

Tecnai™ G² Spirit TWIN / BioTWIN Next generation microscopy for Life Sciences

The stringent demands of Life Science and Soft Matter research require fit and adequate microscopy techniques for imaging and analysis. The Tecnai™ G² Spirit is designed to meet this purpose and level of performance. The microscope is offered in two different patented lens configurations: The BioTWIN for high-contrast imaging or the TWIN for general high-resolution purposes. The Spirit produces excellent 2D and 3D images due to special automated and semi-automated functionality. The Tecnai G² Spirit features in a seamless embedded manner:

- High contrast, high resolution for 20 –120 kV operation
- Optimized for 2D & 3D imaging of cells, cell organelles and soft matter
- High level of automation: Auto-Gun and automatic tuning
- Smart Tracking Position System for sample navigation
- Customized protocols for diverse applications
- Sample observation at liquid nitrogen temperature
- Technology for sharp imaging of thicker samples
- Ergonomic design for operational comfort

- High-contrast, high-resolution imaging
- Low-dose observation and imaging
- Low-temperature observation
- Outstanding analytical performance
- Automation for convenience and performance

The Tecnai G² Spirit TWIN, a 20-120 kV / LaB₆ Transmission Electron Microscope, is a general-purpose, high-resolution instrument. It enables the 2D and 3D ultra-structure exploration of cells and cell constituents, as well as the morphology, chemical composition and function of natural or artificial materials that play a crucial role in modern science and technology. Low Dose observation of beam-sensitive and cryo samples is a key performance aspect.

The Tecnai G² Spirit BioTWIN, a 20-120 kV / LaB₆ Transmission Electron Microscope, is the high-contrast, general-purpose instrument that can perform the same tasks and analysis as the TWIN version, but is specifically suited for low contrast samples. It enables to explore the native state of low-contrast, beam-sensitive biological specimens, or other soft materials like polymers. Samples can be unstained or stained. The lens design guarantees maximum contrast.

The microscope has embedded automation that can be used at will for all users. The gun or illumination can be tuned, aligned, saturated and conditioned automatically or manually. The same flexibility holds for focus and stigmation. Automation is fast and convenient and lowers the threshold for novice users and helps securing quality of results.

Essential specs

Objective lens	TWIN	BioTWIN
Line resolution (nm)	0.20	0.34
Cs objective (mm)	2.2	6.3
Cc objective (mm)	2.2	5.0
Focal length (mm)	2.8	6.1
Minimum focus step (nm)	3.0	9.0
Maximum eucentric tilt	± 70°	± 80°
Magnification	18 - 650 000	22 - 300 000
Specimen Exchange Time	< 30 seconds	< 30 seconds
High tension switching Time	< 1 minute	< 1 minute

Electron Source

- W or LaB₆ emitter
- Auto-saturation
- Auto-conditioning
- LaB₆ lifetime > 1 year
- Filament change < 5 min.
- High voltage range 20 – 120 kV or continuously variable
- High tension change < 1 min.

Illumination system

- Four lenses
- User-selectable intensity limit for specimen protection
- User-selectable zoom for constant screen intensity

Imaging

- Five lens magnification system
- High contrast, long-focal-length objective lens (BioTWIN)

- Automated contrast enhancement function
- Focusing aid, adjustable wobbler for all magnifications and directions
- Focus preset for focusing at eucentric position
- Rotation-free magnification and diffraction series
- Magnification aberration corrected lens series
- Embedded CCD and TV camera (optional)
- Plate camera with 56 sheets of film
- Low dose software (optional)

Micro analysis (optional)

- Embedded STEM and EDX
- Small probes (< 0.3 nm)
 - No spurious / system peaks
 - STEM magnification: 150 –3.1 Mx
 - Resolution: 1.0 nm

Specimen stage

- Fully computer-controlled, eucentric side-entry, high-stability CompuStage

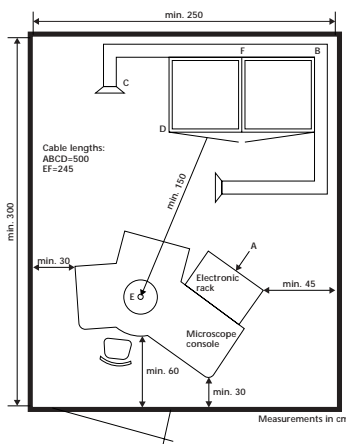
- High tilt and large field of view
- Choice of a variety of specimen holders, (cryo-, multiple, rotation- holders etc.)
- X, Y movement 2 mm, specimen size 3 mm
- Specimen position store and recall including magnification and illumination settings.
- $\Delta x = 0.5 \mu\text{m}$ (x, y) and $\Delta \theta = 0.5^\circ$ (tilt)
- Drift < 1 nm/min with standard holder
- Specimen exchange pumping time 10 – 180 sec. (user-adjustable)
- Specimen exchange without switching off High Tension and emitter
- High tilt (± 80°) and large field of view

Vacuum

- Fully interlocked differentially pumped column.
- Ultra-high vacuum for contamination free observation of the specimen
- TWIN: Cryo box (optional), (not EDX compatible).
- BioTWIN: fixed cryo shields standard (EDX compatible)
- Vacuum levels: specimen chamber and gun area 10⁻⁶ Pa
- Plate camera exchange without switching off High Tension and emitter

Operation / automation

- Operating system: Industry standard *Windows 2000™*
- New ergonomic hand panels
- Remote Operation (optional)
- Scripting SW module (optional)
- 2nd Data Monitor (optional)
- 3D imaging using Xplore3D™ Intelligent Tomography Solution (optional)
- Upgradeable functionality by uploading current and future application software solutions.



Minimal floorplan

FEI Company
 World Headquarters and
 North American Sales
 5350 NE Dawson Creek Drive
 Hillsboro, OR 97124-5793 USA
 Tel: +1 503 726 7500
 Fax: +1 503 726 7509

European Sales
 Tel: +31 40 27 66 768
 Fax: +31 40 27 66 786

e-mail: sales@feico.com
 www.feicompany.com
 www.tecna1.com

Asia-Pacific Sales
 Tel: +65 351 7671
 Fax: +65 354 0644

