

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.

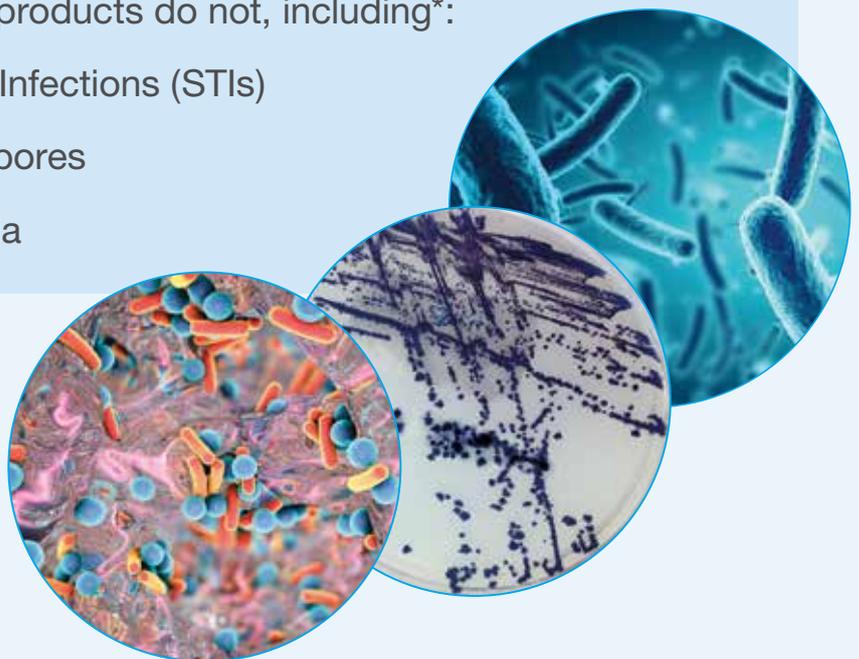
This absolute dedication to going further really sets us apart and ensures we exceed standards in HLD.

trophon is a pioneer globally in microbial efficacy, the first HLD system in the world proven to kill native, infectious, high-risk HPV.¹

trophon inactivates the mandated subset of microorganisms, as required by Australian 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.*

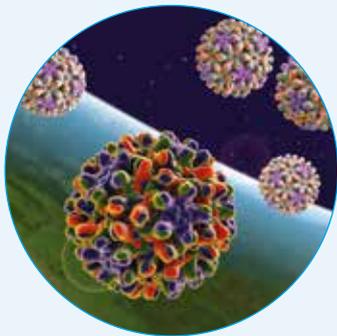


HIV

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

Around 25,313 people were living with HIV in Australia at the end of 2015, of which 10% were unaware of their HIV-positive status.²

trophon has been shown to inactivate HIV in laboratory tests



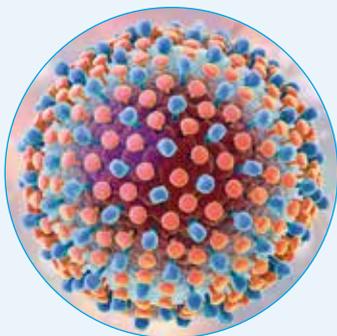
Hepatitis B

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.

In 2015, an estimated 232,600 people had chronic Hepatitis B infection in Australia, of whom only 62% were diagnosed.²

trophon is effective against Hepatitis B on ultrasound probes.

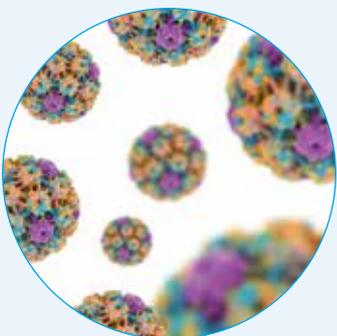


Hepatitis C

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

An estimated 227,306 people are living with chronic Hepatitis C infection in Australia with approximately 10,790 new cases diagnosed in 2015.²

trophon is effective against Hepatitis C on ultrasound probes.



HPV

HPV 16/18 infection which is the main cause for cervical cancers is present in an estimated 8.5% of Australian women.³

HPV causes 99.7% of cervical cancer cases, 88% of anal cancers, 70% of vaginal cancer cases and 50% of penile cancers.^{4,5}

trophon is effective against HPV on ultrasound probes.

Sexually Transmitted Infections (STIs)

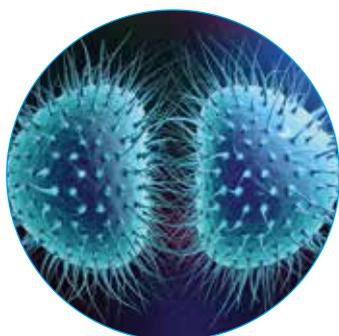


Chlamydia

Chlamydia trachomatis is the second most common notifiable disease in Australia and can result in infertility & ectopic pregnancy.²

At the end of 2015, a total of 66,033 new chlamydia cases were identified in Australia, a majority of which (77%) occurred in young people aged 15-29 years old.²

trophon is effective against chlamydia on ultrasound probes.

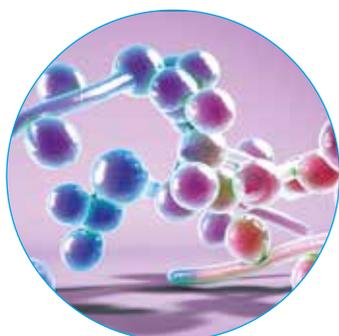


Gonorrhoea

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

In 2015, about 18,588 new cases of gonorrhoea were notified in Australia. A trend towards increase in gonorrhoea rates has been observed in both males and females since 2006 through to 2015.²

trophon is effective against gonorrhoea on ultrasound probes.



Candida

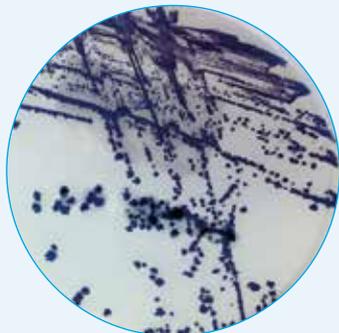
Candida albicans can cause fungal infection in mucous membranes such as the throat and vagina.

Yearly incidence of candidemia in Australia was 1.81 cases per 100,000 population according to a population based surveillance study between 2001 and 2004.⁶

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

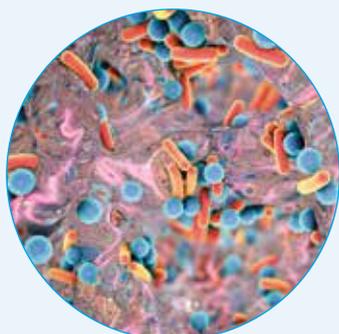
Clostridium difficile is a common hospital acquired infection (HAI), characterised by severe diarrhoea.

According to prospective national surveillance of public hospital-diagnosed CDI in Australia (hospital identified CDI increased significantly from 3.25 for every 10,000 patient days in 2011 to 4.03 for every 10,000 patient days in 2012).^{7,8}

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.*

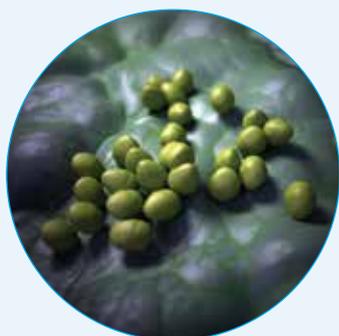


MRSA

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.⁹

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.

Enterobacteriaceae resistance to cephalosporins is on a rise in Australia and in 2015, an increase in detection and spread of type of CRE called *Klebsiella pneumoniae* carbapenemase-producing bacteria (KPC) was reported in some Australian hospitals.^{10,11}

trophon is effective against CRE on ultrasound probes.

TGA mandatory testing requirements

The TGA 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.

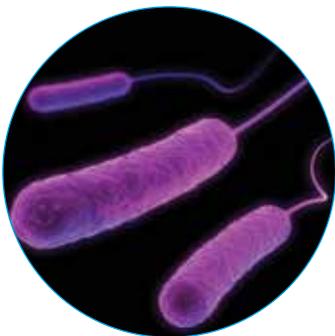


Fungicidal

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 TGA registered 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
Carbapenam-resistant <i>Escherichia coli</i>	<i>Candida albicans</i>
<i>Staphylococcus aureus</i>	<i>Aspergillus niger</i>
<i>Pseudomonas aeruginosa</i>	Viruses
<i>Enterococcus hirae</i>	Polio virus
Methicillin-resistant <i>Staphylococcus aureus</i>	Adenovirus
Vancomycin-resistant enterococcus	Human hepatitis B virus surrogate (duck hepatitis B virus)
<i>Neisseria gonorrhoea</i>	Human immunodeficiency virus type 1
Mycobacteria	Hepatitis C virus surrogate (Bovine viral diarrhoea virus)
<i>Mycobacterium terrae</i>	Human papillomavirus (HPV16 and HPV18)
Bacterial endospores	Chlamydia
<i>Geobacillus stearothermophilus</i>	<i>Chlamydia trachomatis</i> (ATCC strain)
<i>Bacillus subtilis</i>	
<i>Bacillus cereus</i>	
<i>Clostridium difficile</i>	

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^{14,15}

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.

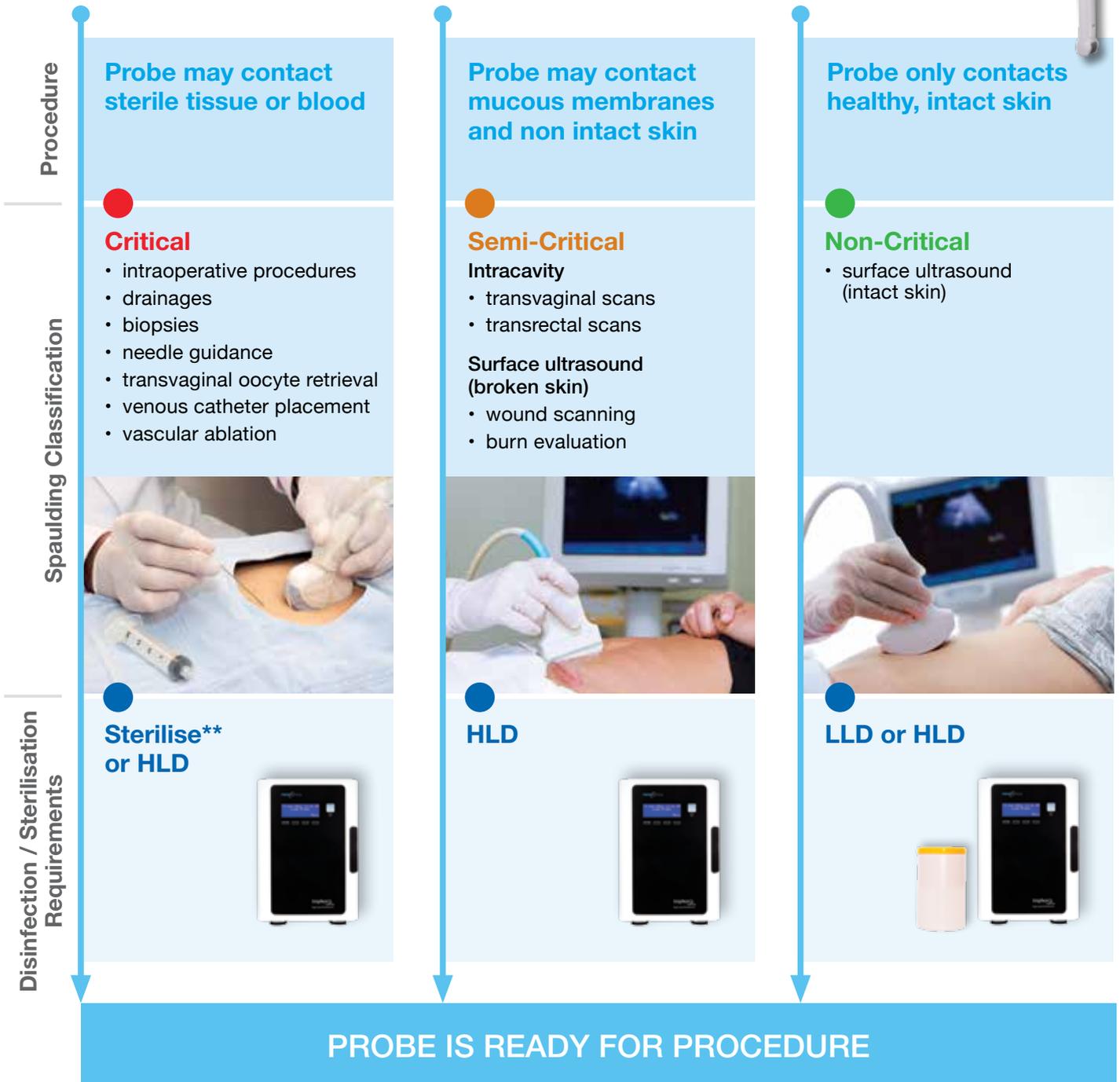
All of these factors can lead to the contamination of probes in clinical practice, resulting in cross infection between patients and even staff.

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 sterilised, 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.¹⁴

Making the choice simple
For outstanding ultrasound probe HLD compliance.

References: 1. 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. 2. The Kirby Institute. HIV, viral hepatitis and sexually transmissible infections in Australia Annual Surveillance Report 2016. The Kirby Institute, UNSW Australia. 2016. Available from: http://kirby.unsw.edu.au/sites/default/files/hiv/resources/SERP_2016-Annual-Surveillance-Report_UPD170116.pdf. Accessed 19 April 2017. 3. ICO Information Centre on HPV and Cancer. Australia, Human Papillomavirus and Related Cancers, Fact Sheet. 2016. Available from: http://www.hpvcentre.net/statistics/reports/AUS_FS.pdf. Accessed 19 April 2017. 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. Yapar N. Epidemiology and risk factors for invasive candidiasis. *Ther Clin Risk Manag.* 2014; 10: 95-105. 7. Difficile Infection (CDI). Updated on 9 Feb 2016. Available from: [http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-phlncd-clostridium-difficile-infection-\(CDI\).htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-phlncd-clostridium-difficile-infection-(CDI).htm). Accessed 19 April 2017. 8. Tracey L, Lirke A, Armstrong P and Riley TV. From the hospital to the home – the rise and rise of Clostridium difficile infection. *Australian Family Physician – Abdomen.* 2015; 44(10):712-717. <http://www.racgp.org.au/afp/2015/october/from-the-hospital-to-the-home-%E2%80%93-the-rise-and-rise-of-clostridium-difficile-infection/> 9. 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. 10. Facing the challenge of multi drug resistant gram-negative bacilli in Australia. *Medical Journal of Australia – clinical Focus.* 2015; 202(5): 243-. Available from: https://www.mja.com.au/system/files/issues/202_05/har01257.pdf 11. Healthcare Associated Infections Program. Prevention And Management Of Carbapenem resistant Enterbacteriaceae In NSW Hospitals – Information For Clinicians. Clinical Excellence Commission 2015. Available from: http://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0009/258642/CRE-Fact-Sheet-2015-21-Sep-2015.pdf. Accessed on 19 April 2017. 12. 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. 13. Hoyer R, Adhikari S, Amini R. Ultrasound transducer disinfection in emergency medicine practice. *Antimicrob Resist Infect Control.* 2016;5:12. 14. ACIPC-ASUM. Guidelines for Reprocessing Ultrasound Transducers. *Australasian Journal of Ultrasound in Medicine.* 2017;20(1):30-40. NAN0020.

*Nanosonics internal test data

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 the thousands of global health care facilities around the world who do.

