

Guide to Disinfectants for Human-derived Material Use in Research Labs

This document provides information regarding disinfectants that are EPA-registered for the destruction of HIV and Hepatitis B virus and satisfy the requirements of the OSHA Bloodborne Pathogen (BBP) Standard. Disinfectants meeting these criteria must be used for terminal disinfection of surfaces following the use of human-derived materials (including cell culture). The products listed below are examples of ready-to-use or dilute-to-use products that meet these requirements and are found on the [EPA List D](#). They all have a short contact time and are formulated for extended shelf life. Before selecting one of these or any other disinfectant product, you should confirm with the manufacturer that the product has a current EPA registration for the destruction of HIV and HBV. (Note: Product names can change and sometimes the product name on the EPA list will differ, but the EPA registration number will remain the same.)

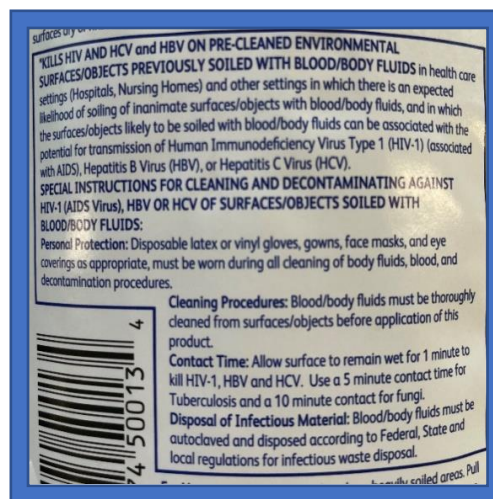
Product Name	Manufacturer EPA Reg #	Active Ingredients	Shelf Life (from date of manufacture)	Contact Time*	Ready-To-Use (RTU) or Dilute-To-Use (DTU)
Super Sani-Cloth	9480-4	Quaternary ammonium chlorides + alcohol	24 months	2 minutes	RTU Wipes
Oxivir Wipes	70627-60	Hydrogen Peroxide	24 months	1 minute	RTU Wipes
CaviCide 1	46781-12	Quaternary ammonium chlorides + alcohol	24 months	2 minutes	RTU
Virex TB	70627-2	Quaternary ammonium chlorides	36 months	1 minute	RTU
Virex II/256	70627-24	Quaternary ammonium chlorides	36 months (conc.) 12 months (dilute)	10 minutes	DTU
Peridox Concentrate	8383-12	Hydrogen peroxide + peracetic acid	24 months (conc.)	2 minutes	DTU
Spor-Klenz Concentrate	1043-120	Hydrogen peroxide	Contact manufacturer	10 minutes	DTU

*The contact time listed in the table is for destruction of HIV/HBV/HCV; other organisms may require more or less contact time. Check the product label for organisms the product was tested against, and what contact time is needed. For SARS-CoV-2 the product should be EPA-registered and have a disinfection claim against human coronavirus. A full list of EPA-registered Covid-19 disinfectants can be found on the [EPA List N](#).

Benefits and limitations of ready-to-use (RTU) versus dilute-to-use (DTU) products

- **Benefit:** RTU products are generally formulated to have a longer shelf life.
- **Limitation:** RTU products do not have extra handling steps prior to use, removing the possibility of error in dilution or potential exposure.
- **Benefit:** DTU products can be cheaper and more compact than RTU products.
- **Limitation:** DTU products require extra handling steps before use, providing additional opportunities for exposure to the more chemically hazardous concentrated solution.

Does my disinfectant meet the BBP Standard? Look for this (or similar) wording on the label.



What about bleach?

Bleach is a common, effective, and low cost dilute-to-use disinfectant. However, there are a number of disadvantages to its use in the research lab setting for disinfection following experiments with human-derived materials.

- Bleach is a sodium hypochlorite solution with most commercial bottles containing around 5-6% active ingredient. For disinfection purposes, bleach is most effective at a 0.5-0.6% solution so it needs to be diluted 1 part bleach to 9 parts water. Since it degrades rapidly, bleach solution should be mixed fresh daily for use.
- Surface disinfection contact time is at least 10 minutes.
- Household bleach generally has a pH of 11 to 13, so it is corrosive to certain surfaces (metals, fabrics) and will cause injury when it comes in contact with skin or eyes.
 - Whenever possible, pour bleach behind a sash or shield to provide enhanced splash protection.
 - Splash goggles, chemical-resistant gloves, and lab coat are required for all bleach pouring activities including discharge of liquid wastes containing bleach down the sink.
- Bleach should never be mixed with ammonia-based products as this can generate deadly chlorine gas.
- **DO NOT** autoclave liquid wastes containing bleach. This can lead to potentially explosive conditions and to corrosion of the internal parts of the autoclave.

What about ethanol?

While ethanol is used in many applications in the research lab and is effective in the destruction of many infectious agents, it is not sufficient by itself for disinfection following work involving human-derived materials. Since ethanol is not rated for the destruction of HIV and HBV, it is not EPA-registered for this purpose and not on the EPA List D.

- Ethanol may be used in conjunction with these materials for beginning or intermediate disinfection of surfaces (e.g., wiping down the biosafety cabinet prior to initiation of work with human derived materials) and adjacent items (e.g., wiping of laboratory consumables or equipment before bringing them into the biosafety cabinet).
- If ethanol is used as part of the terminal disinfection step, it must be done in conjunction with the ready-to-use or dilute-to-use products described above; for example, you may wipe down the inside of a biosafety cabinet with ethanol after disinfection with an EPA-registered product.

Important General Disinfection Tips:

- Note the expiration date of your commercial disinfectant. Although the product will be more stable than dilute bleach, it will still expire.
- If using a dilute-to-use product, ensure proper dilution and note the shelf-life of the diluted solution. Write the “expiration date” of the diluted solution on the container so all lab members are aware of it.
- Organic materials reduce the efficacy of most disinfectants. Remove any visible contamination before applying the disinfectant for the appropriate contact time (amount of time the surface needs to remain wet) to get the best disinfection result.
- Spraying disinfectant directly onto a contaminated surface (including gloves) may actually spread contamination through the force of the spray striking the contaminated surface. Consider saturating an absorbent cloth and applying the disinfectant through wiping when possible.

Need more assistance regarding disinfectants?
Please contact VU Biosafety at VUBiosafety@vanderbilt.edu