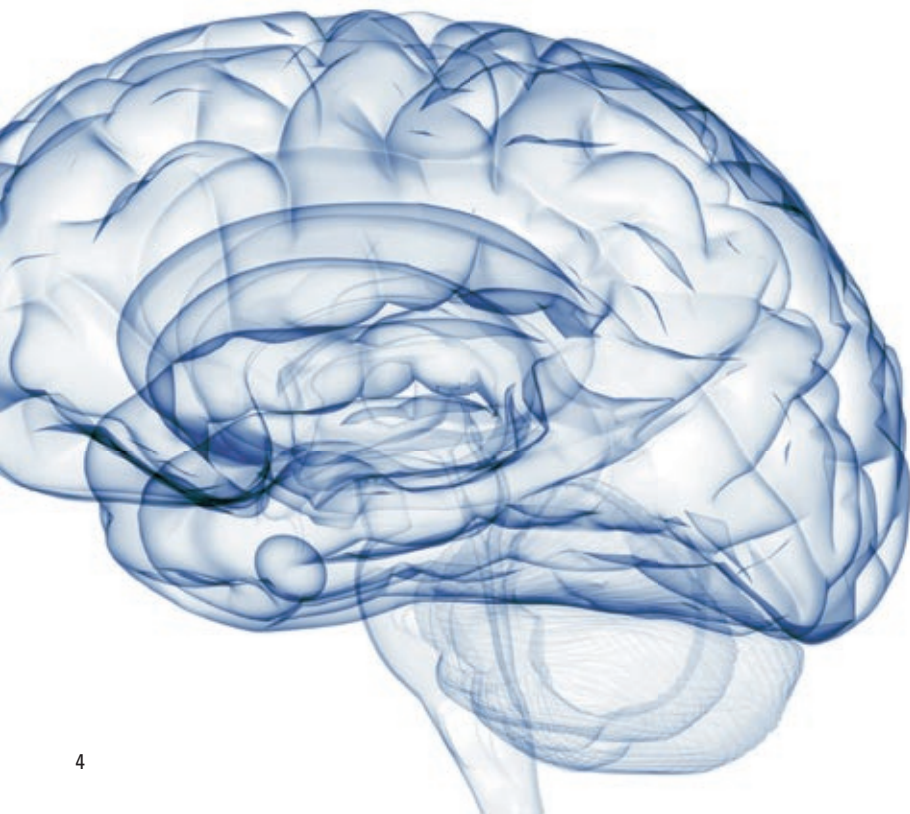
Of course, this performance increase is reflected in your daily work: Set up your specimens on the microscope table with comfortable freedom of movement and discover details that were previously unrevealed, even in stereomicroscopy.



The human brain is a fascinating piece of work. Using the data it receives from both eyes, it calculates a three-dimensional image of our environment in an unceasing stream. What is truly remarkable, however, is the brain's ability to gauge situations with lightning speed based on the information it receives, and to react to such situations appropriately.

#### **Brain jogging with the Leica M205 A and M205 C**

The new Leica M205 A and M205 C stereomicroscopes with FusionOptics™ rely on the unsurpassed adaptability of the brain. The microscope assigns a different task to each of the two beam paths: the right channel contains an image with very high resolution, while the left channel provides very high depth of field. The brain then automatically gathers the best information from both sources and uses it to compose one image with very high richness of detail and depth of field.



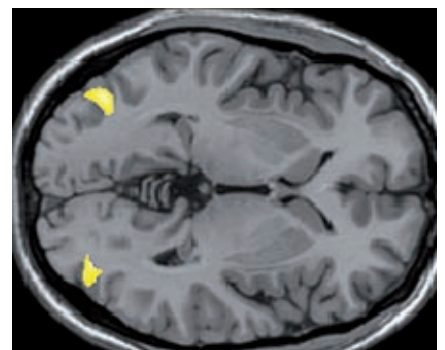
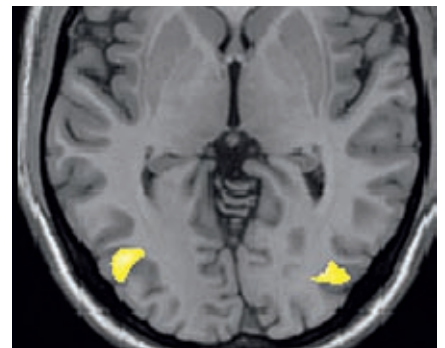
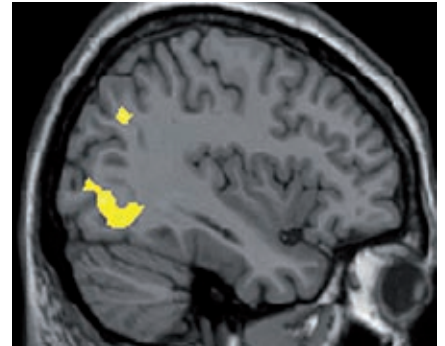
# Juggling Increases Brain Size

Previous studies assumed that humans build brain mass during childhood, develop neurological networking through training in adolescence, can at best maintain this complexity during midlife, and will unavoidably experience diminished mental performance with increasing age.

Now, a study led by Dr. Arne May\* of the University of Regensburg has shown that certain regions of the adult brain have the ability to build brain matter through training. In a group of laypersons who practiced juggling over a three-month period, structural changes in the cerebral cortex were identified after the training period. Astonishingly, the new brain matter formed primarily in the two areas that are responsible for vision and touch. Obviously, the difficulty in juggling lies in visually capturing and analyzing the balls' movements.

Leica FusionOptics™ takes advantage of the flexibility of our brains, and as an added benefit improves mental performance capability.

\* Dr. Arne May, "Juggling boosts adult brain power",  
<http://www.uni-protokolle.de/nachrichten/id/28051/>



The areas marked in yellow are the regions in which new brain matter was shown to have been created. Courtesy of Dr. Arne May (University Clinic Hamburg)





**Leica M205 A: the top-of-the-line stereomicroscope for the fully automated complete system**

With digitally controlled zoom, focus (with the new motorized focus drive) and iris diaphragm, a Leica DFC camera, the motorized mechanical stage and versatile software modules of the Leica Application Suite (LAS), the Leica M205 A is capable of accepting any settings and performing any analysis expected of a stereomicroscope with a few clicks of the mouse.

Of course, this directly affects your daily work: frequently used microscope settings can be restored with a few mouse clicks, time-consuming serial examinations, of relatively large specimens, can be programmed once in the computer and can then be allowed to run automatically whenever necessary.

**Leica M205 C: advance into unexplored territory with FusionOptics™**

It does not matter if you need a large work surface with lots of room for handling specimens or analyzing the tiniest details, which were previously detectable only with a light microscope: with the extraordinary FusionOptics™ zoom, Leica Microsystems has set a new standard for stereomicroscopy.

What was previously thought to be an optical impossibility is now reality in the Leica M205 C. The zoom range of 7.8×–160×, objectives from 0.63×–5×, and an enormous selection of accessories make this a system that performs superbly in any application.



# The New Leica M-Series: A Solution for Every Task



## **Leica M165 C: Classic stereomicroscopy of the highest order**

For those who wish to continue working with classic stereomicroscopes, the Leica M165 C is equal to almost every need. The optical principle of two symmetrical channels is the same as that of the Leica MZ16, but the zoom range and numerical aperture have been increased to 16.5:1.

Of course, the Leica M165 C is also compatible with the full range of cameras, objectives, tubes, bases and accessories. This means not only that you are sure to find a configuration solution for almost any task you have now, but you can also be confident that you will always be able to take advantage of the latest advances in the Leica M series in the future.

## **Leica M125: one instrument for many tasks**

Supreme performance is not always the most important requirement: in many routine situations, you simply need a microscope that is exceptionally tough and reliable, and compatible with a wide range of accessories. Of course one feature cannot be compromised: the best possible optical quality.

With a magnification range of 8×–100×, the Leica M125 is ideal for many applications that may be useful to you: from presorting mechanical components to analyzing plastics and detailed inspection of printed circuit boards, the Leica M125 provides consistently high-quality, detailed images of your specimens.



LEICA M205 C

Planapo 1.0x

Planapo





# You Can Have It All at Once

## **High magnification with great ergonomic benefits**

Conventional stereomicroscopy gives users a choice: they must choose high resolutions and richness of detail, or opt for a larger working distance to be able to manipulate the work specimen. The higher a microscope's resolution, the less free room there is between specimen and objective.

The Leica M205 A and M205 C uses one 1× objective to advance into magnification ranges that were previously only possible with high magnification objectives. This has a directly positive influence on your daily work: the Leica M205 A and M205 C can resolve structures of less than one micrometer. At the same time, the user has a clearance of 61.5mm manipulating specimens. Sorting and processing even for the smallest details can be carried out easily without changing objectives.

## **APO for all**

To take full advantage of the performance capabilities of these new instruments, all new M-series components are corrected exclusively apochromatically. At last, color fringes can be consigned to history once and for all.

# Up to Your Tasks. Put Us to the Test!



Whenever human lives may be affected, technology must be 100% reliable. For this reason, auto-pilots in airplanes and trigger mechanisms in airbags, for example, are subjected to stringent materials testing. This testing includes a wide variety of methods used to measure the behavior and material characteristics of standardized material samples or finished parts (component testing) under thermal, mechanical and chemical stress. During the tests, a material is checked for purity, faults or load capacity.



With the Leica M205 A, M205 C, M165 C and M125 stereomicroscopes, experts in the materials test laboratory can delve into even smaller structures. Thanks to the unique FusionOptics™ system on the Leica M205 A and M205 C, for the first time ever in stereomicroscopy, increased depth of field can be combined with higher resolution.

With the electronic coding that is applied for all components involved in imaging, the tester can eliminate practically all sources of error associated with measurement applications, and reproduce his test settings at any time. Using the Leica Application Suite (LAS), you can read out all relevant data, store images in an image database and measure and analyze them using the computer. The two new light sources, LED5000 MCI™ (Multi Contrast Illumination) and LED5000 RL offer a wide variety of adjustment and automation options. Along with the automated mechanical stage and the new M-series, they form a complete system. Not only does this help to avoid errors, it also saves time, one of the most important advantages offered by the new Leica M205 A, M205 C, M165 C and M125.

Brush marks on metal section

Through-connections on printed circuit board

Section through soldered joint

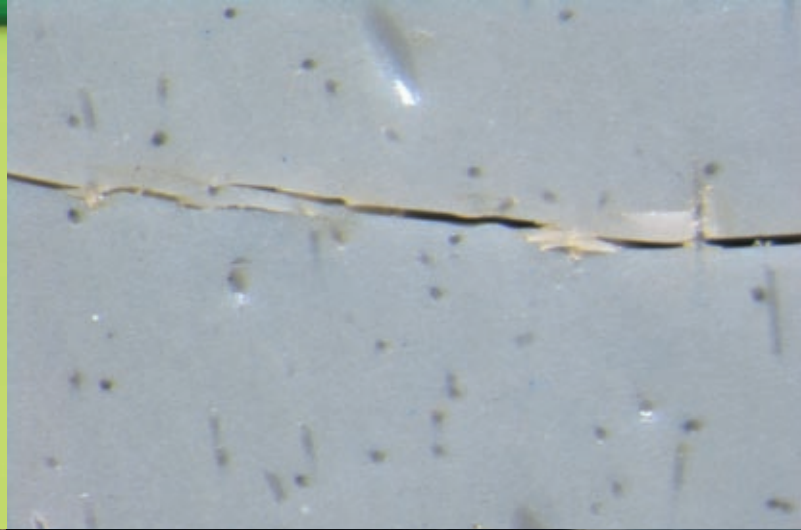
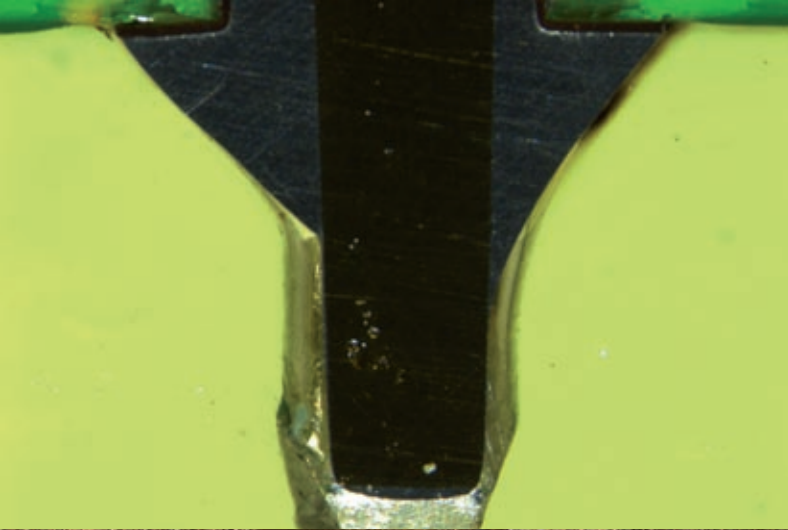
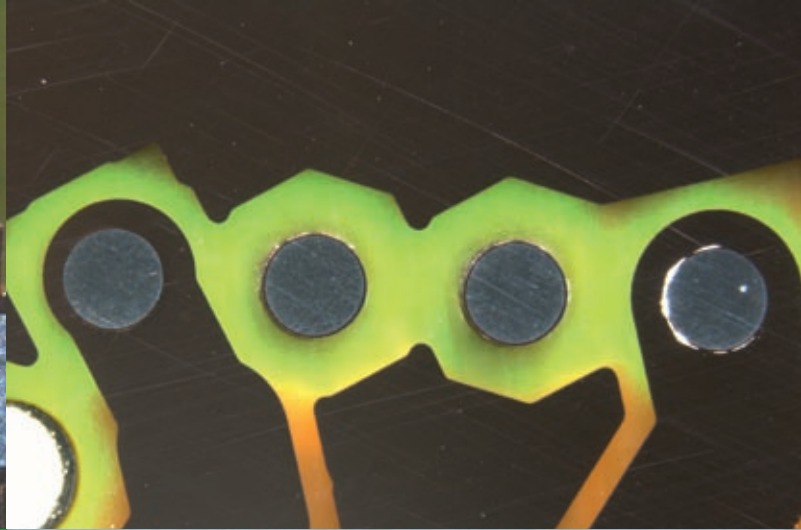
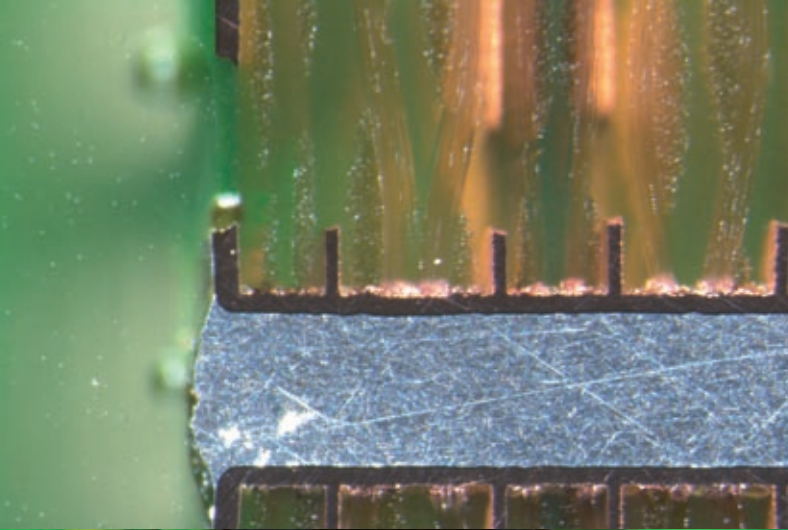
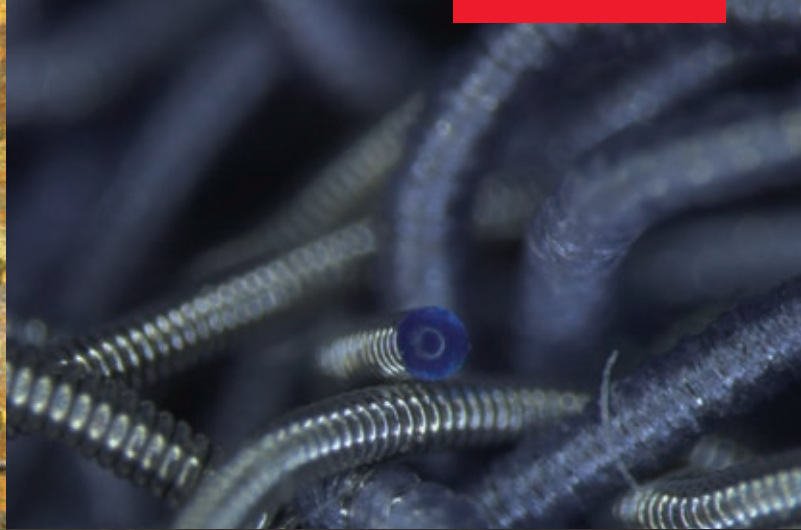
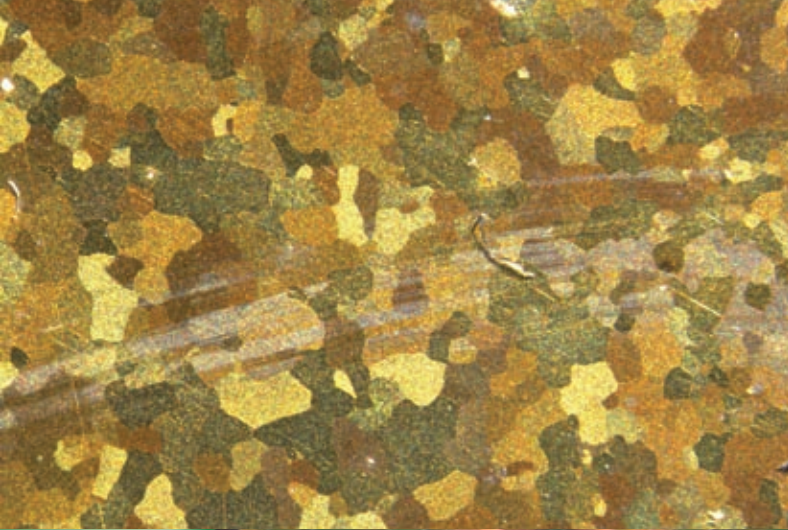
Cutout of clockwork

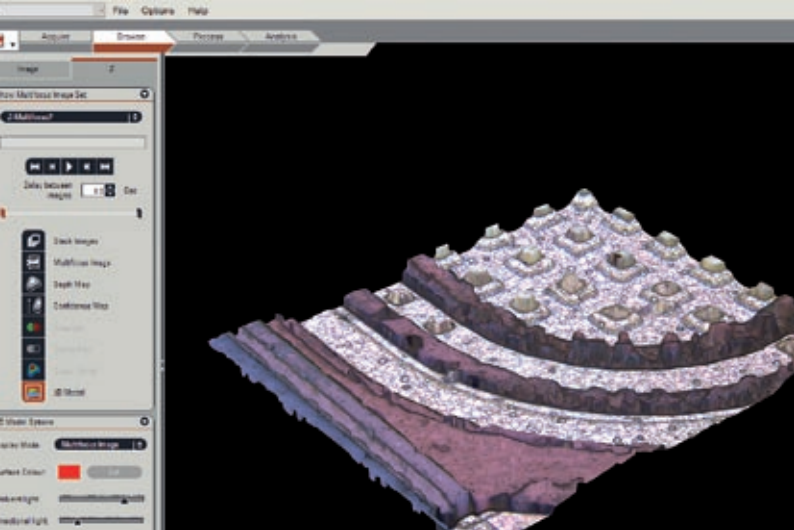
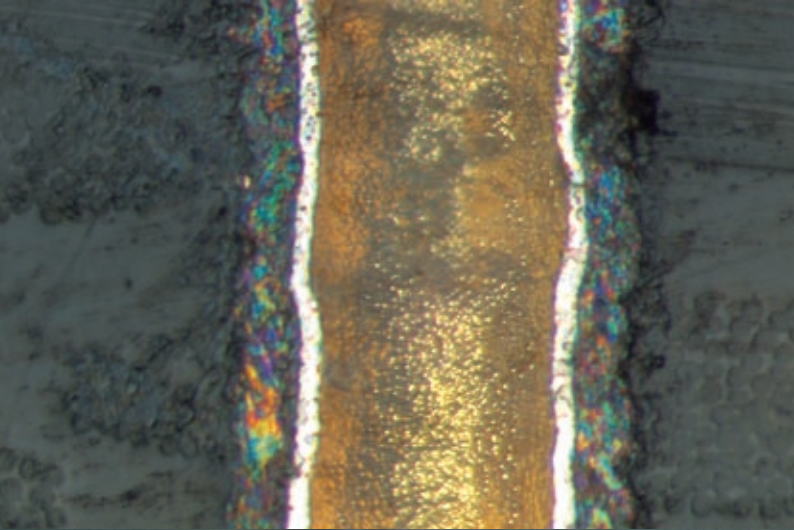
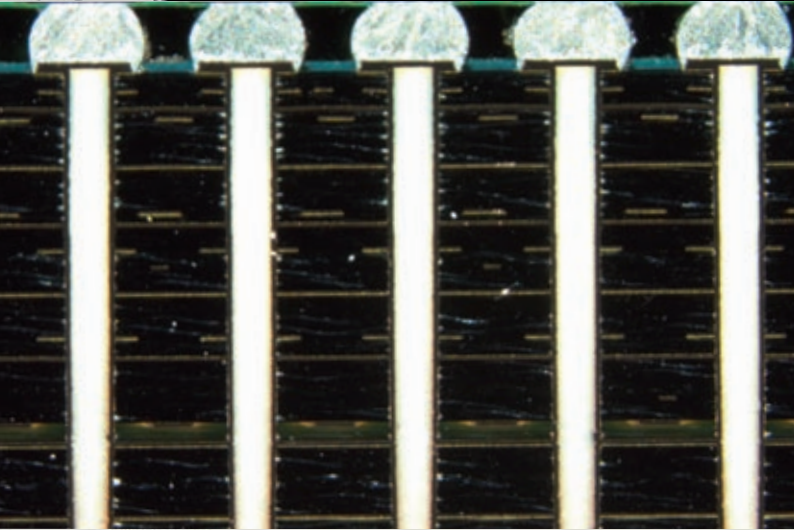
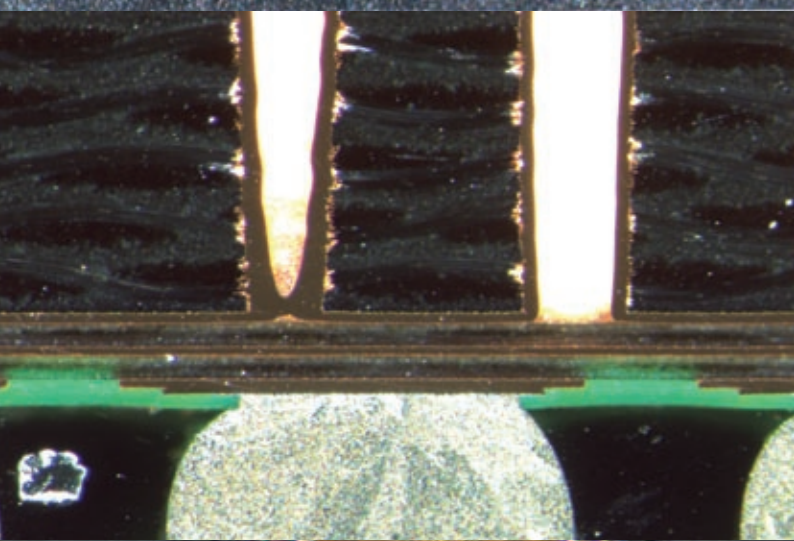
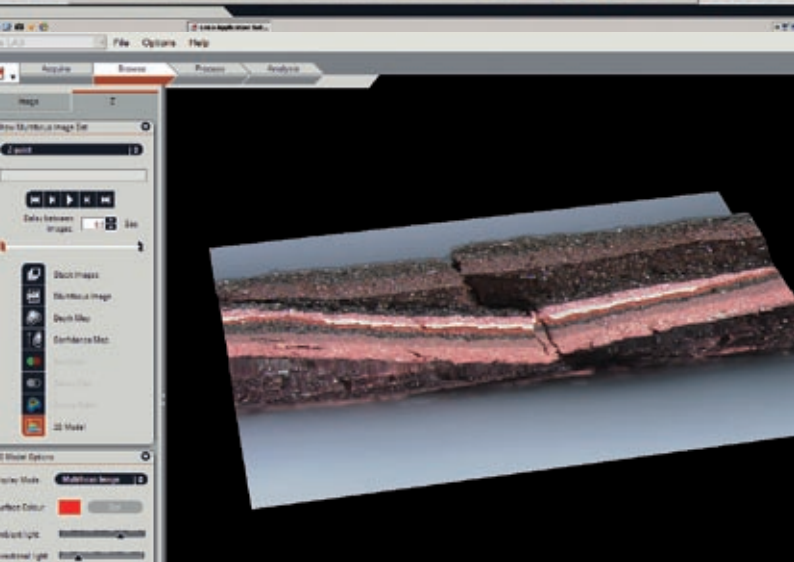
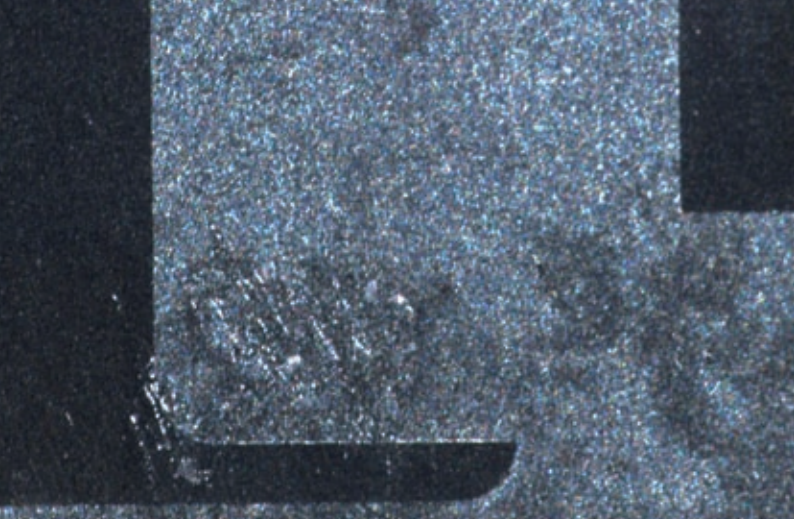
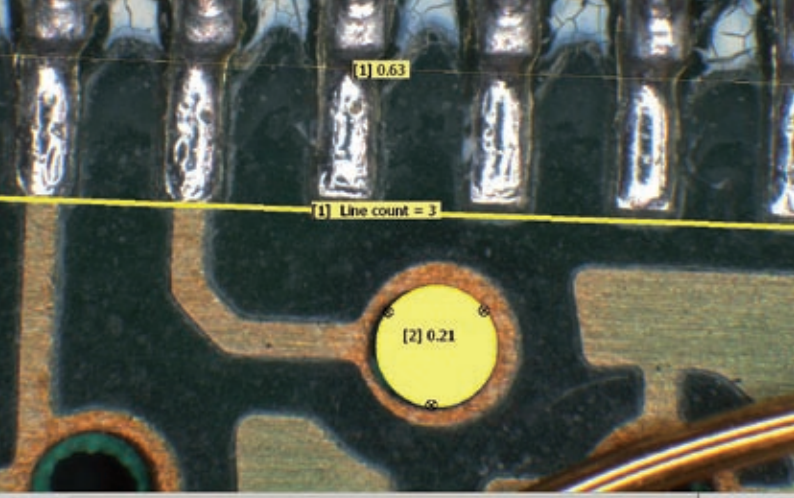
Medical implant

Defective through-connection

Microcrack through composite material

Cut through crimp contact





# Leica Application Suite: the Cerebrum for Your Data

## **Integrated complete solution**

The Leica Application Suite (LAS) combines automated microscopes, digital cameras, illumination and software from Leica in a single environment for a consistent, user-friendly imaging solution with incomparable performance. Thanks to its versatility, the Leica Application Suite can be used for an exceptionally wide variety of applications. With its wide range of image processing functions, the LAS cuts down the time required for displaying, processing, measuring and documenting digital images. The software monitors all Leica components that are connected to the computer, such as the stereomicroscope, objective changer, DFC camera, LED5000 illumination and motorized cross-stage. The data thus obtained are processed in LAS; to do so, all installed modules communicate with each other. Thus LAS is an intuitive solution that makes both routine and research analysis easier.

## **Features at a glance:**

- LAS increases productivity by integrating microscopes, digital cameras and application software in order to coordinate imaging tasks using an intelligent control system.
- LAS automates the digital microscopy environment with the computer-aided functions of Leica microscopes.
- Just one application does everything: recording, storing and commenting; it can also display high-quality images in a thumbnail gallery.
- High modularity – software that keeps pace with your tasks.

# Technical Highlights

## Leica M205 A, M205 C, M165 C, and M125



The digital display of the Leica M205 A shows all essential settings at a glance



A new, extremely stable focusing column ensures the quality of high magnification



Contacts of internal instrument encoding



The objective nosepiece also conforms to the highest standards applied to the magnification range without tedious refocusing



The LED5000-RL ring light is one of the new, fully integrated illumination components and can be controlled entirely on the device itself or via the Leica Application Suite

### Stereomicroscope with the highest zoom

- 20.5:1 zoom allows overview and detail observation using one instrument

### Numerical aperture of 0.35 (with 2× planapochromatic objective)

- One-of-a-kind resolution of 1050lp/mm enables resolution of structures smaller than 476nm

### Rigid, sturdy mechanical structure

- Rigid, sturdy structure supports high optical performance
- Detail solutions such as integrated cable duct and complete integration of electronics keep your workspace neat and clean

### Encoding and Motorization

- M165 C / M205 C: Continuous electronic readout of the magnification
- M205 A: Motorization of magnification and iris diaphragm

### Parfocal objective nosepiece

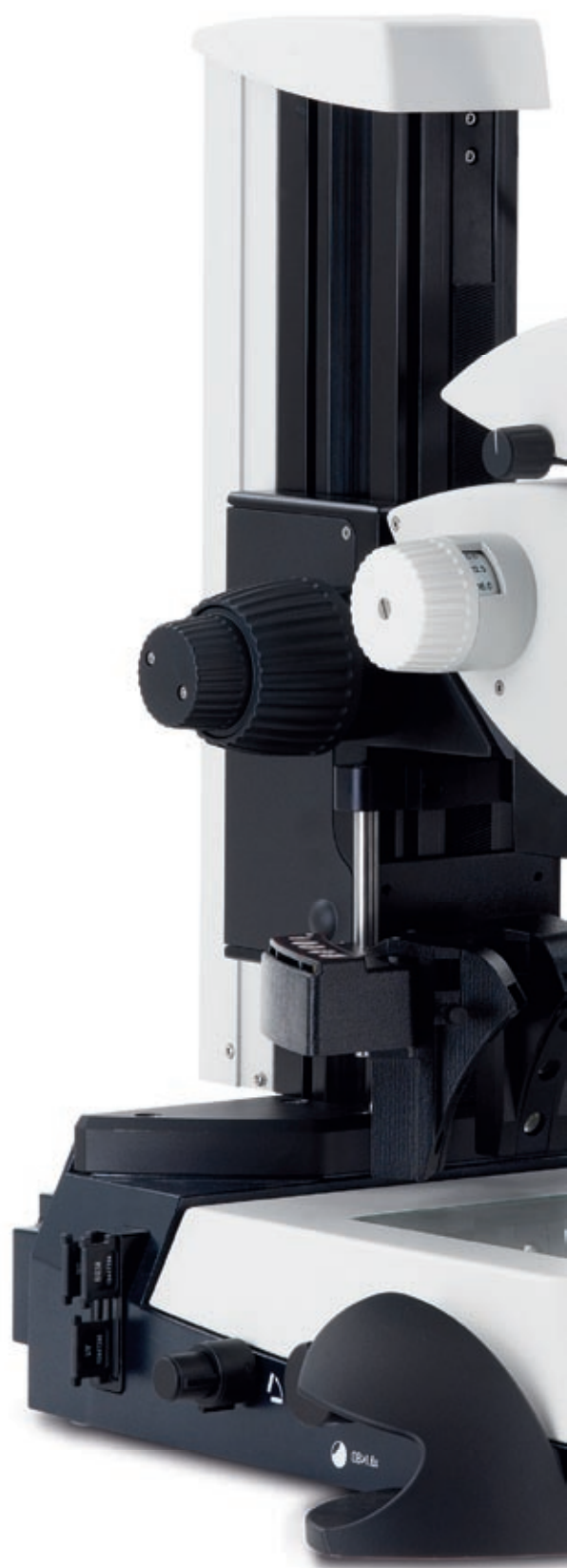
- Objective changes without refocusing
- User-defined combination of main objectives provides huge range of applications
- Encoding provides continuous configuration information to the LAS

### Modularity

- New Leica M-series instruments can be combined with many existing system components
- Selection of various objectives, stands, cameras, illumination sources and other accessories
- The optimal solution is assured for practically any application

### Completely integrated illuminator

- New illumination components seamlessly integrated in the complete system
- Complete control and reproducibility of settings
- Finding the right illumination setting is a snap
- Complete control of settings, manually or using LAS





### Relaxed work

- Trinocular tube with 30° viewing angle
- Trinocular tube with 5°–45° viewing angle
- Maximum viewing comfort for different microscope users

### Revolutionary FusionOptics™ (Leica M205 C)

- Right channel with high resolution
- Left channel with high depth of field
- Information from both channels is combined in the brain
- Unparalleled resolution, brilliance and depth of field

### Diopter increments

- Prevents accidental adjustment of dioptic correction
- Replaceable eyecups for the highest standards of hygiene

### Apochromatically corrected optics

- Optics corrected for chromatic aberrations and flatness
- No distracting color fringes or distortions when observing, recording or analyzing images

### Convenient operation under the microscope

- Largest working distances for all Leica main objectives
- Optimum access to work specimen
- Field of vision number 23 enables wide-area overview of the specimen



Leica M125 with new motorized focus and LED5000 RL LED illumination



The viewing angle is adjustable from 5°–45° for the most relaxed head position possible



A locking system on the oculars prevents the diopter compensation from being changed inadvertently



The new, planapochromatic objectives prevent color seams, and field number 23 enables a large overview of the specimen



Planapo 1×: the working distance of 61.5mm leaves a lot of free space under the objective

Leica Design by Christophe Apothélos

# “With the user, for the user”

## Leica Microsystems

Leica Microsystems operates globally in four 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.

### • Biosystems Division

The Leica Microsystems Biosystems Division brings histopathology labs and researchers the highest-quality, most comprehensive product range. From patient to pathologist, the range includes the ideal product for each histology step and high-productivity workflow solutions for the entire lab. With complete histology systems featuring innovative automation and Novocastra™ reagents, Leica Microsystems creates better patient care through rapid turnaround, diagnostic confidence, and close customer collaboration.

### • Surgical Division

The Leica Microsystems Surgical 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.

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.**

### Active worldwide

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| Portugal:               | Lisbon                | Tel. +351 21 388 9112   | Fax +351 21 385 4668   |
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### and representatives in more than 100 countries

In accordance with the ISO 9001 certificate, Leica Microsystems (Switzerland) Ltd, Industry Division, has at its disposal a management system that meets the requirements of the international standard for quality management. In addition, production meets the requirements of the international standard ISO 14001 for environmental management.