

EBL-SEM

Device description

The Pioneer Two system in LNQE is a hybrid system for electron beam lithography and scanning electron microscopy (EBL-SEM). It has a maximum acceleration voltage of 30 kV and uses as an electron emitter a thermal field emission (TFE) Schottky-source. The most important parameters are:

- System type: Pioneer Two from Raith
- Beam current: 5pA – 20 nA
- Beam size: < 1,6 nm
- Inlens detector
- Dual-detector for secondary and backscattered electrons
- EDX-detector (Bruker QUANTAX 200) for elements between Z=5 and Z=95
- Nanolithography resolution: 8 nm
- Pattern generator speed: 6 MHz
- Field stitching und overlayer accuracy: 50 nm ($m+3\sigma$)
- Stage travel range: 50 x 50 x 25 mm
- Stage with 360° rotation und 0 – 90°tilt

EBL-SEM – User fees

The research Group Ding (Institute FKP, Dept. ATMOS) is responsible of the EBL-SEM in the LNQE. Its use is subject to a fee. The costs are based on the guidelines of the DFG for the application of usage costs (DFG form 55.04). The DFG distinguishes between usage models:

- "Service operation": The work is carried out by the employees of the Group Ding (FKP-ATMOS).
- "User operation": The users work independently (with less support from the employees of the Group Ding).

Since the Group Ding does not have an employee dedicated only to this device, these different models are currently only of limited use:

- The number of authorized users is strictly limited (instruction and examination), whereby colleagues from the various specialist areas are to be taken into account as representatives of the respective subject.
- Use of the EBL-SEM in "user mode" is therefore only possible if an authorized user is involved.

Billing is based on full hour base, the costs are shown in the following table:

Device	Fees (€/hour)		
	User Operation	Service Operation	Non-academic externals (only Service operation)
SEM (Microscope only)	40,- €/h	80,- €/h	200,- €/h
EDX by day (incl. SEM)	45,- €/h		
EDX overnight (incl. SEM)	30,- €/h		
Electron beam lithography	45,- €/h		

The EBL-SEM is located in the cleanroom of the LNQE. Access to the clean room is only possible after instruction by the Chief Technical Officer, Mr. Oliver Kerker. In addition, the LNQE charges fees for the use of the cleanroom (300,- €/quarter of the year).

The desired times are booked with Mr. Chenxi Ma (see below for details) maximum 14 days beforehand. The booked time is then published in the online calendar of EBL-SEM (<https://owa.lnqe.uni-hannover.de/owa>) and is since then considered as binding. A booking that has not been cancelled at least 3 days in advance leads to the above costs.

In user operation, EBL-SEM users have to prepare their samples themselves.

Please consult the LNQE managers for access to the clean room.

When using the EBL-SEM, the users is required to thank the LNQE in publications. (e. g. The Authors would like to thank... "the LNQE for EBL-SEM"). After publication, a PDF of the publications must be sent to the LNQE.

These terms of use are binding for all users.

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