

KleaniK™

PROVIDING INFECTION CONTROL SOLUTIONS



SINK DISINFECTION SYSTEM

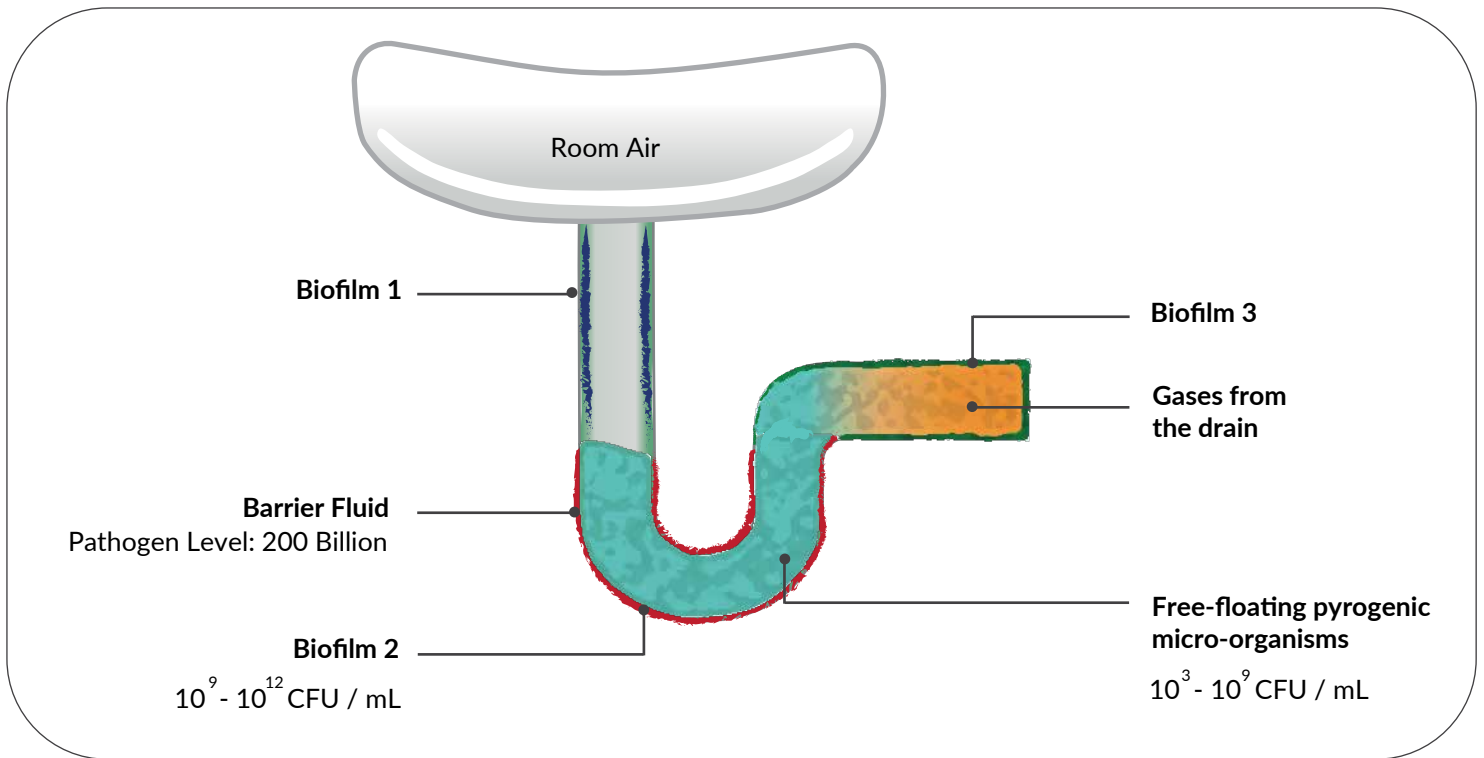
NECAT SIMINIBUS ORTUS



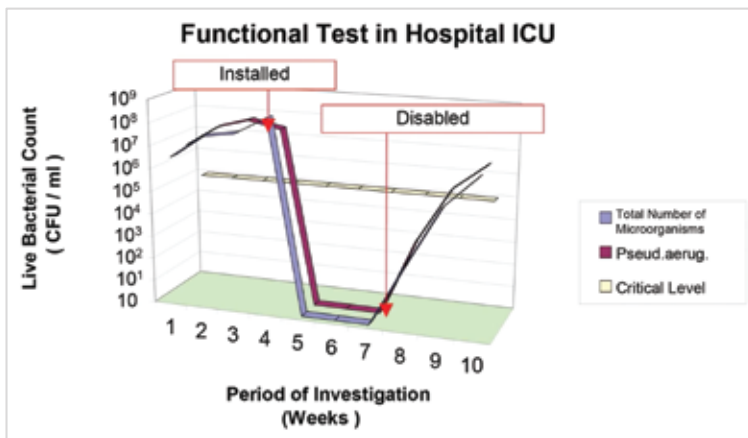
SINK DRAINS - A MAJOR SOURCE OF HOSPITAL ACQUIRED INFECTIONS

$10^6 - 10^{10}$ cfu/mL of bacteria in average hospital sink drain
 $10^3 - 10^5$ cfu/mL gram negative rods

BIOFILM BUILD-UP → AEROSOLS → TRANSMISSION OF BACTERIA → SPREAD OF INFECTION



KleaniX™ A CONVENIENT PREVENTATIVE SOLUTION



- ✔ Continuous Disinfection of Sink Drain
- ✔ Thermo and Vibration
- ✔ Fully Automatic and Self Regulating
- ✔ Proven Technology
- ✔ Enhanced Patient Safety, Reduced Hospital Cost

HOW DOES KLEANIK WORK?

KLEANIK is a fully automatic system, which continuously cleans and disinfects the p-trap under the sink during normal operation by integrating 3 of action:

- ✔ Thermo-disinfection inactivation of microorganisms
- ✔ Vibration cleaning dissolution of biofilm
- ✔ Anti-bacterial inner coating inhibition of biofilm formation and adherence to the inner pipe wall

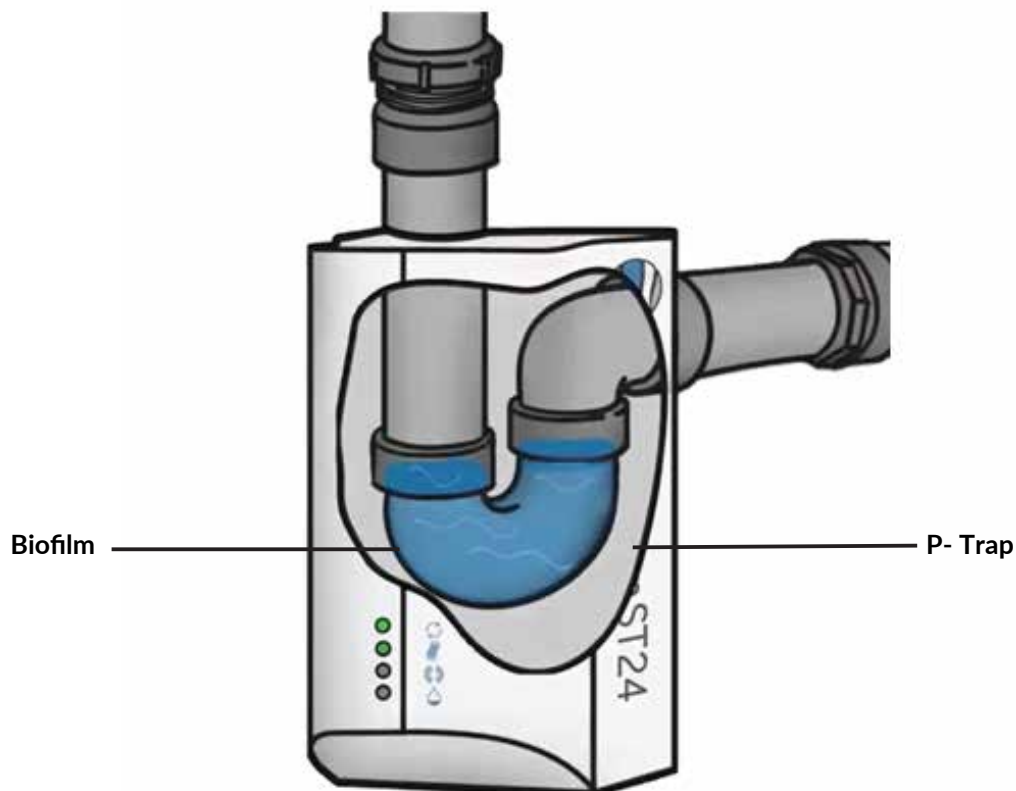
ESCAPE OF PATHOGENS FROM THE DRAIN IS VIRTUALLY OR ALMOST COMPLETELY PREVENTED:



No biofilm formation is detectable in the p-trap interior even after several years of continuous operation.



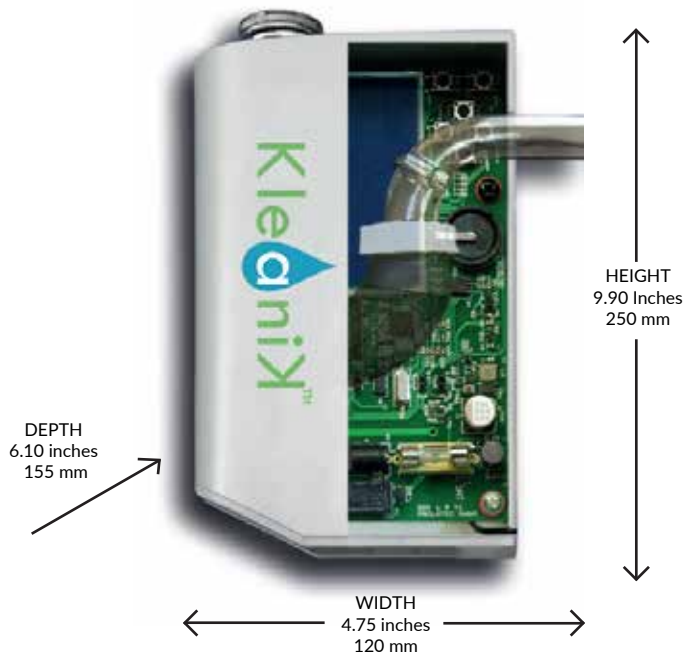
No obstruction was observed during a multi-year clinical trial in any of the devices due to the vibration cleaner.



THE KLEANIK SOLUTION

The KLEANIK™ technology virtually eliminates the risk of bacterial contamination from sink drains by:

- ✓ Preventing biofilm formation through electromechanical vibrations
- ✓ Continuously killing bacteria in sink drains through heat application
- ✓ Preventing the spread of aerosol borne infections



ADVANTAGES:

- ✓ Fully automatic and self-regulating
- ✓ Clinically-proven to reduce bacteria in p-trap water by 99.99%
- ✓ Can be retrofitted at a minimal cost
- ✓ No consumables
- ✓ Easy to Install

P-trap only	Standard p-trap	P-trap with Kleanik
<ul style="list-style-type: none"> ● Bacterial content sink drain ● Biofilm formation ● Emission into environment following water inflow ● Patient colonisation rates 	<ul style="list-style-type: none"> ● 105-1010 CFU/mL bacteria, of which 103-106 CFU/mL gram negative rods ● Starts after a few days ● Up to 439 CFU/1,000 l'air ● 20 – 40 % 	<ul style="list-style-type: none"> ● 0 - 500 (max 103) CFU/mL ● Is prevented completely and permanently ● No detectable emissions ● 5 – 10 % 4,5

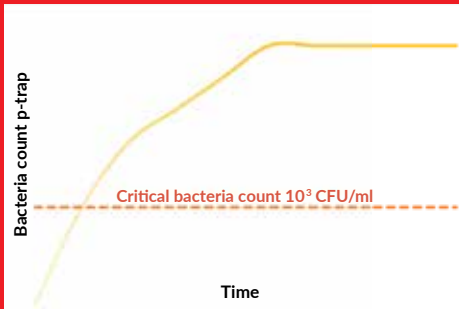
BACTERIAL CONTAMINATION AND PROLIFERATION IN SEAL WATER OF SINK PROCESSES

Without disinfection	Chemical disinfection / biocide treatment	Disinfecting / cleaning with Kleanik
<p>Effect Continuous increase in the live bacteria content (CFU/mL) in the sealing liquid of the odour trap</p> <ul style="list-style-type: none"> ● Introduction of bacteria, e.g. during the washing and rinsing processes Retrograde germination of the sealing liquid from the drain line ● Odour trap offers the ideal requirements for fast germination of the micro-organisms. Very fast biofilm generation with extremely high bacterial concentrations 	<p>Effect Discontinuous bacteria reduction in the sealing liquid of the odour trap (usually 5 log-steps)</p> <ul style="list-style-type: none"> ● Recontamination of the sealing liquid as a result of the biofilm not having been removed or fully removed Long-term biofilm formation is typically not prevented. The development of tolerance and resistance against disinfectant is possible in long-term applications 	<p>Effect Continuous, maximum bacteria reduction in the entire odour trap at temperatures of ~85 °C / 185 °F (7 log-steps in 30 minutes)²</p> <ul style="list-style-type: none"> ● Immediate and full effect after the first disinfection cycle ● Long-term biofilm generation is fully prevented (assisted by the vibration cleaning) ● The development of resistance against sonothermal disinfection is not possible
<p>If a contaminated odour trap is replaced with a factory-new standard p-trap, what one can observe after only a few days is again a biofilm generation and a live bacteria count in the sealing liquid that is equivalent to that of the replaced p-trap¹</p>	<p>After each biocide treatment, recontamination occurs after just a few hours as a result of:</p> <ul style="list-style-type: none"> ● Proper introduction of bacteria into the odour trap due to washing and rinsing ● Release of pathogens from the biofilm, in part with an increased tolerance against disinfectant “Revival” of bacteria from the VBNC state* <p>The chemical disinfectant only reduces the bacteria count in the p-trap temporarily and must therefore be repeated on a regular basis</p>	<p>No new or re-germination</p> <p>All vegetative bacteria that accumulate in the odour trap are killed by heat within 30 minutes</p> <ul style="list-style-type: none"> ● No tolerance development ● No additional personnel and time

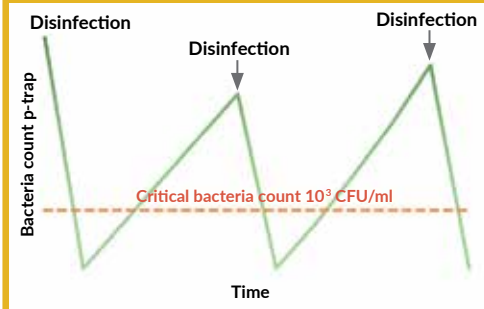
*VBNC = viable but not culturable, state of reduced metabolic activity as response to stress (e.g. malnutrition, disinfection, low temperature), under more favourable environmental conditions, bacteria may return to full viability and infectivity.

BACTERIA IN THE P-TRAP AND FORMATION OF INFECTIOUS BIO-AEROSOLS

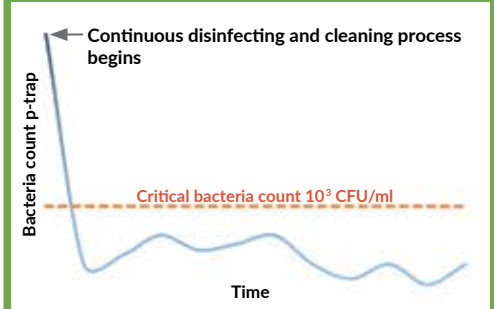
The bacteria count development in the standard p-trap without disinfection is equivalent to a growth curve



The bacteria count development in the standard p-trap with chemical disinfection/biocid treatment is equivalent to a sawtooth wave



The bacteria count development with Kleanik sonothermal disinfection system is equivalent to a steep reduction curve with persistent curve progression from 0 to max 10^3 CFU/mL



After a few days (no more than 2-3 weeks), the bacteria count in the sealing liquid of the new, untreated odour trap has exceeded the critical volume (10^3 CFU/mL). Despite proper use of the washing station, infectious bioaerosols developed

- The washing station is potentially infectious and despite disinfecting the surface daily, it is hygienically unsafe

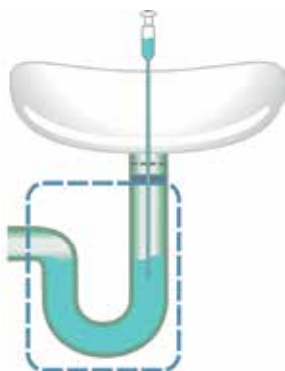
The critical bacteria count for the bioaerosol generation (10^3 CFU/mL) is again exceeded after a short period of time, and the bacteria count may even be higher than the original bacteria count of the previous disinfection, if disinfectant-tolerant bacteria are selected

- There is only a temporary safety with regard to preventing infectious bioaerosols immediately after chemically disinfecting the washing station when it is used properly

As a result of the continuous disinfecting and cleaning process, the critical bacteria count for the bioaerosol generation permanently drops below 10^3 CFU/mL. Thus, the aerosols formed at the washing station are not infectious

- If surface disinfection is correctly performed daily, the washing station is hygienically safe

ONLY CORRECT P-TRAP TESTING LEADS TO CONCLUSIVE RESULTS

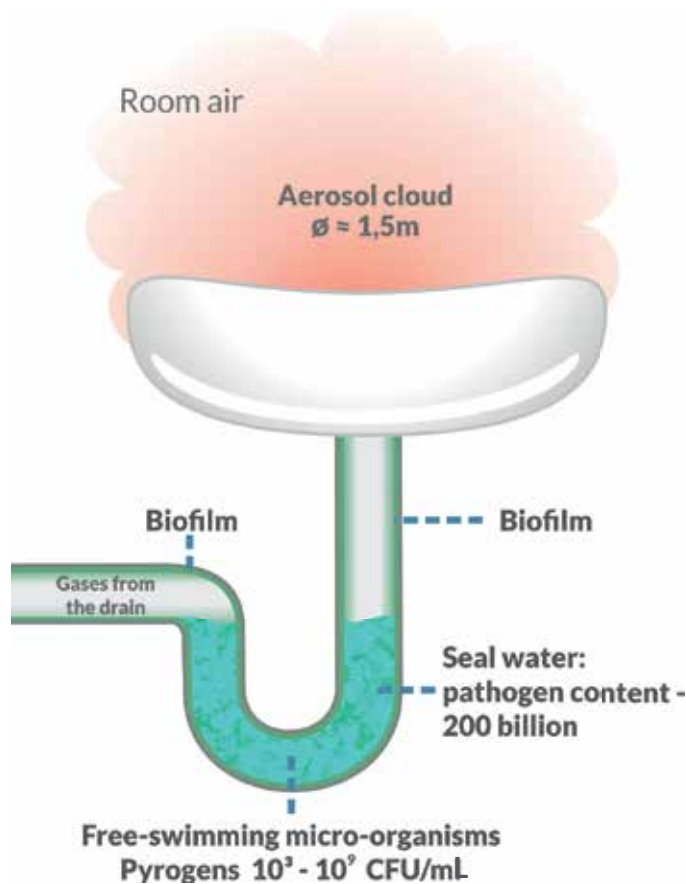


Take samples from the sealing fluid, because:

- Bacteria that temporarily adhere to the interior walls of the drain valve are irrelevant for the emission from the odour trap and the epidemiological success of the disinfecting measure.
- There is no direct dependency between the number of emitted microorganisms and the live bacteria count of the sealing liquid.¹

Take samples using a sterile disposable pipette that is dipped into the sealing liquid directly without touching the sink and drain.

Take controlled samples - do not test immediately after washing hands or eliminating waste to allow the disinfection to work.



THE PROBLEM ZONE

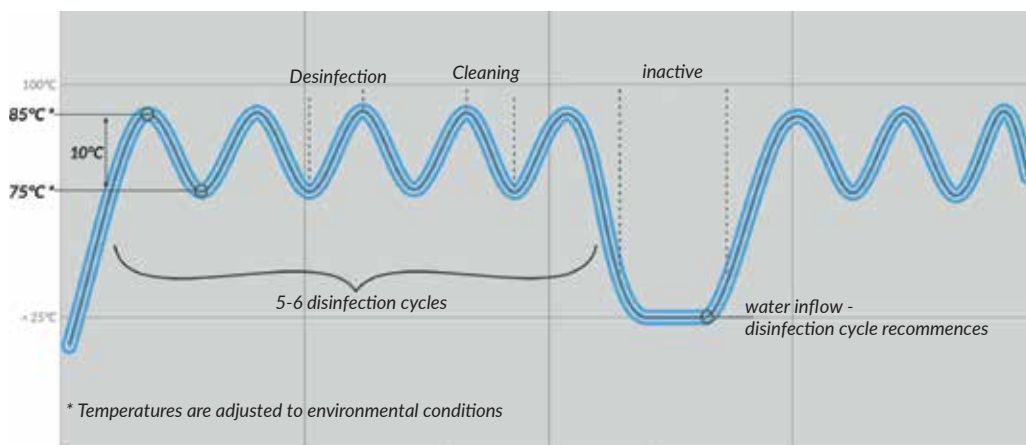
Sink drains in clinics and hospitals are open pathogen reservoirs and sources for emitting bacteria.^{1,2,3} They contain on average $10^5 - 10^{10}$ CFU/mL of bacteria, including $10^3 - 10^6$ CFU/mL of gram-negative rods.⁴

Water flowing into the sink drain produces aerosols on the surface of the seal water which can emit the bacteria up to a distance of 1.5 meters around the p-trap.⁵

In case of bacterial contamination of the seal water of $> 10^5$ CFU/mL, so many micro-organisms are carried into the air in the room that a measureable transmission of bacteria from the seal water to the hands of patients or staff takes place.^{2,6}

Numerous clinical investigations prove: **conventional sink drains do not fulfill the high hygiene standards needed in invasive intensive care.**

THE KLEANIK OPERATING FUNCTION



The thermo disinfection carried out by Kleanik fulfills the standards of the technical process of pasteurization by means of heating (10 to 15 seconds at 85°C). In the process, the unit heats up to the set temperature (85°C) and slowly cools down while the subsequent vibration cleaning takes place. Once the minimum

set temperature has been reached (75°C), the heating process and thus the disinfection cleaning cycle recommences once again. If no interruption is caused by additional water inflow, then the entire process is completed after 5-6 cycles in a period of approximately one hour and Kleanik switches into standby mode until water flows in again.

BENEFITS OF IMPLEMENTING THE KLEANIK SINK DESINFECTATION SYSTEM:



The continuous disinfection of the p-trap is carried out without using chemicals; such as virox or bleach.



Kleanik disinfects the seal water in sink drains continuously and automatically by means of thermal disinfection .



The electromechanical cleaning of the inside walls of the p-trap prevents the formation of biofilm and eliminates the layers of previously formed biofilm



Kleanik achieves a 7-log stage reduction in bacteria. The bacteria in the p-trap water is reduced by 99.99999%.¹



Kleanik effectively reduces bacteria after the first disinfection cycle.¹



Patient colonisation and the incidence of nosocomial infections by waterborne bacteria are reduced by 50-70%.²



By utilizing Kleanik, the need for antibiotics are reduced approximately 30%, and the number of days of isolation is reduced by approximately 35%.³ As well as the reduction / elimination of extended hospital stays.



HOW CAN WE HELP YOU ?

Imperial Surgical Ltd.
850 Halpern Ave.
Dorval, QC H9P 1G6

Toll free: +800-661-5432
Telephone: +1-514-631-7988
E-Mail: info@surgmed.com
WEBSITE: WWW.KLEANIK.COM