

Risk Grouping: AS/NZS2243.3:2010 (Section 3, from p 19) - See appendix A for how to access the Australian Standards without having to pay!

- The biological register is for listing all of your biological materials so that the university can determine the level of overall risk it carries.
- The register is also a tool to help the university ensure that the risks are being contained in the correct facilities
- In the past, there have been significant incidents where researchers have carried out research without the appropriate approval, have imported materials without an import permit, and have carried out research on imported materials in the incorrect facility that also did not carry the correct certification

Because of these breaches, the university engaged KPMG to do an internal audit and they concluded that UNSW does not know the extent of the biological materials being used, or if they all are meeting the relevant legislative and Standard requirements.

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- Microorganisms include bacteria, viruses, prions, fungi or fungi-like organisms, infectious stages of parasites, and materials that *might* or do contain microorganisms, can be put into 4 different groups according to their level of risk
- The risks can be several. The main one is pathogenicity (infectivity).
- How infective a microorganism is depends on things like: the host range, the infective dose, how the microorganisms needs to get into the body of the host, the effectiveness of preventative measures and if there is effective treatment.
- The risk relates to the seriousness of infection in humans, animals, plants etc.
- The risk can also relate to the economic effects on industries, such as agriculture and livestock, or ecosystems (note that plant pathogens have a separate set of tables in the Standard).

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Of the four Risk Groups:

- Risk Group 1 are the most common microorganisms, covering microorganisms that have the lowest risk. These are unlikely to be human pathogens, and include human, animal & plant microorganisms common to a community or region
- Risk Group 2. These range from opportunistic pathogens to serious & potentially fatal pathogens (animal, plant & especially human). There are good controls and good treatments for these
- Risk Group 3 have a much higher risk because there are limited controls and/or treatments available, can be fatal, or leave the host with lifelong problems
- Risk Group 4 microorganisms have the highest risk. These have no treatments, are usually fatal or could wipe out an entire industry.

Most of the UNSW research is Risk Group 1 and 2

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In the laboratory

- aerosols provide the greatest risk, especially if they contain pathogenic (infective) microorganisms provide the most common cause of infection of personnel, plus
- Microorganism-containing aerosols are a common source of cross contamination of work.

Consequently

- facilities where work with microorganisms is carried out are specifically designed to help contain and control aerosols.
- There are 4 levels of Physical Containment (PC), which correlate with the four different Risk Groups.

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Risk Group 1 microorganisms

- Have the lowest risk to humans, other animals and other ecosystems, require a minimum of a PC1 facility, but they can be used in PC2 – 4 facilities.

Risk Group 2 microorganisms,

- include many of the human pathogens, need at least a PC2 facility (but can also be used in PC3 & 4 facilities).

Risk Group 3 microorganisms

- need at least a PC3 facility and

Risk Group 4 microorganisms

- can only be used in a PC4 facility. UNSW does not have a PC4 facility.

There is a PC3 facility on upper campus (for human viruses)

Lower campus has no PC3 or PC4 facilities

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PC1 facilities (p38-9)

- All surfaces & furnishings impermeable, easy to clean, resistant to chemicals, heat
- Open spaces accessible & easy to clean
- Dedicated handwash basin just inside at each facility exit
- Backflow prevention
- Eyewash facilities
- PPE storage
- Secure facilities outside the lab for storing personal items
- Avoid generating aerosols out on the open bench
- **PC1 work practices (p39-40)**

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If you work in a PC1 facility, familiarise yourselves with PC1 work practices. It is good practice to also incorporate as many PC2 work practices as you can.

Authorised access is required.

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PC2 facilities (pp 40-42 & in addition to PC1)

- Floors to be coved to walls & plinths to facilitate cleaning
- Minimise horizontal surfaces fittings & fixtures, pipes, to enable cleaning of dust
- Windows & doors closed during work
- Single-outlet hands-free dedicated hand basin inside each lab, near exit
- PPE storage hooks near exit
- Backflow prevention on reticulated services
- Biohazard sign on outside of each entry
- Inward airflow by forced extraction, not directed towards doors or BSCs
- **PC2 work practices (p42-44)**

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If you work in a PC2 facility, familiarise yourselves with PC1 AND PC2 work practices.

Restricted & authorised access is required.

Do you have material that might or does contain microorganisms?

How can you tell if they are dangerous to you, others in the facility, or to the environment?

- The import permit for imported materials that require an Approved Arrangement will have the relevant information
- Look at the data sheets that come with your purchase

Internet search:

- Find out what you can about your material and the microorganisms possibly present
- Look up peer-reviewed papers & the references
- **Find out the Scientific name of the pathogens**

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- **Go to the Australian Standard AS/NZS2243.3:2010 and look at the tables (pp25 – 34) (See Appendix for instructions)**
- A microorganism can have 2 different Risk Groups, depending on if it's a diagnostic sample, if you are culturing it, if it is pathogenic, if it is genetically modified to be less pathogenic, if you are using less than a specified amount &/.
- There are no Risk Group 1 tables, but you can't assume that if it isn't the Standard, it must therefore be a Risk Group 1.
- Most of the worlds known microorganisms fall into Risk Group 1 so it isn't practical to have Risk Group 1 tables in the Standard. You will need to look online for information about microorganisms that are not in a table to determine the risk group, based on the evidence
- Note that there are no Risk Group 1 human pathogens, unless they have been genetically modified to no longer be pathogenic

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NOTE: Other countries may have a different Risk Group for a microorganism to that which we have in our Australian Standard. Some reasons for this are:

- the microorganism could be endemic in a particular country therefore a lower risk in that country, or
- a country might have an overall lower health standard than Australia, therefore a microorganism may be of a higher risk in that country.

You must identify what our Australian Standard has set for the Risk Group first and then determine the Australian containment requirements.

- you can gain more in-depth information about human pathogens from the [Public Health Agency of Canada](#). This is a valuable resource as it provides additional information to help you work safely with these pathogens
- [Risk Group Database](#) is also another useful resource for comparing risk groups in different countries

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[Public Health Agency Canada](#) – for Pathogen Safety Data Sheets

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- Work practices that can increase the risk of a microorganism or a tissue culture (eg cancer cell lines) to people in the lab – examples:
- Creating aerosols of the materials that have been mixed with cytotoxic or toxic substances, and possibly inhaling these or getting them in your eyes/on your skin
 - Combining these materials with, or forming them into, nanoparticles
 - 3-D printing – fumes from the process, dust from the removal of the object from the printer
 - Being untrained or using poor technique when performing injections with hazardous substances
 - Not using identified controls properly or wearing the required PPE
 - Not understanding infection control – aerosols and drips – regularly clean surfaces – benches, outer surfaces of containers, equipment, non-disposable PPE (lab gowns need to be frequently laundered)
 - Not disposing of materials into the correct waste stream, therefore putting our contractors at risk
 - Allowing unauthorised people into the facility unaccompanied
 - YOU MUST: Keep facility doors closed at all times, wash your hands frequently, and especially before leaving the facility, clean outer surfaces of items leaving the facility

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So, do you have research materials that are difficult to classify?

APPENDIX A

If you are on campus and going through the University server, you can access the Australian Standards here: <https://safety.unsw.edu.au/>



Scroll down to Australian Standards & open the link.

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HS430 Legislation - Biosafety
HS667 Legislation - Chemicals
HS660 Legislation - Electrical
HS661 Legislation - Noise
HS662 Legislation - Plant
HS663 Legislation - PPE

Weblinks

ABC

Australian Standards

Australasian Universities Safety Association
Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)
AustLII (Australian Legal Institute Information)
Australian Safeguards & Non-Proliferation Office
Biosecurity (Department of Agriculture and Water resources)

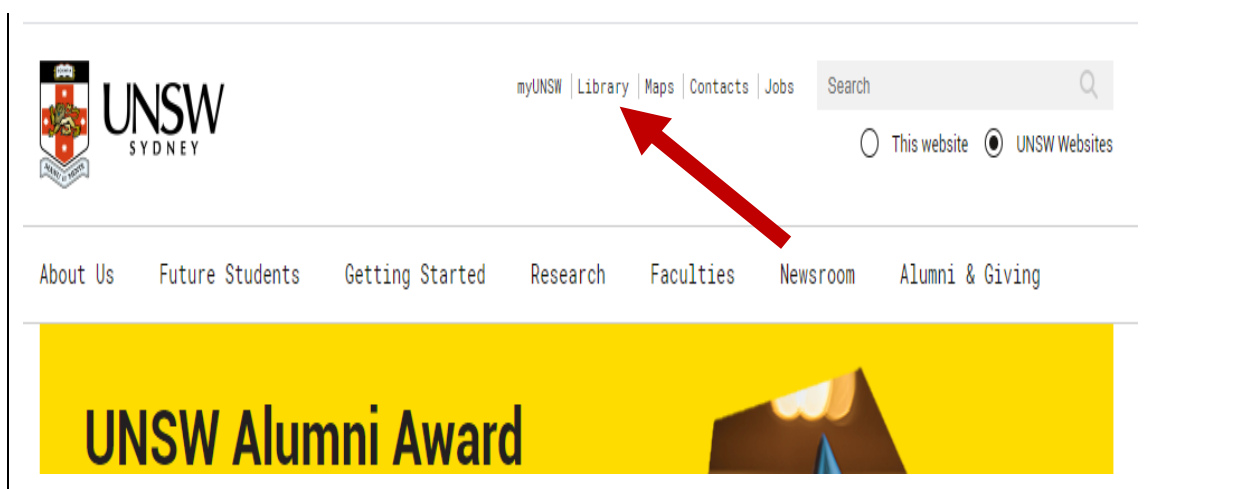


Type in the Standard number and click on “Search”. The database is slow to show responses to your mouse clicks, so be patient.

PLEASE LOG OUT OF THE SITE WHEN YOU ARE FINISHED

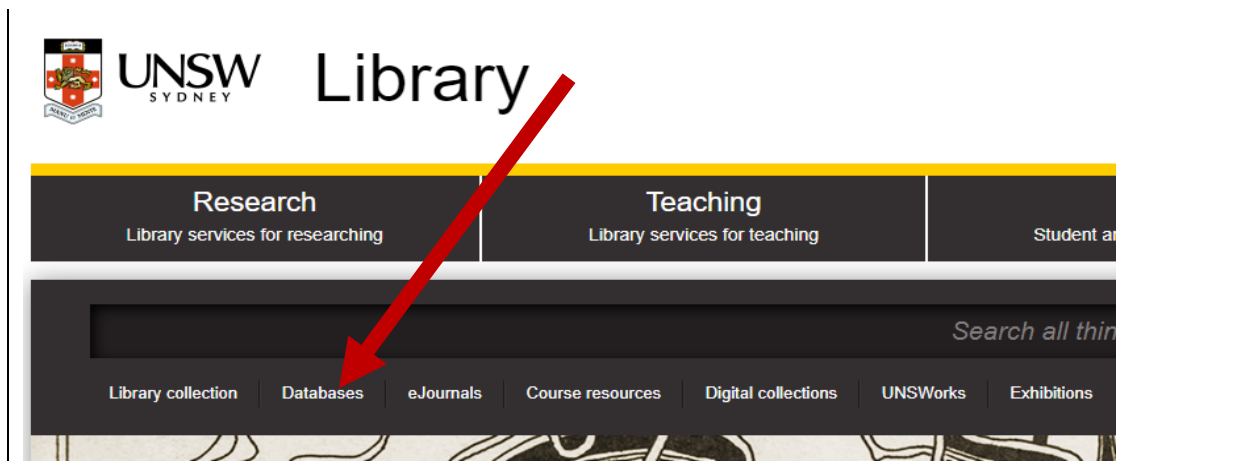
If you are working off-site, you can access the Australian Standards by going through the University Library (note that access is not available on mobile devices):

From the UNSW Homepage, open the UNSW library page



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Next, open the Databases page



Type in 'Australian Standards' into the search box & click on the magnifying glass. Select 'Australian Standards: SAI Global'. You will then be asked to log-in using your zID and zPass.

Click on Australian Standards. You will be asked to log in *again*.

When the page opens, type in the Australian Standard number and click on "Search". The database is slow to show responses to your mouse clicks, so be patient. The document opens in a new Tab. You can go back to the previous tab and log out of SAI Global.



If you download the document to your drive, it will expire after 5 days. You are also not able to copy & paste text out of a Standard. If you want to keep the information, the Library recommends that you print the pages that you want from document before the expiry date.

PLEASE LOG OUT OF THE SITE WHEN YOU ARE FINISHED