LVEM 25

Low Voltage Electron Microscope

Fast • Compact • Powerful

delong instruments®

… your way to electron microscopy

INTRODUCING THE LVEM 25

High Contrast & High Resolution

- Unmatched contrast of biologic and light material samples
- Image resolution as good as 1.0 nm
- Meaningful results without the need for heavy metal staining
- Equipped with TEM, STEM and ED imaging modes

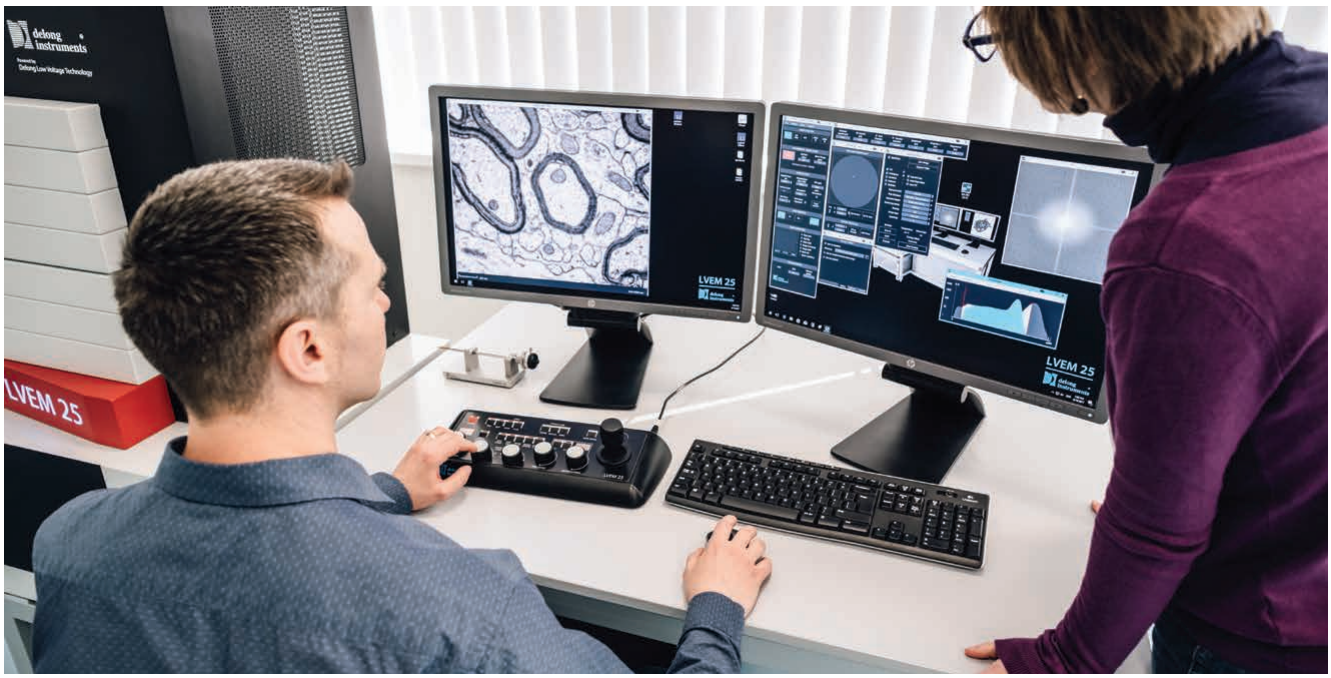
Compact & Robust Design

- More compact than other TEM microscopes
- Uniquely engineered space-saving design
- Readily installed in nearly any laboratory environment
- No special facility requirements needed (such as cooling, special power or an anti-vibration isolation)

Uncomplicated & Rapid Results

- Easy to learn and operate
- Simplied software and intuitive controls
- Quick sample exchange allows for high throughput imaging
- Designed for conventionally prepared samples

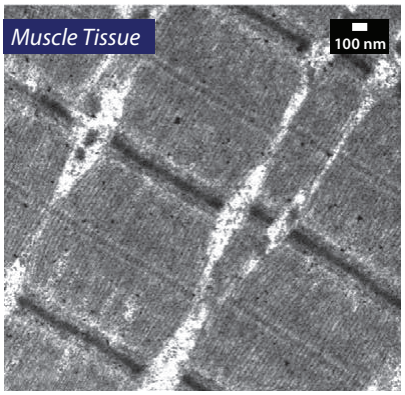
YOUR WAY TO ELECTRON MICROSCOPY



The LVEM 25 produces images with unmatched contrast from your conventionally prepared samples. Three powerful imaging modes are available in a single compact instrument. Switching between imaging modes is done easily via operating software, providing quick image collection of the same region of interest in TEM, STEM and ED modes.

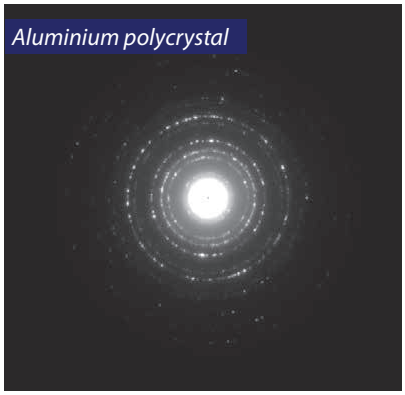
TEM Mode

The 25kV TEM mode is standard on all LVEM 25 microscopes and provides high frame rate live-image and digital image acquisition through the use of a high-sensitivity and low-noise 5.5MP scientic CMOS camera for imaging thin sections.



STEM Mode

The optional 10 and 15kV STEM modes enable the ability to image at even lower accelerating voltages, providing incrementally higher levels of contrast as well as allowing for work with thicker samples.

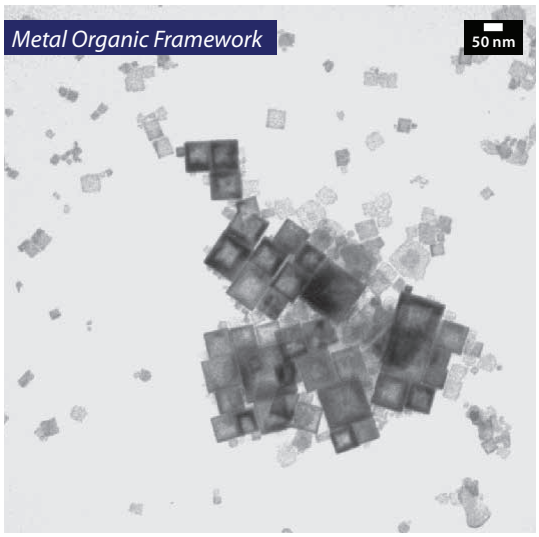


ED Mode

Electron diffraction is included with every system allowing for structural characterization of crystalline materials.

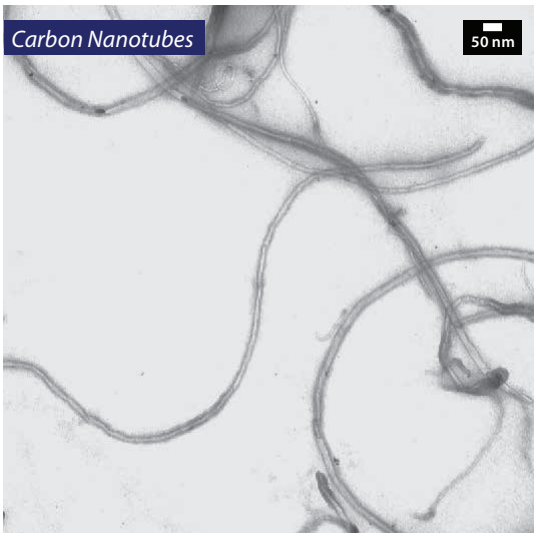
MATERIAL SCIENCE APPLICATIONS

The LVEM 25 is fast, compact and powerful. For users in materials science, this translates to an instrument that delivers quick and meaningful results while taking up very little lab space. The LVEM 25 benefits from a higher operating voltage than the LVEM 5, allowing for greater beam penetration and providing better imaging of internalized structures of various sample types. To further facilitate the imaging process, the LVEM 25 includes features such as automated coarse focus, precise stage movements and position recording, seamlessly blending functionality with capability.



Nanoparticles

Analyse shapes, structures and size distributions of various types of nanoparticles composed of silver, gold or polymers quickly and with contrasted clarity.



Nanotubes

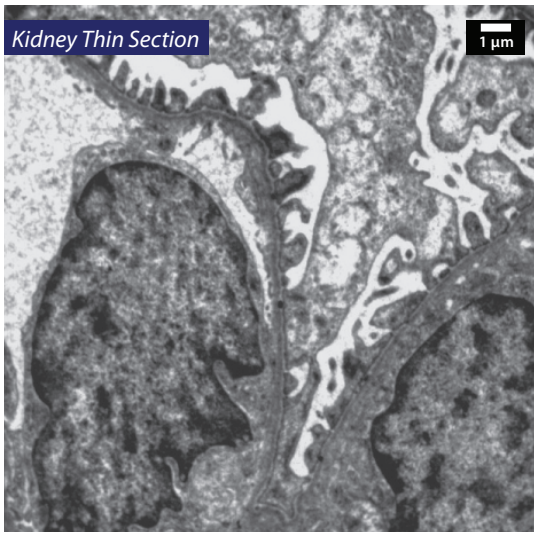
Verify the quality and purity of nanotube materials. High contrast image results reveal detailed sample features.

Polymers

Understand the morphology and detect imperfections in the crystalline structure of polymeric materials with highly detailed and contrasted results.

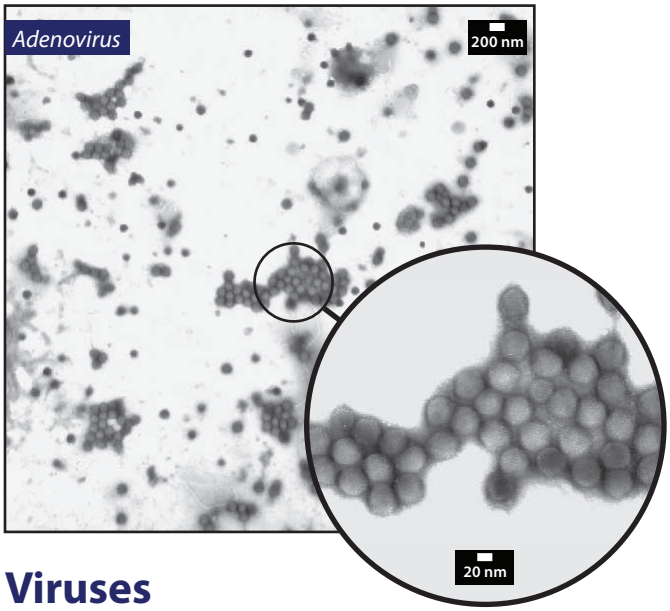
LIFE SCIENCE & PATHOLOGY APPLICATIONS

The LVEM 25 is a perfectly suited instrument when it comes to imaging in the life sciences. It provides well-contrasted and highly detailed images from samples where image contrast is often a challenge to obtain, maintains the ability to image conventionally prepared samples without any adaptation to sample preparation protocols, and it contains the unique ability to image stained and unstained samples with the same level of expected results. With the added benefits of being compact and easy to use, the LVEM 25 is already contributing in the fields of pathology, virology and drug delivery.



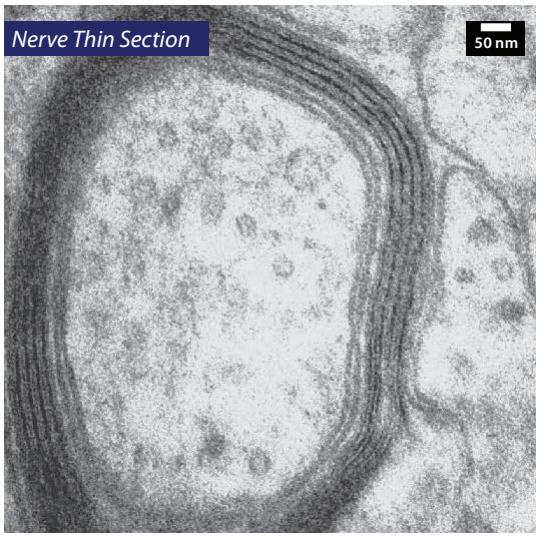
Kidney Thin Sections

Image thin sections of kidney tissue to identify immune complex glomerulonephritis, renal amyloidosis and dense deposit disease with confidence.



Viruses

Detect and study viruses such as rotavirus, adenovirus and herpesvirus quickly and with great detail.



Nerve Thin Sections

Observe unmyelinated fibers, collagen pockets and amyloid deposits with clarity.

KEY TECHNICAL FEATURES

Compact Design

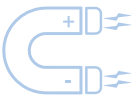
A perfect fit

The compact and versatile LVEM 25 is designed to be installed where electron microscopy is needed most, creating seamless and efficient work flows.

No Special Facilities

Worry-free installation

As a result of its small footprint and novel column architecture, the LVEM 25 does not require a dedicated room, anti-vibration isolation, special power supply or cooling of any kind, thereby simplifying the instrument's installation.



Permanent Magnet Lenses

No cooling required

The LVEM 5 and LVEM 25 are the only TEMs using permanent magnet lenses. This unique factor allows for the miniature architecture and eliminates any cooling requirements.

Field Emission Gun

Highest contrast

A 25kV Schottky type FEG with very high brightness and spatial coherency allows for strong interactions between the emitted electrons and the samples. This is what provides the LVEM 25 with uniquely high contrast.

Controls & Software

Complete imaging control

The LVEM 25 comes with intuitive software for microscope operations and imaging. User operations are facilitated with simple adjustments for illumination, magnification and image optimization. The included PC and monitor allow for on-screen measurements and statistics, as well as live histogram correction and FFT.

Manipulator

Precise sample area selection

The LVEM 25 employs a Piezo driven stage actuator with joystick control for intuitive sample movement. Stage position can be recorded, and the instrument is able to return to previously marked areas of interest.

Ultra-High Vacuum Pumps

Clean column, clean imaging

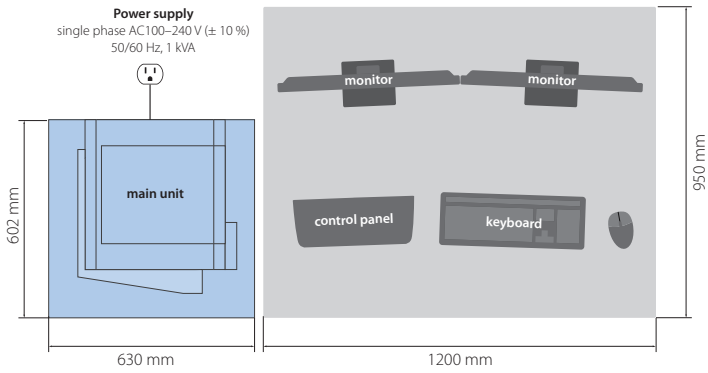
A maintenance free turbomolecular pump provides rapid evacuation of the airlock system and the silent and vibration free ion getter pumps produce an ultra-high vacuum imaging environment, free from contamination.

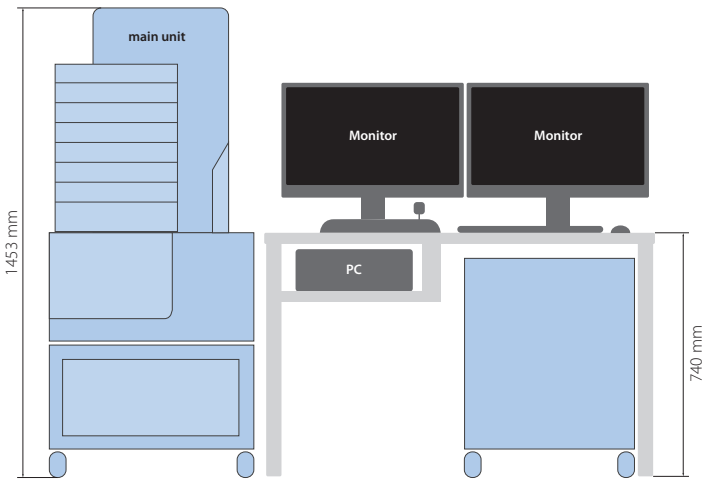
SPECIFICATIONS

OPERATION		
Electron gun	Schottky field emission gun	
Specimen size	standard Ø 3.05 mm TEM grids	
Objective lens	Magnetostatic	
Condenser lens	Magnetostatic	
Projective lens	Electrostatic	
Specimen movement	x, y: ± 1 mm	z: ± 0.5 mm
Tilt holder	± 6°	
Specimen exchange time	approx. 3 min	
IMAGING MODES		
TEM		
Nominal accelerating voltage	25 kV	
Resolution	1.0 nm	
Total magnification*	3,400 – 1,300,000×	
Magnification in Low mag regime*	1,500×	
Field of view	100 – 0.25 µm	
Field of view in Low mag regime	225 µm	
**valid for image on display at binning 2×2*		
ELECTRON DIFFRACTION		
Probe size	500 – 8,000 nm	
Camera length (binning 2x2)	2,000 – 5,000 pixels	
Camera constant (binning 2x2)	17 – 40 nm pixels	
STEM 15		
Nominal accelerating voltage	15 kV	
Resolution	1.3 nm	
Maximum magnification	750,000×	
Maximum field of view	80 µm	
STEM 10		
Nominal accelerating voltage	10 kV	
Resolution	1,0 nm	
Maximum magnification	940,000×	
Maximum field of view	105 µm	

STEM IMAGE CAPTURE	
up to 2,048 × 2,048 pxls/8 bits	
TEM IMAGE CAPTURE	
Camera	sCMOS
Sensor size	2,560 × 2,160 pixels
Digitalization	16-bits
VACUUM	
AIRLOCK SYSTEM	
Diaphragm and turbomolecular pump	10^{-5} mbar
OBJECT SPACE	
Ion getter pump	10^{-8} mbar
ELECTRON GUN	
Ion getter pump	10^{-9} mbar
POWER CONSUMPTION	
Standby mode	60 VA
Operation consumption	410 VA
Maximum consumption	600 VA
DIMENSIONS AND WEIGHT	
MICROSCOPE UNIT	
Weight	140 kg
Dimensions (w × d × h)	630 × 600 × 1500 mm
AIRLOCK PUMPING STATION	
Weight	17 kg
Dimensions (w × d × h)	355 × 300 × 300 mm
ELECTRONICS UNIT	
Weight	50 kg
Dimensions (w × d × h)	550 × 650 × 670 mm
MAINS CONNECTION	
Voltage / frequency	100 – 240 V / 50 – 60 Hz
INSTALLATION BENEFITS	
No cooling water needed	
Only single phase plug needed	

LVEM 25 Installation Layout





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Please be sure to visit our website for more information at: **www.lv-em.com**

Your Local Distributor

The LVEM 25 is supported globally by sales and service offices in local markets. Please consult our website for the distributor in your country. You can also contact us directly for any questions you may have or to be referred to your distributor.