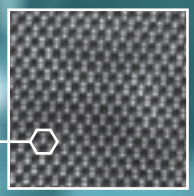
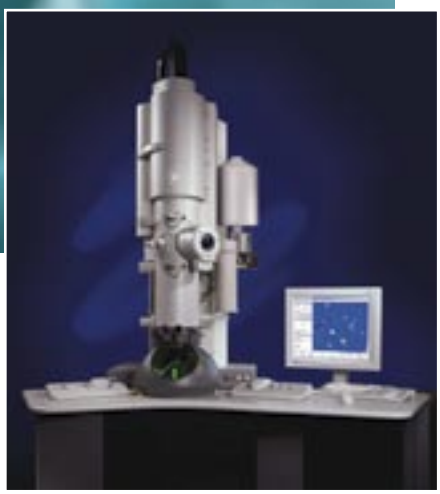
PRODUCT DATA

FEI COMPANY™



Understanding decreasing dimensions



Tecnai™ G² 20
The Multi-Tasking Tool for Nano Research

The Tecnai G² 20 Transmission Electron Microscope is a highly advanced, state-of-the-art instrument. Running under the Windows® XP operating system, it offers high performance with versatility, high productivity with ease of use, and all in a personal, secure environment. The accessories that may be fitted onto these systems – e.g. STEM, CCD cameras, EDX and EELS detectors – are embedded into the user interface, allowing differently experienced operators to fully utilize the functionality of the total system through one, coherent interface. The Tecnai G² 20 is a versatile instrument offering a wide range of application solutions.

A fundamental understanding of materials and cellular properties starts with a thorough characterization of the structure under investigation. Morphology, crystal structure, chemical composition, interface structure, surfaces and defects, all have their influence on the entity's properties and behavior. TEM has proven to be a very powerful technique for studying a wide range of general and advanced materials, soft matter, composites, hybrids, tissues and cellular compounds. Interaction of the electron beam with the specimen under investigation generates a wide range of signals, all, carrying different types of valuable information. The Tecnai G² 20 has been especially designed to acquire and process these signals efficiently and effectively. The combination of high-resolution 2D and 3D imaging at both ambient and cryogenic conditions, bright-field, dark-field STEM imaging, electron diffraction and detailed microanalysis, makes the Tecnai G² 20 a versatile tool for classical Materials and Life Science applications in Nano Research.

The Tecnai G² 20 can be supplied in a variety of custom configurations. A range of patented symmetric objective lenses are available, all with their unique performance focus to exactly meet the requirements and need for your applications: high resolution work (S-TWIN) or ultra high resolution (U-TWIN), for high tilt applications (maximum ±80° for tomography- TWIN) and for optimal probe coherence and analytical performance (X-TWIN).

- *High performance in (S)TEM imaging an nano-analysis*
- *Ultra-clean vacuum for High Resolutionroom temperature and cryo imaging*
- *Compatible with FEI's suite of application software solutions*
- *High resolution versatile tool for material and life science applications*
- *Fully embedded spectroscopy for spectrum profiling and imaging*
- *Robust routine analysis down to the sub-nanometer*
- *Computerized stage with eucentric specification for:*
  -High resolution tomography
  -Maximized tilt and stability

The Tecnai G² 20 can be equipped with fully embedded digital STEM, EDX and Energy Filter or PEELS, as to allow combinational experiments like spectrum profiling and spectrum imaging.

Essential Specs

Electron Source

- LaB_6 or W emitter
- High stability of emission and long life

Imaging

- High tilt and large field of view (±70° tilt for TWIN)
- Coma-free alignment for high-resolution objective lens centering
- Rotation-free magnification and diffraction series
- Magnification reproducible within 1.5 %
- Embedded CCD camera
- Plate camera with 56 sheets of film

Diffraction

- Wide range of diffraction techniques, from coherent illumination for selected area diffraction or micro-diffraction to highly convergent (large angle) beam diffraction
- Maximum diffraction angle up to 32° (U-TWIN)
- Energy filtered diffraction down to low camera lengths (<200 mm)

STEM

- Bright Field and Annular Dark Field mode
- Magnification range up to 480 kx

Micro-analysis

- Excellent EDX in-hole performance
- Low system background in EDX
- Embedded EDX and EELS spectrum profiling and imaging

Specimen stage

- Fully computer-controlled, eucentric side-entry, high stability CompuStage
- Maximized tilts for any X, Y, Z, α, ß coordinates
- Capable of accommodating a variety of specimen holders including low-background double-tilt holder
- X, Y movement 2 mm, specimen size 3 mm
- Specimen recall reproducibility: "0.3 µm (x, y) and "0.1˚ (a tilt) attainable
- Drift < 1 nm/minute with a standard holder

Vacuum

- Fully interlocked differentially pumped column.
- Gun and column area pumped by separate Ion Getter Pumps
- Liner tubes pumped by additional Ion Getter Pump
- Ultra-high vacuum for contamination-free observation
- Vacuum levels of specimen chamber and electron gun (< 2.7 x 10^{-5} Pa)

Automation

- Operating system: *Windows*® XP
- Remote Operation (optional)
- Scripting SW module (optional)
- Application software for Low Dose imaging, for Montage, Grid scanning, for diffraction and crystallography, and for calibration (optional)
- XPlore*3D*™: FEI's intelligent tomography solution (optional)
- Software for ease-of-use and standardization: Automatic eucentric height, focus, astigmatism correction and gun alignments (optional)

Objective lens	TWIN	S-TWIN	X-TWIN	U-TWIN
	(high tilt)	(high res)	(fine probe)	(ultra h-res)
Point resolution (nm)	0.27	0.24	0.25	0.19
Line resolution (nm)	0.14	0.14	0.14	0.14
Cs objective (mm)	2.0	1.2	1.3	0.5
Cc objective (mm)	2.0	1.2	1.4	1.0
Focal length (mm)	2.7	1.7	1.7	2.2
Minimum focus step (nm)	3.0	1.8	1.8	0.35
Maximum eucentric tilt	±70˚	±40˚	±30˚	±24˚
TEM magnification	25x – 750 kx	25x – 1030 kx	22x - 930 kx	25x – 1 Mx
SA diffraction camera length (mm)	50 - 7000	30 - 4500	30 - 4500	45 - 4300
Maximum diffraction angle	± 10˚	± 13˚	± 12˚	± 16˚
EDS solid angle (sr)	0.13	0.13	0.30	0.13
STEM magnification	100x – 5.0 Mx	100x – 5.0 Mx	100x – 5.0 Mx	100x–5.0Mx

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TOOLS FOR NANOTECH

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