

## About HIV

HIV stands for Human Immunodeficiency Virus, which weakens a person's immune system by destroying important cells that fight disease and infection; it causes AIDS (Acquired Immunodeficiency Syndrome).

According to UNADIS, there are approximately 31 ~ 44 million people worldwide living with HIV/AIDS at the end of 2017 and yet no effective cure exists for HIV/AIDS.

## HIV transmission

Some people who have HIV/AIDS do not show any symptoms at all for 10 years or more, but can spread the infection to others by certain body fluids (blood, semen, pre-seminal fluid, rectal fluids, vaginal fluids, and breast milk from a person who has HIV can mainly transmit HIV).

The major routes of HIV transmission:

- Sexual contact
- Blood transfusion
- Sharing needles
- From mother to child during pregnancy
- Occupational transmission (e.g. health-care workplace)

## Test for Removing HIV/AIDS from Staron®

### Purpose

As noted above, a contact with blood, semen, vaginal fluids or body fluids containing blood may risk exposure to HIV. So, it is important to clean a surface properly to reduce a risk of HIV infection in the health-care workplace such as hospitals and clinical laboratories, etc.

The tests conducted on Staron® under controlled scientific conditions in an accredited laboratory in accordance with the recognized International Standard ISO/IEC 17025:2005 is to demonstrate that HIV can be removed from the surface of Staron® with diluted bleach.

### Method

The test conforms in principle to EPA OCSPP 810.2000 (2018) and 810.2200 (2018) Product Performance Test Guidelines, and follows the procedure outlined in the ASTM International test method designated E1053-11, "Standard Test Method to Assess Virucidal Activity of Chemicals Intended for Disinfection of Inanimate, Nonporous Environmental Surfaces".

### Results

A treatment procedure of a 15 second submersion in diluted bleach (5,000 ppm sodium hypochlorite) followed by a 15 second submersion in sterile deionized water was able to completely inactivate HIV-1 ( $\geq 5.71$  Log<sub>10</sub> reduction) from the Staron®.

A treatment procedure of a 15 second submersion in 70% Isopropanol followed by a 15 second submersion in sterile deionized water was able to inactivate HIV-1 from the Staron® by 5.62-5.95 Log<sub>10</sub>. However, low levels of viral survivors were observed.

A treatment procedure of a 15 second submersion in sterile deionized water alone reduced the viral load of HIV-1 from the Staron® by 1.61-1.74 Log<sub>10</sub>.

## Staron® Features and Benefits

Staron® acrylic solid surface is a non-porous material, so it resists bacteria, mold, and moisture from penetrating the surface. This characteristics of product enable user to remove a virus such as HIV using general bleach cleaner.

TEST DATA

**Unaudited Preliminary results for 977-101: Evaluation of Elimination of Virus from a Solid Surface Material by Bleach or Alcohol - Human Immunodeficiency Virus Type 1 (HIV-1)**

Table 1 - titer results

Surface	Treatment	Replicate	Titer ± 95% CL (Log <sub>10</sub> TCID <sub>50</sub> /mL)	Volume (mL) <sup>A</sup>	Viral Load (Log <sub>10</sub> TCID <sub>50</sub> )
Staron Solid Surfaces	Diluted Bleach (15 second submersion) + Rinse (15 second submersion)	Rep 1	≤ 0.83 *	4.0	≤ 1.43
		Rep 2	≤ 0.83 *		≤ 1.43
		Rep 3	≤ 0.83 *		≤ 1.43
	70% IPA (15 second submersion) + Rinse (15 second submersion)	Rep 1	0.92 ± 0.32	4.0	1.52 ± 0.32
		Rep 2	0.92 ± 0.32		1.52 ± 0.32
		Rep 3	0.59 ± 0.45		1.19 ± 0.45
	Rinse only (15 second submersion)	Rep 1	4.80 ± 0.17	4.0	5.40 ± 0.17
		Rep 2	4.80 ± 0.00		5.40 ± 0.00
		Rep 3	4.93 ± 0.12		5.53 ± 0.12
	Untreated	Rep 1	6.68 ± 0.12	4.0	7.28 ± 0.12
		Rep 2	6.30 ± 0.19		6.90 ± 0.19
		Rep 3	6.55 ± 0.16		7.15 ± 0.16
		Average Viral Load			7.14 ± 0.16

<sup>A</sup> Volume refers to the volume of the virus recovery solution.

\* No virus was detected; the theoretical titer was determined based on the Poisson distribution.

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Table 2 - Reduction factors

Surface	Treatment	Input Viral Load (Log <sub>10</sub> TCID <sub>50</sub> ) <sup>B</sup>	Replicate	Output Viral Load (Log <sub>10</sub> TCID <sub>50</sub> )	Reduction (Log <sub>10</sub> TCID <sub>50</sub> )
Staron Solid Surfaces	Diluted Bleach (15 second submersion) + Rinse (15 second submersion)	7.14 ± 0.16	Rep 1	≤ 1.43	≥ 5.71 ± 0.16
			Rep 2	≤ 1.43	≥ 5.71 ± 0.16
			Rep 3	≤ 1.43	≥ 5.71 ± 0.16
	70% IPA (15 second submersion) + Rinse (15 second submersion)	7.14 ± 0.16	Rep 1	1.52 ± 0.32	5.62 ± 0.36
			Rep 2	1.52 ± 0.32	5.62 ± 0.36
			Rep 3	1.19 ± 0.45	5.95 ± 0.48
	Rinse only (15 second submersion)	7.14 ± 0.16	Rep 1	5.40 ± 0.17	1.74 ± 0.23
			Rep 2	5.40 ± 0.00	1.74 ± 0.16
			Rep 3	5.53 ± 0.12	1.61 ± 0.20

<sup>B</sup> Input Viral Load is the average Viral Load of the untreated samples.

## Conclusions:

A treatment procedure of a 15 second submersion in diluted bleach (5,000 ppm sodium hypochlorite) followed by a 15 second submersion in sterile deionized water was able to completely inactivate HIV-1 (≥5.71 Log<sub>10</sub> reduction) from the Staron Solid Surface material.

A treatment procedure of a 15 second submersion in 70% Isopropanol followed by a 15 second submersion in sterile deionized water was able to inactivate HIV-1 from the Staron Solid Surface material by 5.62-5.95 Log<sub>10</sub>, however, low levels of viral survivors were observed.

A treatment procedure of a 15 second submersion in sterile deionized water alone reduced the viral load of HIV-1 from the Staron Solid Surface material by 1.61-1.74 Log<sub>10</sub>.