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DATASHEET

Selectris and Selectris X Imaging Filters

Experience the thrill of atomic-resolution cryo-EM

Designed for stability and speed, the Thermo Scientific™ Selectris™ and Selectris X Imaging Filters are post-column imaging filters that improve the contrast of TEM images, resulting in high-resolution structures up to atomic resolution.

The zero-loss filtering of the Selectris Filters removes noise caused by inelastically scattered electrons, producing an increased signal-to-noise ratio (SNR) and improved contrast. Designed for high stability, ease of use, and paired with the latest generation Thermo Scientific Falcon™ 4 Direct Electron Detector, Selectris Filters enable you to obtain high-resolution structures quickly, increasing the productivity of your single particle analysis (SPA) and cryo-electron tomography workflows.

With the Selectris Filters, zero-loss energy filtering is straightforward due to the thorough integration of software and hardware along with extensive automation and exceptional stability. Every mechanical and electron-optical element has been designed for stability and reproducibility, enabling the unattended and reliable acquisition of large datasets with narrow energy slit widths (<10 eV). Particularly for the thin samples often used in SPA, the capability to use <10 eV slits provides an additional boost in contrast, enhancing resolution and throughput.

Designed for high stability, the zero-loss peak position of the Selectris Filters is insensitive to temperature variations in the environment, eliminating the need for frequent tuning. On the rare occasion that filter tuning is necessary, it can be completed automatically within minutes; this ensures smooth daily operation and efficient data acquisition.

Selectris Filters are available on the award-winning Thermo Scientific Krios™ and Glacios™ Cryo-TEMs and are fully integrated into the instruments' operation and application software.

Key Benefits

Designed for stability

- Contrast enhancement on thin and thick samples thanks to <10 eV zero-loss energy-filtered transmission electron microscopy (EFTEM)
- Sophisticated aberration correction, low image distortions, and uniform energy resolution over entire field of view
- Minimized sensitivity to temperature variations

Straightforward operation

- Fully integrated in Thermo Fisher Scientific instrument operation software as well as Thermo Scientific EPU and Tomography Software for data collection
- Filter tuning is only needed occasionally and is completely automated
- No need to interrupt data collection for zero-loss centering

Falcon 4 Direct Electron Detector

- High detective quantum efficiency (DQE) across the spatial frequency range
- High speed: can routinely produce 300+ movies/hour
- Built-in electron event representation (EER) for full temporal resolution (240 frames per second), no need for fractionating at time of acquisition
- Super-resolution up to 16k x 16k without file-size penalty
- Efficient file-size compression

Selectris X Filter – taking the next step toward atomic resolution

Expanding on the stability, ease-of-use, and performance of the Selectris platform, the Selectris X Imaging Filter offers an even more sophisticated electron optical system for further aberration correction. This results in extremely low distortion characteristics in both the image and energy domains, opening the way to true atomic-resolution structures in single particle analysis cryo-electron microscopy (cryo-EM).

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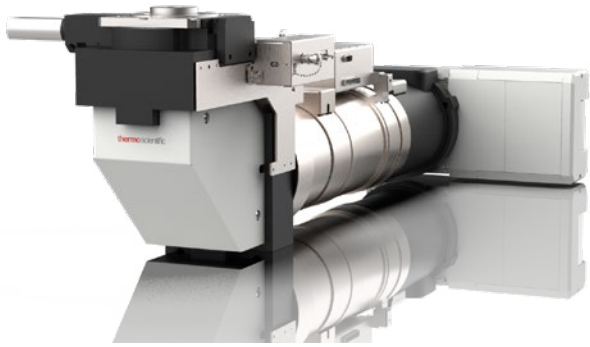
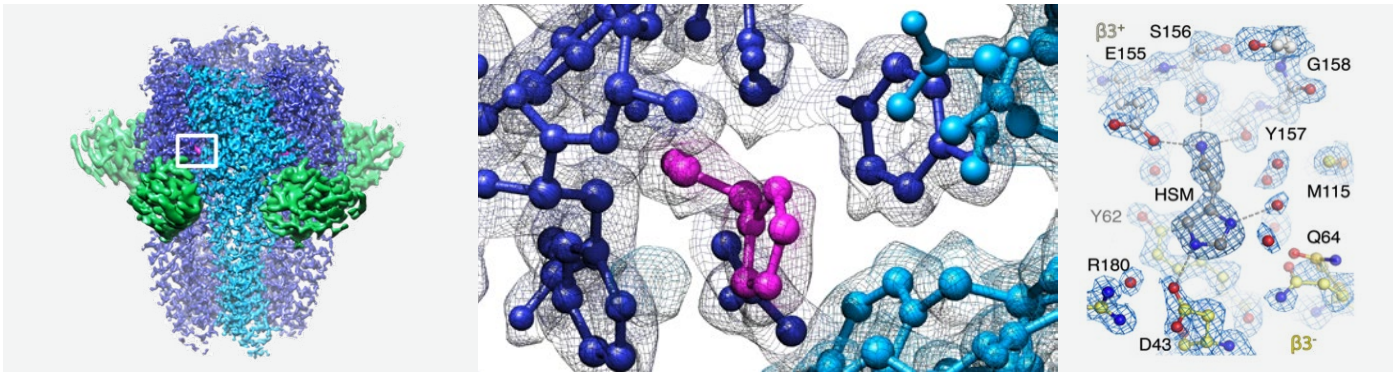
System requirements

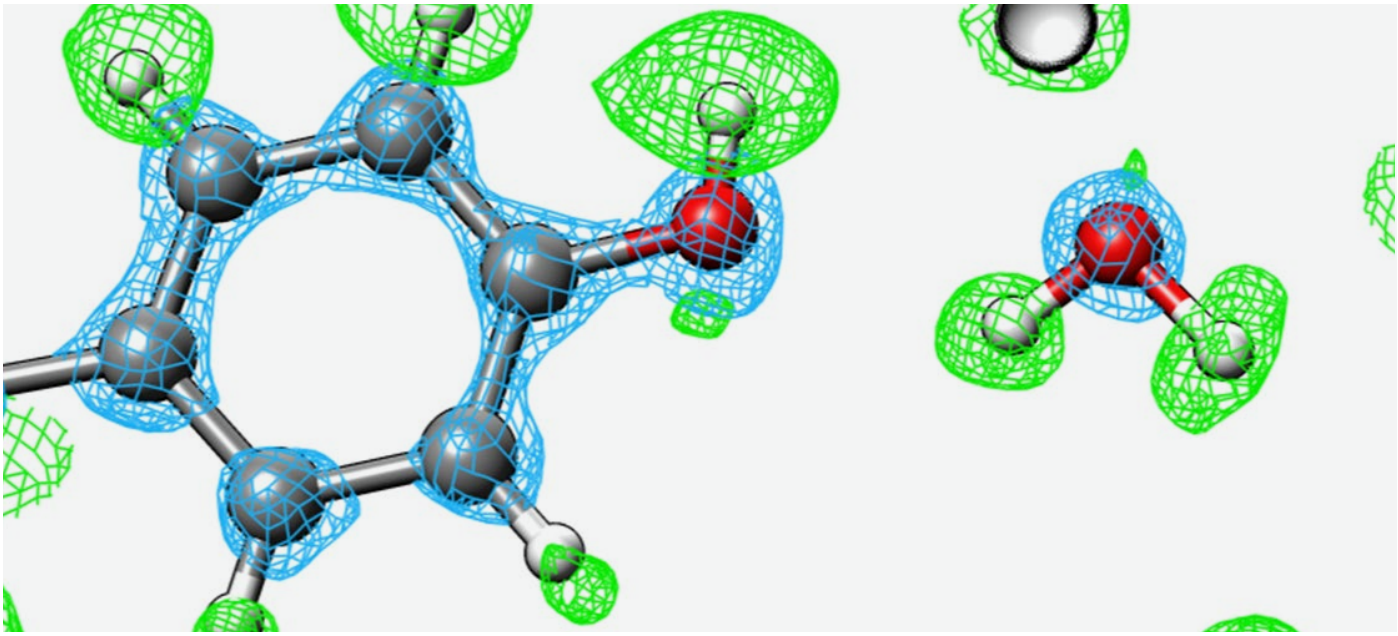
Selectris and Selectris X Filters are available on new Krios and Glacios Cryo-TEMs. Retrofits to existing microscopes are possible on most Thermo Scientific cryo-TEMs operating under Windows 10. An extended datasheet with additional specifications is available upon request.



The Thermo Scientific Selectris Imaging Filter.



$GABA_A$ receptor resolved at 1.7 Å shown from a side view (left). Detail of the binding pocket is shown in the middle. Histamine coordination and a number of water molecules (red spheres) are shown on the right. Adapted from Nakane, T. et al. bioRxiv (2020), CC-BY 4.0. *Image courtesy of Andrija Sente and Radu Aricescu, MRC-LMB Cambridge.*



Apoferritin resolved at 1.2 Å, showing hydrogen atoms in the difference map (green densities). The hydrogen bonding network around Y32 and water-302 is shown. *Image courtesy of Sjors Scheres, MRC-LMB Cambridge and Abhay Kotecha, Thermo Fisher Scientific.*

Find out more at **thermofisher.com/EM-Sales**

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