

MC^N

Melbourne Centre for **Nanofabrication**

User Manual



Table of Contents

MCN Overview	4
Operational Purpose and Scope	4
Access	5
Business Hours	5
Conditions Of Access	5
Facility Induction.....	5
User Fees.....	5
Security	6
Security Fobs	6
Visitors	6
Site Tours	6
Staff Contacts.....	7
References	7
OH&S Roles and Responsibilities	8
Responsibilities for Staff, Users and Supervisors.....	8
Visitors	9
Environmental Health & Safety (EHS) Vision Statement:	9
Building Layout & Evacuation Plan	10
Emergency Procedures.....	11
Emergency Response Alarms	12
Emergency Evacuation (Fire Alarm)	12
Gas Hazard Alarms.....	12
Orange/Red Lights & Siren's	13
In the event of a FIRE or SMOKE:.....	14
Emergency Response Resources.....	14
Emergency Response Contacts.....	15
Step by Step Access Procedure	16
Training	17
Equipment Licenses.....	18
ACLS – Online Booking System	19
Account Registration.....	19
Online Instrument Bookings.....	20
ACLS Booking Rules.....	24
Instrumentation and Support Facilities	25
MCN Equipment List	25
MCN Ancillary Equipment	26
Electrical Measurement Package.....	27
Optical Microscopes.....	27
Research-Based Software.....	27
Instrument Managers and Trainers	27
Instrument Management Matrix	28
Storage of Materials and Data.....	30
Samples and Materials	30
Data Storage via Cloud Stor	30

Safety Rules and Laboratory Procedures.....	31
General Rules	32
Personal Protective Equipment (PPE)	32
Bio – Chem Laboratory Use	33
Cleanroom Use	34
Acceptable - Cleanroom Items	34
Prohibited - Cleanroom Items	34
Chemical Usage	34
Entry into Cleanroom.....	34
Chemical Handling	35
General Chemical Handling.....	35
Fume Cupboards.....	35
Chemicals	36
Emergency Stop buttons	36
UPS power	36
Oxygen Sensors and Alarms	36
Sharps and Breakages	36
Liquid Nitrogen	37
Compressed Gases.....	37
Hazards and Incidents	38
Chemical and Biological Spills	38
Gas Leak.....	38
Incident Reports	38
Acids.....	39
Solvents	39
Solids.....	40
Emergency First Aid	40
Emergency Eye Wash and Showers.....	40
APPENDICES	41
Access and Pricing Policy.....	42
Access Flowchart.....	43
User Agreement.....	44
IP Policy	47
Security Policy	49
Out of Hours Policy.....	50

MCN Overview

The Melbourne Centre for Nanofabrication (MCN) is the Victorian Node and headquarters of the Australian National Fabrication Facility (ANFF). MCN is a multi-user research facility, operating the largest purpose-built cleanroom complex in the southern hemisphere. Drawing upon the wealth of knowledge within six Universities and the CSIRO, we aim to bridge the gaps between scientific disciplines and commercial needs.

MCN offers access to leading edge, state-of-the-art micro/nano fabrication and characterisation equipment and processes for all sectors of industrial, research and the academic community, both local and global.

Current expertise is provided in the areas of advanced materials processing and biotechnology, leading to the development of a wide range of customised sensors, actuators, and devices applied to areas from biomedicine and energy to nano-electronics and the environment.

Operational Purpose and Scope

The MCN user manual provides all staff and users of the Melbourne Centre for Nanofabrication (MCN) Facility with a convenient reference that can be consulted to find out about the Centre, its staff and capabilities.

This user manual outlines operating procedures, occupational health and safety information, conduct, environmental responsibilities, chemical use, access to and use of equipment and associated procedures. These procedures apply to all staff and users within the facility.

If you have any questions or comments regarding this manual or this facility, please contact the Facility Manager.

Access

Business Hours

The **main entrance is accessible from 9am until 5pm, Monday to Friday**. A security fob will provide you with additional access via the main entrance from 8.30am until 5.30pm (normal working hours) and into the access controlled (laboratory) areas. The Confocal, PC2 and Cleanroom laboratories all have FOB activated doors that will prevent users from exiting after 5:30pm. Should you require access to MCN outside of these normal working hours, please refer to the **Out of Hours Work Policy**, in the Appendices of this manual or available online <http://nanomelbourne.com/access>

Conditions Of Access

A condition of access to the facility is to include: (a) the address, "MCN, 151 Wellington Road, Clayton, Vic 3168, Australia" on the title head of any publications resulting from work undertaken at the MCN Facility in addition to any home collaborator address; and (b) the following acknowledgement on any publications or presentations resulting from work undertaken at the MCN Facility: "This work was performed in part at the Melbourne Centre for Nanofabrication, which is the Victorian node of the Australian National Fabrication Facility, an initiative partly funded by the Commonwealth of Australia and the Victorian Government".

Facility Induction

All users must complete an onsite Facility OH&S Induction prior to commencing any work in laboratories, instrument training or equipment use. The **OH&S Facility Induction is offered every Monday morning at 10am** (please check the web site first to ensure that this session has not be rescheduled to another day/time at <http://nanomelbourne.com/access>). Users can attend the induction without the need to book (unless there is a large group). Users who have not yet completed the OH&S Facility Induction will not be able to undertake any work on site and must be under supervision at all times.

User Fees

The **Access and Pricing Policy** outlines the hourly charges that are applied for all use of equipment at MCN and can be referred to in the Appendices of this manual or available online

<http://nanomelbourne.com/assets/mcn-ap-policy-sept-2011.pdf>.

Users accept that use of MCN's facilities will be charged at the published rates unless otherwise agreed by an MCN staff member.

Security

MCN is monitored by Monash Security and therefore all staff and users of the Facility must be able to produce identification upon request when on site. They must also observe any direction given by a Monash Security representative including instructions to leave a restricted area that they have previously been authorized to enter. Should you observe or become aware of any unauthorised personnel working in MCN's restricted area's (e.g. labs or cleanrooms) please notify an MCN staff member or phone (Monash Security on 990 53059 - after hours) immediately.

Security Fobs

MCN users RFID tag enabled fobs to provide electronic (controlled) access. All users must complete an onsite OH&S Facility induction before a fob is issued. Everyone who is inducted is eligible to receive a Security Fob as outlined in the Security Policy located in the Appendices of this manual or available online <http://nanomelbourne.com/access>. Lost Fobs must be reported immediately for deactivation and users must NOT share their FOB with other users.

Visitors

Visitors to the site must always be accompanied by a member of staff, or a Licensed User. Visitors are NOT permitted to perform any work themselves on the MCN site.

- Visitors escorted to the laboratory areas MUST sign in
- Visitors to the loading bay/office/meeting/tea room areas need NOT sign in

Visitors to the laboratories must sign into the Visitors log book at reception and wear an identifying visitor badge at all times whilst onsite. The visitor log book also serves as the fire roll. Upon leaving the facility, visitors must sign out and return their visitor badge to reception. Staff/users hosting visitors are responsible for their safety including during a building emergency (e.g. evacuation).

Site Tours

All site tours to the MCN laboratories must remain under the supervision of an MCN staff member or a Licensed User. Licensed Users must seek approval from the Facility Manager or Director before bringing visitors to the labs or cleanrooms. MCN receives frequent requests for tours and wherever possible will endeavor to accommodate these requests. Tours, however, need to be conducted in a way that results in a minimal impact on users.

Note: *If you are interested in arranging a group (or individual) tour of the facility, please email an enquiry to MCN-enquiries@monash.edu or phone 03 9902 4073.*

Staff Contacts

Senior Management

Dr Dwayne Kirk - Managing Director dwayne.kirk@monash.edu	03 990 24049
Dr Gareth Moorhead - Science Director gareth.moorhead@csiro.au	03 990 24073
Dr Paul Spizzirri – Facility and OHS&E Manager paul.spizzirri@monash.edu	03 990 29653 0407 203 145 (a/h)

Senior Instrument Managers

Dr Matteo Altissimo matteo.altissimo@monash.edu	03 990 29654
Dr Sasikaran Kandasamy sasikaran.kandasamy@monash.edu	03 990 29655
Dr Manoj Sridhar manoj.sridhar@monash.edu	03 990 29656

Instrument Managers

Douglas Mair douglas.mair@monash.edu	03 990 29658
Zoran Vasic zoran.vasic@monash.edu	03 990 29659
Varsha Lal varsha.lal@monash.edu	03 990 29657

Administrative Officer

Vanessa Peters – Receptionist, EA to MD vanessa.peters@monash.edu	03 990 24073
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References

MCN Website
www.nanomelbourne.com

General Enquires
MCN-enquiries@monash.edu

AC Lab System (ACLS) Equipment bookings
<http://vera073.its.monash.edu.au>

OH&S Roles and Responsibilities

MCN staff members are responsible for the day-to-day operation of the MCN facility, its instrumentation and services. It is essential that an MCN staff member is consulted immediately if users or visitors have any doubts or are unsure about the safe work practices employed at the MCN. It is also vital that staff are informed immediately of any issues such as damaged equipment, consumable replenishment, safety hazards or incidents, inappropriate behaviour by others, etc.

Safety is paramount for all users of this facility. Safe work practices must be adopted at all times and MCN staff must be alerted to any safety concerns. The population of the MCN building is comprised of staff, users, contractors and visitors who all have specific responsibilities when on this site. They are as follows:

Responsibilities for Staff, Users and Supervisors

Staff and Users

Staff and students must:

- Follow the OHS policy and procedures of Monash University and the MCN
- Seek advice before starting new or unfamiliar work
- Be familiar with the emergency and evacuation procedures and routes
- Follow the directions of emergency response and health & safety staff
- Know the location of emergency equipment (if trained in its use)
- Wear appropriate clothing and footwear for the work you do
- Use (appropriately) and maintain any Personal Protective Equipment (PPE) provided
- Use a documented risk management process to manage OHS risks
- Not willfully or recklessly endanger anyone's health and safety
- Immediately report Hazards or incidents to the Safety Officer

Users

Licensed Users must:

- Not allow anyone into the building (Visitors) using your FOB pass after hours
- Not bring a contractor on site without discussing this first with the Facility Manager
- Identify new procedures/chemicals/hazards being considered for use at the MCN to the Safety/Facility Manager (BEFORE bringing them on site). Through consultation, an appropriate solution for managing new hazard elements will be developed with you.

Supervisors

If you supervise students, you are responsible for their health and safety. You must:

- Encourage appropriate attitudes towards OHS
- Ensure that you, your staff and students undertake recommended OHS training
- Use a documented risk management process to manage OHS risks
- Apply relevant OHS policy (MCN and Monash) and procedures
- Actively participate in OHS inspections and audits
- Include OHS performance in staff appraisals
- Appropriately authorize your staff/students to perform hazardous activities as identified by the MCN User agreements

Note: *You can delegate the supervision or training of staff and students to a suitably qualified person, but you are responsible for ensuring they are competent and have had the relevant training.*

Visitors

Visitors must

- Sign in at reception and wear a visitors pass before entering any laboratory areas (note that the visitor logbook is also the fire roll for the site)
- Review the Visitors Emergency Guide (located at Reception and throughout the site) to identify the emergency escape routes and evacuation system for the MCN
- Remain in the company of a supervising member of staff or inducted user at all times
- Follow the direction of MCN staff, Monash Security or emergency response personnel
- Not perform ANY hazardous activities while on site.
- Sign out and return the visitors pass to reception when leaving

Environmental Health & Safety (EHS) Vision Statement:

MCN and its staff are committed to workplace safety, resource conservation, and managing our environmental impact. This is achieved by

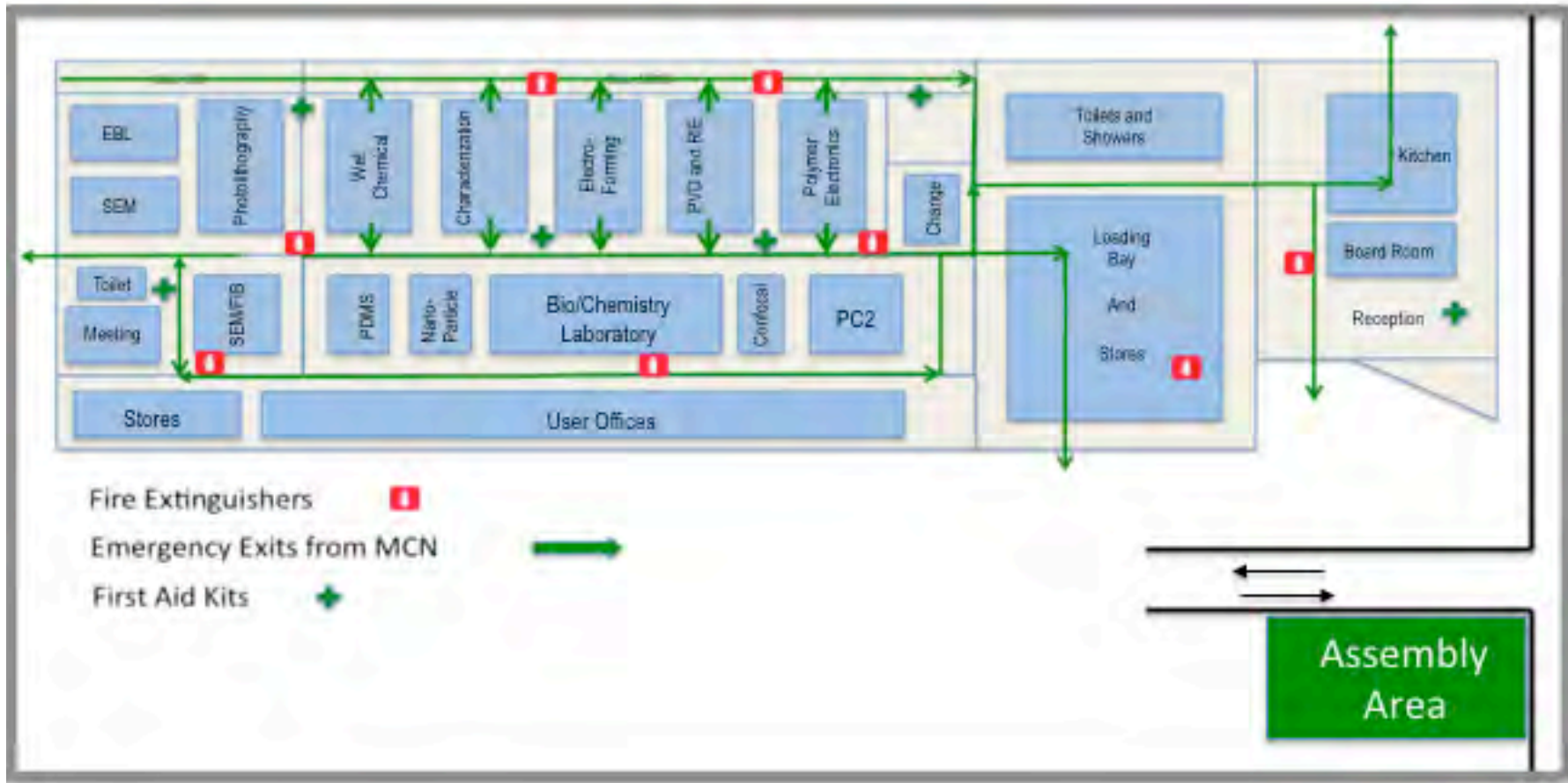
- Ensuring activities conducted at MCN are compliant with legislative/regulated/best practice requirements
- Promoting EHS awareness through training, communication and participation
- Ensuring all users and visitors comply with Monash and MCN policies
- Assessing hazards to identify appropriate management strategies prior to implementation
- Using resources efficiently and minimizing landfill waste

Note: *The MCN Environmental Health & Safety Strategic Plan is located on the <http://nanomelbourne.com/access>*

Building Layout & Evacuation Plan

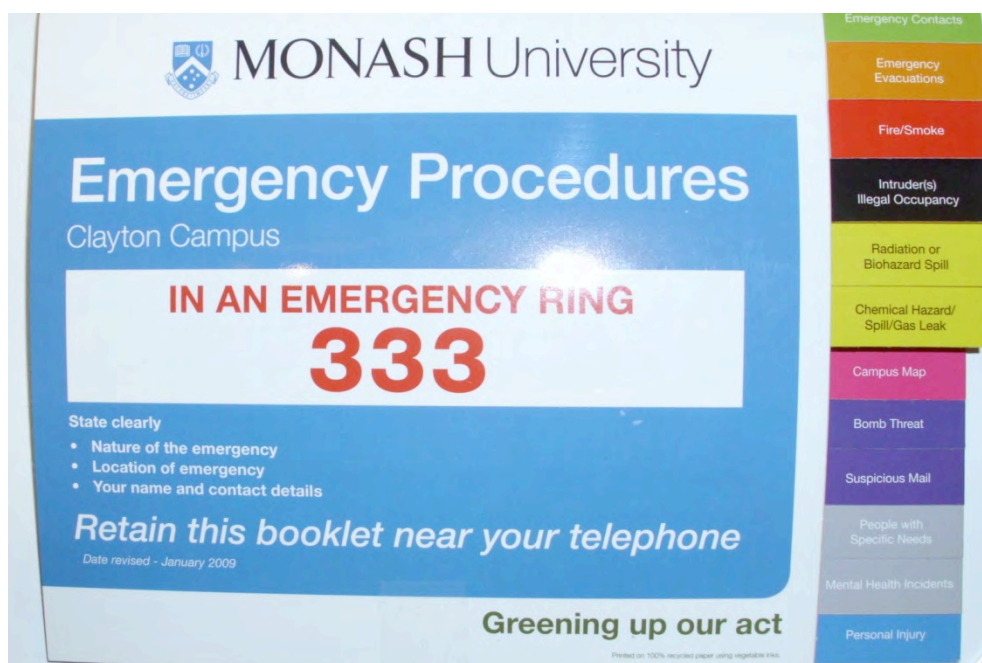
Emergency exit signs are displayed throughout the facility indicating the evacuation routes.

The Evacuation Assembly Area from all escape routes is located on the grass opposite the front entrance of the building (refer to diagram).



Emergency Procedures

There is a range of Emergency Response Procedures available for Staff/Users/Visitors to employ when visiting/working at the MCN. These procedures are outlined in the Monash Emergency Procedures Booklet (see below), which are located next to every telephone on site.



This booklet contains important information on how to respond to concerning behaviours in a systematic way to prevent the risk of escalation to a more serious incident. The booklet covers the following areas:

- Emergency Contact Information (Monash)
- Emergency evacuation
- Fire/Smoke
- Intruders/illegal occupancy
- Radiation or biohazard spill
- Chemical Hazard / spill / gas leak
- Bomb threat
- Suspicious mail
- People with specific needs
- Mental health incidents
- Personal injury

Emergency Response Alarms

The Melbourne Centre for Nanofabrication (MCN) employs TWO (2) different alarm systems to manage the site's Emergency Response. They are:

1. Conventional Emergency Evacuation (FIRE) alarms and
2. Gas Hazard alarms

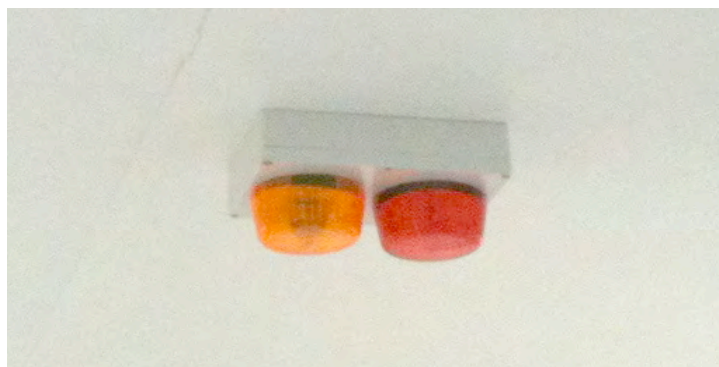
Emergency Evacuation (Fire Alarm)

On hearing the FIRE ALARM (BLEEP, BLEEP, BLEEP) OR being instructed to evacuate by a Floor Warden (Yellow Cap)

1. Secure confidential/valuable items (IF TIME PERMITS)
2. Proceed to the nearest EMERGENCY EXIT and leave the building
3. Follow instructions from the Floor/Chief Wardens
4. Proceed to the ASSEMBLY area and remain there until given the ALL CLEAR to return to the building by the Chief/Floor Warden or Emergency Services Personnel (Fire Brigade, Police, Ambulance)
5. Present yourself to a floor warden for checking against the fire role (visitor logbook)

Gas Hazard Alarms

The MCN facility is fitted with around 40 sensors monitoring oxygen levels (oxygen depleted environments) and leaks from toxic gases. The alarms are self-contained and incorporate a red and orange strobe light along with an audible siren on the side (see below). These units are distributed throughout the site and are usually mounted on ceilings or high on walls.



Orange/Red Lights & Siren's

Orange Flashing Light WITHOUT Local Siren

The Orange Flashing Light indicates a loss of containment pressure (negative) on the gas manifolds (service areas of the facility). This is NOT A SIGNAL TO EVACUATE.

Notify MCN staff immediately of this alert.

Orange/Red Flashing Light WITH Local Siren

The ORANGE/RED FLASHING LIGHT + SIREN (LOCAL) indicates the Low/High level detection of a toxic gas or oxygen deficiency approaching/exceeding the dangerous threshold.

On seeing the flashing ORANGE light and hearing the alert tone (Beep, Beep, Beep), staff/visitors and users should:

1. Stop working
2. Make safe your work/area and secure confidential/valuable items (if time permits)
3. EVACUATE THE BUILDING avoiding areas with significant bottled gas (or Nitrogen) in storage or use
4. Proceed to the nearest EMERGENCY EXIT and leave the building
5. Follow instructions from the Floor/Chief Warden
6. Proceed to the ASSEMBLY area and remain there until given the ALL CLEAR to return to the building by the Chief/Floor Warden or Emergency Services Personnel (Fire Brigade, Police, Ambulance).
7. Present yourself to a floor warden for checking against the fire role (visitor logbook).

Note: *that the gas hazard alarm siren is associated with the flashing strobe lights and IS NOT the same as the fire evacuation alarm siren.*

The emergency response procedure upon detecting Fire and/or Smoke is as follows:

In the event of a FIRE or SMOKE:

1. RESCUE AND OR REMOVE any person in danger ONLY if it is safe to do so
2. ALARM – Raise the alarm by informing your nearest MCN staff member (where possible) and by pressing one of the red Fire “Breakglass” buttons distributed around the site. You can also call 0-000 and ask for the fire brigade.
3. CONTAIN the fire by closing doors (don’t lock them) as you leave.
4. EXTINGUISH &/OR EVACUATE to your Assembly Area as instructed by Floor Wardens. Only attempt to extinguish a Fire IF you have been trained, IF it is safe to do so and IF you have someone else there to assist you.
5. Advise Monash Security on ext 333 (or 9905 3333) and provide them your name, location (151 Wellington Rd Clayton, Bld 222) and the type and extent of fire/emergency. They are able to send assistance and coordinate the emergency service response.
6. Remain at the ASSEMBLY AREA until given the ALL CLEAR to return to the building by the Chief/Floor Warden or Emergency Services Personnel (Fire Brigade, Police, Ambulance).
7. Present yourself to a floor warden for checking against the fire role (visitor logbook).

Note: *While fire hoses are available on site, their use should be restricted to Emergency Services Personnel (Fire Brigade) only because there are no floor drains on site.*

Emergency Response Resources

Fire Extinguisher Locations

- Reception – Ground floor, within fire hose reel cabinet
- Cleanroom – Bay 1 corridor and Class 100 airlock
- Chase 1 and 3
- Loading Bay
- User workstations/corridor – G52 and G42 entrances
- Plant Room – Level 1
- Sick Bay – Level 1

First Aid Kit Locations

- Cleanroom Chases
- Cleanroom - located along the corridor opposite Bay 2 and Bay 4
- Laboratories – Utility stations at both ends of the corridor
- Reception
- Sickbay – Level 1

Emergency Response Contacts

Safety Officer and Chief Warden

Paul Spizzirri 03 990 29653 or 0407 203 145

Fire Wardens

Zoran Vasic 29659

Doug Mair 29658

Manoj Sridhar 29656

Matteo Altissimo 29654

Varsha Lal 29657

Sasi Kandasamy 29655

Vanessa Peters 24073



Breathing Apparatus

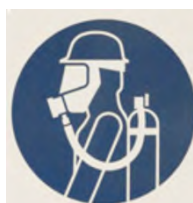
Paul Spizzirri 29653

Matteo Altissimo 29654

Zoran Vasic 29659

Doug Mair 29658

Sasi Kandasamy 29655



First Aid Officers

Zoran Vasic 29659

Doug Mair 29658

Manoj Sridhar 29656



Step by Step Access Procedure

MCN is staffed with technical specialists (Instrument Managers) to provide training, technical support or service delivery to users as required. Industry access is also facilitated as are research collaborations, contract research and development and consulting. The pricing schedule for each of the site capabilities can be found online at <http://nanomelbourne.com/access>.

The following four steps are required to access the MCN facilities and services.

Step 1: The first step is to contact one of our Instrument Managers or email MCN-enquiries@monash.edu. They can advise you on the feasibility of your proposed project, and can usually give you a time line and cost estimate. MCN staff will respond to your initial contact within two working days.

Instrument Manager	Responsibility	Phone
Matteo Altissimo matteo.altissimo@monash.edu	Electron Beam Lithography / Microscopy	03 9902 9654
Sasi Kandasamy sasikaran.kandasamy@monash.edu	Thin Film Deposition / Etching, Photolithography	03 9902 9655
Douglas Mair douglas.mair@monash.edu	Photolithography / ALD / Characterisation	03 9902 9658
Varsha Lal varsha.lal@monash.edu	Confocal Microscopy / AFM / TIRF	03 9902 9657
Manoj Sridhar manoj.sridhar@monash.edu	Focused Ion Beam / Scanning Electron Microscopy	03 9902 9656
Zoran Vasic zoran.vasic@monash.edu	Thin Film Deposition / AFM / Organic Photovoltaics	03 9902 9659

Step 2: Once you have agreed upon your project details with the relevant Instrument Manager(s), you will be asked to submit a user registration form located on our ACLS [online booking system](#). (*refer to page 20, for more information*)

Step 3: Once your registration is approved you will need to attend an MCN facility induction held onsite every Monday at 10:00am, unless advised otherwise should you intend to perform any of the work yourself.

Step 4: Contact the relevant Instrument Manager(s) to begin appropriate instrument training if necessary.

Training

Training needs should be discussed during your initial contact with MCN. Equipment can only be used by licensed users. A range of user license types are available, depending on your skills and needs (*refer to page 19, for more information relating to equipment licenses*).

Responsibilities

In order for equipment training to be as effective as possible, the following outlines the responsibilities of the Trainer and the Trainee.

Trainer's Responsibilities

- To teach the Trainee how to operate the equipment safely, effectively and without damage.
- To instruct the Trainee in the basic principles of operation of the equipment and to teach the Trainee how to perform basic adjustments in order to achieve reasonable performance.
- To teach the basic techniques relevant to the Trainee and their project.
- To provide advice to the Trainee on optimisation of the equipment for its performance.

Trainee's Responsibilities

- To always seek help if you are unsure of the correct operating procedure or if the equipment is not working properly.
- To always follow the Trainer's instructions on the operation of the equipment. To take detailed notes to allow follow up.
- To learn the theory of the technique being taught and related techniques by consulting books and the scientific literature. MCN staff can suggest suitable references.
- To become proficient in operating the equipment in a safe manner.
- Training sessions are not intended to yield scientific results but rather to teach the Trainee as described above. However, should publishable data be obtained and analysed by the Trainer, the Trainee must ensure the Trainer is invited to be a co-author on the publication.

Additional Training

After you have completed your initial training and as your work progresses, you may require additional training. This could be in the application of more advanced techniques, in the operation of other equipment or in the access of additional areas. To arrange additional training, please contact the relevant Instrument Manager.

Equipment Licenses

Most pieces of equipment have a document detailing its Standard Operating Procedure (SOP) and a list of trained users.

Users may only use instruments and/or processes as authorised by the respective Instrument Manager(s). MCN offers three levels of access as detailed below. If you require additional time on any instrument, please contact the relevant Instrument Manager.

License Group	Max hours/day	Max hours/month
Limited	4	16
Standard	8	32
Out-of-hours*	24	32

* Users who have out-of-hours licenses will be able to make bookings outside of the (normal working hours) from 8.30am until 5.30pm. All other trained users will only be able to make bookings during normal business hours.

Note: *Trained users are not permitted to train other users.*

All equipment licenses will expire at the end of each year and a renewal reminder will be sent to all users late in the year with directions to renew the license. This ensures our user records are kept up to date. If more than three months have lapsed since you last used an instrument then you will be required to arrange a training session to refresh your memory of the instrument's operation and to bring you up to date with any changes in operating procedures.

ACLS – Online Booking System

The ACLS (AC Lab Systems) online booking system is used to book/access equipment and you must be a licensed user to access the booking system. It is MANDATORY that usage of any major equipment at MCN be booked using ACLS.

Only appropriately licensed users will be able to make instrument bookings online through the ACLS booking system. Users who do not possess the appropriate license(s) or those requiring assistance from MCN staff need to contact the relevant Instrument Manager to organise a booking.

Account Registration

All new MCN users should complete the user registration form on the MCN ACLS booking system <http://vera073.its.monash.edu.au>. Before becoming a registered user you must ensure that you or your supervisor have sufficient funds to cover the access you are proposing.

Completing the ACLS online registration form

Please ensure you fill in all five required pages of information inclusive of personal information, terms and conditions, school/organization information, supervisor information and MCN facilities requested, before submitting the registration form. All new user account requests will be sent to the MCN Facility Manager for verification and approval. All users will receive an automated email notification containing their selected username and password once their user accounts have been approved and activated.

Cancelling an online instrument Booking

Bookings can only be cancelled a minimum of 24 hours before your booked session. If you need to cancel your booking later, please contact the appropriate Instrument Manager as soon as possible. The procedure for cancelling a booking is similar to the procedure for making a booking. Navigate to the day of your booking as above and simply uncheck the boxes against the timeslots that you had previously reserved.

Melbourne Centre for Nanofabrication.MCN.Australia

http://vera073.its.monash.edu.au/book.dll

CloudStor: NTS Service MCN ACLS MCN Wiki MCN ANFF Home Bio21 Institute - UniMelb MCEM-Monash NetBank - Logon TIPTOP Job List

MC^N
Melbourne Centre for Nanofabrication

Registration Terms & Conditions School/Org Supervisor Facilities Submission

NEW USER REGISTRATION

Title

Given Name*

Family Name*

Student/Staff No. (000 for visitors only)

Email*

Retype Email*

Login Password*

Retype Login Password*

Type of Researcher

Work Phone*

Work Address

Address 1

Address 2

Suburb

State

Postal Code

MCN Local Contact*

Select one staff at least:

Douglas Mair

Manoj Sridhar

Matteo Altissimo

Sasikaran Kandasamy

Varsha Lal

Zoran Vasic

*: Indicating the compulsory data fields

Screenshot of MCN ACLS online user registration form

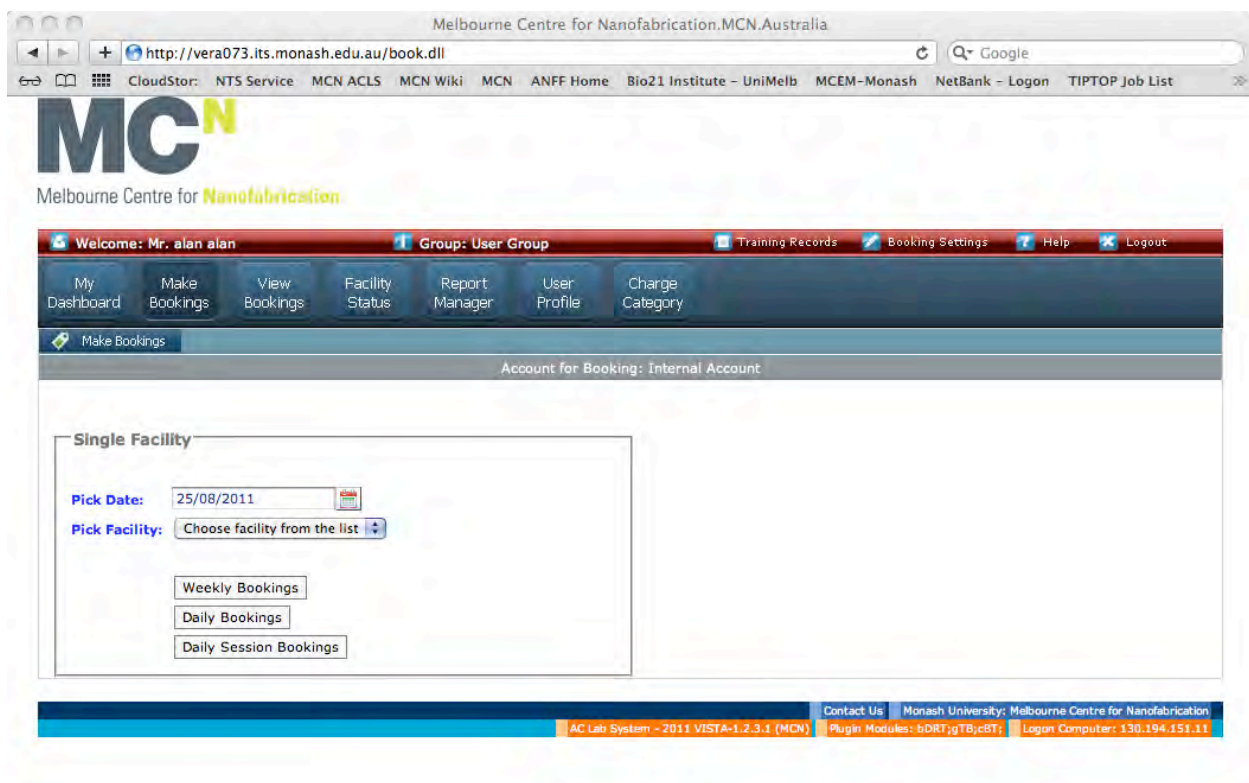
Online Instrument Bookings

To make an online booking, log in to the MCN ACLS system <http://vera073.its.monash.edu.au> using your username (email address used for registration) and password. A screenshot of the login screen of the MCN ACLS system is shown above for reference. If you encounter any problems regarding logging into the system, please use the "Contact Us" link at the bottom of the page or send an email to the MCN Facility Manager.



**Screenshot of MCN ACLS login screen.
Please enter your username and password as directed.**

After logging in, you should automatically be in the "Make Bookings" section of the program as shown below. Select the instrument (from the drop down list) and day that you would like to book, and select "Weekly" (to view the booking calendar for the whole week around the date selected), "Daily" (to view the booking calendar for only the day selected) or "Session" (to view the booking calendar for only the day selected and to record any notes specific to your booking).



Screenshot of MCN ACLS "Make Booking" page.

A calendar (either daily or weekly, as selected) will then appear with check boxes indicating available timeslots on the instrument selected. A screenshot of a daily booking calendar is shown as an example below. Check the boxes against the available timeslots that you would like to reserve. Check the "Booking Reminder" box at the bottom of the calendar if you would like to receive an email reminder of your booking 2 days before your booked session.

The screenshot shows a web browser window with the URL <http://vera073.its.monash.edu.au/book.dll>. The page header includes the MCN logo and navigation links like 'CloudStor', 'NTS Service', 'MCN ACLS', etc. The main content area displays a 'FIB-SEM Booking Calendar on 30/08/2011'. The calendar is a grid with time slots from 00:00-00:59 to 23:00-23:59. The first slot (00:00-00:59) is selected with a checkmark. Below the calendar, there are two checkboxes: 'Tick to Receive Booking Confirmation' and 'Tick to Activate Booking Reminder (2 Days)'. An 'Accept' button is at the bottom. The footer contains system information: 'AC Lab System - 2011 VISTA-1.2.3.1 (MCN)', 'Plugin Modules: bDRT;gTB;pBT;', and 'Login Computer: 130.194.151.11'.

Screenshot of daily booking calendar for 30/08/2011 for the FIB-SEM instrument.

ACLS Booking Rules

Please note that users are billed based on booked time. Kindly observe the following simple rules so that we can optimize access for everyone.

- You must attend, ON TIME, every session you are booked for, unless there are exceptional circumstances beyond your control (such as illness).
- If you are unavoidably delayed in starting a session, you MUST contact the relevant Instrument Manager. Users who fail to notify MCN of a delay within 30 minutes of their scheduled start time may have their session reassigned to another User. Persistent lateness may result in a reduction or suspension of booking entitlements.
- You must fill in the instrument logbook at the start and end of your session. Note any unusual conditions or equipment problems. Report serious problems in writing and in person to the Instrument Manager or Facility Manager if the Instrument Manager is not available. Failure to fill in logbooks correctly can result in a reduction in your booking entitlement or license.
- Bookings are NOT transferable, equipment can only be used by the person who booked it.
- If instrument time is available, you can extend your session outside the booked time (subject to your license) but please contact the Instrument Manager to have the booking adjusted.

Instrumentation and Support Facilities

MCN has a broad range of equipment available for use.

MCN Equipment List

Equipments / Capabilities	Model	Location
Electron Beam Lithography	Vistec EBPG5000plus	G36
Dual-beam Focused Ion Beam / Scanning Electron Microscope	FEI Helios Nanolab 600	G42
Field Emission Gun Scanning Electron Microscope	FEI Nova NanoSEM 430	G37
Mask Aligner with Nano Imprint Lithography	EVG 620	G34
UV Flood Light Source		G34
Automated Spin Coater with Hot Plate	Karl Suss Delta 80RC	G34
Hot Embosser	EVG 520IS	G34
Inductively Coupled Plasma Reactive Ion Etcher	Oxford Instruments Plasmalab 100 ICP380	G25
Plasma Enhanced Chemical Vapour Deposition	Oxford Instruments Plasmalab 100 PECVD	G25
Ion-assisted DC/RF Sputtering	Intlvac Nanochrome I	G25
Electron Beam & Thermal Evaporator	Intlvac Nanochrome II	G25
Polymer Electronics (incl. ALD, thermal evap.)	Angstrom Engineering	G22
Electroforming	Digital Matrix	G27
Electroplating	Digital Matrix	G27
Atomic Force Microscopy	Veeco Dimension ICON	G29
Total Internal Reflectance Microscope	Nikon Ti-U	G52B
Confocal Microscope	Nikon A1Rsi MP	G52B
Biological Atomic Force Microscopy	JPK NanoWizard II	G52B
Zeta Potential Analyzer	Anton Paar Surpass	G47B
Plate Reader	Synergy MX	G53
Micro Array Protein Spotter	Nanoprint 60	G52
Probe Station	Alessi	G29
3D Printer	Objet Eden 260V	G52
Atomic Layer Deposition (Thermal and Plasma)	Cambridge Nanotech – Fiji F200	G27
Stylus Profiler	AMBIOS XP-200	G29

MCN Ancillary Equipment

Equipment / Items	Location
Sputter Coater (SEM)	G44
Plasma Cleaner / Bonder	G44
Thinky Mixer / Degasser (PDMS)	G44
Programmable Hotplates	G34
Stirrer Hotplates with temperature sensors and stands	G32
Lab Ovens (4×Cleanroom, 1×Bio Lab)	G32
Vacuum Ovens (1×Cleanroom, 1×Bio Lab)	G32
Mobile Storage Cabinets – Cleanrooms, Nitrogen purgeable	G34, G36, G37
Fridge – Chemicals (1×Cleanroom, 1×Bio Lab)	G34
Micro Balance	G34
Desiccators (Cleanroom and PDMS Labs)	G22, G25, G27, G29, G32
Bio Fridge (150L Capacity)	G52
Probe Sonicator	G52
Benchtop Ultrasonic Bath	G32, G27
TW8 Water Bath	G52
Sanyo -86°C Upright Freezer	G53
Eppendorf Mixmate Shaker	G52
Lab Advantage Vortex Mixer	G52
Eppendorf Microcentrifuge	G53
Tomy Seiko Portable Autoclave	G53
Sanyo CO ₂ Incubator	G52
Sanyo Cooled Incubator	G52
Liquid N ₂ Dewar 10L	G24
Shimadzu Electronic Top Loading Balance	G44
Eppendorf Pipettes	G52, G53
pH meters handheld – Eutech cyberscan	G29
pH meters benchtop – Eutech cyberscan	G52
Conductivity meter – Eutech cyberscan	G52

Electrical Measurement Package

Equipment	Model	Location
Function Generator	Keithley 3390	G29
Digital Multimeter	Keithley 2000	G29
Source-Measure Unit	Keithley 237	G29
Picoammeter	Keithley 6487	G29
Electrometer	Keithley 6517B	G29
300MHz, 4-Channel Oscilloscope	Agilent DSO5304A	G29
3GHz Network Analyser*	Agilent E5062A	G29
DC Power Supply	Agilent 3649A	G29
Digital Multimeter	Agilent 34411A	G29
Handheld Multimeter	Agilent U1251A	G29

*Requires training, please contact MCN staff.

Optical Microscopes

Equipment	Model	Location
Upright Microscopes	Nikon LV150	G29, G32, G34
Stereo Microscopes	Nikon SMZ800	G29, G32, G34
Inverted Microscope	Nikon Ti-S	G53
Speed Camera	Nikon Ti-S	G47A

Research-Based Software

L-Edit	Mathematica	Origin
Matlab	LabView	AutoCAD

Instrument Managers and Trainers

The Instrument Managers is responsible for the overall management of the instrument, its performance and maintenance. This includes training and issuing of licences, operating procedures, booking schedules, day-to-day operation and maintenance of the instrument and new user training.

Instrument Management Matrix

Capability	Primary	Secondary	Tertiary
MATERIALS LABS			
EBL	Matteo	Manoj	
SEM	Matteo	Manoj	
NIL	Sasi	Matteo	Doug
Hot Embosser	Sasi	Doug	Matteo
Mask Aligner	Doug	Sasi	Matteo
Spin Coater	Doug	Sasi	Matteo
Characterisation Bay	Doug	Sasi	Manoj
AFM - cleanroom	Zoran	Doug	
Electroplating (Au)	Matteo	Zoran	
Electroforming (Ni)	Matteo	Zoran	
Tube Furnace	Zoran	TBA	
ALD	Doug	Zoran	
Sputterer	Zoran	Sasi	
E-beam Evaporator	Zoran	Sasi	Matteo
PECVD	Sasi	Doug	Matteo
ICP-RIE-Gen	Sasi	Doug	Matteo
ICP-RIE-Si	Sasi	Doug	Matteo
Glove Box (incl. ALD, Thermal Evap.)	Zoran	Doug	
Wetbench – Class 100	Matteo	All IM's	
Wetbenches – Class 10,000	Zoran	All IM's	
Dicing Saw	Zoran		

BIO/CHEM LABS			
PC2 Laboratory (All items)	Varsha	Christina	
Confocal / AFM	Varsha	Doug	Christina
TIRF	Varsha	Doug	
3D Printer	Varsha	Doug	
Array Spotter	Varsha	Zoran	
Zeta Potential	Varsha	Manoj	
Fumehoods (4)	Varsha	Manoj	Paul
Integration & Screening Suite	James Friend	TBA	
Nanoparticle Laboratory (All items)	TBA	Varsha	Paul
PDMS Laboratory (All items)	Manoj	Varsha	Paul, Sasi
FIB-SEM	Manoj	Doug	Matteo

Storage of Materials and Data

Samples and Materials

MCN users are not permitted to bring in or store materials other than those provided in the building without prior consent. Any materials left in the facility will be disposed of appropriately after a short grace period unless arrangements have been made for long-term storage at MCN.

Samples and all reagents being used must be labeled with the user's name, telephone number, date and composition and chemical name (where appropriate) and stored in designated areas within the laboratories during work at MCN.

MCN can assist you if you need to store your samples under special conditions, for example, vacuum or inert gas.

Data Storage via Cloud Stor

Data storage is the responsibility of the user. Users must remove their data from MCN computers within a reasonable timeframe, (fortnightly). MCN encourages researchers to use the CloudStor to transfer research data from the instrument computers at MCN to their own storage media.

Note: *MCN does NOT permit the use of memory sticks (USB's) on any instrument computer.*

Step 1: Log onto the following website to authenticate your internet access
<https://my.monash.edu.au/services/internet/>.

Step 2: Log onto CloudStor (<https://cloudstor.aarnet.edu.au/filesender/>) and click "Logon"

Step 3: Select your home institution from the dropdown list and press "Select"

Step 4: You should now be redirected to a login page from your home institution. Follow the prompts to log in using the username and password from your home institution.

You should now be redirected to a login page from your home institution. Follow the prompts to log in using the username and password from your home institution. Then follow the prompts to send yourself and any of your colleagues a link to download the research data files via CloudStor. We recommend that you ZIP all your data files before uploading it on CloudStor at this point for convenience. If you encounter any difficulties with CloudStor, please contact your Instrument Manager.

Safety Rules and Laboratory Procedures

The Safety Rules and Laboratory Procedures comprise part of the Facility OH&S Induction that all users are required to complete. Note that these are the general rules and procedures applying to all people present within and using the facility. You will be instructed in any additional rules and procedures that apply for specific items of equipment as part of your training.

MCN follows the Monash University OH&S Risk management protocols. For general information, refer to the following web site <http://adm.monash.edu.au/ohse/assets/docs/others/ohs-riskmanagement.pdf>.

When any hazard is identified with either your samples or the experimental processes to be used, a Risk Assessment (RA) must be prepared by the user and signed by the user, Supervisor and Facility Manager. Uncontrolled hazards must be reported using the Monash University Incident and Hazard Report see <http://www.monash.edu.au/ohs/forms/index.html>. Templates for Risk Assessments are also available online at <http://www.monash.edu.au/ohs/forms/index.html> or from MCN Instrument Managers.

If a hazard has been assessed and after taking into account all normal methods of risk minimization, the risk is still medium or high, then a Safe Operating Procedure (SOP) must be prepared by the user if a suitable SOP does not already exist within MCN (Note: a SOP may also be called a Safe Work Instruction). Safe Work Instruction Templates can be found online at <http://www.monash.edu.au/ohs/forms/index.html>. All RAs and SWI/SOPs for processes with risks that remain as medium or high must be checked and counter-signed by the Safety Officer or Deputy Safety Officer.

For more OH&S information visit: <http://www.adm.monash.edu.au/ohse>

General Rules

- If in doubt, always seek help!
- Mobile phones are to be switched off while in the labs and cleanrooms.
- Eating, chewing, drinking is strictly prohibited within the labs and cleanrooms.
- Headphones are not permitted while in the labs or cleanrooms.
- Only operate equipment for which you hold a valid licence. Doors and emergency exits must be kept clear.
- Do not tamper with fire extinguishers, first aid kits and other emergency equipment.
- Children under 16 are not permitted in any laboratory unless by prior agreement with the Facility Manager.
- No running in the building.
- MCN is equipped with very sensitive smoke and fire detectors. Any work that may generate smoke or dust must be carried out in a fume cupboard.
- MCN is a NON SMOKING area. The patio area outside the kitchen is also a NO SMOKING area.
- A list of emergency contact personnel is displayed outside each laboratory and enquiries should be directed to that person.
- Closed footwear must be worn in all laboratories and cleanrooms.
- Food and drink is not permitted past the access controlled area, including the lab's, cleanrooms and workstations/offices which run the length of the Lab area.

Personal Protective Equipment (PPE)

Additional Personal Protective Equipment, PPE (e.g. cleanroom garments, laboratory coats, long trousers, protective aprons, safety glasses, full-face safety visor, gloves...) must be worn wherever indicated and will be supplied by the MCN.

Please remove gloves before touching door handles, phones or other communal items in ALL labs. If you are sensitive to latex, do not use latex gloves – Nitrile gloves are available in all areas but ensure that you have established the chemical suitability of the gloves that you use prior to working with chemicals. Personal protective clothing and equipment must not be worn in office areas, toilets or meals areas.

Bio – Chem Laboratory Use

Lab coats are to be worn whenever conducting work in the labs, this includes the Microscopy lab. Lab coats shall be stored on the hooks provided at all entrances to the labs and not on the back of chairs. Safety glasses and gloves shall be worn in the lab as required and PPE shall not be worn outside except during an emergency evacuation. Wash hands before leaving the lab. Dirty labcoats are to be placed in the hamper located in the air lock to be laundered; any coat that is contaminated needs to be treated separately (please alert staff to this). Exceptions to this are the coats used for the PC2 lab which need to be handled and laundered separately.

Access to the microscopy and PC2 labs is by swipe card access and is strictly limited to licensed users of the area and equipment. Equipment logbooks must be filled in at the start and end of a session. Always follow the operating procedures provided with each piece of equipment. Note any unusual conditions or equipment problems and report these to the instrument manager or relevant lab contact. Never attempt to repair any equipment, problems, faults, or unusual behaviour must be reported in sufficient detail in the logbook and to a staff member. Names of staff members responsible for laboratories can be found on the doors and next to relevant equipment.

No items of equipment, tools or consumables can be removed from the room in which they belong without the permission of a staff member. Work areas must be left clean and tidy when finished. Glassware must be cleaned by the user immediately after use and must not be removed from the Centre.

Samples and reagents must be labeled with the DG Class, Risk and Safety Phrase numbers, a DG diamond for reagent bottles, user's name, telephone number, date of preparation/disposal and composition and can be left in designated areas within the preparation laboratories for short periods while work is being conducted. It is assumed that anything left behind is not needed and will be disposed of after a short grace period. Keep benches, sinks, and fume hoods clean and clear of clutter.

Consult with the Facility Manager prior to bringing any chemicals, materials requiring quarantine conditions or imported materials with AQIS permits on site.

Note: *If something is not functioning as you expect, seek help.*

Cleanroom Use

Acceptable - Cleanroom Items

- Special Cleanroom notepads and paper are available on request.
- Equipment should be checked against cleanroom compatibility and properly cleaned before being taken into the cleanroom. MCN staff must be contacted if any instruments or material is to be taken into the cleanroom. Contact MCN Staff if you have any queries before entering the cleanroom.

Prohibited - Cleanroom Items

- Regular paper products of any description
- No food or drink

Chemical Usage

- Before any chemical that is not currently available at the MCN is brought into the cleanroom, MCN staff must be consulted, and appropriate procedures must be adhered to.

Entry into Cleanroom

- Full cleanroom apparel must be worn in all areas of the cleanroom. This consists of full suit, hood, overshoes, safety glasses and gloves. Users must be fully conversant with the gowning procedure prior to entry – training can be provided by an instrument manager if required.

Do's:

- Change gloves whenever they get dirty or torn
- Pay attention to safety signs and protocols
- Report defective clothing to the cleanroom staff
- Use a fresh pair of gloves whenever handling wafers
- Use cleanroom paper and dust free ballpoint pens
- Wipe down wafer handling area with isopropanol/methanol

Don'ts:

- Lean on equipment
- Touch building hardware, oily machinery or wafer loading areas
- Touch your face or skin with gloves on
- Use paper, pencils or markers that leave dust or lint
- Wear cosmetic, powders or colognes

Chemical Handling

General Chemical Handling

- NEVER 'experiment' or alter any processes without consulting a suitably qualified person
- ALWAYS wear PPE (e.g. face shields, gloves, acid-proof gowns etc.) as specified in the RA
- NEVER mix chemical waste since this may give rise to hazardous compounds and/or reactions. Ensure that all chemical wastes are disposed of correctly (see waste disposal)
- All storage containers including beakers, bottles and process tanks must be properly labeled and labels should be replaced when damaged or defaced
- Labels must state the chemical name (e.g. acetone), hazard class (e.g. flammable) symbol. Where it is not practicable to label the container, a warning sign with the same minimum information may be placed adjacent to the container, such that there is no doubt as to the contents.
- When labeling etches use the descriptive name (pump etch, mesa etch etc) and list the constituents
- Certain chemicals react violently when mixed and must not be stored together (e.g. sulphuric acid and hydrogen peroxide). Others may react to give hazardous products and these must not be stored together either (e.g. cyanides and acids).
- DO NOT use incompatible substances in the same workstation. Refer to the compatibility charts posted on the storage cabinets.
- Every process should be designed so as to eliminate exposure of personnel to hazardous materials and reactions. Where this is genuinely not possible, advice from Monash OH&S must be obtained before the process is used
- Medical advice should be sought at the first signs of illness or distress.
- Appropriate hazard warning signs should be placed at areas where chemicals are used or stored and on or near equipment containing chemical substances
- DO NOT carry glass bottles or containers by hand. Always use a carrying cradle.
- It is important that all personnel know the substances they are using, their properties, and modes of action on the body and the early symptoms of health damage.

Fume Cupboards

Work with the sash open far enough to perform the procedure comfortably. Do not leave any unnecessary glassware, chemicals, and equipment in the fume cupboard. Never use a fume cupboard if the extraction fan or backwash is not working. Report any faults immediately.

Chemicals

In accordance with the general rules of MCN, every operation involving the use of a hazardous substance or dangerous goods must be assessed for risk and Users must have signed and completed a Risk Assessment in order to perform processes and MSDS's must be present for all reagents and chemicals produced in quantities above 100g. All processes must be carried out in accordance with the Risk Assessment. No new processes, or alterations to existing processes, will be carried out without consultation with the Facility Manager and subsequently generating a new RA.

Emergency Stop buttons

All laboratories are fitted with an Emergency Stop button. Pressing this button will cut all power to GPOs in these rooms. Fume cupboards are also fitted with Emergency Stop buttons that will cut power to that fume cupboard. The Emergency Stop Buttons are located near the door and light switches for the lab and near the emergency exits in each of the cleanroom bays.

UPS power

All red general power outlets (GPOs) are supplied from by an emergency generator located in the electrical plant room.

Oxygen Sensors and Alarms

There are different alarm systems installed within the MCN facility. It is vital that users understand these systems and the appropriate response to these alarms.

There are two types of gas alarm within the cleanrooms. One is to indicate a toxic gas leak and the other is to signify a low oxygen level possibly caused by a displacement of oxygen from an inert gas leak. The status is indicated by a system of red and amber lights with no lights illuminated signaling no detection. Refer to the Alarm section of this document for further information. If an oxygen alarm is operating, you must not enter the area.

Sharps and Breakages

All broken glassware and other sharp objects are to be placed into the sharps or broken glass bins. Broken glassware does not need to be decontaminated by the user but, MCN staff will need to be alerted to the contaminant so that appropriate action may be taken.

Liquid Nitrogen

(Not currently available at MCN). Liquid nitrogen may be used in many parts of the MCN and its risks are to be understood by all users. Liquid nitrogen can cause severe burns and the eyes are particularly vulnerable. Always wear the apron, full-face visor, insulating gloves and closed footwear when filling dewars from the liquid nitrogen storage vessels or when transferring and pouring liquid nitrogen from the dewars. Runners with mesh uppers and sandals are not acceptable when handling liquid nitrogen.

- Never handle liquid nitrogen whilst wearing disposable gloves.
- Liquid nitrogen boil-off can displace oxygen so there is a risk of asphyxiation, thus minimize spillage and decant in well-ventilated areas.
- Thermal shock can cause materials to fracture: only use the provided dewars or talk to staff if alternative are required. As liquid nitrogen gasifies, there is a large volume increase - never store liquid nitrogen in sealed vessel.
- Liquid nitrogen must not be removed from MCN. Be aware that liquid nitrogen will cause liquid oxygen to form on cold surfaces by condensation from the atmosphere.

Compressed Gases

The following compressed gases are within MCN:

- Nitrogen
- Argon
- Oxygen
- Tetrafluormethane
- Trifluoromethane
- Sulphur hexafluoride
- Ammonia
- Chlorine
- Silicontetrachloride
- C4F8
- Helium
- Forming Gas – 4% Hydrogen in Nitrogen
- Hydrogen

Hazards and Incidents

Note: Any occurrence that leads to or that could potentially lead to injury or danger to health must be reported to the Facility Manager. The Incident Report Form can be obtained from: <http://adm.monash.edu.au/ohse/assets/forms/hazard-incident-report.pdf>
Spill kits are available throughout the building.

Chemical and Biological Spills

Chemical spill kits are located throughout the labs and cleanrooms. Biological spill kits are located in the PC2 and re-configurable labs. The locations will be pointed out during the induction; contents and instructions for the use of spill kits are located on the kit however, if in doubt, consult with an MCN staff member.

Gas Leak

All of the labs and cleanroom bays have reticulated nitrogen supplies. Risk of asphyxiation can occur if there is a major nitrogen leak and the air conditioning is not operating, for example, during a power failure. **YOU MUST NOT ENTER OR REMAIN IN A LABORATORY IF YOU SUSPECT THE AIRCONDITIONING IS INOPERATIVE.**

Note: Contact a MCN staff member if gas cylinders need to be changed. Users must not attempt to change any cylinders. In all cases, if there is doubt as to the hazards or of the method of disposal of any spill, evacuate the area and alert MCN staff.

Incident Reports

Significant spills requiring cleanup are classified as Incidents and must be reported immediately to the Facility Manager. An incident report is prepared to determine if it can be prevented in future.

If a spill does occur it is important that all users recognise the hazardous properties of the chemicals. If in any doubts as to the correct method of dealing with a spill, evacuate the immediate area and obtain advice from the laboratory manager. The area should be isolated and users alerted to the spill and prevented from entering the area. It may be possible to deal with small spills (eg. 2L) using the spill kits available however, this will depend on the nature of the reagent. Larger spills may require a response by external contractors or the HAZMAT team of the Fire Brigade. Under these conditions, the building would normally be evacuated.

Where larger spills occur or particularly hazardous chemicals (e.g. hydrofluoric acid) are involved, evacuate the area and contact the Facility Manager to co-ordinate the clean up. Minor spills may be dealt with by using one of the methods recommended below.

Acids

Special requirements must be followed in the event of a hydrofluoric acid (HF) spill. In the event of an HF spill, immediately contact an MCN staff member. If a minor acid (other than HF, and low volume) spill occurs in the fume hood, put on (PPE) as recommended in the MSDS and flush the spill with copious amounts of water, turning on the taps and wash-down facility as well. Note that concentrated acids will generate a great amount of heat when mixed with water, so it is important that large quantities of water are used.

If the spill occurs on the floor, follow the procedure detailed below:

- Wear appropriate PPE (the as used during the handling of the reagent)
- Use the neutralizer spill kit to react with acids/bases rendering them harmless.
- Once neutralized, absorbent pillows may be used to contain/absorb the spill
- The absorbant spill kit should be used to collect the neutralized liquid for removal
- When all liquid is absorbed, place pillows and socs in a hazardous waste bag, seal and label.
- Absorber material should be put back in the spill response bucket for removal
- Wipe/Mop the floor with a damp cloth

Care should be exercised in the Class 100 cleanroom especially where a grill perforates the raised floor as the solution can seep through to the sub floor area. In this situation, please contact an MCN staff member to coordinate the clean-up, paying particular attention to electrical sockets.

Hydrofluoric Acid

Hydrofluoric acid is managed using certified training and the management policy found on the Monash web site at <http://www.monash.edu.au/ohs/topics/info-sheets/hydrofluoric-acid.html>

Solvents

The major hazard of a solvent spillage is fire, but some solvents may have narcotic or other physiological properties as well. Consult the appropriate Material Safety Data Sheets if in doubt as to the hazard of any specific compound. When dealing with large solvent spills, breathing apparatus **MUST** be worn, therefore evacuate the area and alert MCN staff. At all times bear in mind the risk of fire, therefore, immediately ensure that all sources of ignition within a radius of 6 metres are extinguished or turned off. This includes all electrical equipment. Evacuate the area. If it is safe to do so, follow the instructions for acid spills.

Solids

Collect solid spills by careful brushing and always wear a dust mask or breathing apparatus if the solid is toxic or irritant. The collected solids should be treated with care and placed in a hazardous waste bag, which should be sealed and labeled with contents, origin and dated. MCN staff via Chemsal may then dispose of the bag and contents. Solid wastes contaminated with a known dangerous goods class can be disposed of using the solid waste DG wheelie bins found on site.

Emergency First Aid

Any chemical contact is potentially hazardous and it is vital to act quickly. Flood the affected area with water, unless the MSDS specifically says not to, for at least 10 minutes and seek assistance from a first aider. If liquids, particularly corrosive or toxic liquids, are spilled on the clothes, immediately flood with water and remove the clothing at the same time. (Any HF spill requires special attention and should be immediately referred to emergency personnel.) Beware of spreading the chemical to unaffected areas of the body. Small splashes can usually be effectively dealt with just by washing, but with a large amount of contamination, medical advice MUST be sought immediately.

Emergency Eye Wash and Showers

Emergency showers and eyewashes are located within every clean room bay and near every door in the bio-chem lab with the exception of G42. The showers and eyewashes are connected to an internal alarm system and use will trigger the alarm to alert staff to an emergency.

If activated accidentally, please notify the facility manager immediately to stop the alarm.

In any case, seek medical advice to ensure all proper treatment as it is important to realise that some chemicals may be absorbed through the skin and may give rise to toxic effects some time later. Exposure to certain chemicals (e.g. solvents) may present no symptoms at the time of exposure but may lead to serious skin problems after a period of time or repeated exposure. Certain highly corrosive or toxic chemicals have specific treatments (e.g. hydrofluoric acid burn calcium gluconate gel). Note that these are only first aid measures and must be treated as such.

Eye contamination by any chemical is very serious. Flush the affected eye with copious amounts of water, holding the eye open and with the head in such a position that the chemical is not washed into the other eye. Do not attempt to remove contact lenses at this point.

Severe damage to the eyes can occur very quickly and may be irreversible.

Seek assistance from a first aider and/or call for assistance on 333.

APPENDICES

MCN policies are available from our website to download - <http://nanomelbourne.com/access>

- [MCN Access and Pricing Policy](#)
- [MCN User Agreement](#)
- [MCN IP Policy](#)
- [MCN Security Policy](#)
- [MCN Out Of Hours Policy](#)

Access and Pricing Policy

The purpose of this document is to provide guidance and pricing information for accessing the Melbourne Centre for Nanofabrication central facility (hereafter referred to as the MCN).

A. Organisational Matters and Policies

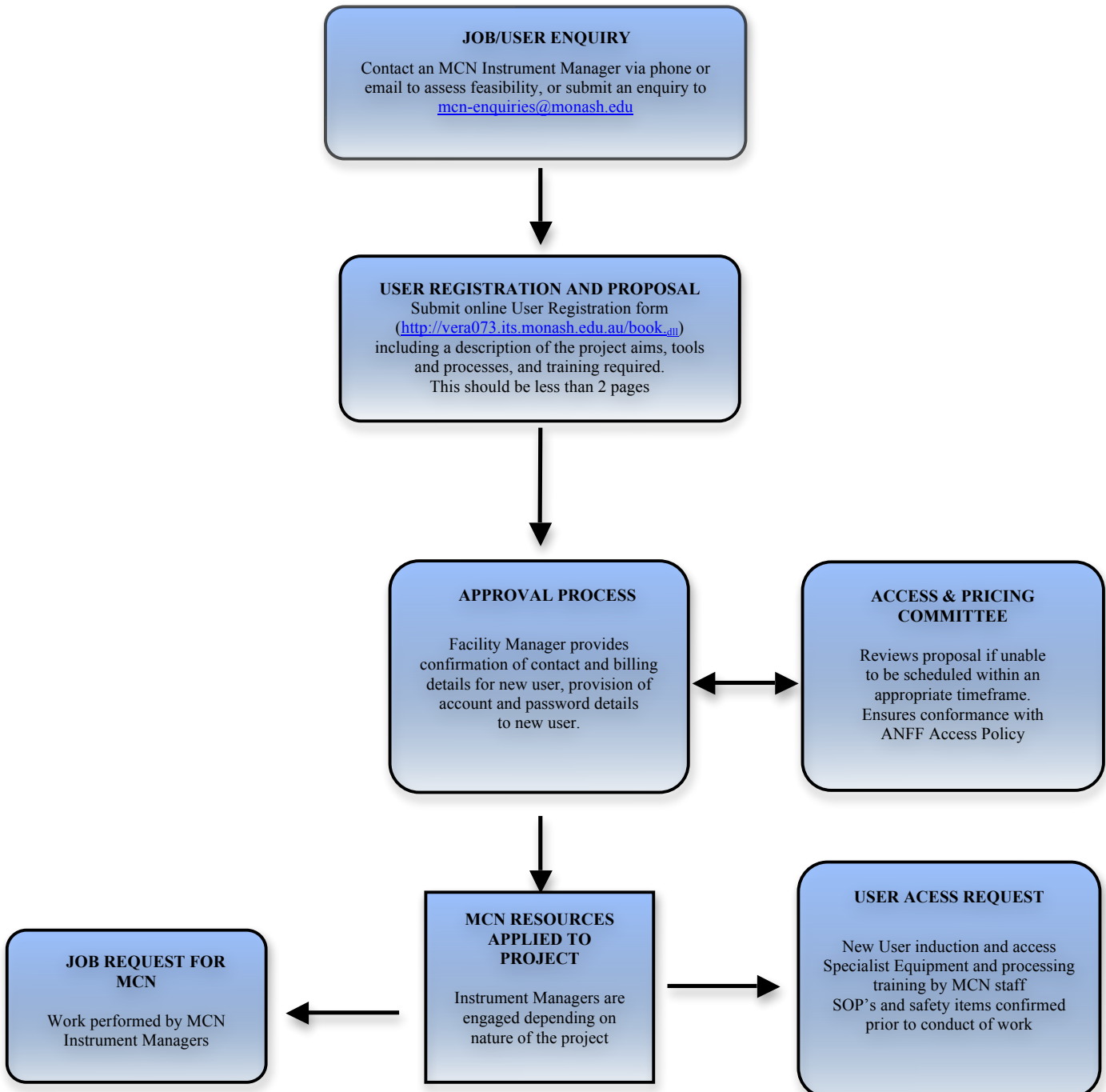
1. The Melbourne Centre for Nanofabrication (MCN) is one of a number of collaborative nodes of the Australian National Fabrication Facility (ANFF), a national network of micro and nano fabrication laboratories established through the DEST National Collaborative Research Infrastructure Strategy (NCRIS).
2. As a condition of its funding support through NCRIS, the external user access to the Node must be consistent with the general principles laid out in the national ANFF Access and Pricing Policy.
3. The Node is hosted by Monash University and as a result all ANFF node users must satisfy all Monash University policies and procedures, including OH&S policies, guidelines and Out of Hours policies together with the specific procedures of the MCN.

B. Access for New Users or Processing Requests

1. The MCN Instrument Managers are the first point of contact for all potential users of the Node. Instrument Managers at MCN can be contacted directly by phone or by email (<http://nanomelbourne.com/access>), or a general request can be submitted to the instrument managers at mcn-enquiries@monash.edu. Users may be directed to the Instrument Managers via ANFF headquarters or via other Nodes of the ANFF.
2. The most relevant Instrument Manager (depending on nature of the project) will be assigned to assist each new user, and will liaise with other process experts at MCN to assess the scope and viability of the project(s) that is(are) proposed.
3. Once feasibility of the project has been established with an Instrument Manager, a new user registration form (<http://vera073.its.monash.edu.au/book.dll>) should be completed as a formal application for accessing the Node (less than two pages). This form allows the user to briefly describe the work, the expected outcomes, funding source if applicable, the equipment and staff resources required (including estimated training time). The Instrument Manager can assist the user in preparing this Job/User proposal.
4. Submitted proposals from a new user will be processed by the Facility Manager, by checking the completeness of contact and billing details, arranging for site induction if necessary, and provision of an account and password to the user for access to the online booking system.
5. If the work cannot be scheduled within a reasonable period due to other commitments of the facility, the application will be referred to the Access & Pricing Committee, chaired by the Managing Director.
6. If the Job Proposal does not involve work in the MCN by a new user, the work will be undertaken by MCN staff at a price as set out in section C below.
7. In the case of a User Proposal for a new user, the user will be required to attend and pass the standard MCN OHS induction procedure before they begin any work in the MCN. If the user is not a Monash University staff member or student, then they must be given visitor status for work on Monash University premises.
8. In addition to other requirements, the MCN User Agreement must be completed and returned to the Facility Manager before user access or a job can commence.
9. The MCN reserves the right to revoke Job/User Approvals with seven days written notice.
10. The MCN Access and Pricing Committee will review the decisions of the MCN Executive Group at regular meetings, currently set at 6-monthly intervals, to ensure that access to the Node is in accord with the guidelines set out in the national "ANFF Access and Pricing Policy" and as requested by DIISR.
11. The MCN Access and Pricing Committee is composed of the ANFF CEO, the MCN Managing Director, the Facility Manager and representatives from the major user groups.

Access Flowchart

Below is a flowchart indicating the required access protocol for use of the facilities at the MCN.



C. Pricing Structure

Six user categories are defined for access to MCN facilities (see categories A-F in Table 1 below).

Table 1. Pricing regimes for basic access to the MCN

Support Provided	PhD Student	University/Publicly Funded Researcher	Industry User
Unassisted	A	B	C
Assisted	D	E	F

In addition to all other induction, operational health and safety and training requirements, researchers who wish to gain unassisted status must complete (and be assessed for competency against) application-specific training provided by the MCN Instrument Managers. All job requests for independent completion by an MCN Instrument Manager are conducted at rate E or F (Assisted University or Assisted Industry User). All training requests are conducted at rate D.

Table 2. Basic pricing structure for use of MCN major equipment and laboratories (hourly rates).

EQUIPMENT	Unassisted Use			Assisted Use		
	A	B	C	D	E	F
CLEANROOM LABS (only)	\$20	\$30	\$50	\$100	\$100	\$150
BIO/CHEM LABS (only)	\$20	\$30	\$50	\$100	\$100	\$150
EBL	\$150	\$200	\$300	\$225	\$275	\$400
DRIE (per system)	\$100	\$125	\$200	\$175	\$200	\$300
HOT EMBOSSING	\$100	\$125	\$200	\$175	\$200	\$300
PECVD	\$100	\$125	\$200	\$175	\$200	\$300
ALD – FIJI F200	\$100	\$125	\$200	\$175	\$200	\$300
UV FLOOD LIGHT SOURCE	\$75	\$100	\$150	\$150	\$175	\$250
FIB	\$75	\$100	\$150	\$150	\$175	\$250
SEM	\$75	\$100	\$150	\$150	\$175	\$250
PVD (EBEAM)	\$75	\$100	\$150	\$150	\$175	\$250
PVD (SPUTTER)	\$75	\$100	\$150	\$150	\$175	\$250
POLYMER SYSTEM	\$75	\$100	\$150	\$150	\$175	\$250
MASK ALIGNER	\$75	\$100	\$150	\$150	\$175	\$250
AFM	\$75	\$100	\$150	\$150	\$175	\$250
CONFOCAL MICROSCOPE	\$75	\$100	\$150	\$150	\$175	\$250
TIRF	\$75	\$100	\$150	\$150	\$175	\$250
3D PRINTER	\$75	\$100	\$150	\$125	\$150	\$200
ZETA POTENTIAL METER	\$50	\$50	\$100	\$100	\$100	\$150

Small volumes of basic consumables are included in cost price; however, large volumes or specialised consumables (e.g. substrate materials) will be at full cost to the user and must be arranged with the Instrument Manager. Any retooling will be charged to the user at cost.

Note: Pricing and access for in-kind equipment and facilities at MCN Participant Organisations laboratories will be determined by the facility managers at those laboratories. All access and equipment charges are subject to regular review and may be changed without notice

Discounts are available to non-industry users by making a pre-paid purchase.

Option 1 – Pre-paid purchase	Discount to be applied
\$2,000 pre-paid account	15% Discount
\$5,000 pre-paid account	20% Discount
\$10,000 pre-paid account	25% Discount
\$25,000 pre-paid account	30% Discount

User Agreement

Name of user _____ (User)
 User's organisation _____ (Organisation)
 User's direct supervisor and Faculty/Department: _____

The Melbourne Centre for Nanofabrication (**MCN**) is the Victorian node of the Australian National Fabrication Facility. The MCN facility is comprised of a central facility at Monash University's Clayton campus and remote facilities at CSIRO's Clayton site, The University of Melbourne's Parkville campus, La Trobe University's Bundoora campus, Swinburne University's Hawthorn campus, Deakin University's Geelong campus and RMIT University's Melbourne city campus. MCN staff at each facility are employees of the organisation hosting that facility.

The User wishes to access and use the _____ [*insert applicable facility name (eg, MCN central facility or Melbourne University remote facility)*] facility (**MCN Facility**) to _____ [*insert purpose of access including description of research to be carried out in the MCN Facility and materials to be used*] in accordance with the terms and conditions set out in this user agreement.

The User and the Organisation each agree:

1. that the Host grants the User a licence to enter the MCN Facility for the purpose set out above, subject to the conditions in this user agreement;
2. that the User must not access the MCN Facility unless and until the User receives written notification from the Host that the User's access to the MCN Facility has been approved;
3. that the User and the Organisation have read and understood the MCN Access and Pricing Policy (available online www.nanomelbourne.com/access) and agree to pay all applicable charges for accessing the MCN Facility in accordance with that policy;
4. that the licence to enter the MCN Facility may be immediately terminated by the Host if the User fails to comply with the MCN Access and Pricing Policy and the other conditions of access set out in this user agreement;
5. the User must complete the MCN onsite Safety Induction to the satisfaction of the MCN Facility manager and acknowledge that this must be completed before the User will be allowed to use the MCN Facility;
6. the User must comply with all of the Host's occupational health and safety requirements, sexual harassment and discrimination policies, waste handling and disposal procedures and other policies, procedures, manuals and guidelines that apply to the MCN Facility;
7. the User must not bring (and the User's project must not involve) any hazardous or biological materials into, or generate any hazardous or biological materials within, the MCN Facility without submitting a completed hazardous and biological materials sheet to the MCN Facility manager as part of the User's application for access to the Facility, and obtaining the MCN Facility manager's approval;
8. that the User must comply with all directions given by MCN Facility personnel in relation to use of the MCN Facility, including directions relating to safety, maintenance and efficient use of equipment within the MCN Facility;
9. to comply with and be bound by MCN IP Policy (available online www.nanomelbourne.com/access);
10. not to use or disclose any confidential information of any other user of the MCN Facility of which they become aware through the User's access and use of the MCN Facility unless they obtain the prior written consent of that third party;
11. to include: (a) the address, "MCN, 151 Wellington Road, Clayton, Vic 3168, Australia" on the title head of any publications resulting from work undertaken at the MCN Facility in addition to any home collaborator address; and (b) the following acknowledgement on any publications or presentations resulting from work undertaken at the MCN Facility: "*This work was performed in part at the Melbourne Centre for Nanofabrication, an initiative partly funded by the Commonwealth of Australia and the Victorian Government.*";

12. to endeavour to advise the MCN Facility manager of any publications (or other significant research outcomes) resulting from work undertaken at the MCN Facility;
13. to comply with all applicable Federal and State laws, regulatory requirements, approvals, consents and ethics codes and guidelines (including those adopted by the National Health and Medical Research Council, the Office of the Gene Technology Regulator, the Australian Quarantine and Inspection Services);
14. that the MCN is a multi-user research facility providing access to nanofabrication equipment and processes for Australian researchers and that support is provided on a reasonable effort basis but that the Host does not guarantee any research outcomes or give any other warranties;
15. that, to the extent permitted by law, the Host: (a) excludes all conditions, warranties and liabilities implied or imposed by statute, general law or custom except any liability or implied condition or warranty the exclusion of which would contravene any statute or cause any part of this document to be void; (b) excludes liability (including liability in negligence) for any consequential or indirect loss or damage (including any costs or damages sustained as a result of a claim by a third person), or any property damage or personal injury, in relation to the provision of access to and use of the MCN Facility; and (c) excludes liability to indemnify the User or the Organisation against, or contribute to, any liability of the User or the Organisation to any other person (including other users of the MCN Facility); and
16. that, to the extent permitted by law, the User enters and uses the MCN Facility at his or her own risk and the User releases and forever discharges the Host and its officers, employees and agents from all present and future claims (including claims in contract, tort or statute) which the User may have against them arising out of the User's access to the MCN Facility under this user agreement;
17. that the User and the Organisation are liable for, and each irrevocably and unconditionally indemnifies the Host against all claims, demands, actions, damages, liabilities, losses, costs and expenses made against the Host directly or indirectly arising from or incurred in connection with the User's use of the MCN Facility or any damage to or loss of any property or injury to or the death of any person (including other users of the MCN Facility) caused or contributed to by the User's acts or omissions arising from access and/or use of the MCN Facility;
18. that the indemnity given under clause 17 above will be reduced to the extent that the damage to or loss of any property or injury to or the death of any person (including other users of the MCN Facility) was caused by or contributed to by negligence by the Host;
19. that the Organisation warrants that it has and will maintain, adequate workers compensation and other relevant insurances in respect of the User and the User's access to and use of the MCN Facility;
20. to negotiate in good faith to resolve any dispute or difference that arises between the User / Organisation and the Host;
21. that if any dispute or difference is not resolved within 14 days, it must be referred to the Australian Commercial Disputes Centre (ACDC) for mediation in accordance with ACDC's mediation rules before either party is entitled to commence proceedings;
22. that nothing in clause 20 or 21 will prevent the User, the Organisation or the Host from seeking interlocutory relief in a court of competent jurisdiction; and
23. not to use the Host's name or trademarks without prior written consent from the Host. The User and the Organisation each agree and acknowledge that this deed is given by the User and the Organisation in favour of the Host, and that the Host may enforce this deed against the User and the Organisation jointly or severally.

IP Policy

The Melbourne Centre for Nanofabrication (**MCN**) is an advanced prototyping and nanofabrication research facility established by Monash University, CSIRO, The University of Melbourne, La Trobe University, Swinburne University and Deakin University (**Participants**) under a collaboration agreement dated 14 December 2007 (**Collaboration Agreement**). RMIT University (**Associate**) also contributes to the MCN under an associate agreement dated (**Associate Agreement**). MCN is the Victorian node of the Australian National Fabrication Facility, which is overseen by Australian National Fabrication Facility Limited.

The MCN is hosted by a central facility at Monash University's Clayton campus and remote facilities at CSIRO's Clayton site, The University of Melbourne's Parkville campus, La Trobe University's Bundoora campus, Swinburne University's Hawthorn campus, Deakin University's Geelong campus and RMIT University's Melbourne city campus – (each an MCN Facility). MCN Staff at each MCN Facility are employees of the Participant hosting that facility.

The MCN is partly funded by the Commonwealth (Department of Innovation, Industry, Science and Research, formerly Education, Science and Training (**DIISR**) and the Victorian Department of Innovation, Industry and Regional Development (**DIIRD**). In addition to providing access for Participant researchers and Associate researchers, the MCN also provides access for researchers from other organisations (**Third Party Users**) to a range of cross-disciplinary fabrication and integration capabilities spanning the research to product value chain.

Research undertaken in an MCN Facility may lead to the development of commercially valuable and scientifically important intellectual property rights. MCN recognises the importance of developing a clear and consistent approach to the allocation of these intellectual property rights to alleviate uncertainty, to avoid potential future disputes and to ensure that appropriate access arrangements are in place for valuable technology developed using an MCN Facility.

For the purpose of this policy: '**IP**' means all property in the nature of intellectual or industrial property including:

- (a) all rights in relation to patents, inventions, utility models, copyright, circuit layouts, plant varieties, designs, trade and service marks (including goodwill in those marks), trade names and domain names, indications of source or origin, Know How and any right to have information kept confidential;
- (b) any application or right to apply for registration of any of the rights referred to in paragraph (a); and
- (c) all rights or forms of protection of a similar nature or having equivalent or similar effect to any of the rights in paragraphs (a) or (b), which may subsist anywhere in the world (including Australia), whether or not such rights are registered or are capable of registration; and

'**Know How**' means all information not in the public domain including inventions, drawings, designs, circuit diagrams, computer programs, data, formulae, specifications, design procedures and procedures for experiments and tests, results of experiments and tests, and information relating to the design, assembly, manufacture, supply or use of any products or services.

The following IP principles for use of MCN facilities have been cooperatively formulated in light of the MCN objectives and adopted by the MCN Committee:

1. The IP provisions in the Collaboration Agreement or Associate Agreement (as applicable) will apply to any IP created by a Participant researcher or Associate researcher in the course of using an MCN Facility.
2. The Third Party User (or the Third Party User's employing organisation) will retain ownership of any IP created solely by the Third Party User in the course of using an MCN facility ('Third Party User IP').
3. Unless otherwise agreed in an individual project agreement, if any Third Party User IP comprises a new or improved method or technique relating to the use of an MCN Facility and has been developed with the active contribution of an MCN staff member, the Third Party User (or the Third Party User's employing organisation) grants each Participant and Associate a non-exclusive, world-wide, royalty free, irrevocable, perpetual licence (including the right to grant sub-licences) to exercise that IP.
4. Unless otherwise agreed in an individual project agreement, the Third Party User (or the Third Party User's employing organisation) and the Participant or Associate hosting the relevant MCN Facility will jointly own any IP created by the Third Party User and employees of that Participant or Associate in the course of the Third Party User using an MCN Facility ('Joint IP').
5. Unless otherwise agreed in an individual project agreement, in respect of any Joint IP, the Third Party User (or the Third Party User's employing organisation) and the Participant that jointly owns that IP each:
 - (a) grants the other a non-exclusive, world-wide, royalty free, irrevocable, perpetual licence (including the right to grant sub-licences) to use and disclose that IP for any purpose; and
 - (b) agrees to pay the other a share of any revenue received by it (after deducting any costs directly incurred by it in earning that revenue) as a direct result of the commercialisation of that IP, commensurate with the other's contribution to the development of that IP.

Security Policy

This policy defines the security procedures used to ensure safety and monitor access to the office, laboratory, cleanroom and supporting spaces at the Melbourne Centre for Nanofabrication (MCN).

Security

1. All visitors to MCN must sign-in using the Visitors Log held at reception. An exception can be made if the visitor is escorted by an MCN staff member at all times and is only visiting the office/administration areas. In case of emergency, the staff member has full responsibility for the safety and evacuation (if needed) of the visitor.
2. Staff and other semi-permanent users of MCN will be listed on a magnetic board at reception and must indicate their presence on-site by using the in/out columns.
3. Access to all MCN laboratories and cleanrooms is restricted by an internal physical security system. No visitor to MCN will be allowed to enter the MCN laboratory or cleanroom areas unless:
 - a. They have been personally issued with a fob for security access; or
 - b. They have made an online booking for access to the facilities, and have received a fob for security access at the time of signing in at reception; or
 - c. They have signed-in at reception and are being escorted at all times by an MCN staff member.
4. The use of a security fob is permitted for the person it is issued to only. The holder of a security fob shall not:
 - a. Provide the fob to anyone else for their use; or
 - b. Allow other persons to "tail-gate" them into the cleanroom or laboratories.
5. The loss of a security fob must be reported immediately to an MCN Staff Member so that it may be promptly deactivated. An administration fee of \$50 may apply for the purchase and programming of a replacement fob.
6. Any breach of this policy will be grounds for possible suspension or removal of all access privileges at MCN.

Monitoring of Access

7. The security fob is used to record entry and exit of all users from the cleanroom and laboratory areas for tracking and billing purposes.
8. All users must register the fob at the appropriate ENTRY door reader when entering a cleanroom or laboratory. "Tail-gating" another user is not permitted.
9. All users must register the fob at the appropriate EXIT door reader when leaving a cleanroom or laboratory. Failure to register the exit from a room may result in a minimum 8-hour charge for use of the facilities.
10. Special arrangements will be made for group activities conducted within the laboratories or cleanroom facilities at MCN.

Name of User: _____ Date: _____

Signature of User: _____ Security Fob Number: _____

Out of Hours Policy

Access to MCN laboratories/cleanrooms and use of MCN equipment outside of normal working hours (8.30am – 5.30pm) must be undertaken only in accordance with the allowable usage and application processes described below.

Tier-1. General Access

Allowable: General access to all laboratory and cleanroom environments and access to all general equipment is allowed for the conduct of all low-risk procedures as determined by MCN staff. All sign-in procedures must be followed to record presence in the facility, including notification of Monash security if you are unassisted and unaccompanied. Monash nonemergency security can be contacted on Ph: 9905 3059. Users must carry ID at all times.

Reference: <http://fsd.monash.edu.au/security/your-campus>

Application process: Email request to any MCN Instrument Manager for consideration (with endorsement by supervisor if u/g or graduate student) with a list of activities to be undertaken. Upon review and approval, your name will be recorded on Register of Authorised Personnel for out-of-hours access (register to be held at MCN reception with authorising signature from Instrument Manager or Facility Manager for each entry).

Tier-2. Access to Major Equipment

Allowable: Subsequent to achieving Tier-1 access, use of major equipment is allowed according to its availability for booking via the ACLS system. No major equipment (i.e. any instrument listed on ACLS) can be used unless booked. Out-of-hours equipment availability will be released onto the ACLS system by the relevant instrument managers according to demand, or by special arrangement.

Application process: Via ACLS booking system according to availability of each instrument, or by application to the relevant Instrument Manager.

Tier-3. High-risk Procedures

Allowable: Subsequent to achieving Tier-1 access, procedures that are known to be of moderate or high risk can only be undertaken with full risk assessment. This includes (but is not limited to) use of HF, Piranha solution, use of concentrated acids, use/transport of large volumes of gas/LN₂, use of high-voltage equipment, or other procedures as identified by users or MCN staff.

Application process: A full risk assessment is required to be submitted to an MCN Instrument Manager for review, with final approval required from MCN Facility Manager, MCN Science Director or MCN Managing Director. The risk mitigation strategy must include the coordination of multiple personnel on-site in addition to any task-specific safety measures.

Note: *Booking of all major instrumentation (i.e. anything shown on ACLS) is MANDATORY within the facility before use at any time (normal or out of hours).*

Any unauthorised use of major equipment or progression to any Tier of out of hours access without approval will be grounds for removal of all access privileges at MCN.