

REMOVING HIV (AIDS VIRUS)

The laboratory test results presented in this bulletin demonstrate that Corian® can be easily cleaned of Human Immunodeficiency Virus (HIV) with diluted bleach solution.

Removing HIV (AIDS Virus) from Corian®

Summary

Corian® is a nonporous material that is easily cleaned of Human Immunodeficiency Virus (HIV), the cause of AIDS. In addition, Corian® does not release any compounds inherently toxic to HIV.

Laboratory tests conducted by the DuPont Applied Biotechnology Group demonstrate that a high concentration of HIV can be removed from surfaces of Corian® in healthcare and research facilities by rinsing with a diluted household bleach solution. A 10% solution of continuous household bleach (0.5% sodium hypochlorite) killed all infectious HIV contamination on Corian®.

Test Method

1. One-inch-diameter discs were cut from a 1/4-inch-thick piece of Corian®. (The discs were slightly smaller than the internal diameter of a Costar plate well.)
2. Discs were sterilized by autoclaving.
3. Virus-containing tissue culture media from CEM cells infected with HIV 3B were clarified by low-speed centrifugation and placed in a p150 tissue culture dish.
4. Discs of Corian® were submerged in this virus stock. (The titer of this stock was not determined, but titers are typically between 10⁴ and 10⁵ TCID₅₀/ml.)
5. Three discs were individually picked up with a hemostat and transferred to three wells of a six-well plate. To simulate "contaminated" surfaces, the virus stock adhering to the discs was not removed.
6. Three more discs were similarly removed from the virus stock. These were rinsed (two complete dippings) in three successive beakers, each containing 150 ml of calcium- and magnesium-free Hanks Buffered Saline Solution (HBSS). The discs were then placed in individual wells of a six-well plate.
7. Another three discs were similarly removed. These were dipped twice in 250 ml of 70% ethanol, followed by three successive rinses in HBSS, as described above.
8. The last three discs were also individually removed with hemostats. These were dipped twice in 150 ml of freshly diluted household bleach, 0.5% sodium hypochlorite (diluted 1:10), followed by three successive rinses in HBSS, as described previously.
9. One ml of medium containing 1 x 10⁶ CEM cells was added to each well on top of the treated discs of Corian®. This volume submerged the discs in medium.

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10. Plates were incubated at 37°C in a CO₂ incubator for 12 days. Cultures were fed on days 2, 5 and 7. Samples of the supernatant culture media were harvested on days 7 and 12 and were frozen at -80°C until assayed for viral p24, the core protein of HIV, by the DuPont HIV Antigen ELISA method.*
11. Samples were adjusted to 0.5% Triton® X-100 and 0.2-ml aliquots were assayed for viral p24 antigen levels with the DuPont HIV Antigen ELISA (NEA-500).* The test plate was incubated with sample overnight, according to the package instructions.

Test Results

1. Visual Observations: CEM cells grew well in all culture wells. No toxic effects of bleach or 70% ethanol were observed after three rinses in HBSS. CPE, consisting of giant fused cells, was observed in the wells that had been cultured with unrinsed, “contaminated” discs and in the wells with HBSS-rinsed discs.
2. High viral p24 values (greater than 1,000 pg/ml) were observed in the culture supernatants derived from the culture of susceptible CEM cells with unwashed or HBSS-washed discs.
3. Lower viral p24 values (100 pg/ml to 700 pg/ml) were observed in the culture of susceptible CEM cells with 70% ethanol-washed discs.
4. No detectable viral p24 (less than 10 pg/ml) was observed in the culture supernatants derived from the cultures of susceptible CEM cells with dilute, bleach-washed discs.

Test data for all samples are reported in Table 1.

Table 1. ELISA Antigen Assay Results for HIV-Contaminated Corian®

SAMPLE	ELISA O.D. CULTURE NUMBER			VIRAL P24 (PG/ML)
	1	2	3	
Day 7				
Unwashed	>3	>3	>3	>1,000
Washed	>3	>3	>3	>1,000
70% Ethanol	1.512	1.953	1.718	500–700
10% Bleach	0.051	0.037	0.037	<10
Day 12				
Unwashed	>3	>3	>3	>1,000
Washed	>3	>3	>3	>1,000
70% Ethanol	0.452	0.472	0.488	125
10% Bleach	0.030	0.059	0.036	<10

*Call 1-800-551-2121 to order or for technical information.

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Interpretation of Test Results

1. The vigorous growth of CEM cells in cultures containing discs of Corian® indicates that no products toxic to the growth of these cells were released from the Corian®.
2. The CEM culture method permits viral growth. Any infectious virus that survived the disinfection procedure would grow to easily detected levels in the CEM culture.
3. Infectious HIV was detected on all discs except those that had been rinsed in the bleach solution. Simple dilution or rinsing in ethanol did not disinfect HIV-contaminated Corian® in this experiment; only bleach killed the virus.

For More Information

For more information about the stability of HIV in clinical and laboratory situations, see the April 11, 1986, issue of the *Journal of the American Medical Association* (Vol. 255, No. 14).

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