

(Source: AS/NZS 2243.3:2010)

CLASSIFICATION OF MICROORGANISMS BY RISK GROUP

The World Health Organisation (WHO) suggests that each country draw up risk groups according to the microorganisms encountered within its boundaries. The following risk group classification is for microorganisms that are infectious for humans and animals in Australia and New Zealand.

- **RISK GROUP 1** – (low individual and community risk) - a microorganism, or material containing microorganisms, that are already present in the environment, and are **unlikely to cause human, plant, insect or animal disease**, disrupt a region or an industry,.
- **RISK GROUP 2** - (moderate individual risk, limited community risk) – a microorganism, or material containing microorganisms, that **can cause human, plant, insect or animal disease**, but is unlikely to be a serious hazard to laboratory workers, the community, livestock, or the environment. Laboratory exposures may cause infection, but effective treatment and preventive measures are available, and the risk of spread is limited. **Includes human opportunistic pathogens.**
- **RISK GROUP 3** – (high individual risk, limited community risk) – a microorganism, or material containing microorganisms, that **usually causes serious human, plant, insect or animal disease** and may present a serious risk to laboratory workers. It could present a risk if spread in the community, in a region, to the livestock industry or the environment, but there are usually effective preventive measures or treatment available.
- **RISK GROUP 4** – (high individual and community risk) – a microorganism, or material containing microorganisms, that usually produces **life-threatening human, plant, insect or animal disease**, represents a serious hazard to laboratory workers. It presents a significant risk if spread in the community, in a region, to the livestock industry or the environment and may be readily transmissible from one individual to another. It is often exotic, and effective treatment and preventive measures are not usually available.

Human and animal infectious microorganisms - classification is based on the pathogenicity of the agent, mode of transmission and host range of agent, availability of effective preventative measures and availability of effective treatments.

Plant infectious microorganisms – classification is concerned with the containment of plant pathogens to avoid risks to the environment, and considers factors such as the ability to spread, whether they are endemic or exotic, and the host range. They include fungi, bacteria, viruses, viroids, rickettsiae, phytoplasmas and nematodes. (AS/NZS2243.3 Clause 3.2.3, including Risk Groups 1 to 4).

Invertebrates carrying microorganisms – Risks are based on factors that include the nature of the microorganism that the invertebrate can be carrying, its

ability to disperse, its resistance to pesticides and the nature of the invertebrate itself. (AS2243.3 Clause 3.2.4, including Risk Groups 1 to 4).

Examples of microorganisms by risk group: - Tables 3.1 – 3.11 (AS/NZS 2243.3:2010, pp 25 – 34) for Risk Groups 2 to 4

- **Bacteria, Chlamydiae, Rickettsiae & Micoplasmas** – Mostly risk group 2 & some risk group 3. (Refer to Table 3.1, 3.5).
- **Parasites** – Risk group 2. (Refer to Table 3.2).
- **Fungi** – Risk groups 2 & 3. (Refer to Table 3.3, 3.6).
- **Viruses** – Risk groups 2, 3 & 4. (Refer to Table 3.4, 3.7, 3.8). Additional requirements for poliovirus. Refer to Appendix C.
- **Prions** – Risk group 2. (Refer to Table 3.4 and Clause 3.7)

Plant pathogens – Risk groups 2, 3 & 4, refer to Table 3.9, 3.10 & 3.11 respectively.

Physical Containment (PC) level is dependent on the Risk Grouping:

- Risk Group 1 requires Physical Containment level 1 (PC1)
- Risk Group 2 requires Physical Containment level 2 (PC2)
- Risk Group 3 requires Physical Containment level 3 (PC3)
- Risk Group 4 requires Physical Containment level 4 (PC4)

Diagnostic specimens, opportunistic human pathogens and unknowns would normally be regarded as Risk Group 2 and handled in a PC2 facility, unless information provided with the specimen suggested that a higher containment level would be required. These specimens may contain multiple types of pathogens. A pathogen that has been isolated from such a sample, must be handled according to its corresponding Risk Group and handled in an appropriate PC level facility.

Reference:

[Australian Standards](#) AS/NZS2243.3:2010 Safety in Laboratories Part 3: Microbiological safety and containment

Related UNSW documents:

(HS323) [Biosafety Procedure](#)

(HS651) [Risk Determination of Human Biological Material - Guideline](#)

[Gene technology Research Procedure](#)