

DECTRIS[®]

detecting the future



MYTHEN2 X



HPC microstrip X-ray detectors

Ultimate speed for advanced
synchrotron applications

synchrotron

MYTHEN detector systems have transformed the standard definition of X-ray powder diffraction crystallography, giving it another dimension: time. This exciting new domain was brought to perfection with the advent of MYTHEN2 X detectors, starting a new era of time-resolved and *in-situ* studies. Based on MYTHEN's strip size and point-spread function, the MYTHEN2 X family introduces unprecedented frame rates at highest dynamic range, while pushing the limits of the energy range. The Detector Control System, DCS4, with electronic gating and external trigger allows

for tailor-made multi-modular solutions and full synchronization of the detector(s) with other systems. Time dimension does not ask for compromises in data quality or system flexibility: from *in-situ* stress measurements to fast phase transitions, MYTHEN2 X is deepening the level of details that can be observed in solid-state reactions.

The MYTHEN2 X detector family is designed for the most demanding users, who do not accept limits in speed, or in data quality. The ball is in your court.

Key advantages

- Frame rate 1000 Hz
- Two module sizes: 1280 and 640 strips
 - Short strips for X-ray energies down to 4 keV
 - Thick sensors for PDF measurements
 - Multi-modular systems tailored to your needs
- Compact size in symmetrical design
- Media and maintenance free

Unprecedented speed

The MYTHEN2 X detectors allow frame rates up to 1000 Hz to be obtained for up to four modules, while keeping the dynamic range at 24 bit. These advances ask for no compromises in data quality. MYTHEN's 50 μm strip is now available in two lengths, ensuring supreme resolution and signal-to-noise ratio for a wide X-ray energy range.

Flexible systems for custom geometries

The versatile MYTHEN2 X family embodies the HPC technology in three sensor thicknesses and two strip lengths, covering the needs of all X-ray analyses in a range between 4 and 40 keV. The redesigned MYTHEN2 module is now available in two sizes: MYTHEN2 R 1K with 1280 strips and MYTHEN2 R 1D with 640 strips. The compact size and symmetrical sensor position of MYTHEN2 detectors is suitable for any diffractometer geometry: from tightest environments to setups that require multi-modular systems. Up to four modules can be arranged in any desired geometry and simultaneously operated using the new Detector Control System, DCS4.

Applications

- Time-resolved experiments
- X-ray powder diffraction and scattering techniques
 - Residual stress measurements
 - Thin film and texture analysis
 - PDF analysis
 - SAXS, WAXS, GISAXS
- Dispersive fluorescence spectroscopy

Reaching low energies with 4 mm strip length

The perfect combination of 320 μm sensor thickness with 4 mm strip length ensures maximal quantum efficiency and optimal signal-to-noise ratio for energies as low as 4 keV. Combined with fluorescence suppression and the absence of dark current, MYTHEN2 systems allow accurate stress and retained austenite measurements to be performed within milliseconds.

MYTHEN2 X	1K	1D
Sensor thickness [μm]	320, 450, 1000	
Strip width [μm]	50	
Strip length [mm]	8 and 4 (320 μm only)	
Dynamic range [bit]	24	
Energy range [keV]	4-40*	
Readout time [μs]	89	
Frame rate [Hz]	1000	
Point-spread function [strip]	1	
Energy resolution ¹ (rms) [eV]	687 \pm 5	
Cooling	Air	
Module dimensions (WHD) [mm ³]	70x62x22	38x62x22
Module weight [g]	180	100
DCS4 dimensions (WHD) [mm ³]	110x30x160	
DCS4 weight [g]	400	

* X-ray energies down to 4 keV are available only with the 320 μm x 4 mm sensors. Specifications are subject to change without notice

[1] Bergamaschi, A. *et al.* (2008) *Nucl. Instr. Meth. Phys. Res.* **A591**, 163-166