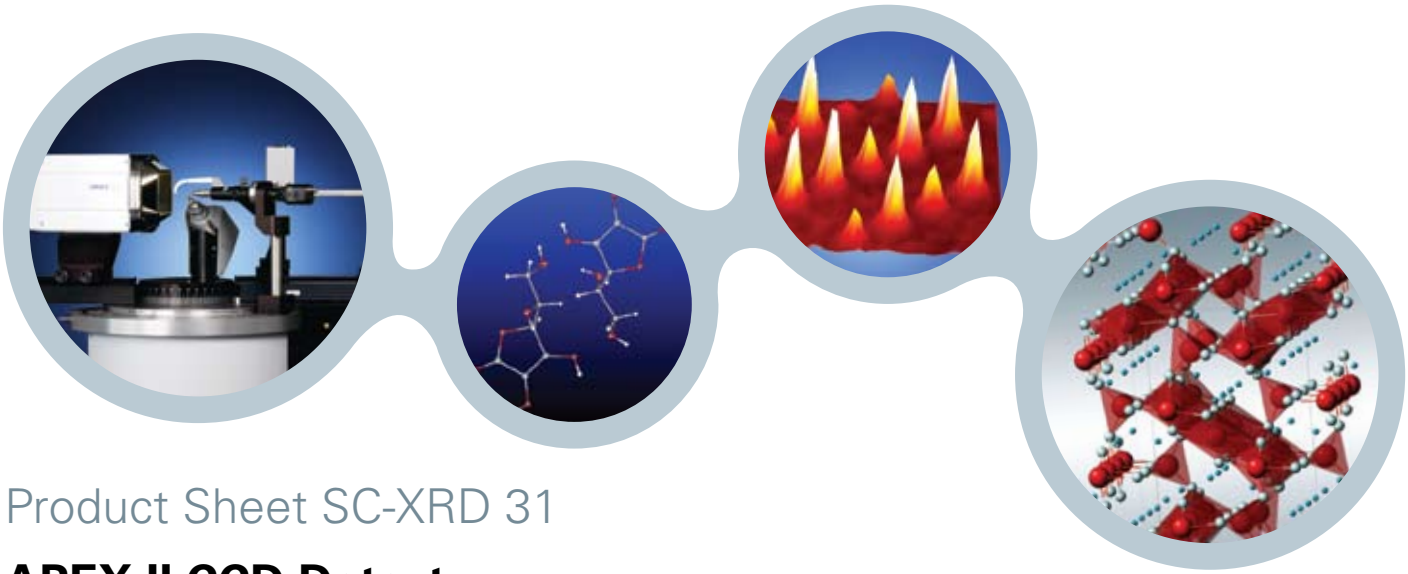


Product Sheet SC-XRD 31

APEX II CCD Detector

Most Sensitive CCD Detector Available

APEX II CCD detector brings you improved CCD technology for structure elucidation on the widest variety of crystalline samples.

Nano- and Micro-Crystals or Very Weakly Diffracting Samples

(Require a very sensitive, low-noise camera for superb signal-to-noise ratio)

High sensitivity	• 1:1 imaging on largest next generation scientific grade CCD chip • high gain scintillation screen
Low noise	• lower-temperature CCD chip cooling • optimized electronics
Best point spread	• smaller spots for even better signal-to-noise ratio

Thermal Diffuse Scattering Experiments

(Require very long exposure times to detect weak diffuse scatter next to very intense Bragg reflections)

Anti-blooming	• electronics prevent overflow of pixels
Ultra low read noise	• slower ultra low read noise modes available
Low dark noise	• lower-temperature CCD chip cooling
High dynamic range	• next generation CCD chip • optimized electronic gain • lower binning modes

APEX II CCD detector

Strongly Diffracting or High Throughput

(Require a high dynamic range and fast readout detector for short data collection time)

Fastest readout	• 4 port; for up to 4 MHz total for sub second readout
High dynamic range	• next generation CCD chip • optimized electronic gain

Mineralogical Samples

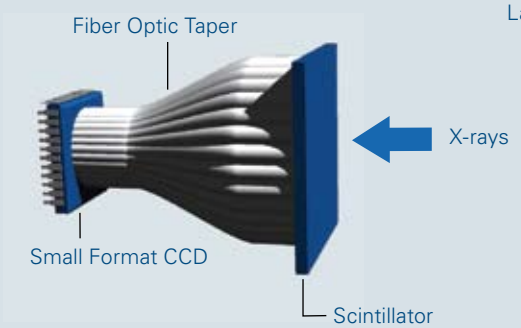
(Require the determination of highly accurate unit cells)

No spatial distortion	• the large CCD chip does not require a fiber optic used in traditional detector designs
Best spatial resolution	• optimized scintillation screen • new improved fiber optic face plate

Technical Specifications	
Sensor type	Fairchild CCD6161
Number of pixels	4096 × 4096
Active area	62 mm × 62 mm
CCD pixel size	15 µm × 15 µm
Demagnification ratio	1:1
Typical quantum gain	160 electrons/X-ray photon (Mo) 74 electrons/X-ray photon (Cu) 204 electrons/X-ray photon (Ag)
Point spread function	FWHM: 75 µm
Readout speed	4 port; up to 4 MHz total
Signal-to-noise for single X-ray photon (Mo)	> 10:1 (SMART 1K detector 0.7:1)

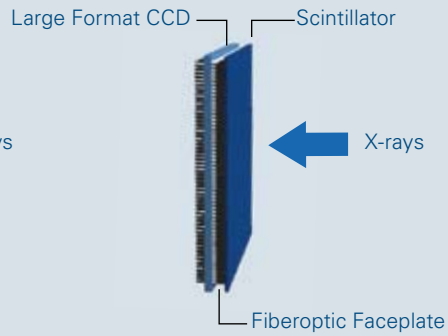
Conventional CCD Detector vs APEX II CCD

Conventional CCD Detector



Transmission of fiber optic taper typically < 10%

APEX II CCD



Transmission of fiber optic faceplate > 70%

In the conventional CCD design, more than 90% of the photons from the scintillator are lost in the fiber optic taper. In the APEX II CCD detector, 1:1 imaging improves the optical transmission by an order of magnitude – allowing data collection on yet smaller microcrystals or very weak diffractors. The APEX II has 15 times the sensitivity of the classic design.

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