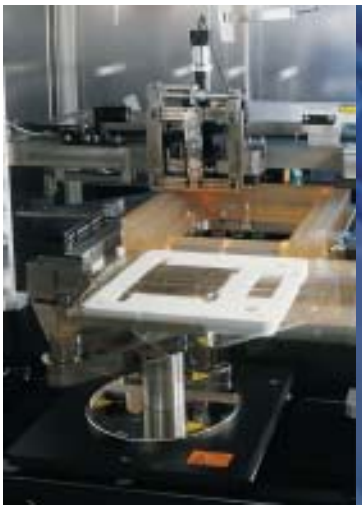
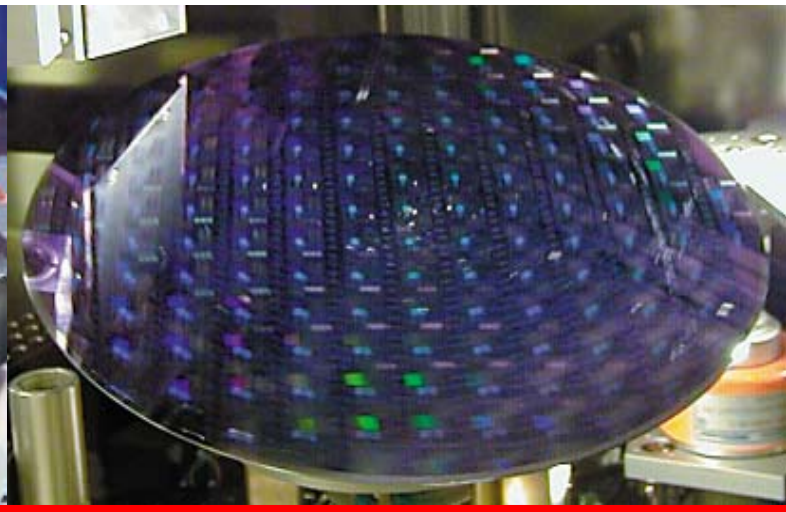
Leica DM4000 M
Leica DM6000 M

Simply Microscopy!
The new Leica DM DigitalMicroscopes for highest demands in the Microelectronic industry

Leica
MICROSYSTEMS

Intelligence
Comfort
Brilliance
Integration





Technological developments in wafer production increase the demands on inspection microscopes.

In order to meet these demands, a microscope must feature highest performance in optics, and needs to be efficient, flexible as well as easy to use.

With the new Leica DM4000 M and DM6000 M hours of fatigue-free, comfortable work is ensured even for non-microscopic specialists.

A newly developed optical system combined with ergonomic controls including a touch sensitive screen sets new standards in microelctronics inspections.

Perfection At Work – Simply Microscopy!

The Exterior: New Technology in a New Design
The first thing you will notice about our new DigitalMicroscopes is their new design: clear, attractive contours for the highest degree in ergonomics.

Looking Through the Microscope: Fascinating Insights
Once you´ve seen your sample through one of these new microscopes, you'll never want to use any other. No microscope in this class can offer better image brilliance, field depth and contrast.

Just Rely On Your Intuition
The new Leica DM DigitalMicroscope series provides the answers to many operator problems. One of the most frequently voiced requests was to lighten the workload. So ways have been found to let the tool do a lot of the work for the operator. The entire microscope is operated intuitively and easily automate complex routines to suit any specific needs.

Experts Call it Ergonomics. We Call it User-Friendly
Ergonomics is a word often used. On the new microscopes the user can actually feel it. Cooperating closely with the Fraunhofer Institute*, Leica designers have not only outperformed the latest technological standards but also all the ergonomical specifications.

Modularity
The system modularity of the Leica DM series microscopes allows inspection workplaces to be tailored to individual requirements. A choice of configuration levels ranging from the manual high performance microscope DM4000 M up to the fully automated system with software supported scanning stage DM6000 M can be provided.

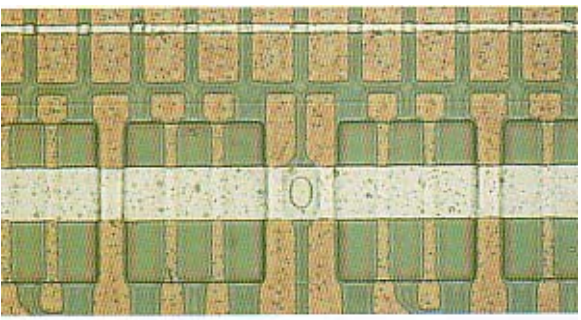
The Leica Product Range Serves For All Needs
Whatever the operator needs for the inspection, can be supplied: the microscopes, the cameras and even the software for analyzing and grabbing and archiving the images.

New All-Embracing Software
Parallel to the new Leica DM DigitalMicroscope series a totally new software concept has been developed. All hardware and software components are controlled from one single interface.

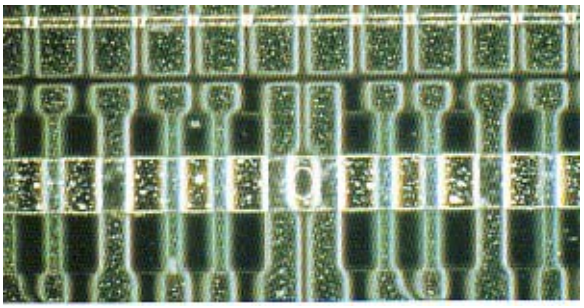
Leica DM4000 M with the basic BT25+ tube in a reflected light configuration with the newly designed 6 x 6“ stage.

*The Fraunhofer Institute IAO (Stuttgart, Germany) investigates ergonomical aspects of various products. In cooperation with their industrial partners they develope industrial designs with highest ergonomical demands.

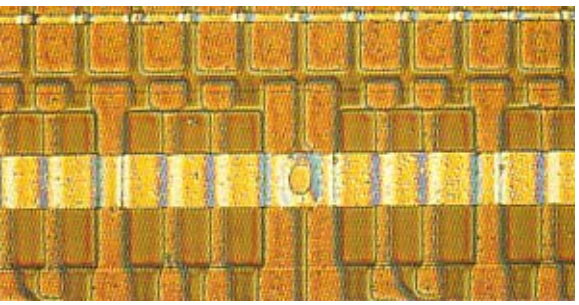
Brilliance



Wafer structure; Brightfield;
PL APO 50x/0.85 BD objective



Wafer structure; Darkfield;
PL APO 50x/0.85 BD objective



Wafer structure; Interference contrast;
PL APO 50x/0.85 BD objective

Incident Light
The entire incident light axis is automated and features motorized aperture and field diaphragms that allows full reproducibility of the illumination conditions. This ensures unsurpassed security in all QC/QA or failure analysis processes. The 4-position reflector turret is also motorized and accommodates optical components for all incident light contrasting techniques. Two reflector positions have wider openings for the insertion of darkfield or Smith reflectors.

Incident Light Brightfield
It's never been so easy to use a microscope: just put the sample onto the stage and focus. The Leica DM4000 M and DM 6000 M recognize the chosen objective, accurately opens and closes the aperture and field diaphragms and adapts the light intensity according to the objective and contrasting technique selected.

Incident Light Darkfield
The darkfield block is situated on the reflector turret and is moved into the light path with a single button click. All diaphragm settings and the lamp intensity are automatically adapted to this change in the contrasting mode.

Incident Light Polarization
Incident light polarization contrast is either manual or automated. In the automated version, the polarizer and analyzer are on a POL-reflector on the motorized reflector turret.

Incident Light Interference Contrast (ICR)
With the Leica DM4000 M you have the choice between semiautomatic or purely manual ICR operation. To avoid operator errors, the correct prism for the chosen objective is indicated in the display. This is simply slotted into the light path. The field-proven ICR system of Leica Microsystems only needs one prism for most objectives, saving time and money. Depending on your application, you can decide for yourself which is more important – contrast or resolution. Working with the DM6000 M the operator only needs a single button click to switch the objective prism, the polarizer and the analyser into the light path within less than 0.5 seconds.

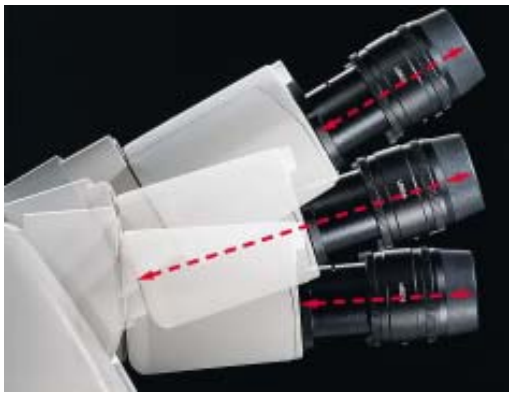
Leica HC optics
Precise imaging of submicron geometries demands the maximum in optical performance, with optimized resolution, contrast and working distance. The HC N PLAN, PLAN FLUOTAR and PLAN APO objectives are designed exclusively for this purpose. Made of new, highly refractive glass types with apo- and semiapochromatic correction, they feature multiple antireflection coating and perfect image flatness across a full 25mm field of view.

New 1.25x Scanning Objective
The new 1.25x overview objective has been specially developed for a fast overview on the sample. Due to the low magnification several dies can be seen with at a single glance. Outstanding field depth, brilliant resolution and perfectly homogeneous illumination ensure excellent results for images grabbed at low magnifications.

Leica N PLAN L, PLAN FLUOTAR L special objecitves
The objective series N PLAN L CORR and PLAN FLUOTAR L with magnifications of 20x, 40x, 50x, 63x and 100x were designed for high demanding semiconductor applications such as masks with pellicles, inspection of bonded chips and LCD inspection. Besides extremely long free working distances, these objective offer exceptionally high numerical apertures, excellent resolution and outstanding crisp, bright and contrasty images for all illumination techniques. The term „CORR“ designates objectives with variable coverglass correction, which are particularly suitable for inspecting LCDs.

Secondary magnification
Combining the Leica DM4000 M or Leica DM6000 M with the magnification changer module a secondary magnification system with increments of 1x, 1.5x and 2x is achieved, resulting in total magnifications of 12.5x up to 5000x.

Comfort



The viewing angle and height of the new AET22 adaptable tube can be individually adjusted to your sitting posture and body size. Plus you can vary the length of the eyepieces to suit the position of your arms.

6 variable function keys (3 on each side of the DM4000 M and DM 6000 M) allow easy switching e.g. between contrast modes

Fast and reliable: the quintuple objective nosepiece of the DM4000 M. One step further is the motor driven objective nosepiece of the DM6000 M

The DigitalMicroscopes Adapt to You in Every Way
The new adaptable tube can be perfectly matched to every operators size and posture. The user can reach the focus knobs with his hands resting on the table. The new 6 x 6“ stage with the integrated overview movement mechanism allows fast, precise and easy scanning of the entire sample. So no matter what is examined, the operator is completely relaxed – even if he sits at the microscope for hours at a time.

Variable Function Keys
The operator or a supervisor can assign any desired function to the six function keys on the base of the microscope. Due to their convenient position behind the focus wheels, frequently used functions are always within easy reach. Highest user comfort was the key element for this development.

Cleanroom class 1
Conformity with cleanroom class 1 has been achieved by the encapsulation of all motor driven parts, e.g. the objective nosepiece, and by use of special non-gasing paints. Due to the automation of all important microscope functions, no manual adjustments are necessary in the vincinity of the sample.

Fast and reliable: The sixtuple objective nosepiece
The coded objective nosepiece of the DM4000 M takes up to six objective lenses. The nosepiece coding is directly coupled to the illumination management in that way, that any readjustment of light or diaphragms does not need to be carried out by the operator.
The motor driven objective nosepiece of the DM6000 M also takes up to 6 objective lenses which are selected directly and turned into the light path in less than 0.5 seconds for neighboring positions. A single button click of the operator is enough to change the objective magnification, to adjust the light, the aperture- and the field diaphragm.

Intelligence

Automation
The integrated automation of the new DigitalMicroscopes DM4000 M and DM6000 M guarantees ease of use, cleanliness and superior ergonomy and virtually eliminates most possible operator errors.

Automatic Adjustment of the Light Settings
The light intensity is automatically set to the light-gathering capabilities of the objectives. This means that the brightness of the specimen image remains constant when you switch to a different objective – and there´s no danger of glare. Because every inspection has its own specific requirements, you can adjust the light intensity individually.
Additionally the new DigitalMicroscopes automatically recognize the contrasting technique and objective that are currently in use. There's no need to adjust diaphragms – unless you choose to.

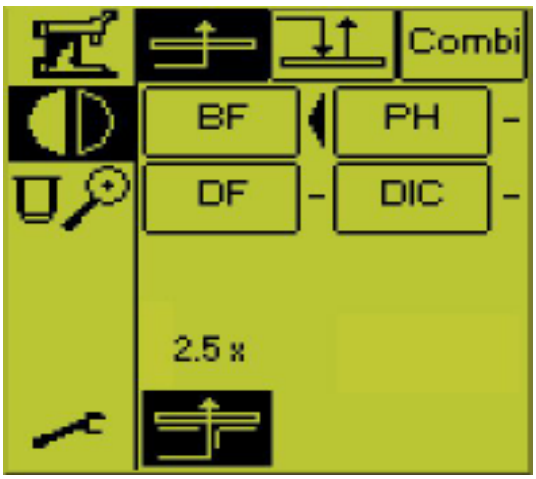
Single Keystroke Contrast Switching – Easier Than Ever Before
The method of changing contrasting technique is unique. One push on the new function keys and the microscope switches between brightfield, darkfield polarization or interference contrast automatically.

Wherever You Look: An Impression of Clarity
All the settings of the Leica DM4000 M can be reviewed at a glance in the clearly laid out display: the contrast technique, the objective, the aperture and field diaphragm and the light intensity. Reproduceable results are easier than ever before.

Control everything via Touch Screen
The touch-sensitive LeicaScreen of the DM6000 M provides special comfort. Not only can all settings be viewed at a glance, but in addition, the clearly-arranged menue structure quickly guides you through the menue pages and allows you to control all motorized modules of the microscope.

An impression of clarity wherever you look: Customer-specific illumination and diaphragm adjustments can be made on the front left side of the DM4000 M or the DM6000 M

Everything you see in the display is stored automatically.
All your results can therefore be reproduced at any time.



Control everything onto the Leica DM6000 Mintuitively with a the clearly arranged menue structur of the LeicaScreen (Touch screen)

Unsurpassed focusing convenience for all objectives with the motorized focus drive of the DM6000 M

Fast scanning of the entire wafer with the rapid adjustment facility of the manual 6x6“ stage

Motorized focus drive of the DM6000 M
This new development provides unsurpassed focusing convenience for all objectives. The focusing speed is fully matched to the magnification of the objective lense. The integrated transducer system (resolution 15 nm) enables the storage of both the focus position for each objective lense and a lower threashold for loding the samples onto the stage. In addition a laser auto-focus system is available.

Remote control
All automated functions of the Leica DM4000 M and DM6000 M can be fully remote controlled via the software package Leica Aplication Suite.

Manual mechanical stage 6“ x 6“ with rapid adjustment facility
For fast scanning, the x/y coaxial drive is decoupled and the stage is moved freely over the entire movement range with the fast positioning handle.
Mountable rotatable wafer holders for 4“ and 6“ are available as an option.

Scanning stages - fast and precise positioning of the inspection coordinates
Scanning stages are a basic necessity in view of today’s requirements in throughput, repeatability and accuracy. Exact, software-controlled positioning is easily achieved with the scanning stage SCAN 6“x6“.

The following performance features render the SCAN 6“x6“ ideal for all standard inspection and review applications:
- 1.5 nm resolution
- < 1µm repeatability
- maximum speed 180 mm/s
- Accuracy +/- 3 µm

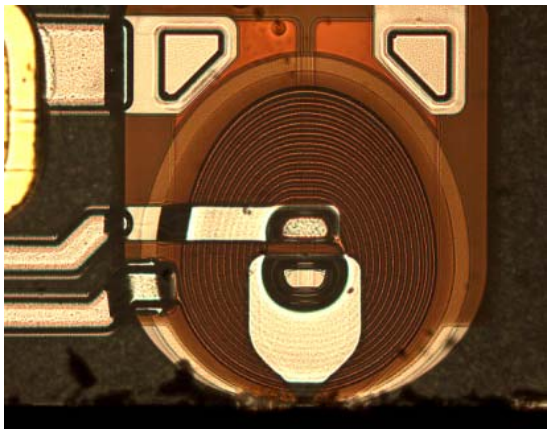
Mirror housing 106
The optional mirror housing 106 is available for simultaneous adaption of a second lamphousing e.g. for fluorescence inspections.

Your System Solutions

Integration

The Choice Is Yours. Now and Any Time in the Future.
To go with the new DigitalMicroscopes new software concept is offered which allows to upgrade the system at any time. All future software and hardware components of Leica will be controlled from the same interface.
A basic software package for remote control and image display/storing comes with all microscopes free of charge.

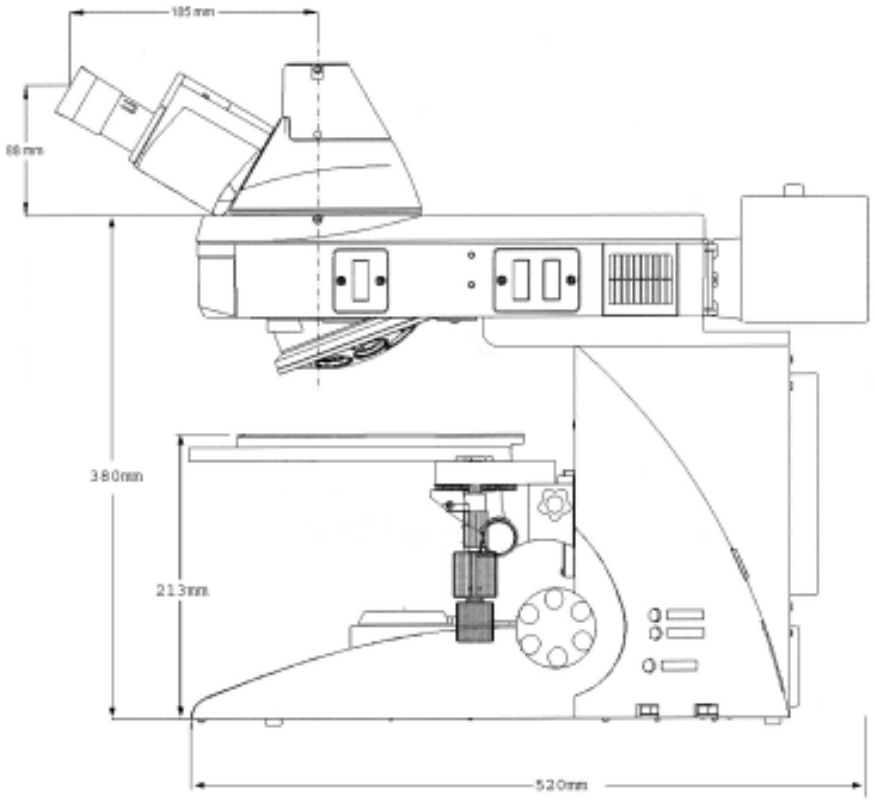
Individual Microscope Configuration and Control
The user interface is extremely easy to use. Function keys, contrasting techniques and other microscope parameters are easily configured on the computer in accordance with the operators preferences or the needs of the working environment. Operator errors are reduced significantly, which is particularly important in an inspection environment. With this new software package a fully remote control of all automated functions of the microscope is possible.

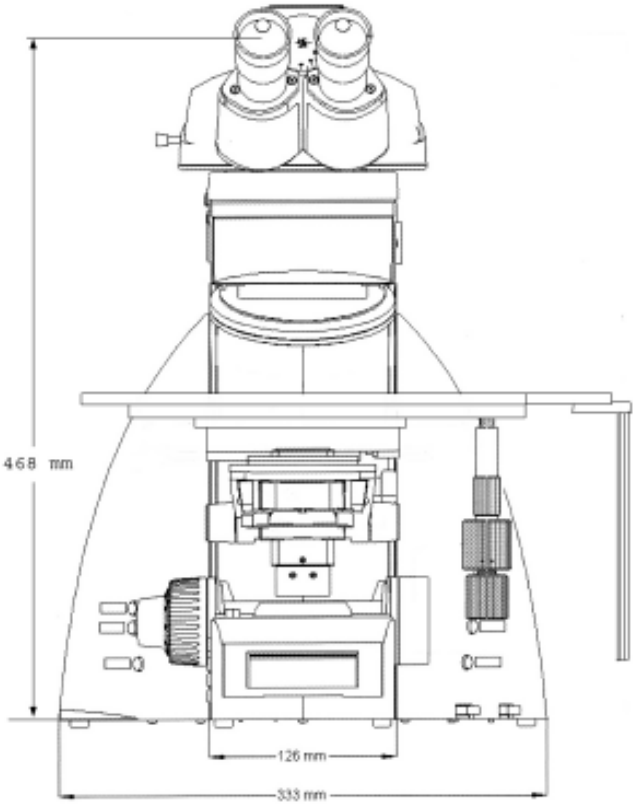


Cameras For Every Requirement
The Leica DC range of digital cameras offers the right camera for every requirement. From general to specific, the cameras are the ideal choice: color or gray-level pictures of any kind of wafers. There are cameras with a live image or real time video mode. The camera chips feature up to 12 megapixel image resolution. And with exposure times between a few µs and several minutes, every user will find the camera for his or her application.

Perfect Image Archiving and Analysis
With Leica IM1000 archiving software an individual personal database environment can be created in which galleries set up picture, annotate images and store microscope parameters are carried out. The system´s report tool prints ready-to-use reports, bearing wafer identification marks etc. if desired.

Dimensions





Specifications

		Leica DM4000 M	Leica DM6000 M
Stand	**Power supply**	– Integrated in stand	– In CTR6000 electronics box
	Display	– Information display (3.7 x 7.7 cm)	– LeicaScreen (7.3 x 7.3 cm) with information and control panels
	Interfaces	– 1 x RS 232 (USB adapter available)	– 1 x RS 232 (USB adapter available)
Operation	**Focus**	– mechanical – 2-gear drive	– motorized – 5 electronic transmissions – incl. parfocality function – Switching between coarse and fine mode – Storage of 2 z-positions possible
	Objective turret	– absolute encoded – 6x M32 thread	– absolute encoded and motorized – 6x M32 thread – incl. dry and immersion mode
	Stages	– mechanical – ceramic-coated – y-drive with cable control – telescopic stage drive with adjustable torque	– motorized – with stepping motor – Switching between fast mode and precise mode – storage of up to 6 stage positions possible
		– mechanical – 4" x 4"	– mechanical – 4" x 4"
		– mechanical – 8" x 4"	– mechanical – 8" x 4"
		– mechanical – with reversed stage drive (for high samples)	– mechanical – with reversed stage drive (for high samples)
		– mechanical – 6“ x 6" with rapid adjustment facility	– mechanical – 6" x 6" with rapid adjustment facility
		– motorized – 6“ x 6"	– motorized – 6“ x 6"
Incident-light axis	**Mot. filter turret**	– 4x – 2 fixed positions – 2 variable positions	– 4x – 2 fixed positions – 2 variable positions
	Illumination	– 100 W halogen lamp – 100 W Hg lamp – 50 W Hg lamp	– 100 W halogen lamp – 100 W Hg lamp – 50 W Hg lamp
	Automation	– Automatic illumination manager (adjustment of light intensity) – Automatic contrast manager (adjustment of field and aperture diaphragm) – Circular and rectangular field diaphragms for eyepiece or camera observation	– Automatic illumination manager (adjustment of light intensity) – Automatic contrast manager (adjustment of field and aperture diaphragm) – Circular and rectangular field diaphragms for eyepiece or camera observation
	Contrast method	– BF – DF – POL – ICR (partially automated) – Fluorescence	– BF – DF – POL – ICR (automated) – Fluorescence

Leica Microsystems – the brand for outstanding products

Leica Microsystems' mission is to be the world's first-choice provider of innovative solutions to our customers' needs for vision, measurement, lithography and analysis of microstructures.

Leica, the leading brand for microscopes and scientific instruments, developed from five brand names, all with a long tradition: Wild, Leitz, Reichert, Jung and Cambridge Instruments. Yet Leica symbolizes innovation as well as tradition.

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

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and representatives of Leica Microsystems in more than 100 countries.

The companies of the Leica Microsystems Group operate internationally in four business segments, where we rank with the market leaders.

Microscopy Systems

Our expertise in microscopy is the basis for all our solutions for visualization, measurement and analysis of microstructures in life sciences and industry. With confocal laser technology and image analysis systems, we provide three-dimensional viewing facilities and offer new solutions for cytogenetics, pathology and materials sciences.

Specimen Preparation

We provide comprehensive systems and services for clinical histo- and cytopathology applications, biomedical research and industrial quality assurance. Our product range includes instruments, systems and consumables for tissue infiltration and embedding, microtomes and cryostats as well as automated stainers and coverslippers.

Medical Equipment

Innovative technologies in our surgical microscopes offer new therapeutic approaches in microsurgery.

Semiconductor Equipment

Our automated, leading-edge measurement and inspection systems and our E-beam lithography systems make us the first choice supplier for semiconductor manufacturers all over the world.

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