

A large, modern building with a dark facade and many windows, some of which are illuminated from within. The building has a distinctive design with a sloped roof and several vertical pipes or chimneys on the roof. The sky is a mix of purple and pink, suggesting dusk or dawn. The building is surrounded by a paved area and some greenery.

› **GENERIC SEM DETECTOR REQUIREMENTS**
D002 2023FPL/INK 29 | R.P. EBELING

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› OVERVIEW

- › The SEM shall be equipped with a set of detectors with the purpose to be able to perform sample surface imaging.
 - › Imaging of surface topography, morphology and material contrast is required.
- › The SEM shall be equipped with one Energy-dispersive X-ray spectroscopy (EDX) detector with the purpose to be able to perform sample surface material analysis.
 - › See appendix D005, and requirement document for more details
- › The SEM shall be able to do both (imaging and analysis) with both conducting and non-conducting samples.

› IMAGING REQUIREMENTS

- › In addition to the following requirements, the SEM shall also fulfil the stated requirements in the requirements document.
- › The SEM shall be able to:
 - › Perform SE imaging, both in high and low vacuum modes.
 - › Perform BSE imaging, both in high and low vacuum modes.
 - › Perform both SE and BSE imaging at the same time, both in high and low vacuum modes.
 - › Perform SE imaging using an Everhart-Thornley Detector (ETD), placed at a fixed position in the SEM vacuum chamber in high vacuum mode.
 - › Perform SE imaging using a low vacuum SE detector, placed at a fixed position in the SEM vacuum chamber.
 - › Perform imaging using a segmented detector, to be able to obtain angle selective detection and detailed topographical information, both in high and low vacuum mode.
- › TNO has the wish, and expectation, that switching between all detectors and vacuum modes can be done while at vacuum, or without having to vent and open the vacuum chamber. (R-1000-075)

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