OCDEM, Churchill Hospital, Oxford OX3 7LE

SOP number: OCDEM S4

Executive Responsibility for Safety: Prof Fredrik Karpe
DSO: Sandy Humphreys
BSO: Prof Patrik Rorsman

Effective date: 01/06/2012
Updated: 30/06/2015
Version: 2.1
Supercedes: 2

OCDEM Disinfection Policy

Contents

Please complete the declaration on page 8 to confirm you have read and understood this policy, return a signed copy to the DSO.

1 Permitted Types of Disinfectant

The following types of disinfectants are authorised for use in OCDEM laboratories.

1.i Virkon

All laboratories should use Virkon as the disinfectant of choice for most applications. Virkon has a broad spectrum bactericidal and virucidal activity, is of low hazard to human health, has good cleaning properties, has a colour activity indicator, and shows reduced metal tarnishing. Stock solutions (2 -5%) should be labelled with the actual concentration and date made up. Virkon solution has a seven day shelf life approximately. It should not be used if it is old or has lost (or is too dilute to see) its pink activity indicator colour. Wash out containers between batches as any remaining spent Virkon will speed loss of colour although activity is not affected.

1.ii Alcohols

Examples: Ethanol, Propanol, Industrial Methylated Spirits (IMS)
Advantages - wide germicidal activity, non-corrosive, excellent for disinfecting instruments.
Disadvantages - fire hazard, irritating to tissues, limited activity in presence of organic matter.

1.iii Quaternary Ammonium Compounds

Examples: Microsol, TriGene.
Advantages - effective against bacteria, fungi, yeasts, algae & viruses, non-corrosive, used for surface disinfection.
Disadvantages - irritating to tissues, toxic to aquatic organisms, therefore cannot be disposed of via the sink.

1.iv Hypochlorites

Examples: Sodium hypochlorite, Chloros, Presept, Milton
Advantages – provide wide germicidal activity and relatively non toxic.
Disadvantages – limited activity in presence of organic matter requiring frequent applications, chlorine disinfectants corrode metals and deteriorate fabrics.
Frequently used for the disinfection of equipment (recommended by the manufacturer).
Do not use household bleaches, they do not contain sufficient quantities of active hypochlorite.

2 Use of Disinfectants

2.i General laboratory disinfection

- Wash down benches, centrifuges etc., and deep clean microbiological safety cabinets using freshly prepared 1% Virkon. (Take care treating metal surfaces e.g. centrifuge buckets or rotors - ensure compatibility and rinse off thoroughly after use).
- Use 70% alcohol (industrial methylated spirit or ethanol) or proprietary agents based on alcohol (Sterisept, Mediswab, Klercide etc.) to swab down microbiological safety cabinets before and after each use.
- Floors can be mopped routinely with very dilute (0.1%) Virkon.
- Hypochlorie should only be used for inactivation of certain chemical reagents and for cleaning surfaces contaminated with cDNA, not for routine

disinfection. It is permitted for disinfection of equipment when recommended by the manufacturer.

- See section 4 for equipment disinfection.

2.ii Experimental material

Make discarded phage, viral, bacterial, yeast, or cell cultures to 1% Virkon (final concentration) using freshly prepared stock Virkon solution or by adding Virkon powder directly. Treat for one hour. Material can then be discarded to the drains. Treated disposable plasticware should then be autoclaved or thoroughly rinsed and disposed of as normal waste.
Agar plate cultures from both Hazard Group 1 and 2 organisms must be autoclaved prior to disposal via the NHS infectious waste stream in accordance with Departmental Policy and clearly stated in individual risk assessments - consult the Biological Safety Officer (BSO).

2.iii Genetically Modified material

All Genetically Modified (GM) waste must be inactivated before disposal into the NHS waste stream either or by autoclaving (solid) or by using Virkon at a final concentration of 1% and treating for a minimum of one hour as outlined in section 2.ii; liquid waste can be discarded to the drains after inactivation.

2.iv Blood from low risk populations

Make up to a final concentration of 2% Virkon and treat for at least one hour. Material can then be discarded to the drains. Blood from risk groups and larger quantities of blood should be discarded via the NHS infectious waste system - consult the BSO for advice.

2.v Hazard Group 2 and 3 organisms

Work with Hazard Group 2 material should have disinfection procedures clearly specified in the risk assessment and posted in the laboratory. Virkon may be appropriate for most work but is not necessarily effective against all micro-organisms and an appropriate disinfectant must be used for each pathogen. Such stock disinfectants without colour activity indicators MUST have the concentration and a use by date clearly marked and users must be aware of the contact time required to ensure disinfection. Advice on the efficacy of various types of disinfectant can be found in the Further Guidance of the University's Biorisk Management Policy. Hazard Group 3 material cannot be handled in OCDEM without a prior risk assessment and authorisation from the BSO.

2.vi Body fluid spillages

To clean and disinfect blood and other body fluid spillages on hard surfaces:
Cover spillage with Virkon powder.
Leave until the liquid is absorbed.
Scrape powder/spillage mixture into receptacle for disposal (sharps bin or orange bags)
Rinse and disinfect the affected area with 1% Virkon.

New disinfectants should not be introduced without consulting the University Biological Safety Officer and the Departmental BSO.

3 Making Up Working Dilutions

Disinfectants are usually provided in concentrated form and have to be diluted in water to the working strength for use. The manufacturer's instructions should be followed to ensure that the required concentrations are achieved. Over dilution will render the disinfectant ineffective. Once made up the disinfecting capacity of diluted products tends to deteriorate rapidly with time
Some products contain coloured indicators to show effective disinfecting capacity. If the disinfectant in use does not contain an indicator then a "use by" or expiry date should be clearly marked on the bottle when the solution is made up.

3.i Virkon

Virkon is available from several general laboratory suppliers (eg VWR International, Fisher Scientific, Mettler Toledo). Virkon is suitable for general disinfection, medical devices, laboratory equipment, surfaces and the treatment of body fluid spillages.
For hard surfaces a 1% solution is required, this is prepared as followed:
Add 1 g of Virkon powder to 100 ml of luke-warm water and stir until the powder has dissolved, leaving a clear pink solution.
The solution is stable for 7 days; it also has a pink indicator and should be discarded when the colour has faded.

3.ii Alcohols

A 70% solution of methanol, ethanol or IMS (in water) can be used for swabbing 'clean' work surfaces. They should not be used for cleaning up biological spills. For a 70% solution dilute the 99 – 100% alcohol in the proportion 70 parts alcohol to 30 parts water.

3.iii Quaternary Ammonium Compounds

Follow manufacturer's instructions for use. To be used as a surface disinfectant only.

3.iv Hypochlorite

A concentration of 10,000 ppm of available chlorine is required for disinfection. Various concentrations can be purchased from VWR. Milton sterilising fluid is a 1% solution (10,000 ppm of available chlorine)**. This needs to be used neat.** Hypochlorite is often recommended by manufacturers for the disinfection of equipment.

4 Laboratory equipment

- After contact with blood or other body fluids, immerse all plastic or glassware in disinfectant before cleaning or disposal. Soak in 1% Virkon for one hour or longer and afterwards wash in tap water until visibly clean; if the plastic or glassware is reusable it must be washed in the laboratory dishwasher before reuse.
- To clean and disinfect automated body fluid processing and handling devices eg. Clinical analysers, check with the equipment manufacturer whether or not Virkon can be used in their machines. If it can:
  - flush lines thoroughly with 1% Virkon,
  - fill lines with 1% Virkon, allow to stand for 10 minutes,
  - flush lines thoroughly with de-ionised water.

If Virkon is not suitable Sodium Hypochorite at a concentration of 10,000 ppm can usually be substituted.

5 Centrifuges

All samples of blood, plasma, urine etc. must be centrifuged in buckets with an aerosol lid.
If you discover a body fluid spill in a centrifuge bucket (usually caused by a broken tube):

- Allow any aerosols to settle.
- If you do not know the origin of the sample and/or cannot be sure the sample is free of pathogens remove the centrifuge bucket/lid assembly to a class II microbiological cabinet.
- If you can be sure the sample is 'safe' transport bucket/lid assembly to the nearest sink.
- Remove the lid.
- Sprinkle Virkon powder into the bucket so that it completely covers the spill.
- Leave until the liquid is completely absorbed.
- Remove the contents into a sharps bin.
- To remove any residue that might contain glass fragments, fill the bucket with water and drain it through a sieve into the sink. Put the contents of the sieve into a sharps bin and wash the bucket out thoroughly. Wash the sieve.
- Flush any residue from the sink with copious amount of water.
- Soak the centrifuge bucket in clean water for at least one hour to ensure all the Virkon is removed and then rinse with running water.
- Dry the bucket and return to the centrifuge.
- Before replacing the bucket wipe over the surface of the rotor and the inside of the drum with 70% alcohol.

6 Medical instruments

To pre-clean contaminated stainless steel instruments:

- manually brush with 1% Virkon,
- rinse thoroughly with tap water,
- soak in 1% Virkon for one hour,
- rinse thoroughly and dry before packing for sterilisation.

Please note: higher dilutions (eg: 1:200) will give the same results with extended contact times. Prolonged contact with soft metals such as brass is not recommended.

7 Precautions

Virkon 1% solution has an exceptional safety profile.
The following precautions should be followed, as with all disinfectants.
Wash splashes from eyes and skin immediately.
Keep the concentrate off the skin.
Store solution out of direct sunlight, at room temperature.
Do not mix with other chemicals, except those recommended by the manufacturer.
Contact with centrifuge buckets must not exceed a maximum of one hour.

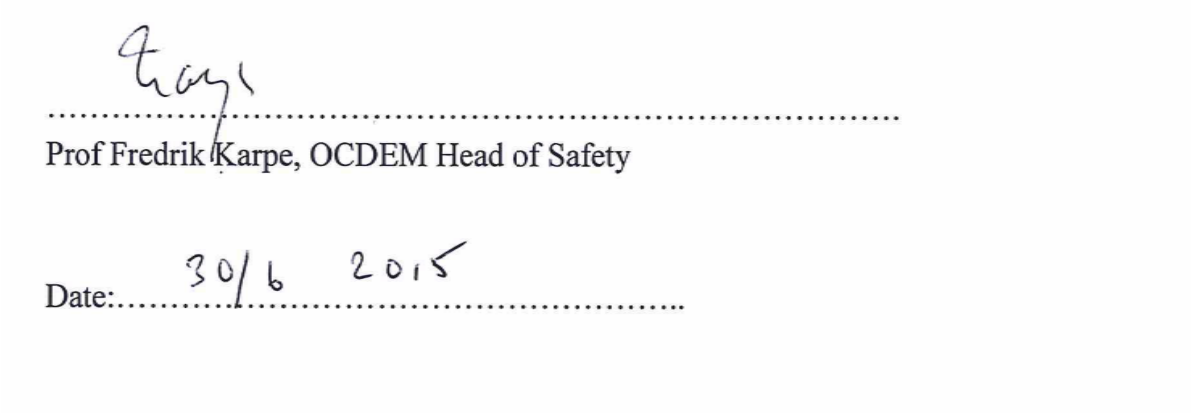
Virkon Powder:
Avoid contact with skin and eyes.
Irritating to skin, nose, throat and respiratory tract.

Risk of serious damage to eyes.
Ingestion may cause severe irritation to mouth, throat and digestive tract.
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
If ingested, do *not* induce vomiting; drink plenty of water (or milk) and seek medical attention.
Store product tightly closed, in a cool dry place.

8 Antiseptics

Products sold as skin disinfectants eg. Hibiscrub, Hibitane, Betadine, pHiso-med, Cidal etc should not be used as a general laboratory disinfectant, since these are only useful to inhibit the growth of microbes on skin.
There should be no need for workers in laboratories to routinely disinfect their hands. Skin disinfectants are for use in clinical settings. All workers should wash their hands regularly while working in the laboratory, when known or suspected to be contaminated, and always before leaving. Ordinary soap is suitable for this. If liquid soaps are used in containment laboratories they should contain a bacteriostatic agent to prevent the multiplication of any contamination. Single use paper towels are recommended.
Please note that many alcohol rub cleansers contain large amount of glycerol. These rubs may dry out the skin, and in extreme cases, where these are used frequently may result in ‘cracks’ and ‘chaps’ as possible routes of infection. Also an important issue not related to disinfection, is that samples can become contaminated with glycerol when these rubs are used.

Document approved and accepted by OCDEM Safety Advisory Committee



Prof Fredrik Karpe, OCDEM Head of Safety

Date: 30/6 2015

I have read and understood this SOP and agree to abide by the regulations therein.

Signed: …… (Staff Member)

Date: ……..

Please copy the signed form and return to the DSO who will forward it to the admin team to place in your personnel record.

Update History

Version	Date	Reason for update	Updated/reviewed by :	Date next review due
1	Oct 2003	New SOP	Author: SMH, accepted by OCDEM SAC	Oct 2004
1	Sept 2004	No changes required	Reviewed by SMH	Oct 2005
1	Oct 2005	No changes required	Reviewed by SMH	Oct 2006
1a	Sept 2006	Minor changes to personnel	Updated by SMH Accepted by OCDEM SAC	Sept 2008
1a	Jan 2009	No changes.	Reviewed by SMH	Jan 2011
2	June 2012	Rewritten as a policy rather than a mixture of policy and guidance.	Updated by SMH, reviewed by Andrew Thompson: comments addressed. Accepted by OCDEM Head of Safety, 19/9/12	June 2014
2.1	30 June 2015	Reviewed – header updated, no other changes	SMH	June 2017