COVID-19

FOAMSTREAM CLEAN ELEMENTS

weedingtech
Herbicide-Free Weed Control, **Redefined**.

WHAT WE KNOW

Foamstream has been approved for use as a biocide by the EU and the EPA. That's why we have always promoted the efficacy of the Foamstream method as a deep cleaning and sanitisation tool in addition to being a leading weed control system.

Independent lab studies we have commissioned show Foamstream to have a highly powerful viricidal effect at controlling potentially life-threatening viruses like Hepatitis C. Although we don't have any conclusive testing regarding Coronavirus (Covid-19) yet, (it is planned), we are confident that the principle of applying extreme heat to the virus will help reduce its transmission in outside spaces.

The table below show the persistence of similar strains of virus akin to COVID-19 against different types of surfaces. It appears that the virus can remain active for a significant amount of time on some common outside surfaces like steel, metal, wood, glass of plastic. **These materials are very common on vehicles, street furniture, bus stops, outside of buildings etc. hence the absolute necessity of disinfecting them.**

Type of surface	Virus	Temperature	Persistence
Steel	MERS-CoV	20°C / 68°F 30°C / 86°F	48 h 8–24 h
	TGEV	4°C / 39°F 20°C / 68°F 40°C / 104°F	≥ 28 d 3–28 d 4–96 h
	MHV	4°C / 39°F 20°C / 68°F 40°C / 104°F	≥ 28 d 4–28 d 4–96 h
	HCoV	21°C / 70°F	5 d
Aluminium	HCoV	21°C / 70°F	2–8 h
Metal	SARS-CoV	RT	5 d
Wood	SARS-CoV	RT	4 d
	SARS-CoV	RT	4–5 d
Paper	SARS-CoV	RT	24 h 3 h < 5 min
Glass	SARS-CoV	RT	4 d
	HCoV	21°C / 70°F	5 d

Type of surface	Virus	Temperature	Persistence
Plastic	SARS-CoV	22°- 25°C / 72-77°F	≤ 5 d
	MERS-CoV	20°C / 68°F 30°C / 86°F	48 h 8–24 h
	SARS-CoV	RT	4 d
	SARS-CoV	RT	6–9 d
	HCoV	RT	2–6 d
PVC	HCoV	21°C / 70°F	5 d
Silicon rubber	HCoV	21°C / 70°F	5 d
Surgical glove (latex)	HCoV	21°C / 70°F	≤ 8 h
Disposable gown	SARS-CoV	RT	2 d 24 h 1 h
Ceramic	HCoV	21°C / 70°F	5 d
Teflon	HCoV	21°C / 70°F	5 d

Table extracted from: Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents, G. Kampfa, D. Todtb, S. Pfaenderb, E. Steinmannb, Journal of Hospital Infection, March 2020, Volume 104, Issue 3, Pages 246-251.

WHY FOAMSTREAM CLEAN

Foamstream Clean

Similarly to weed-killing, sanitisation methods can be divided in two main groups of methods: the chemical and the mechanical.

Chemical methods, either declared harmful or not, is the deepest category. It encompasses most biocides and is heavily regulated. All biocides need to comply and be tested following PREN 16777. The main disadvantage of these solutions is their non-environmental friendliness. There is a potential bioaccumulation and contamination of drinking water is used on large scale. These methods can be used both inside and outside.

Mechanical methods are based on heat in the form of autoclaves, large industrial type ovens, used for disinfecting surgical instruments after operations. These can only be used inside and have a limited capacity.

To the best of our knowledge no large scale, outside mechanical methods has been developed or used. This is Foamstream-Clean unique offering: providing an efficient, outdoors, large-scale, environmentally friendly biocide.

In 2019 Foamstream was tested and approved as an organic biocide by the EPA and the EU. Certified in a UK laboratory following PREN 16777:2014 standards (the European standard that all biocides need to comply to), Foamstream was proved to be highly effective at killing Hepatitis C, as well as other well-known viruses. Its conclusions were:

"According to Draft PREN 16777:2014, Foamstream V4 POSSESSES VIRUCIDAL ACTIVITY at all volumes tested after 1 MINUTE at 98.0°C / 208.4°F under CLEAN conditions (0.3 g/l bovine albumin) against Bovine Viral Diarrhea Virus VR-1422/ BT cells a surrogate for Hepatitis C virus"

FOAMSTREAM AND THE EFFECT OF HEAT ON VIRAL INACTIVITY

EFFECTS OF TEMPERATURE ON VIRAL GROWTH

60-66°C / 140-151°F is the optimum temperature for killing most viruses

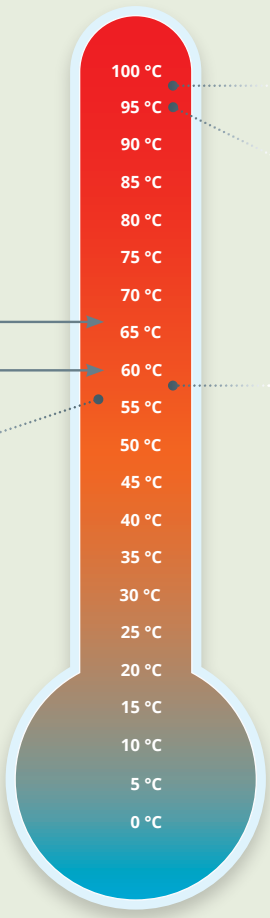
60 - 66°C / 140 - 151°F

At 56°C / 133°F, SARS coronavirus shows a quick decrease in number of infectious viral units*

56°C / 133°F

*https://www.who.int/csr/sars/survival_2003_05_04/en/

N.B. Nothing kills 100% of bacteria and viruses but disinfecting with temperatures above 77°C, when applied properly, can kill 99% of living organisms including bacteria and viruses.



TEMPERATURE OF FOAMSTREAM DURING APPLICATION

98°C / 208.4°F Temperature of Foamstream at lance

95°C / 203°F Temperature of Foamstream at contact point

57°C / 135°F Foamstream stays above 57°C / 135°F for approximately 15 seconds after point of contact**

**time varies depending on speed of application and outside atmospheric conditions. Foamstream stays above 57°C for 15 seconds at an application rate of 2km/hr (1.25miles/hr) or less.

OPERATING PROCEDURE (POTENTIAL) AND GENERAL EXPLANATION

As outlined above, Foamstream efficacy is based on heat, hence the outlined procedure is focused on retaining heat while the work is being performed. A dissociation is made between generally flat and generally vertical surfaces. But first, a quick explanation on lance performances regarding heat retention is performed.

Lances and heat retention

The heat retention mechanism of Foamstream lances is based on smooth laminar flow and foam creation, hence the weeding lance will always provide the best heat retention properties, in any circumstances and the power lance the worst.

- Weeding lance: excellent heat retention properties, providing that the foam stays on the surface. The smaller the lance, the better.
- Nylon brush: good heat retention properties with minimum foam being created.
- Nylon rotating: sub-par retention due to rotating mechanism mixing fresh air and water droplets, close to no foam creation.
- Pavement cleaner: minimal heat retention due to high pressure spraying nozzles creating droplets. Minimal foam creation.
- High pressure lance: high heat dissipation due to high pressure spraying nozzles. If the nozzle is positioned very close to the surface to treat, high heat retention but the operator needs to stay on the same spot for a relatively long time in order to enable the same heat retention properties as a weeding lance

Flat surfaces

These can be, but not limited to: benches, sidewalks, vehicle hoods, tombs, rubber grounds, bins, cigarette disposals.
Topology of surfaces can vary, from smooth to rough. The rougher the surface the better it will be for Foamstream to stick.
Recommended lances: regular weeding lance, nylon rotating, nylon brush.

Recommended procedure:

1. Using the weeding lance, spray the surface at normal walking speed.
2. Assess the foam retention properties of the surface. Is the foam sliding away immediately or is it sticking?
3. If the foam is sliding away, spray the surface again, starting from the 'highest' point so that the foam then moves to other areas. Stay a minimum of 15 seconds on each point along the 'crest'.
4. Once the crest has been cleaned, move onto a lower point, no more than half a meter lower. Repeat step 3
5. Repeat steps 3 and 4 until the surface has been treated.

If the foam is not sliding away, treat the surface by making sure every point has a stack of foam of more than 10 cm.

Optional steps:

1. After 5 minutes, clean the surfaces using the nylon rotating or nylon brush lance.
2. Repeat the initial cleaning procedure.

Vertical surfaces

These can be, but not limited to: park benches, vehicle sides, windows.
Topology of surfaces does not matter too much, since the surfaces a vertical Foamstream will most probably slide immediately after application.
Recommended lances: regular weeding lance, nylon rotating, nylon brush.

Recommended procedure:

1. Using the weeding lance, apply Foamstream along the highest line of the surface, making sure the surface is completely wet
2. Once the crest has been cleaned, move onto a lower point, no more than half a meter lower. Repeat step 3
3. Repeat steps 3 and 4 until the surface has been treated.
4. Using the nylon rotating brush or nylon brush, brush the surface treated by Foamstream.

CLOSING NOTES

Sanitising using Foamstream is still in its experimental phase, not in terms of efficacy but in terms of procedure and user cases. As the activity develops more accurate data and procedures will be put together.

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