



## ***e<sup>-</sup>Flash<sup>HD</sup>* – High detail & high resolution patterns**

With a native CCD resolution of almost 2 Megapixels (1600 x 1200 pixels) and a *state of the art camera optics* for minimized distortions, the new ***e<sup>-</sup>Flash<sup>HD</sup>*** detector provides high definition Kikuchi patterns that display very fine details making it the perfect choice for applications like *residual strain analysis* a.k.a *HR-EBSD*.

Compared to its predecessor (*e<sup>-</sup>Flash<sup>HR</sup>*) the new ***e<sup>-</sup>Flash<sup>HD</sup>*** detector has an improved cooling system which translates in a drop in the dark current of the CCD by at least a factor of four. This means that the Kikuchi patterns produced by the new ***e<sup>-</sup>Flash<sup>HD</sup>*** are now of even greater quality than before, i.e. higher signal/noise ratio.

The new ***e<sup>-</sup>Flash<sup>HD</sup>*** detector uses a high efficiency and high quality phosphor screen to acquire high detailed Kikuchi patterns. The combination of a high pixel resolution CCD chip and a small grain size phosphor material guarantees a final pixel size in the patterns of 20  $\mu\text{m}$  making visible very small shifts in the patterns.

The new detector's capability of providing high definition patterns is complemented by yet another important feature required by *HR-EBSD applications*, i.e. motorized high precision guiding system. With a screen positioning precision better than 10  $\mu\text{m}$  the new ***e<sup>-</sup>Flash<sup>HD</sup>*** detector is the best solution for running the pattern center calibration using methods based on screen movement.

ARGUS™, Bruker's imaging system consisting of two BSE and three FSE detectors arranged above and respectively below the screen, is also available for ***e<sup>-</sup>Flash<sup>HD</sup>***. The BSE detector delivers density contrast images while the FSE imaging system generates color-coded orientation contrast images with unmatched sensitivity for small orientation changes. This capability provides very useful qualitative information regarding the strain state of a region of interest before launching an HR-EBSD measurement.

The new ***e<sup>-</sup>Flash<sup>HD</sup>*** can also be retrofitted with the unique OPTIMUS™ TKD detector head for analyzing electron transparent samples in the best sample-detector geometry possible.

Feature/Option	Benefits
High pixel resolution	High angular resolution for HR-EBSD applications
High quality optics	Kikuchi patterns with low distortions and aberrations
Low functioning temperature / low CCD dark current	Low noise patterns with better indexing quality
High efficiency / quality phosphor screens	Produce high quality/definition Kikuchi patterns
ARGUST™ FSE/BSE	Fully automated color-coded orientation contrast (FSE) imaging and grayscale "BSE" like imaging. FSE images are extremely sensitive to small changes in the Kikuchi signal, e.g. residual strain, magnetic domains, etc.
High precision guiding system	Motorized screen positioning with precision better than 10 µm – no detector/ screen rotation
OPTIMUS™ TKD	Provides optimum sample-detector geometry for TKD analysis. OPTIMUS™ TKD transforms an SEM into a low kV TEM with orientation mapping as well as dark and bright field imaging capabilities.
Slim detector head design	Provides optimum (best solid angle) conditions for simultaneous EBSD/EDS measurements
In-situ detector tilt	Allows optimization of sample-detector geometry for perfect screen illumination at any WD inside the SEM chamber. This standard feature is high vacuum compatible due to built-in welded bellows.
Collision sensor	Automatic retraction of detector at a speed of 10mm/s (audio alarm present)
All electronics inside the detector casing	No external boxes – just two Ethernet cables making the connection with the PC



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