

# trophon® EPR

## Microbial efficacy

We go further...



Paving the way globally in microbial efficacy, we have a highly comprehensive portfolio of efficacy testing in ultrasound probe high level disinfection.

# Ensure the most comprehensive protection for your patients

High level disinfection (HLD) is defined as the complete elimination of all microorganisms except for high numbers of bacterial spores, a small number of which are permitted to remain.

trophon is a fully mobile solution for convenient point of care use and adaptability across all departments where ultrasound imaging is used.



Emergency / trauma



Fertility / women's health



Maternity



ICU

trophon is a breakthrough disinfection technology, setting the new standard of care globally for ultrasound probe reprocessing.

## Make sure you choose an HLD system that is proven effective against the widest range of pathogens

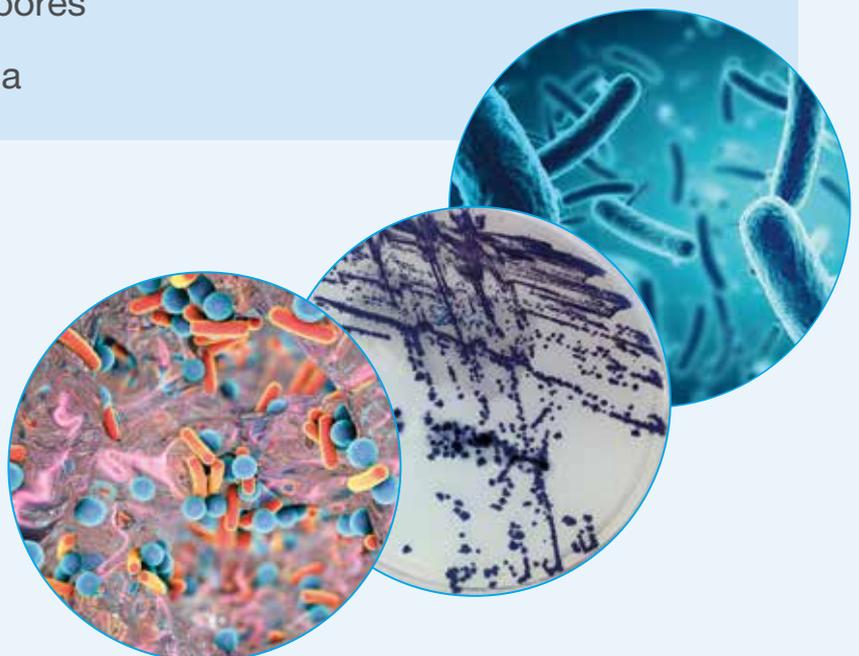
Nanosonics conducts extensive laboratory testing, focused on continually validating the effectiveness of trophon. Patient safety and reducing the risk of infection spread is paramount to us and drives our clinical research and testing.

Going far beyond the minimum regulatory requirements, we prioritise having the broadest possible microbial efficacy program.

trophon inactivates the mandated subset of microorganisms, as required by US regulations.

trophon is proven to also eliminate an extended range of infectious pathogens that other HLD products do not, including\*:

- Sexually Transmitted Infections (STIs)
- *Clostridium difficile* spores
- Drug resistant bacteria



# Sexually Transmitted Infections (STIs)

Ultrasound probes frequently contact body sites where STIs can occur. trophon is proven to completely inactivate a range of STI causing pathogens.\*

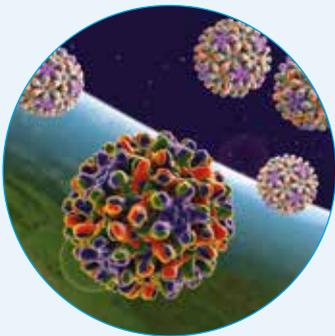


## HIV

Human immunodeficiency virus (HIV) is an incurable disease that affects the immune system, impairing its ability to fight disease.

More than 1.2 million people in the US live with HIV, and 1 in 8 of them are unaware.<sup>1</sup>

trophon has been shown to inactivate HIV in laboratory tests.

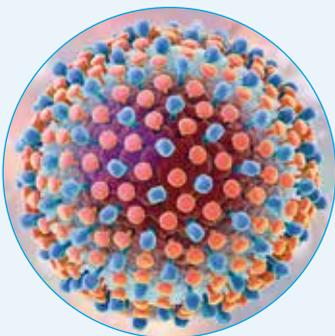


## Hepatitis B

Hepatitis B (HBV) is an infection that attacks the liver. It is transmitted through bodily fluids, for example, during sexual contact.

There is currently no available cure for HBV.

trophon is effective against Hepatitis B on ultrasound probes.

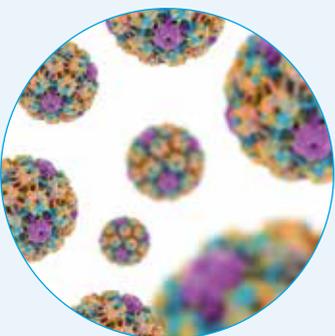


## Hepatitis C

Hepatitis C virus (HCV) is a blood borne virus that can cause chronic infection and liver diseases like liver cancer.

An estimated 2.7 to 3.9 million people in the United States have chronic hepatitis C.<sup>2</sup>

trophon is effective against Hepatitis C on ultrasound probes.



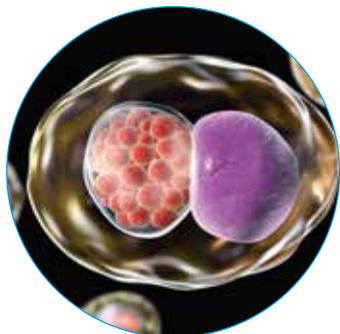
## HPV

HPV is the most commonly diagnosed STI, with around 14 million new genital HPV infections in America each year.<sup>3</sup>

HPV causes 99.7% of cervical cancer cases, 88% of anal cancers, 70% of vaginal cancer cases and 50% of penile cancers.<sup>4,5</sup>

trophon is effective against HPV on ultrasound probes.

# Sexually Transmitted Infections (STIs)

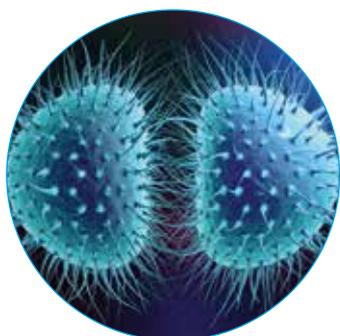


## Chlamydia

*Chlamydia trachomatis* is the most common notifiable disease in America. It can result in infertility & ectopic pregnancy.

In 2015 there were 1,526,658 chlamydial infections reported to the CDC.<sup>6</sup>

trophon is effective against Chlamydia on ultrasound probes.

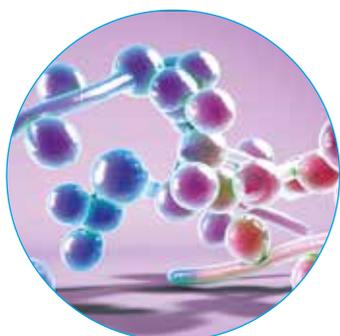


## Gonorrhea

*Neisseria gonorrhoea* is a sexually transmitted disease that infects both women and men and, if left untreated, can lead to infertility.

It is estimated that 820,000 new infections occur annually in America. Less than half of these are detected and reported.<sup>7</sup>

trophon is effective against Gonorrhea on ultrasound probes.



## Candida

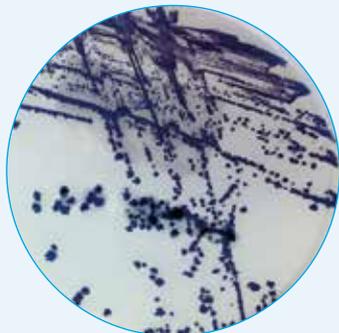
*Candida albicans* can cause fungal infection in mucous membranes such as the throat and vagina.

There are 46,000 cases of invasive candidiasis annually in the US and up to 30% of bloodstream infections are fatal.<sup>8</sup>

trophon is effective against Candida on ultrasound probes.

## Clostridium difficile spores

High level disinfectants are only required to be sporicidal at extended contact times. trophon has been shown to inactivate *Clostridium difficile* spores even within its manufacturer specified 7 minutes cycle time in laboratory testing.\*



### Clostridium difficile

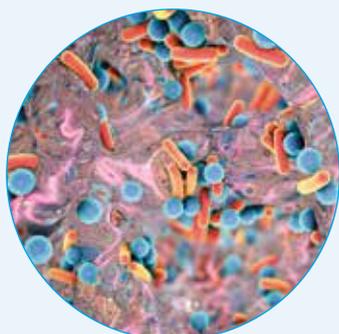
*Clostridium difficile* is a common hospital acquired infection (HAI), characterised by severe diarrhoea.

Is estimated to have caused almost 500,000 infections in the US in 2011. 29,000 of the patients who developed it died within 30 days of the initial diagnosis.<sup>9,10</sup>

trophon is effective against *Clostridium difficile* spores.

## Drug resistant bacteria

Drug resistant bacteria outbreaks in healthcare facilities are a real threat and antibiotics are ineffective against these strains. trophon inactivates these drug resistant bacteria.\*

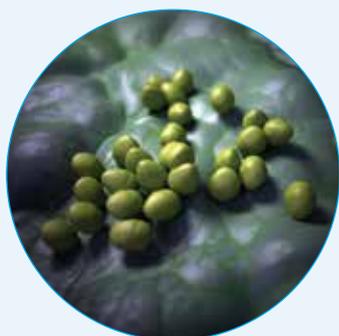


### MRSA

Methicillin-resistant *Staphylococcus aureus* is antibiotic resistant and a common cause of many HAIs.

Infection with MRSA can cause skin infections and can lead to more severe diseases including sepsis, pneumonia and bloodstream infections.

trophon is effective against MRSA on ultrasound probes.



### VRE

Vancomycin-resistant *Enterococci* (VRE) have resistance to one of the last resort antibiotics available.<sup>11</sup>

*Enterococci* reside in the gut and symptoms can be severe. Infection can occur from contaminated healthcare settings.

trophon is effective against VRE on ultrasound probes.



### CRE

Infection with Carbapenem-resistant *enterobacteriaceae* (CRE) can cause severe morbidity and death.

A wave of CRE outbreaks were associated with duodenoscopes in the USA and EU between 2013 and 2015 resulting in hundreds of patient deaths.<sup>12,13</sup>

trophon is effective against CRE on ultrasound probes.

# FDA mandatory requirements

The FDA has minimum requirements for HLD. trophon inactivates all of the mandated microorganisms.\*



## Mycobactericidal

Mycobacteria can cause serious diseases like tuberculosis. HLD should eliminate mycobacteria within the contact time.

Mycobacteria have a tough cell wall and are highly resistant to disinfectants.

trophon is effective against Mycobacteria on ultrasound probes.

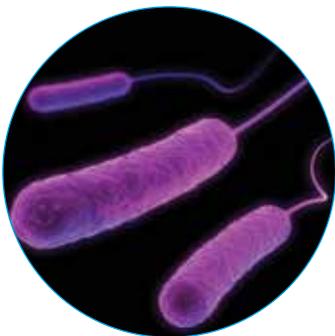


## Fungicidal

Fungi and yeast are opportunistic pathogens. High level disinfectants are required to be effective against fungi.

Fungi and yeast can be highly resistant to disinfection. They can take advantage of a change in a patient's health (e.g. immunocompromised status).

trophon is effective against fungi and yeast on ultrasound probes.



## Bactericidal

Vegetative bacteria (such as *E. Coli*) cause a wide variety of infectious diseases in healthcare and in the community.

All FDA cleared disinfectants should demonstrate activity towards vegetative bacteria.

trophon is effective against vegetative bacteria on ultrasound probes.



## Virucidal

Viruses (unlike bacteria) require a host for replication. High level disinfectants are required to inactivate enveloped & non-enveloped viruses.

Viruses can survive in the environment or on surfaces for periods of time. They can be transmitted via air, droplets, body fluids and contact with surfaces.

trophon is effective against viruses on ultrasound probes.

## Proven effective against a wide range of microorganisms, you can have confidence in trophon

Full range of organisms trophon has been tested against	
Vegetative bacteria	Fungi
<i>Staphylococcus aureus</i>	<i>Trichophyton mentagrophytes</i>
<i>Pseudomonas aeruginosa</i>	Viruses
<i>Salmonella choleraesuis</i>	Polio virus type 1
Methicillin-resistant <i>Staphylococcus aureus</i>	Herpes simplex virus type 1
Methicillin-resistant <i>Staphylococcus aureus</i> clinical isolate	Hepatitis A virus
Vancomycin-resistant <i>Enterococcus faecalis</i>	Adenovirus type 2
Vancomycin-resistant <i>Enterococcus faecalis</i> clinical isolate	Human hepatitis B virus surrogate (duck hepatitis B virus)
<i>Neisseria gonorrhoea</i>	Human hepatitis C virus surrogate (bovine diarrhoeal virus)
Mycobacteria	Human immunodeficiency virus type 1
<i>Mycobacterium terrae</i>	Human norovirus surrogate
Bacterial endospores	Human rotavirus
<i>Clostridium difficile</i>	Human papillomavirus (HPV)
<i>Clostridium sporogenes</i>	Chlamydia
<i>Bacillus subtilis</i>	<i>Chlamydia trachomatis</i> (serotype K)

## Surface probes

It's not only intracavity probes which can potentially become contaminated by any of these wide ranging infectious organisms.

Surface probes may come into contact with a patient's broken skin and bodily fluids, and can also become contaminated with blood and microorganisms.



### **Surface probes are frequently used in semi-critical procedures but often inadequately disinfected<sup>14,15</sup>**

Often there is no visible evidence of blood or microbe contamination on the probe after surface use, so a visual inspection is not a reliable way of concluding lack of contamination.

In addition, there may be a lack of awareness about the risk of infection potential if surface probes are contaminated with blood. This is due to the assumption that because the probe is in contact with skin only (and not intracavity), there is no blood contamination risk.

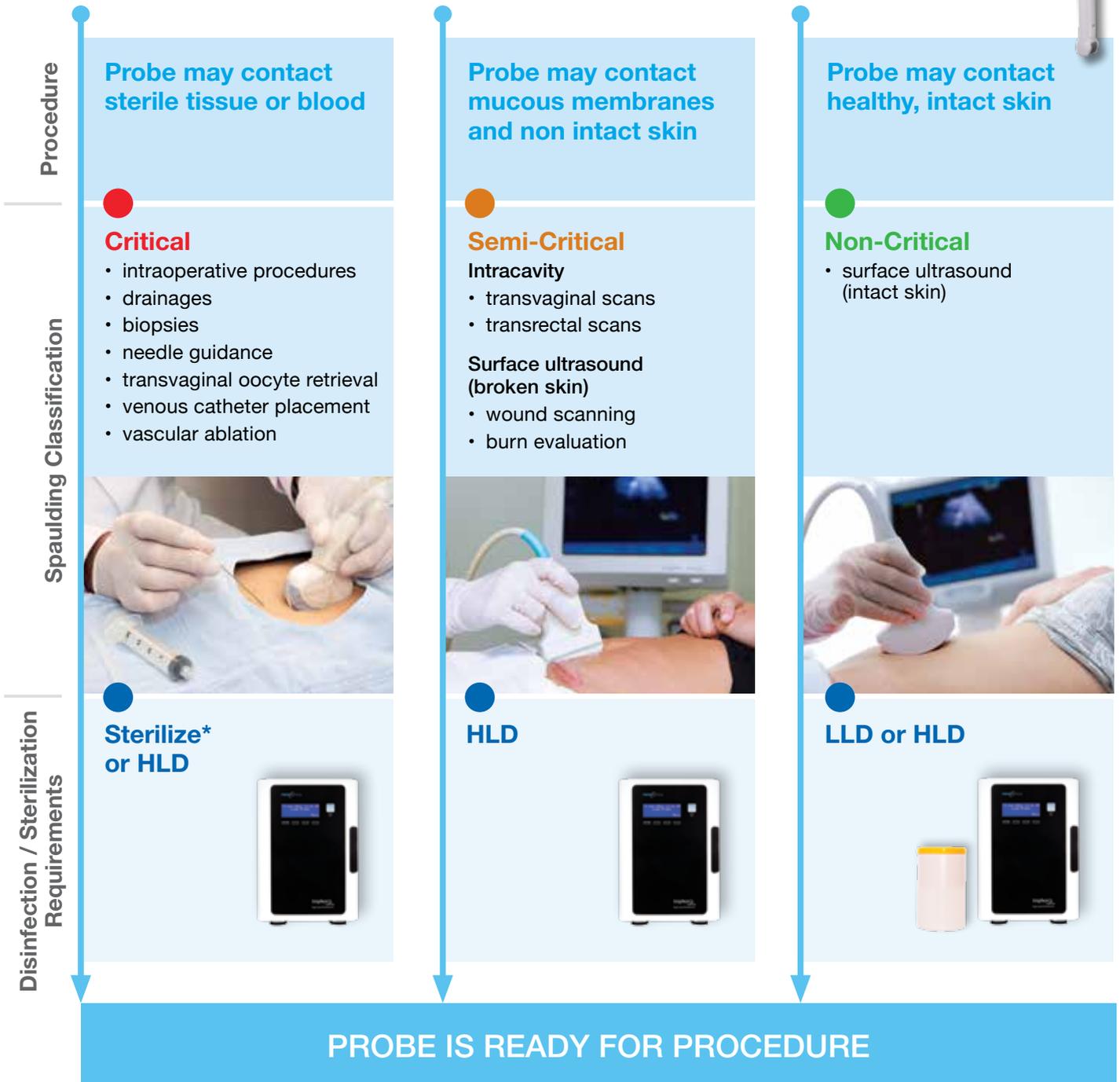
All of these factors can lead to the contamination of probes in clinical practice, resulting in cross infection between patients and even staff.

That's why it's essential to HLD every probe before it is used on the next patient.

# When to HLD with trophon®



## WHAT PROCEDURE WILL YOUR PROBE BE USED FOR?



\*Critical probes should be sterilized, or can also be high level disinfected and used with a sterile sheath. Note: The use of a sheath does not negate the need for HLD.<sup>16</sup>

**Making the choice simple**  
For outstanding ultrasound probe HLD compliance.

\*Nanosonics internal test data

**References:** **1.** Centers for Disease Control and Prevention (CDC). HIV in the United States: At A Glance. CDC Fact Sheet. Updated 30 November 2016. <https://www.cdc.gov/hiv/basics/statistics.html>. Accessed 17 Jan 2017. **2.** Centers for Disease Control and Prevention (CDC). Hepatitis C FAQs for Health Professionals. CDC Webpage. Updated 21 July 2016. <https://www.cdc.gov/hepatitis/hcv/hcvfaq.htm#section1>. Accessed 17 Jan 2017. **3.** Centers for Disease Control and Prevention. Genital HPV Infection – Fact Sheet [Internet]. 2015 [updated 2015 Feb 23; cited 2015 Mar 31]. Available from: <http://www.cdc.gov/STD/HPV/STDFact-HPV.htm>. **4.** Taylor S, Bunge E, Bakker M, Castellsagué X. The incidence, clearance and persistence of non-cervical human papillomavirus infections: a systematic review of the literature. *BMC Infectious Diseases*. 2016;16:293. **5.** Walboomers JM, Jacobs MV, Manos MM, Bosch FX, Kummer JA, Shah KV, et al. Human papillomavirus is a necessary cause of invasive cervical cancer worldwide. *The Journal of pathology*. 1999;189(1):12-9. **6.** Centers for Disease Control and Prevention (CDC). Chlamydia. CDC Webpage. Updated 18 October 2016. <https://www.cdc.gov/std/stats15/chlamydia.htm>. Accessed 17 Jan 2017. **7.** Centers for Disease Control and Prevention (CDC). Gonorrhea – CDC Fact Sheet (Detailed Version). Updated 28 October 2016. <https://www.cdc.gov/std/gonorrhea/stdfact-gonorrhea-detailed.htm>. Accessed 17 Jan 2017. **8.** Centers for Disease Control and Prevention (CDC). Invasive Candidiasis Statistics. CDC Webpage. Updated 12 December 2016. <https://www.cdc.gov/fungal/diseases/candidiasis/invasive/statistics.html>. Accessed 18 Jan 2017. **9.** Centers for Disease Control and Prevention (CDC). Clostridium difficile Infection. CDC Website. Updated 1 March 2016. [https://www.cdc.gov/hai/organisms/cdiff/cdiff\\_infect.html](https://www.cdc.gov/hai/organisms/cdiff/cdiff_infect.html). Accessed 18 Jan 2017. **10.** Centers for Disease Control and Prevention (CDC). Clinicians (Clostridium difficile). CDC Website. Updated 23 September 2016. [https://www.cdc.gov/HAI/organisms/cdiff/Cdiff\\_clinicians.html](https://www.cdc.gov/HAI/organisms/cdiff/Cdiff_clinicians.html). Accessed 18 Jan 2017. **11.** Reed D, Kemmerly SA. Infection Control and Prevention: A Review of Hospital-Acquired Infections and the Economic Implications. *The Ochsner Journal*. 2009;9(1):27-31. **12.** Rubin ZA, Murthy RK. Outbreaks associated with duodenoscopes: new challenges and controversies. *Curr Opin Infect Dis*. 2016;29(4):407-14. **13.** O’Horo JC, Farrell A, Sohail MR, Safdar N. Carbapenem-resistant Enterobacteriaceae and endoscopy: An evolving threat. *Am J Infect Control*. 2016; 44(9):1032-6. **14.** Keys, M., et al. Efforts to Attenuate the Spread of Infection (EASI):, a prospective, observational multicentre survey of ultrasound equipment in Australian emergency departments and intensive care units. *Critical Care and Resuscitation*. Volume 17 Number 1, March 2015. **15.** Hoyer R, Adhikari S, Amini R. Ultrasound transducer disinfection in emergency medicine practice. *Antimicrob Resist Infect Control*. 2016;5:12. **16.** CDC Health Alert Network September 11, 2015. Available from: <http://emergency.cdc.gov/han/han00382.asp>. **17.** Ryndock E, Robison R, Meyers C. Susceptibility of HPV16 and 18 to high level disinfectants indicated for semi-critical ultrasound probes. *J Med Virol*. 2016;88(6):1076-80. NAN0027.

## Contact us

Nanosonics is a global innovator in infection prevention. Our unique, automated trophon® high level disinfection device is paving the way around the world in setting a new standard of care in ultrasound probe disinfection practices. trophon effectively addresses a range of issues associated with traditional methods and offers a breakthrough solution across three core areas: Safety, Versatility, and Simplicity. Nanosonics is headquartered in Sydney, Australia with a highly experienced team of professionals dedicated to providing the best in infection prevention technology.

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Nanosonics prioritises having the broadest possible microbial efficacy program



Have you trophoned today?

Join over 3,000 health care facilities who do (including 49 of the top 50 hospitals in the U.S.)

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