



# Guidelines for the Use of Ethanol as a Decontamination Agent in Laboratories

## Purpose

These guidelines support the Health and Safety Policy and assist in maintaining the university's compliance obligations with the Department of Agriculture, Forests and Fisheries (DAFF; Federal), the Office of the Gene Technology Regulator (OGTR; Federal) and the Department of Primary Industries and Regional Development (DPIRD; State) as well as the Australian and New Zealand Standard for Safety in Laboratories, Part 3: Microbiological Safety and Containment (ASNZS 2243.3; best practice).

The aim of these guidelines is to provide information the use of ethanol and water solutions as a decontamination agent in laboratories.

These guidelines apply to all Curtin workers and staff who work with biological materials or in facilities certified by DAFF, OGTR or DPIRD.

## Definitions

<b>DAFF</b>	Australian Federal Department of Agriculture, Forests and Fisheries
<b>OGTR</b>	Australian Federal Office of the Gene Technology Regulator
<b>DPIRD</b>	Western Australia state Department of Primary Industries and Regional Development
<b>Surface Disinfectant</b>	A chemical preparation used to kill and inhibit microbial growth on a surface
<b>BSC</b>	Biological Safety Cabinet

## Background

Certain types of work in laboratories require the space to be decontaminated after use. This is mainly when using micro-organisms (bacteria, virus, fungi, parasites, etc) in the laboratory and includes the handling of samples that may harbour micro-organisms (animal tissue and samples, human tissue and samples, plants, soil, etc). The decontamination of laboratories can also be a requirement of the certification of a space (e.g. OGTR and DAFF facilities). A mixture of ethanol and water is commonly used in a laboratory setting as a decontamination agent. Ethanol's broad spectrum of activity, relatively low toxicity to humans, low cost and ease of supply, make it a viable option for used in most settings.

The Australian and New Zealand Standard for Safety in Laboratories Part 3: Microbiological Safety and Containment (ASNZS 2243.3) recommends the use of 80% v/v ethanol (70% w/w) for the decontamination of work surfaces and general laboratory areas.

## Preparation

Ethanol can be purchased prediluted or can be prepared in the laboratory. It is recommended to prepare a slightly higher dilution (82-85% v/v) to allow for a small amount of loss over time. Solutions must be changed every 4 weeks at a minimum, if solutions are prepared in bulk this expiry date must be carried across to any child containers.

### Labelling

Labelling of containers must conform with the Chemical Management Plan. The label must also include the expiry date of the ethanol solution which is 4 weeks from the date it was made. An example of a compliant label is shown below.

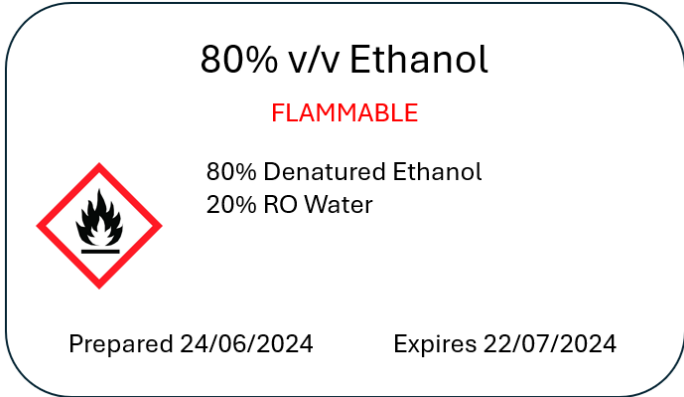


Figure 1. Example Label for Diluted 80% v/v Ethanol

### Stability

The stability of 80% v/v ethanol in a variety of containers was tested. There was no appreciable change in ethanol concentration in containers over the time of the study as measured by the specific gravity of the solutions and converted to percentage ethanol using the OIML tables (Figure 2). The containers tested were a 500mL spray bottle (P), 500mL squeeze bottle (Q), a full 1L Schott style bottle (Schott) and a half full 10L HDPE drum (Pail). All containers must be labelled with an expiry date of 1 month after dilution.

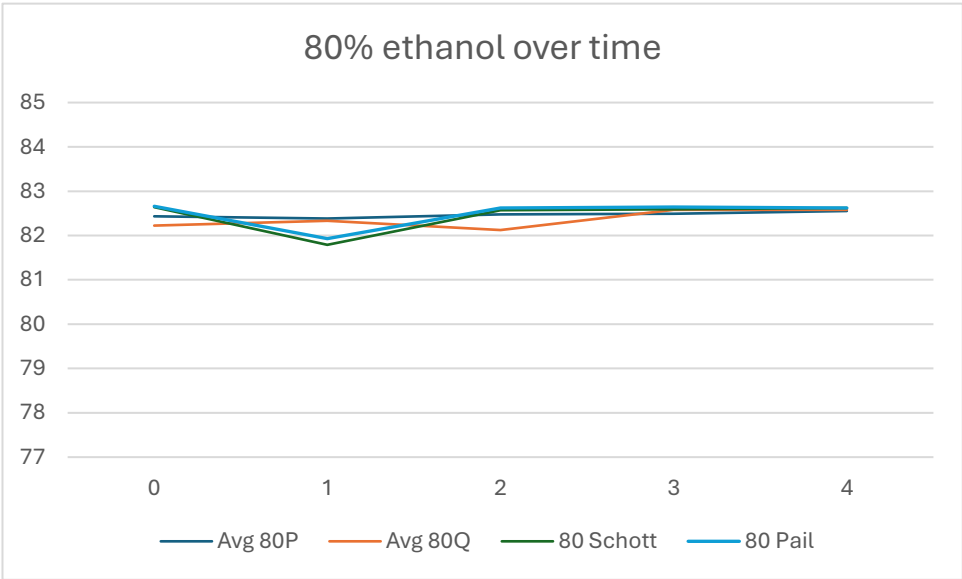


Figure 2. Stability of 80% v/v Ethanol Over Time in a Variety of Container Types



## Use

For correct decontamination 80% v/v ethanol should be left in contact with a surface for at least 10 minutes. The area can be sprayed with 80% v/v ethanol, or it can be squeezed onto the surface and then lightly wiped to ensure a film of ethanol is spread over the area. The 80% v/v ethanol should then be allowed to air dry on the surface.

For biological safety cabinets the best practice is to apply 80% v/v ethanol to a paper towel and wipe the internal surface of the cabinet leaving a film of ethanol. Ethanol solutions should not be sprayed directly into the BSC as the aerosolised ethanol can damage the filters in the unit.

For equipment and other items that require decontamination before removal from a facility or because of a spill, the manufacturers instruction should be followed. In general, electrical items must be turned off before they are decontaminated. They should be wiped down with a paper towel that has had 80% v/v ethanol added to it as per the instructions for BSCs.

Care should be taken to not spray large amounts of 80% v/v ethanol within the work area. This can be common in tissue culture facilities and microbiological labs when items are surface disinfected before placing into a clean BSC. The large amount of 80% v/v ethanol in the air can be a hazard and can damage floors and furniture. The preference is for a paper towel to be sprayed with 80% v/v ethanol and this then used to wipe down the material before placing it into a BSC.