

ANNEX 1: REQUIRED INSTRUMENT SPECIFICATIONS

The National Museum of Denmark seeks to purchase a scanning electron microscope with a maximum price of DKK 1,000,000, exclusive of VAT.

The bidder must describe the components included in the purchase and provide a fixed price. It will be weighted positively in the determination of this award that the tender meets or exceeds the National Museum's needs, as detailed below. Price will not be the only award criterion.

Required features:

- The microscope must allow for imaging in both high vacuum and low vacuum modes.
 - at least 10 different pressure settings must be available in LV mode
- Four detectors are required:
 - Everhardt-Thornley secondary electron detector (ET SED)
 - backscattered electron detector (BSED)
 - The BSED must have adjustable elements to allow for morphological, as well as compositional, information in the image.
 - energy-dispersive silicon drift characteristic x-ray detector (SD EDS)
 - gas phase low vacuum secondary electron detector (LV SED)
- The acceleration voltage range must be at least 1-20 kV.
- The minimum magnification using electron imaging must be less than or equal to 35x (at WD = 10 mm). That is, optical imaging up to 160x is not acceptable.
- The chamber must accommodate samples with minimum diameter of 60 mm and minimum height of 40 mm.
- The working distance must be adjustable during operation and must have an adjustment range of at least 10 mm.
- The SEM must have an external operation panel that allows for the control of, at least: magnification, focus, astigmatism correction, XY position, brightness, and contrast.
- When the microscope is not in use, the whole system can be turned off.
- The sample stage must allow for the mounting of a range of sample holders.
- Vacuum pumps must be oil free.
- The EDS software must:
 - allow the user to view and save the map for each element separately (without the underlying electron image)
 - allow the user to select specific element lines for mapping
 - allow exportation of spectra

- Minimum one-year warranty and maintenance. Maintenance contract should include compensation for downtime if service engineers cannot come to Denmark.
- Minimum two training sessions: one with installation and one after several months of use.
- Minimum of five spare filaments.
- Minimum of one additional software license to allow for later interpretation of data on a remote computer.

Additional desirable features:

- Optical navigation camera for coarse navigation of the sample.
- Motorized XY stage with software-driven position navigation.
- Additional holder for larger samples.
- Additional year of maintenance.
- Noise shielding for external pump(s).

