



Terms and conditions for the use of the Münster Nanofabrication Facility (MNF)

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§1 Purpose and objectives

The Münster Nanofabrication Facility (MNF) is a service center at the University of Münster. The MNF specializes in technologies relating to research in the field of nanosciences, with a particular focus on nanostructuring and nanoanalytics to a very high degree of precision, up to molecular dimensions under 10 nanometres. The MNF is open to all scientists researching in the field of nanotechnology. Especially to users at the University of Münster, the MNF offers in particular the technological possibilities for carrying out research projects in the field of high-resolution nanotechnologies. The technologies in place at the MNF are continually optimized so as to be able to meet new challenges. The centralization of the equipment park in the fields of nanofabrication and nanoanalytics ensures efficient use and a pooling of knowledge.

§2 Capabilities and facilities

The MNF provides equipment and technical expertise for high-resolution nanofabrication and nanoanalytics at the Center for Nanotechnology (CeNTech) and the Center for Soft Nanoscience (SoN). Cleanrooms with a net laboratory floor space of approx. 400 m² are available for using the equipment infrastructure. Of these 400 m², and in accordance with DIN EN ISO 14644-1, around 30 m² are in operation in cleanroom class 5, and 180 m² in cleanroom class 6. The remaining area meets the requirements of cleanroom class 7.

The equipment park at the MNF comprises equipment for the structuring, manipulation and characterization of nanostructures. In addition to deposition equipment, other equipment is also available for packaging and integration technology, as well as for metrology. A detailed list of the equipment currently housed at the MNF is accessible [online](#). Additional details are set out in the [MNF Regulations](#), which can be found on the MNF homepage. MNF equipment is supervised by equipment managers, who provide instruction on using the equipment and are responsible for service operations. Technical staff from the MNF, as well as from SoN and CeNTech, are on hand to carry out technical maintenance work on the equipment.

§3 MNF administration and management

The Facility Manager, the Facility Coordinator and the Senior Scientists make up the management of the MNF. The Facility Manager is responsible for the scientific management. The Facility Coordinator is responsible for the administrative management and is supported by the experienced Senior Scientists in the discharge of her duties. The management looks after the interests of the MNF, working together with the executive committee at SoN and the dean's office at the Department of Physics. Technical tasks at the MNF are carried out by technical staff assigned to the MNF. In carrying out this work, the MNF is also supported by technical staff at SoN and the Department of Physics. The management is also assisted by an advisory board.

§4 Access to the MNF

A signed declaration form is required for any access to the MNF. Every user at the MNF is associated with a scientific project. Potential users submit applications to the MNF for projects with a defined duration. In addition to the scientific aims, the project description sets out the equipment due to be used, and this is part of the user agreement. The MNF management decides whether applications are approved. Project durations can be extended. Working groups with several users can submit applications to the MNF for several projects. For each project, a short description must be written

which, in agreement with the users, is published on the MNF website. Electronic access to the MNF is activated by the Facility Coordinator after the MNF general training has been successfully completed.

§5 Opening time

The MNF is open during regular opening hours, from 8 am to 6 pm, Monday to Friday. Experienced users can also use the MNF at weekends and after 6 pm after clearance by the Facility Coordinator. The MNF is closed on public holidays and can only be used on these days after permission has been granted by the Facility Coordinator. Use outside the regular opening hours there are extended safety stipulations which are explained in the [MNF Regulations](#).

§6 User groups

User groups are divided into academic and industrial users. Academic users are in turn subdivided into internal users (University of Münster working groups) and external users (other academic institutions, universities and research institutes). User groups are charged different fees in line with the schedule of fees (Annex I and the [hourly rates](#)).

§7 Use of equipment and booking guidelines

- (1) The user of the equipment accepts the regulations governing the use of the MNF. These regulations are binding upon all users. An infringement of the regulations may lead to the user or users being excluded from any further work at the MNF. The Facility Coordinator decides on any exclusion.
- (2) For any work carried out using MNF equipment installed in the rooms of CeNTech and SoN, the house rules of each building must be observed.
- (3) The use of the cleanrooms and the laboratories at the MNF is based on the guidelines set out in the [MNF Regulations](#) which can be accessed via the MNF website.
- (4) Within the MNF, there are two possible ways to use the equipment:
 - The work is undertaken as a service provided by MNF staff. Further details can be found under §8.
 - The work is carried out by independent user(s). Further details can be found under §9.
- (5) Equipment is assigned for use via a web-based booking system. This can be accessed online via the MNF website. The booking system provides access to all equipment at the MNF, for which a user fee is charged. The maximum booking times for the equipment are specified in Annex I and are recorded cumulatively for the working groups involved. Equipment at the MNF can only be used after a booking has first been made, and only during the times booked.
- (6) Any booking made in the MNF booking system is binding. Any booking times which are not needed must be cancelled at least 24 hours before the starting time of the reservation. If the time booked is not used, the booking costs are, as a rule, charged to the working group.
- (7) Equipment times are assigned after bookings have been received. If the booking period for the equipment has been completely used up, the MNF management decides on the assignment of any further usage time.
- (8) The equipment can only be used on operational machines which have been cleared for use. During any downtime of the equipment there is no right of reimbursement of costs for resulting process losses.

§8 Use of equipment in service operation

Commissions for service work are carried out in the order in which they are received, with the highest possible level of efficiency, and as agreed between the ordering party and the responsible MNF staff member. Assigning priorities is determined by the degree of utilization of the equipment and by the needs of internal University of Münster users and external users. In urgent cases, the decision lies with the MNF management. In service operations, the equipment is operated by MNF staff in accordance with existing technical possibilities. Service operations are subject to the scale of fees. Use of the equipment in service operations is charged on the basis of the time taken.

§9 Independent use of equipment

Scientific staff and students at the University of Münster (internal users), as well as external academic users, may use the cleanroom and the equipment at the MNF by themselves (independent use) after initiation and approval by the staff responsible for the equipment. Independent use is also possible for industrial users after a contract is signed between the industrial party and the MNF and permission has been given by the Facility Coordinator. Sophisticated instruments may only be used without supervision when long-term, regular use is necessary, and after intensive training over several days under the direction of MNF staff has verifiably taken place. The following conditions must be fulfilled for any independent use of equipment at the MNF:

- Participation in the general safety training for working in laboratories (providing evidence of this is the responsibility of the institute to which the independent user belongs).
- Acceptance and observance of the General Laboratory Regulations of the University of Münster, the MNF Laboratory Regulations and the regulations contained in the [MNF Regulations](#).
- Successful completion of the training course for working in a cleanroom and of the annual refresher courses. This training is offered regularly by the MNF.
- Registration in the browser-based diary and booking system.
- Observance of the standards set out in the [MNF Regulations](#) for handling and preparing scientific samples.

Electronically secured access to the cleanrooms at the MNF is only activated after the requirements listed above have been fulfilled. Activation can be revoked at any time, as described in the regulations contained in the [MNF Regulations](#).

§10 Fees

- (1) Fees are charged for the use of the cleanroom and the MNF equipment, either in the laboratories or in the cleanrooms. These take the form either of a flat-rate monthly access fee, or fees for the use of equipment, which are charged on an hourly basis. The use of equipment not listed in the schedule of fees is included in the flat-rate access fee. Fees are calculated according to the relevant user group. Further pieces of equipment may be integrated in the schedule of fees.
- (2) Fees for usage are charged for each specific project on the basis of the usage time recorded in the booking system and in accordance with the MNF's schedule of fees
- (3) Users are required to make the relevant entries in the booking system, i.e. the start and finish of the usage time, details of the project and the work carried out, etc. These entries form the basis for the billing, as well as providing evidence of usage of the equipment.

- (4) Billing is based on either the reserved or the actual usage time, whichever is the longer. Reserved times which are not taken have to be cancelled at least 24 hours in advance, otherwise a fine is billed. If a user forgets to record the end of the usage time, an automatic closure will occur one hour at the latest after the end of the period of time reserved. The additional usage time will be billed. Cancelled usage time can be booked by other users of the MNF in line with regulations.
- (5) Settlement of fees and billing is done on a quarterly basis.
- (6) Working groups using the MNF are charged fees up to a maximum amount, in accordance with the schedule of fees (capping). The capping level is set out in Annex I for each type of group. There is no capping of fees for industrial customers.
- (7) Expenditure incurred by working groups such as costs for repair work can be offset against the usage costs, provided the outlays are not reimbursed through other funds at the SoN or CeNTech. Surpluses are not reimbursed.

§11 Liability

Users assume responsibility for the equipment used during usage time. If any damage is caused to equipment while it is being used – as a result of a deliberate operating error, inappropriate use or suchlike – the working group or the user's company will bear the costs for repairing the damage. Any costs for repairing damage must be settled promptly.

§12 Acknowledgement of contributions by the MNF

Any contribution made by the MNF is to be suitably acknowledged in publications. If, in a piece of research, any important contributions to ideas, execution or analysis were made at the MNF or by the MNF staff, the acknowledgement should be provided for example in the form of co-authorship by the MNF staff. Smaller contributions should be mentioned in the acknowledgements. The MNF management is also to be informed about the publication and notified of the bibliographical details. Evidence of publication is used by the MNF as justification for those providing its funding.

§13 Data processing, dissemination and storage

Data generated and used at the MNF are stored on the servers assigned to the MNF in collaboration with the University of Münster IT Centre and are made available upon request, provided the information is not protected by exploitation rights. The data include in particular the design files created by the MNF in service operations, as well as logbook entries generated by instruments. Data generated as part of publications with contributions by the MNF are held as raw data on the MNF servers. Users should use the data generated at the MNF in accordance with the German Research Foundation guidelines and to administer them conscientiously (§15(4)).

§14 Exploitation rights

Any processes and forms of usage relating to equipment which are developed at the MNF remain the property of the University of Münster. The MNF is to have an appropriate share in any exploitation rights resulting from assistance given by MNF staff.

§15 Miscellaneous

- (1) Every user undertakes to use the equipment entrusted to him/her properly and carefully and to use only such methods as the user has been trained to use. All instructions given by Equipment Managers or by any other MNF staff are to be complied with in full.
- (2) Users are obliged to notify the Equipment Managers immediately if any defects or safety risks are discovered in the equipment. The aim is to correct any defects at an early stage and thus exclude any subsequent damage to the equipment.
- (3) Without prior consultation with the MNF management and the Safety Officer, it is not allowed to bring into the MNF any test materials which may give rise to safety risks. MNF staff must be informed of the necessary safety measures.
- (4) The MNF, as well as all users of the MNF, undertake to uphold the rules of good research practice (refer to the advice from [DFG](#) and the [University of Münster](#)).
- (5) Superusers with responsibility for the equipment cannot be excluded from using the equipment.

Annex I

Schedule of fees

(1) Access fee

A monthly basic fee is levied for the use of the MNF cleanrooms at SoN and CeNTech. This basic fee is levied per user group working at the MNF as soon as a member of staff is working in the MNF rooms in the relevant month. The basic fee is levied up to the capping limit. The basic fee provides access to the cleanrooms and permits the use of equipment for which no separate fees are levied. Personal protective equipment as well as some of the general consumables in the facility are included in the access fee.

Internal academics (euros per month)	External academics (euros per month)	Industry (euros per month)
500	750	1000

(2) Capping

Monthly access fees and equipment fees at the MNF are recorded cumulatively for each working group up to an annual capping amount as set out in the table below. When the capping limit has been reached, no further fees for usage are charged. In such cases too, booking equipment is subject to the booking times listed in Section 3.

User group	Capping amount (in euros)
Working group W3, external	20,000
Working group W3, internal	10,000
Working group W2, external	14,000
Working group W2, internal	7,000
Junior research group, external	6,000
Junior research group, internal	4,000
Industrial customer	-

(3) Booking times

All pieces of MNF equipment at CeNTech and SoN are reserved via the online booking system. The booking times set out below are to be understood as cumulative usage for one working group per week. There are extended usage times for working groups which oversee equipment.

Instrument	Acad. internal (h)	Acad. external (h)	Industry (h)
Electron beam lithography - Raith EBP5150	8	5	4
Transmission Electron Microscope (TEM)- Thermo Fisher Scientific FEI TITAN Themis G3 60- 300	8	4	4
Helium/Neon Focused Ion Beam (FIB) – Zeiss ORION NanoFab	8	5	4
Dual Beam microscope (SEM / FIB)- Zeiss CrossBeam 340	8	5	4
Scanning Near-Field Optical Microscopy (SNOM) - neaSNOM	8	4	4
Nano Imprint Lithography System - EVG620 NT	6	3	3
3D Lithography - Nanoscribe Photonic Professional GT	8	4	4
Inductively Coupled Reactive Ion Etcher (ICP RIE) - Oxford PlasmaPro 100	6	3	3
Reactive Ion Etcher (RIE) - Oxford PlasmaPro 80	6	3	3
Plasma Enhanced Chemical Vapour Deposition (PECVD) - Oxford Plasmalab 80+	4	2	2
Polymer pen lithography- n.able Molecular Printer	4	2	2
Beam pen lithography- TERA-print	4	2	2