Technical data sheet N° TDS-G12

Beam delivery system
GeniX 3D Cr High Flux

July 2010

Fig. 1: Beam delivery system head and control unit

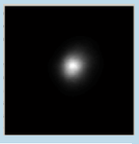
Chromium X-ray radiation is used in diffraction applications on iron containing material to reduce background provided by sample fluorescence. Chromium X-ray radiation can also be used efficiently in protein crystallography for structure solving by Single wavelength Anomalous Diffraction (SAD) from sulfur atoms. However providing high flux at the sample is critical for these applications due to high absorption in air and/or sample environment at this radiation.

The GeniX 3D Cr High Flux combines a high brilliance microfocus tube with high efficiency FOX3D aspheric optics. The coupling of the source and the optic is optimized to provide high flux on a homogeneous x-ray beam at the sample.

The advanced focusing properties provide a high flux density, approximately 10 times higher than with a standard sealed tube and multilayer optic system. The GeniX 3D Cr HF is adapted for both high quality and rapid measurements with a high spatial resolution. The well controlled divergence in two dimensions provides additional capability for 2D diffraction measurements.

The GeniX 3D is in the tradition of the well known GeniX platform in terms of high reliability, high stability and low maintenance making it a high performance system with low cost of ownership. The new GeniX 3D platform implements intuitive alignment concepts for further simplified integration on every type of diffractometer.

Fig. 2: High resolution CCD pattern of beam at focus position. Box size is 1x1 mm². FWHM = 150µm



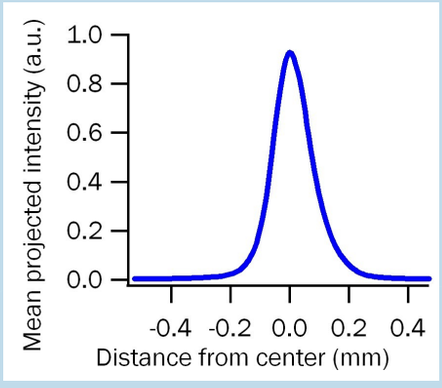


Fig. 3: X-ray horizontal beam profile of the spot (fig.2).

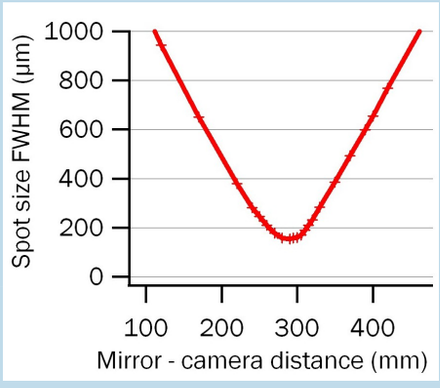


Fig. 4: Focusing curve (FWHM) .

Applications
- *stress analysis*
- *protein crystallography*
- *microdiffraction*
- *XRF*

Benefits
- *very high flux density*
- *excellent beam focusing*
- *extremely stable beam*
- *compact system, easy to integrate*
- *low power and low maintenance source*
- *smart source power management*
- *intuitive interface*

Options
- *configurable collimator system*
- *software utility for remote operation*

Accessories
- *alignment camera*
- *beamstop*
- *collimator*
- *pindiode detector*
- *dry vacuum pump*
- *water to air chiller*

Preliminary Technical Data

Subject to technical changes without notice

Beam features	
• Wavelength	2,29Å / 5.4 keV (Cr Kα)
• Integrated flux (vacuum, 14W-35KV-0.4mA source)	> 300 x10^6 photons/sec
• Divergence	~ 6mrad FW20%M both planes
• Spot size at focus (14W/40µm FWHM source)	<190 µm FWHM
• System output to focus	~240 mm (without collimator)
Electronic	
• Dimensions	3U — 19" — 600mm in depth
• Total weight	13.6kg
• Power	110/220 V (AC)
Head	
• Dimensions (LxWxH)	24 x 12 x 37 cm^3
• Total weight	Maximum 14.5Kg
Integration	
• System power consumption	150 Watts
• Remote control features	Ethernet port & Software
• System shutter	Safety shutter
• Cooling flow rate (closed loop)	>1.0l/min (set point 25°C)
• Dry vacuum pump	Working pressure: 3mbar Pump speed: 0.6m3/hr

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