



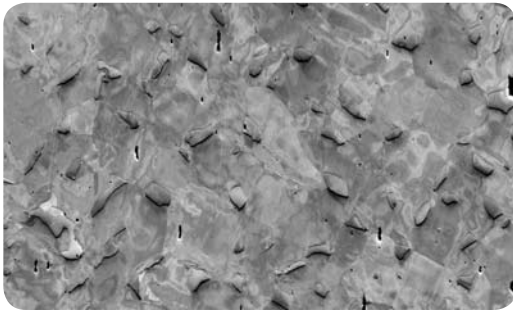
## • FSE/BSE detectors for *eFlash*<sup>1000</sup>

Bruker's high performance EBSD detector *eFlash*<sup>1000</sup> is now optionally available with a set of forescattered electron (FSE) and backscattered electron (BSE) detectors – *eFlash*<sup>1000+</sup>. This further increases the versatility of the detector and provides valuable additional information for meaningful and efficient EBSD analysis.

The set of two BSE detectors is mounted above the screen of the EBSD detector. The three FSE detectors are below the screen. This position of the detectors does not affect the performance or user-friendliness of the *eFlash*<sup>1000</sup>, the screen remains user replaceable.

All electronics required for the operation of the FSE/BSE detectors are already included in the *eFlash*<sup>1000+</sup> detector encasement. Apart from the convenience this also ensures that signal loss is minimized as the preamplifiers are close to the detectors. The principle of user friendliness also applies to these detectors. Automatic signal optimization is offered for every detector. Nevertheless, if desired, the signal of the specific detectors can be adjusted manually.

The FSE/BSE detectors are user replaceable as well. This is not only advantageous in case of repairs, but a very useful feature for avoiding damage under extreme environmental conditions, e.g. in-situ heat treatment experiments.



Greyscale FSE image of a polished section of the Cape York iron meteorite, similar to what can be obtained with common FSE detectors.



Color coded image produced by mixing the signals of the Bruker FSE detectors, showing microstructural details invisible in the greyscale image.

### BSE detectors for improved image quality

If the EBSD detector is fully inserted the standard SEM SE and BSE detection systems tend to produce noisy images of low quality. Bruker's BSE detectors are positioned optimally to acquire the BSE signal from samples with a high tilt angle, as is the case for EBSD measurements. This includes the location above the screen and the inclination towards the sample, both of which ensure optimum signal strength. Also, the EDS detector can pass between the BSE detectors, to provide best possible conditions for simultaneous EDS and EBSD acquisition.

The BSE detectors produce a density-dependent signal, similar to that by conventional SEM BSE detectors. This signal can be used individually or mixed with that from the FSE detectors.

### Colored SEM images using Bruker's FSE detectors

Each of the three FSE detectors below the EBSD screen captures a part of the diffraction signal. As this is anisotropic

and dependent on crystallite orientation, it is improbable that all three of the FSE detectors will register the same signal brightness for adjacent grains.

Color coding and mixing the individual detector signals produces colorful images of the grain structure. This feature is unique to Bruker's FSE detectors. The user even has the choice to define palettes for optimum sample representation.

The **eFlash<sup>1000+</sup>** detector vertical shift feature is very useful for further signal optimization, also in this case. The FSE detectors can be repositioned without affecting the conditions for sample image formation (sample position, requirement for refocusing, and more).

These images prove very helpful for subsequent EBSD analysis. The clarity of the image indicates the quality of sample preparation. Moreover, these images can be used to judge the microstructure of the sample and to determine areas most interesting or representative for the actual EBSD analysis, as well as for an extremely fast analysis of heterogeneities in the microstructure.

### eFlash<sup>1000</sup>



#### Short specifications

- Acquisition and indexing speed 880 patterns/s (8x8 binning), 620 patterns/s (4x4)
- In situ vertical shift to allow several 10 mm working distance variation for optimum signal (SEM dependent)
- UHV compatible detector with welded bellows, all electronics integrated
- Highly sensitive, allows operation at low kV
- Motorized insertion mechanism, manual or software controlled
- Multiple safety features
- Adaptable to most SEMs, 48 mm minimum port diameter required.

● **Bruker Nano GmbH**  
 Schwarzschildstraße 12  
 12489 Berlin · Germany  
 Phone +49 (30) 670990-0  
 Fax +49 (30) 670990-30  
 info@bruker-nano.de  
[www.bruker.com](http://www.bruker.com)

**Bruker Nano**  
 1239 Parkway Ave, Suite 203  
 Ewing, NJ 08628 · USA  
 Phone +1 (609) 771 4400  
 Fax +1 (609) 771 4411  
 info@bruker-nano.com

Sales representative: