

MetalJet C2



The MetalJet C2 offers an attractive, cost effective version of the metal-jet source technology with simplified electron optics producing a round electron beam focus. It is similar to a standard solid target X-ray tube, but features Excillum's unique liquid-metal-jet-anode technology.

Technical specifications

Target material¹	Liquid metal alloy	Min. focal spot size	~10 μ m (~5 μ m offered on request)
Target type	Liquid jet	Focal spot size	User variable
Voltage	21–70 kV	Take off angle	User variable
Power²	0–200 W	Emission stability³	< 1%
Max current	4.3 mA	Position stability³	< 1 μ m
X-ray shutter	Optional	Min. focus-object distance⁴	18 mm
Dual port mode	Optional	Beam angle⁵	13°
Communication protocol	TCP/IP	Integrated radiation shielding⁶	Yes

¹ Room temperature liquid gallium alloys consist mainly of gallium, indium and tin. Although they have low reactivity and low toxicity, they should be handled according to their safety data sheets and local regulations. The supported anode alloys are ExAlloy G1 with 95% gallium and ExAlloy I1 with 21% indium (see typical emission spectra on next page).

² The actual power used is dependent on spot-size and voltage. Maximum power allowed by the software is 200 W, however, maximum output power of the 70 kV high-voltage generators is 300 W.

³ Standard deviation.

⁴ Without a shutter (24.8 mm with shutter).

⁵ Without a shutter (10.5° with shutter).

⁶ In order for the source to be fully shielded it needs to be operated with the shutter mounted and closed, otherwise the source naturally emits X-rays through the window and in the window region.

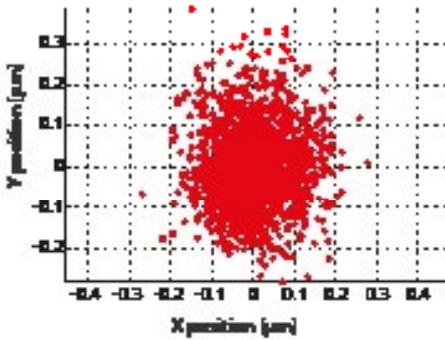
Performance examples

Spot size ⁷⁾ [μm, FWHM]	E-beam power [W]	Ga Kα (9.2 keV) peak brightness [photons / (s mm ² mrad ²)]	Ga Kα radiant flux [ph / (s mrad ²)]
20	50	1.4×10^{10}	2.6×10^6
80	200	6.8×10^9	8.7×10^6

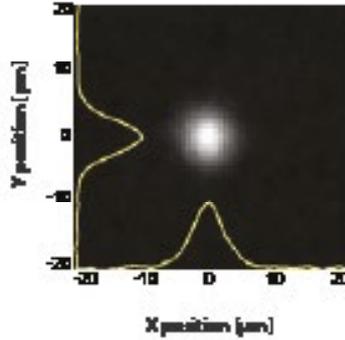
⁷⁾ E-beam spot size, similar to the X-ray spot height. The X-ray spot width will be smaller.

Characteristics

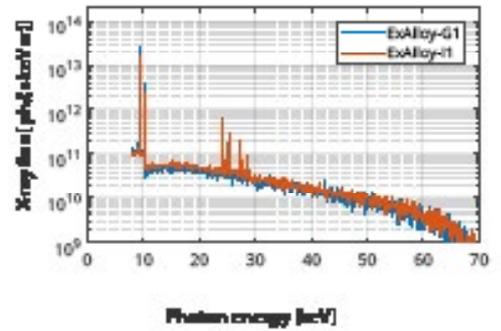
Spot stability over 24 h



Spot shape example



Emission spectra at 50 W, 70 kV, 20 μm (0.1 keV bin width)



Installation and operation

The source consists of the head and the pump system with dimensions shown in the drawing. The head has to be mounted essentially straight above the pump system. The coupling is semi-rigid, allowing some movement of the source head.

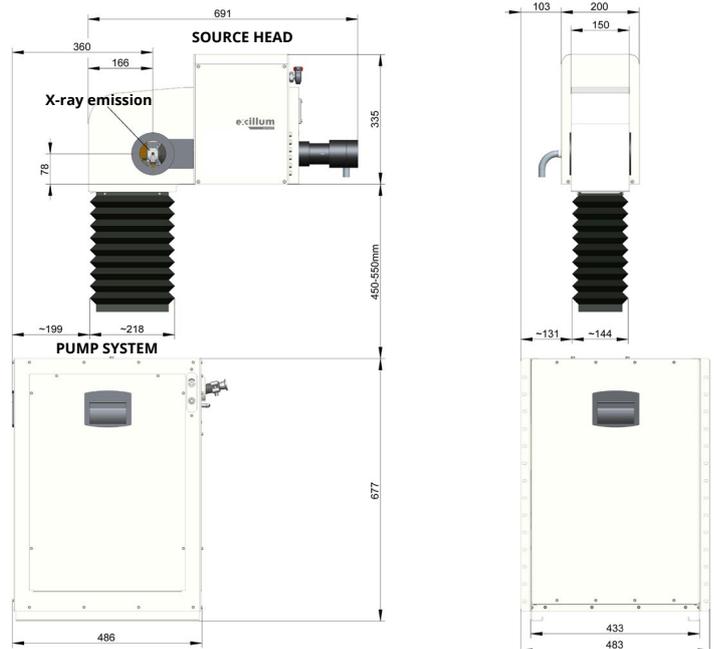
In addition, the MetalJet C2 consists of two 4U (176 mm height) 19" rack electronics boxes and a floor standing air/water chiller (69×36×62 cm), that can be mounted up to 4m from the head and pump system.

The source can be remotely operated through TCP/IP or directly through the GUI. The GUI can be operated on the source itself if it is equipped with monitor, keyboard and mouse, or on most computer platforms with a TCP/IP connection to the source.

The source cannot be operated as a standalone unit and must be integrated into a system providing the proper interlock connections.

Mains: AC, single phase, 200–240 V, 16 A, 50/60 Hz.

Ambient: 20–25°C (stable within $\pm 0.2^\circ\text{C}$ for optimal source stability), max 85% relative humidity.



Safety and compliance

For information about the safety and compliance of all Excillum X-ray sources, please visit our website: www.excillum.com/compliance

Intellectual property

All trademarks, domain names and copyrights herein are the property of Excillum or their respective owners. Excillum's X-ray sources and technologies are protected by several patents. For detailed information, please go to: www.excillum.com/our-company

This specification is subject to change without notice.

© 2024 Excillum AB