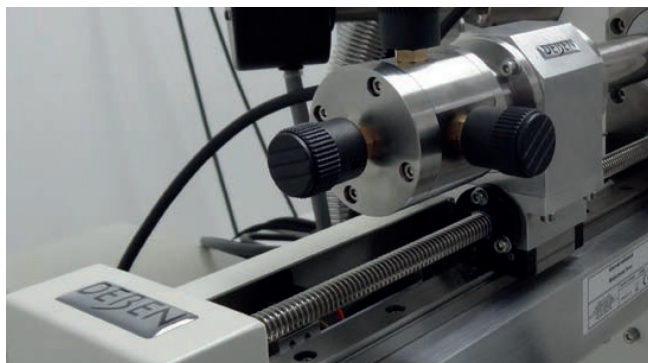


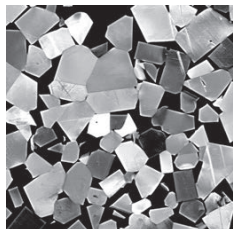
# Solid state SEM backscattered electron detector



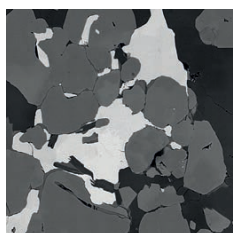
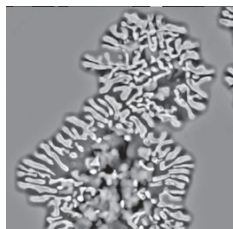
Backscattered electron detectors (BSE) have been widely used for the investigation of specimens in the scanning electron microscope (SEM) for many years. Every sample emits several types of electrons when hit by a primary electron beam. One type of these emitted electrons is the backscattered electron (BSE). The most commonly used BSE detector is the solid state type (semiconductor device).



Solid state BSE detectors are positioned between the sample and the objective lens. The electron beam passes through a hole in the centre of the detector and backscattered electrons are collected as they are returned from the sample.



The resulting image has greyscale based on the contrast produced by the sample. The contrast of the image depends on various factors like the atomic number (Z) of the sample material, the acceleration voltage of the primary beam, and the specimen angle (tilt) with relation to the primary beam. Backscattered electrons therefore give us useful information about the composition and surface topography of the sample. Material with a high atomic number (Z), like gold (Au) will generate more BSEs than material with a lower atomic number, like silicon (Si). Because of these differences in backscatter electron yield the detector can be used to identify different phases or inclusions.



## Applications

- Phase contrast imaging
- Imaging un-coated samples
- Use alongside EDX detector
- Imaging of minerals, metals, semiconductors

## Features

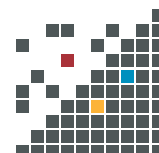
- Low kV operation (1 kV to 30 kV)
- Atomic number resolution 0.1 delta Z for brass samples – Z=30
- Low noise & high sensitivity, microprocessor controlled amplifier
- Four quadrant silicon detectors, 10 mm, 18 mm or 24 mm Ø
- Simultaneous quadrant acquisition or signal mixing
- High speed TV rate imaging
- Motorised insertion & retraction
- PC controlled with USB connection and Deben GUI

The Deben BSE detector is configured as standard with a four quadrant 18mm low kV silicon detector. Each quadrant can be configured as either (Positive/Negative or Off) allowing the user to set acquisition angle (by changing the working distance) and acquire either Compositional or Topographical information.

Image acquisition is via a microprocessor controlled amplifier providing an unrivalled scope of adjustment and optimisation. High quality images can easily be acquired and fed back into the SEM video system via the SEM auxiliary video input for viewing, further processing and saving. The quality of this amplifier in terms of noise, sensitivity and greyscale definition far exceeds those generally found fitted to SEM manufacturers standard BSE detectors.

Motorised insertion & retraction is supplied as standard, allowing keypad and PC positioning control. Alignment of the detector position is better than 20µm.

Software can be installed on the SEM or a standalone computer, acquisition parameters can be set to automatic or manual, providing ease of use for novice or expert microscopists.



# Solid state SEM backscattered electron detector

## Outline specifications

- Retractable mounting mechanics including feed-through flanges and mounting adaptors to suit most SEMs
- Motorised insertion and retraction
- 4 input channels, single video output
- Auxiliary video input is required on SEM for image display and saving
- 18 mm low kV silicon detector
- 8,000,000:1 total gain range, auto control system with imaging speeds up to TV rate
- Gen5 microprocessor controlled amplifier system with all cables and manuals
- PC software for USB system control
- Easy to use software control interface compatible with Windows XP/7.0 32/64bit
- Operating voltage 115 V or 230 V, fully CE and RoHS compliant

## Options

- Bellows sealing
- 3 video outputs
- UHV options
- Manual insertion & retraction
- 10 mm or 24 mm diodes

