

CERAMIC X-RAY TUBES FOR XRD

Modern ceramic technology - improved performance and increased reliability.

Bruker AXS ceramic tubes are 100% compatible with the traditional glass tubes for X-ray diffraction.

The main benefit of ceramic insulation versus glass insulation is the higher reproducibility of the focal spot position. This facilitates the change of tubes in case of tube replacement or change of wavelength.

The improved design of the cathode leads to a longer life compared to conventional glass tubes. The design of the ceramic tubes guarantees state-of-the-art spectral purity.

There are two and four window versions available. The standard version is the two window version. It provides one line and one spot focus and works with the one window tube housings (type S and type P). The four window version is required for three and four window tube housings in double goniometers, goniometers with film camera, and X-ray work benches.

A wide variety of anode materials and focus dimensions are available.

Like all Bruker AXS products, the ceramic tubes are manufactured according to ISO 9001 standards.



Ceramic X-ray Tubes

Short Anode

Tube Type	Anode Material	Maximum Power (W)	Number of Windows (line/spot)	Cooling Head	Order Number
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Long fine focus (0.04mm x 12mm - 0.4mm x 1.2mm)

KFL-Cu-2K	Cu	2200	1/1	0°	RGW:3346694
KFL-Cu-4K	Cu	2200	2/2	0°	RGW:3825374
KFL-Mo-2K	Mo	3000	1/1	0°	RGW:3825234
KFL-Mo-4K	Mo	3000	2/2	0°	RGW:3825382
KFL-Cr-2K	Cr	1900	1/1	0°	RGW:3825275
KFL-Cr-4K	Cr	1900	2/2	0°	RGW:3825424
KFL-Co-2K	Co	1800	1/1	0°	RGW:3825291
KFL-Co-4K	Co	1800	2/2	0°	RGW:3825440
KFL-Fe-4K	Fe	1000	2/2	0°	RGW:3825416
KFL-W-4K	W	3000	2/2	0°	RGW:3825390
KFL-Ti-4K	Ti	400	2/2	0°	RGW:3825408

Fine focus (0.04mm x 8mm - 0.4mm x 0.8mm)

KFF-Cu-2K	Cu	1500	1/1	0°	RGW:3346678
KFF-Cu-2K-90	Cu	1500	1/1	90°	RGW:3826059
KFF-Cu-4K	Cu	1500	1/1	0°	RGW:3826174
KFF-Mo-2K	Mo	2000	1/1	0°	RGW:3826034
KFF-Mo-2K-90	Mo	2000	1/1	90°	RGW:3826042
KFF-Mo-4K	Mo	2000	2/2	0°	RGW:3826182
KFF-Cr-2K	Cr	1300	1/1	0°	RGW:3826075
KFF-Cr-4K	Cr	1300	2/2	0°	RGW:3826224
KFF-Co-2K	Co	1200	1/1	0°	RGW:3826091
KFF-Co-4K	Co	1200	2/2	0°	RGW:3826240
KFF-Fe-4K	Fe	900	2/2	0°	RGW:3826216
KFF-W-4K	W	2000	2/2	0°	RGW:3826190
KFF-Ti-4K	Ti	300	2/2	0°	RGW:3826208
KFF-Mo-2K-180	Mo	2000	1/1	180°	RGW:7034742
KFF-Cu-2K-180	Cu	1500	1/1	180°	RGW:7034734

Normal focus (0.1mm x 10mm - 1mm x 1mm)

KFN-Cu-2K	Cu	2000	1/1	0°	RGW:3826331
KFN-Cu-2K-90	Cu	2000	1/1	90°	RGW:3826364
KFN-Cu-4K	Cu	2000	2/2	0°	RGW:3826497
KFN-Mo-2K	Mo	2400	1/1	0°	RGW:3826349
KFN-Mo-2K-90	Mo	2400	1/1	90°	RGW:3826356
KFN-Mo-4K	Mo	2400	2/2	0°	RGW:2841505
KFN-Cr-2K	Cr	1800	1/1	0°	RGW:3826380
KFN-Cr-4K	Cr	1800	2/2	0°	RGW:2841547
KFN-Co-2K	Co	1800	1/1	0°	RGW:3826406
KFN-Co-4K	Co	1800	2/2	0°	RGW:2841562
KFN-Fe-4K	Fe	1500	2/2	0°	RGW:2841539
KFN-W-4K	W	2400	2/2	0°	RGW:2841513
KFN-Ti-4K	Ti	500	2/2	0°	RGW:2841521
KFN-Mo-2K-180	Mo	2400	1/1	180°	RGW:7034791
KFN-Cu-2K-180	Cu	2000	1/1	180°	RGW:7034783

Ceramic X-ray Tubes

Long Anode

Tube Type	Anode Material	Maximum Power (W)	Number of Windows (line/spot)	Cooling Head	Order Number
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Long fine focus (0.04mm x 12mm - 0.4mm x 1.2mm)

KFL-Cu-2L	Cu	2200	1/1	0°	RGW:3346702
KFL-Cu-4L	Cu	2200	2/2	0°	RGW:3825457
KFL-Mo-2L	Mo	3000	1/1	0°	RGW:3825309
KFL-Mo-4L	Mo	3000	2/2	0°	RGW:3825465
KFL-Cr-2L	Cr	1900	1/1	0°	RGW:2835341
KFL-Cr-4L	Cr	1900	2/2	0°	RGW:3826000
KFL-Co-2L	Co	1800	1/1	0°	RGW:3825368
KFL-Co-4L	Co	1800	2/2	0°	RGW:3826026
KFL-Fe-4L	Fe	1000	2/2	0°	RGW:3825499
KFL-W-4L	W	3000	2/2	0°	RGW:3825473
KFL-Ti-4L	Ti	400	2/2	0°	RGW:3825481

Fine focus (0.04mm x 8mm - 0.4mm x 0.8mm)

KFF-Cu-2L	Cu	1500	1/1	0°	RGW:3346686
KFF-Cu-4L	Cu	1500	1/1	0°	RGW:3826257
KFF-Mo-2L	Mo	2000	1/1	0°	RGW:3826109
KFF-Mo-4L	Mo	2000	2/2	0°	RGW:3826265
KFF-Cr-2L	Cr	1300	1/1	0°	RGW:3826141
KFF-Cr-4L	Cr	1300	2/2	0°	RGW:3826307
KFF-Co-2L	Co	1200	1/1	0°	RGW:3826166
KFF-Co-4L	Co	1200	2/2	0°	RGW:3826323
KFF-Fe-4L	Fe	900	2/2	0°	RGW:3826299
KFF-W-4L	W	2000	2/2	0°	RGW:3826273
KFF-Ti-4L	Ti	300	2/2	0°	RGW:3826281

Normal focus (0.1mm x 10mm - 1mm x 1mm)

KFN-Cu-2L	Cu	2000	1/1	0°	RGW:3826414
KFN-Cu-4L	Cu	2000	2/2	0°	RGW:2841570
KFN-Mo-2L	Mo	2400	1/1	0°	RGW:3826422
KFN-Mo-4L	Mo	2400	2/2	0°	RGW:2841588
KFN-Cr-2L	Cr	1800	1/1	0°	RGW:3826463
KFN-Cr-4L	Cr	1800	2/2	0°	RGW:2841620
KFN-Co-2L	Co	1800	1/1	0°	RGW:3826489
KFN-Co-4L	Co	1800	2/2	0°	RGW:2841646
KFN-Fe-4L	Fe	1500	2/2	0°	RGW:2841612
KFN-W-4L	W	2400	2/2	0°	RGW:2841596
KFN-Ti-4L	Ti	500	2/2	0°	RGW:2841604



BRUKER ADVANCED X-RAY SOLUTIONS

Selection of Anode Material with respect to the Application

Anode Material	Characteristic α_1 -Radiation (nm)	Application
W	$L\alpha_1$ 0.147639	Where an intensive white spectrum is of more interest than characteristic radiation, e.g. Laue exposures on single crystals
Mo	$K\alpha_1$ 0.070930	When low absorption is desired, e.g. with single crystal experiments and transmission measurements. The most important reflections occur at relatively small 2θ -angles, where the Lorentz polarization factor leads to higher intensities. The angular resolution is low.
Cu	$K\alpha_1$ 0.1540562	Ideal for most powder diffraction examinations and thin film analysis such as high resolution XRD and reflectometry, as well as light atom single crystal experiments.
Co	$K\alpha_1$ 0.1788965	Used for investigation of ferrous samples where the Fe fluorescence would cause a high background.
Fe	$K\alpha_1$ 0.1936042	Used for investigation of ferrous samples where the Fe fluorescence would cause a high background.
Cr	$K\alpha_1$ 0.228970	Provides clear diffraction patterns with well separated reflections. Ideal for materials with large unit cell dimensions like clay minerals, for complex organic substances, and for stress analysis.
Ti	$K\alpha_1$ 0.2748510	Used for stress analysis.

Technical Data

Maximum voltage	60 kV
Total series resistance	50 k Ω
Max. heating voltage	11 V
Max. heating current	3.8 A
Foreign lines on delivery	< 1%
Increase of foreign lines per 1000h	< 0.9%
Cooling water flow-rate	\geq 3.5 l/min
Cooling water temperature	\leq 35° C
Water pressure	\geq 8 bar
Weight	ca. 1.9 kg

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