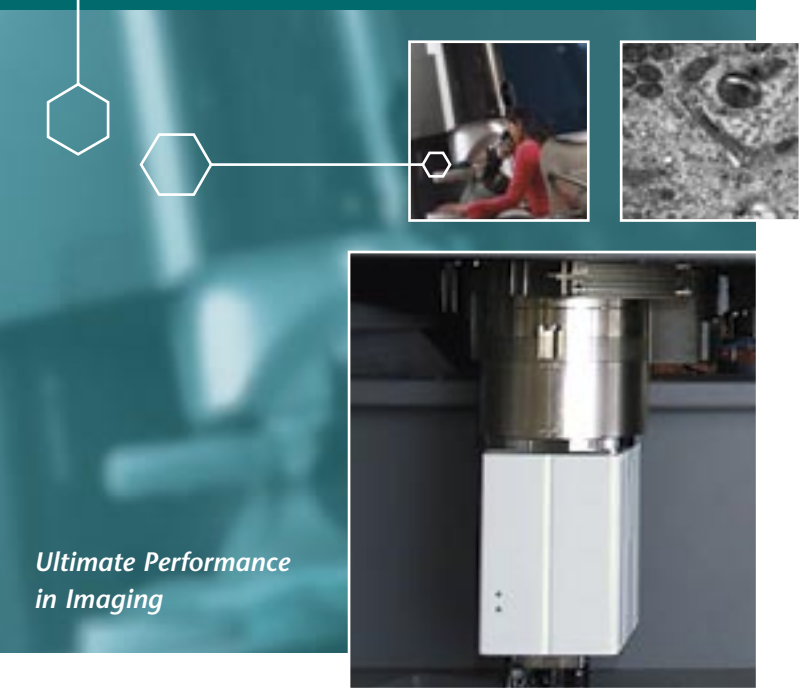
PRODUCT DATA

FEI COMPANY™



FEI™ Eagle 2k CCD

4 Mega pixel TEM CCD camera

- *True 2k x 2k performance*
- *Razor sharp images*
- *Very large dynamic range*
- *High DQE for high quality*
- *Fully embedded, easy to use*
- *FEI™ TEM Imaging and Analysis software*
- *Fast multi-port read-out*
- *Peltier cooled*

FEI Company™ is introducing its proprietary 2k x 2k, fiber-optically coupled TEM CCD camera series with superior image quality. Razor sharp images, a very large dynamic range and the highest build-quality are now available.

High Resolution and Large Dynamic Range

High resolution and fast read-out speed are claimed for some TEM CCD cameras, a large dynamic range for others. FEI combines all these advantages into one camera: the Eagle 2k. It has a very large dynamic range (16 bit), high resolution, high DQE and fast multi-port read-out speed. The Eagle 2k uniquely delivers true 2k x 2k performance due to a balanced and perfect match between pixel size, fiber-optical coupling and scintillator thickness. Eagle 2k's performance characteristics will meet and probably exceed the most demanding application needs.

Optimization for Resolution or Sensitivity

The Eagle 2k CCD camera is available with a High Resolution (HR) or High Sensitivity (HS) scintillator. The HS scintillator is tuned for the highest DQE, while the HR sintillator is tuned for the optimum resolution.

Detector Quantum Efficiency (DQE)

The DQE is the best measure of dose efficiency. A CCD camera with a high DQE requires a lesser dose to obtain the same image quality as a CCD camera with a lower DQE. With its high DQE the Eagle 2k HS is the choice for low dose applications. Due to the large dynamic range and high resolution the Eagle 2k HR is an excellent choice for applications where, for example, diffraction patterns need to be imaged.

Fiber-optical Coupling

Fiber-optical coupling (1:1) of the electron-sensitive layer (scintillator) with the CCD sensor increases the amount of light collected in comparison with lens-optical coupling and as a result drastically improves the sensitivity of the camera.

Powerful and Intuitive Software

The Eagle 2k is fully embedded in FEI's microscope software which runs seamlessly with FEI applications (E.g. Xplore*3D*, TrueImage, Low Dose, and AutoAdjust), giving one unified user interface.

The included FEI TEM Imaging and Analysis (TIA) software allows the selection of camera and viewing mode, binning, integration time and read-out area. TIA enables the acquisition of series of CCD images for recording *in-situ* experiments and simple playback, review, and extraction from image series. TIA includes on- and off-line data processing features like FFT and full support for real (image mode) and reciprocal space (diffraction mode) calibrations.

Very Large Dynamic Range

Eagle 2k's large pixel size allows the collection and storage of many CCD electrons resulting in the highest dynamic range of any TEM CCD camera to date. Details in contrast of your samples are imaged with the highest level of detail in grey values. Eagle 2k's low read-out noise further helps to image even the smallest amount of electrons.

Quality and Reliability

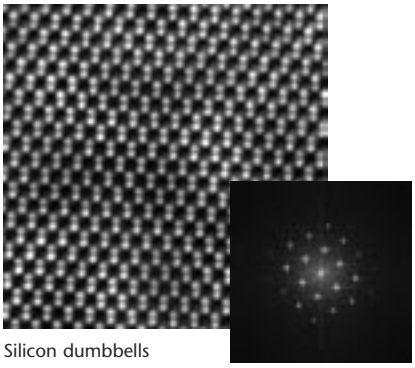
The Eagle 2k is fully supported by an FEI warranty and service. The Eagle 2k is a bottom-mounted, non-retractable camera with no moving parts and does not need a separate camera control unit. This leads to the highest achievable build-quality. This high quality and FEI's professional service organization result in a maximum uptime.

Available FEI Eagle 2k camera types

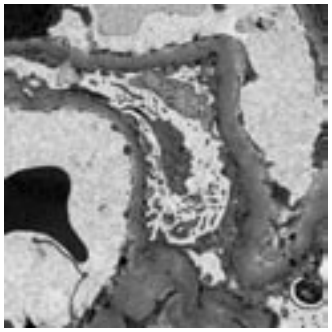
FP 5270/82	Eagle 2k HR 200kV
FP 5270/92	Eagle 2k HS 200kV
FP 5270/83	Eagle 2k HR 300kV
FP 5270/93	Eagle 2k HS 300kV

Specifications FEI Eagle 2k

Operating voltage	Up to 300kV
CCD field of view	61.2 x 61.2 mm^2
CCD/pixel size	2048 x 2048 pixels, 30 x 30 μm^2
Binning	1x, 2x, 4x
Read-out area	Full, half or quarter
Mounting position	On-axis TEM bottom
Magnification on CCD with respect to film	1.3x
Peltier cooling	-25 °C (regulated)
DQE @ ½ Nyquist (200kV, 10 pe^- /pixel)	> 15% for HR scintillator > 20% for HS scintillator
Read-out noise	< 18 $CCDe^-$
Read-out speed (4-port read-out)	2.5 Mpix/sec, 2.5 sec/full frame
Dynamic range / digitization	28000:1 / 65,536 grey values (16 bit)
Non-linearity	< 1%
Gain factor	Optimized to fully utilize the AD converter range for each binning mode
Scintillator (P43)	High Resolution or High Sensitivity
Software	FEI CCD camera embedding (included) (TEM Imaging & Analysis)



Silicon dumbbells



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TOOLS FOR NANOTECH

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