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Flex-Beam оптика Техническое описание

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flex-Beam

Flexible Design, Unyielding Performance



The new XOS flex-Beam maintains the performance of the well-known X-Beam while delivering a new level of flexibility: in design, integration, and serviceability. The flex-Beam provides an excitation source aligned with industry-leading polycapillary optics that deliver unprecedented stability and intensity. The fully integrated solution is compact and easily integrates into any instrument or system.

The flex-Beam platform provides fully-integrated X-ray beam solutions including an air-cooled X-ray source coupled to a focusing or collimating polycapillary optic. The flexible system design enables seamless exchanges of X-ray sources or different optics with easy field-alignment to provide consistent performance. The compact size and stability of the beam intensity allow for easy integration of the flex-Beam, which reduces time-to-market for cutting edge, new instrument designs.

The flex-Beam is available in several standard focused or collimated beam configurations and performance packages; it can also be customized to specific beam applications.

Features and Benefits

Industry-Leading Performance

- Extremely high flux density:
 - With focusing optic: 50W provides flux density greater than a 12KW rotating anode source
 - With collimating optic: 50W provides flux density approaching sealed tube performance
- Enhanced spatial resolution for focusing X-ray beam

Flexible Design with Smaller Footprint

- Compact geometry eases integration
- Supports interchangeable optics or apertures
- Integrated air-cooled system
- Integrated shutter module meets PTB regulations
- Oil-free packaging
- Safety inter-lock available
- PC controlled software interface included

Easy Serviceability

- Field-alignment for optics and easy tube replacement

Optional Features:

- High-performance Superflux option offers 2x-3x more intensity than standard model
- Integrated 8 position filter assembly
- 50W High Voltage Power Supply available
- PCS 50 controller offers precise command and custom settings

Applications:

- **XRF**
 - Micro XRF analysis
 - In-situ and in-line process monitoring
 - Small particle analysis
 - Film and plating thickness
 - Elemental mapping
 - Forensics
- **XRD**
 - Single crystal XRD
 - Powder XRD
 - In-situ and in-line process monitoring
 - Texture, stress, and strain measurements

flex-Beam Compact X-ray sources with high flux

Custom Solutions. flex-Beams can be used in different applications where compact X-ray source with high photon flux is required. Various configurations are available to be used in μ -XRF, diffraction, in-line process monitoring or in-situ analysis, and medical imaging applications. Below are few examples of available flex-Beams. XOS can customize flex-Beam optics based on customer requirements.

Standard - Focusing Beam (μ XRF)

OFD (mm)	2	4	9	20	50	100
Focal spot size (μ m, FWHM, Mo K α)	8	15	25	45	100	180
Output beam intensity (photon/s)*	2.5×10^7	5×10^7	1×10^8	1.5×10^8	2.5×10^8	3×10^8

Note:

* Mo K α with a Mo-anode X-Beam at 50kV/1mA.

Superflux - Collimating/Parallel-beam Optics (XRD/WDS)

Output beam diameter (mm)	0.5	1	2	3	4	6	10
Output beam intensity (photon/s)*	3.0×10^8	1.2×10^9	3.5×10^9	6.5×10^9	1.0×10^{10}	1.3×10^{10}	1.8×10^{10}

Note:

* Cu K α with a Cu-anode X-Beam at 50kV/1mA. Output beam divergent angle is 0.2 degree.

Superflux - Slightly Focusing Optics (XRD/XRF)

Output convergent angle (degree)	0.25	0.5	1	2
Output beam intensity	5.0×10^8	1.6×10^9	5.0×10^9	1.6×10^{10}

Note:

* Cu K α with a Cu-anode X-Beam at 50kV/1mA. OFD is 140mm and focal spot size is 0.5mm.

Specifications

Nominal Output Power	50W, cables customized
Nominal Source Current	1 mA
Stability	< 0.5% RSD over 8 hours, temperature independent
Ambient Operating Temperature	5°-60° C
Cooling Mode	Integrated forced air
Targets	Cr, Cu, Mo, Rh, W

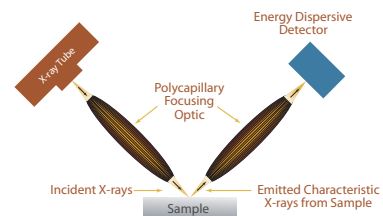


Figure 1

Overview of flex-Beam system with polycapillary-focusing optic.

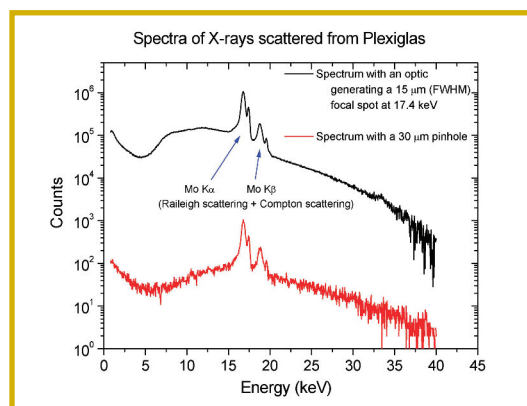


Figure 2

Comparison of MXRF spectra generated using a focusing polycapillary optic and a pinhole aperture.

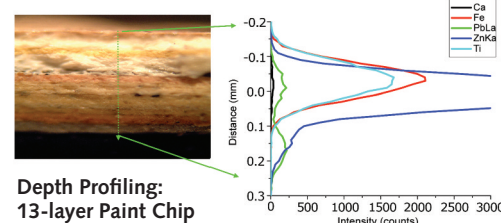


Figure 3

Confocal μ -XRF allows 3-D profiling of 13-layer paint chip for different elements at various depths.



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