BIODESCONTAMINACIÓN

STERIS BIODECON VHP®

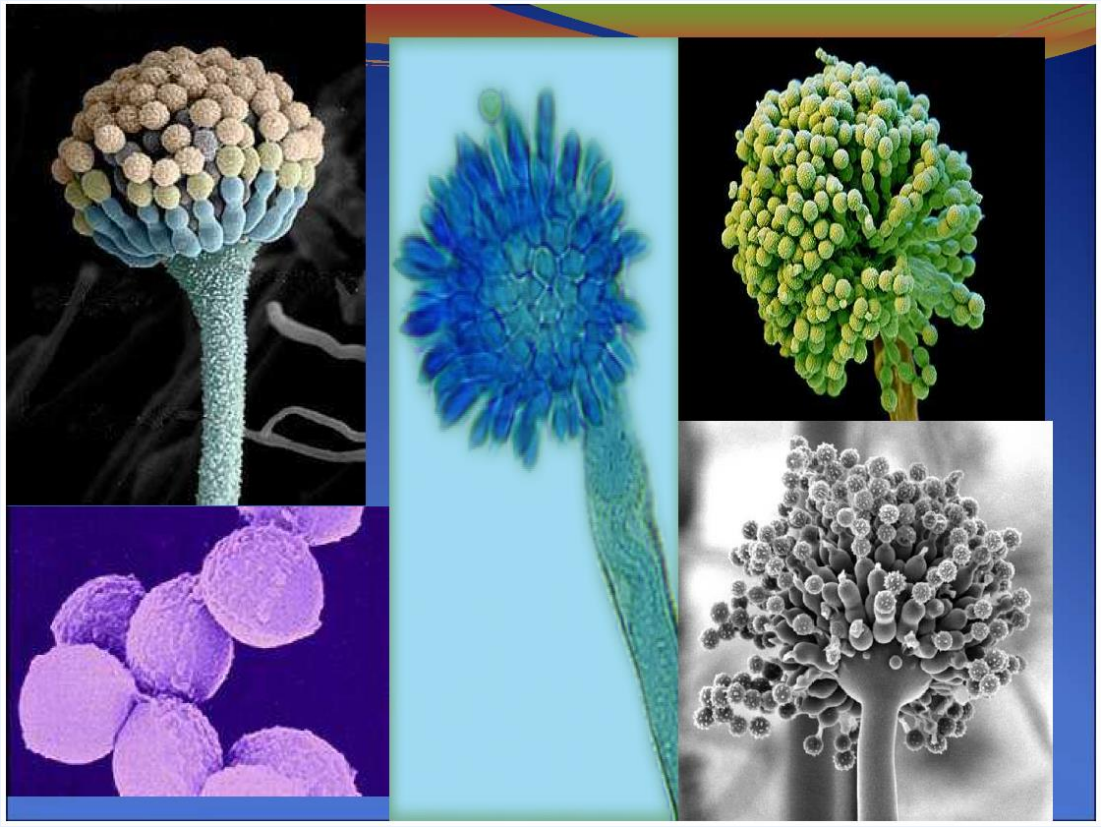
Vapor de Peróxido de Hidrógeno

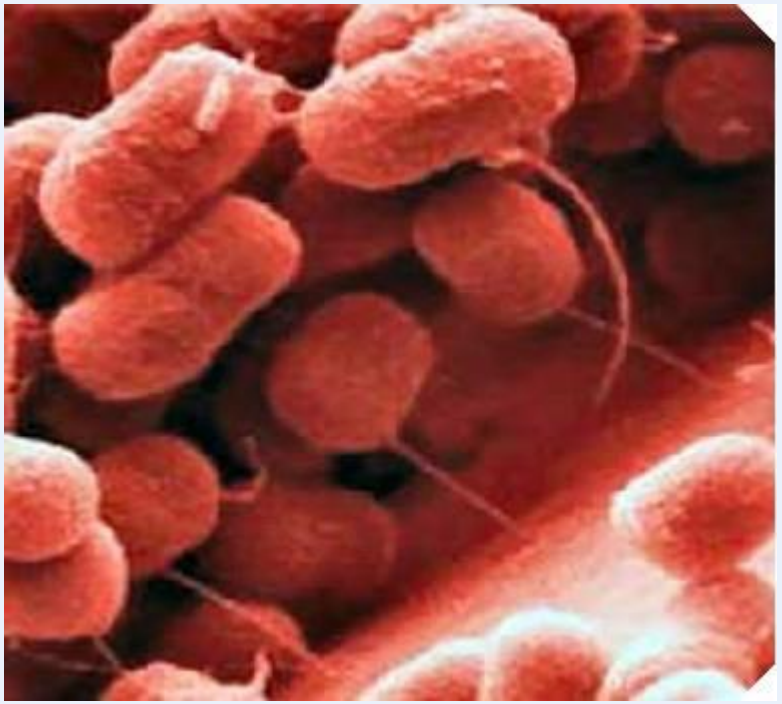
Julian Pons

Steris Iberia S.A.U.

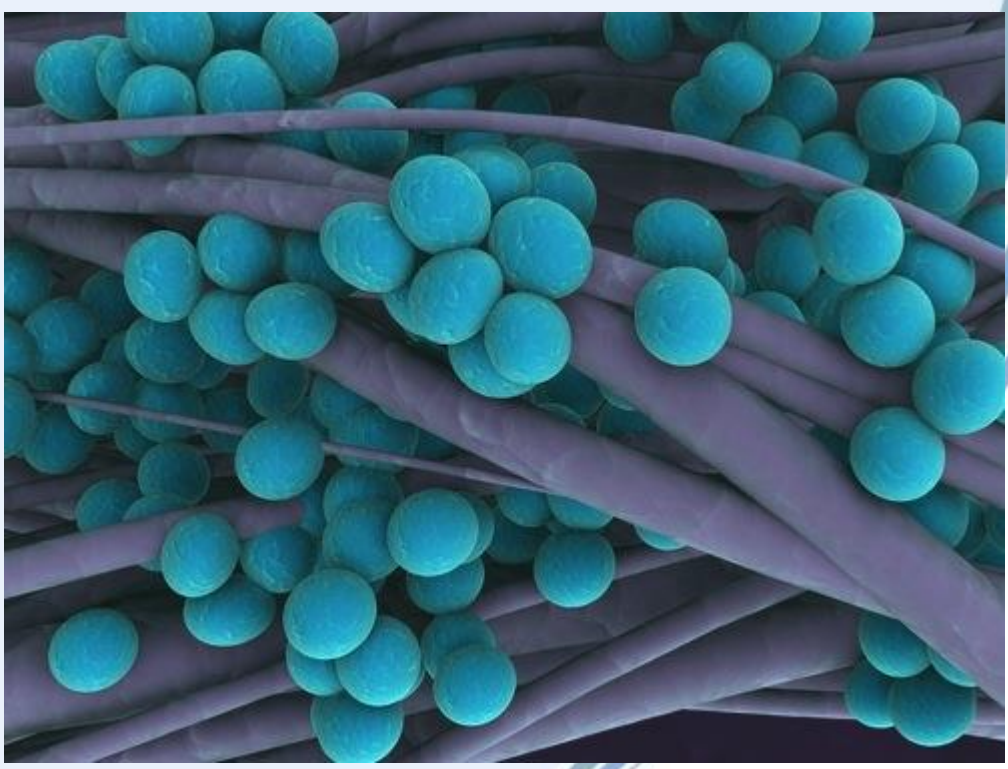
Associação Portuguesa de Hotelaria Hospitalar

STERIS®






SPL



Importancia de la Desinfección Ambiental

Paciente Colonizado

Paciente Susceptible

VHP® BIODECON
STERIS

EVIDENCIA CIENTÍFICA DEL PAPEL DEL MEDIO-AMBIENTE EN LA TRANSMISIÓN

THE JOURNAL OF HOSPITAL INFECTION
The Official Journal of the Healthcare Infection Society

Intensive care unit environmental surfaces are contaminated by multidrug-resistant bacteria in biofilms: combined results of conventional culture, pyrosequencing, scanning electron microscopy, and confocal laser microscopy

H. Hu, K. Johani, I.B. Gosbell, A.S.W. Jacombs, A. Almatroudi, G.S. Whiteley, A.K. Deva, S. Jensen, K. Vickery

Received: March 17, 2015; Accepted: May 26, 2015; Published Online: June 25, 2015

Risk of organism acquisition from prior room occupants: a systematic review and meta-analysis

B.G. Mitchell, S.J. Dancer, M. Anderson, E. Dehn

Received: June 8, 2015; Accepted: August 4, 2015; Published Online: August 21, 2015
Publication stage: In Press Accepted Manuscript

LIMPIEZA Y DESINFECCIÓN CONVENCIONAL

PROBLEMAS CON LOS PRODUCTOS

PROBLEMAS CON LOS PROCEDIMIENTOS

Box 1
Summary of problems associated with conventional cleaning and disinfection

Problems associated with the cleaning/disinfection products include:

- Infectiveness of some agents against some pathogens; for example, many frequently used hospital disinfectants are not effective against *C. difficile* spores and norovirus.[44,85,134]
- Toxicity to staff or the environment.[44,46]
- Damage to hospital materials and equipment.[44]
- Susceptibility to interference with organic matter on surfaces.[85]
- Potential for biocide/antibiotic cross-resistance.[82]

Problems with cleaning/disinfection procedures include:

- Adequate distribution of the active agent, given the challenges of the complex hospital environment.[35]
- Ensuring correct contact time for the microbial reduction achieved *in vitro*.[134]
- Repeatability of the process depends on the operator.[35]
- Designation of responsibility for various items, particularly complex portable medical equipment.[135]
- Compliance with protocols/policies from an (often) poorly paid, poorly motivated workforce.[136]
- Inadequate training and education of personnel.[136]
- Inadequate time given to do the job properly.[136]
- Insufficient (or non-existent) cleaning prior to disinfection.[85]
- Incorrect formulation of the disinfectant.[82,137]
- Contamination of cleaning solutions/materials.[137,138]
- The effectiveness of conventional cleaning and disinfection is difficult to monitor.[11]

From J.A. Otter et al. Journal of Hospital Infection 83 (2013) 1-13

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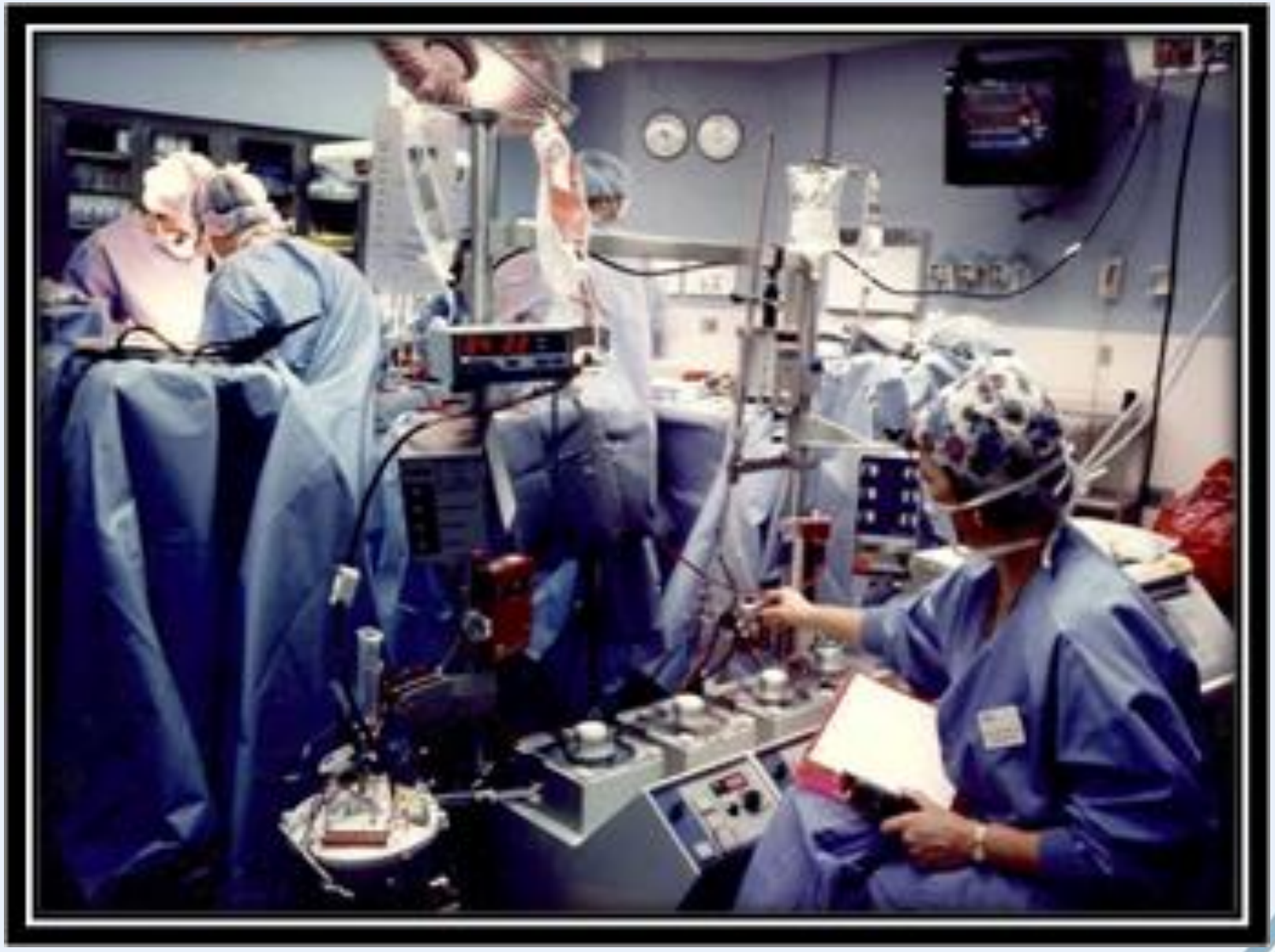
CUESTIONES Y PREOCUPACIONES SOBRE LA LIMPIEZA HOSPITALARIA



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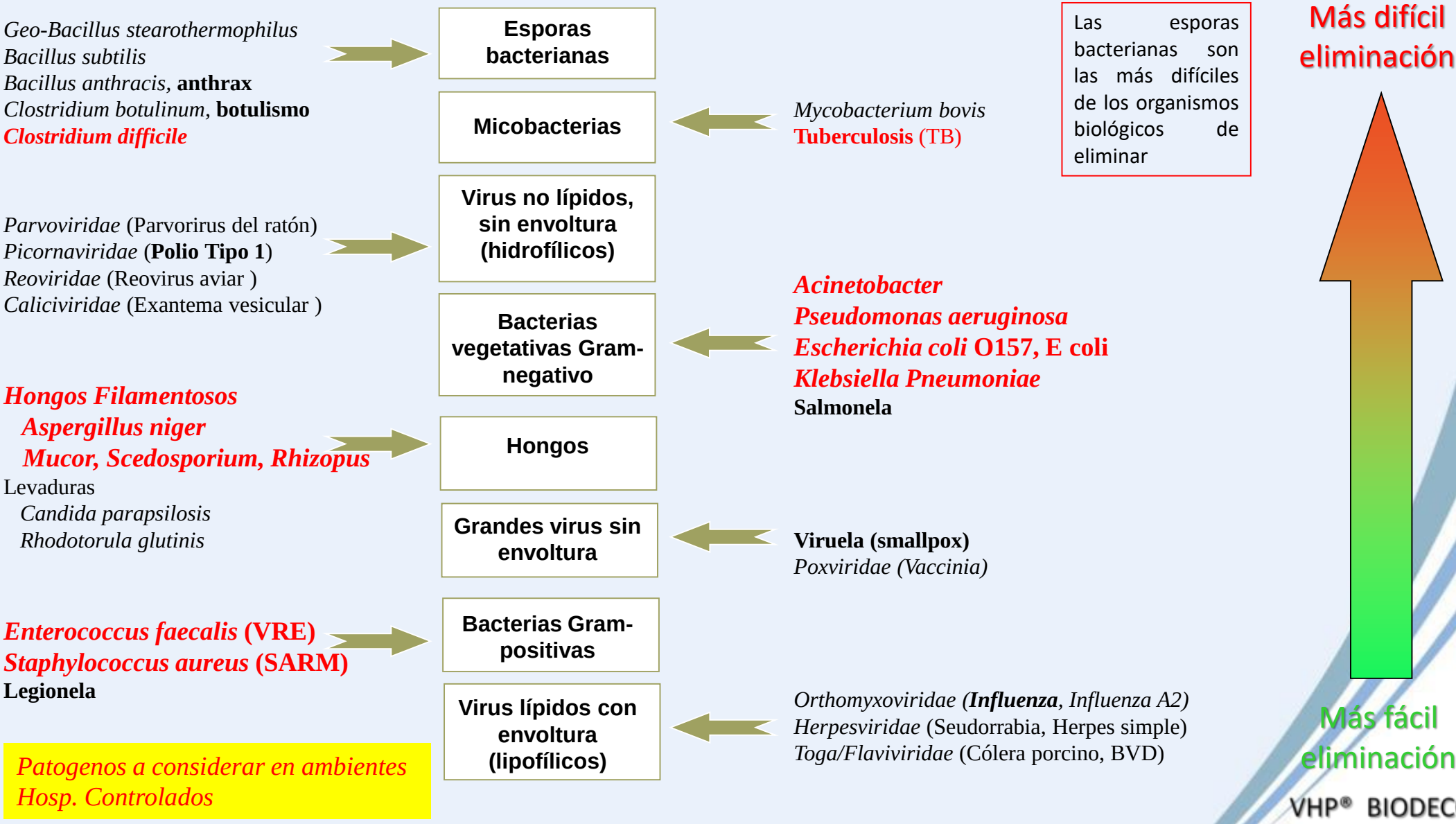
RESISTENCIA RELATIVA DE LOS MICROORGANISMOS A PROCESOS DE BIODESCONTAMINACIÓN



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PERSISTENCIA DE LOS MICROORGANISMOS
(CLÍNICAMENTE RELEVANTES) EN SUPERFICIES SECAS INORGÁNICAS

TIPO	DURACIÓN DE PERSISTENCIA (RANGO)
Bacterias:	
Acinetobacter	3 días - 5 meses
Clostridium difficile (esporas)	5 meses
Mycobacterium tuberculosis	1 día - 4 meses
Staphylococcus Aureus (incl SARM)	7 días - 7 meses
Enterococcus Incl VRE	5 días - 4 meses
Virus:	
Coronavirus	3 horas
Virus asociados al SARS	72 - 96 horas
Norovirus y FCV	8 horas a 7 días

Referencia: ***BMC Infectious diseases journal 2006 6:130*** www.biomedcentral.com

¿QUÉ PRODUCTOS Y TECNOLOGÍAS DEBERÍAN SER USADAS CONTRA LOS DIFERENTES TIPOS DE PATÓGENOS?

VHP® BIODECON
STERIS

VHP® Vapor de Peróxido de Hidrógeno

BIODESCONTAMINACIÓN

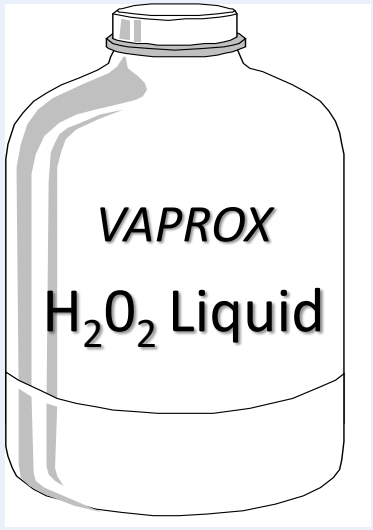
TECNOLOGÍA VHP®

Associação Portuguesa de Hotelaria Hospitalar

STERIS®

VHP® (PERÓXIDO DE HIDRÓGENO VAPORIZADO)

Proceso de baja temperatura



35%

Vaporización

VHP

H_2O_2

H_2O + O_2

Residuos no tóxicos

Esporicida en Bajas Concentraciones

(Valor típico 0.5-2 mg/l a 25ºC)

Dos ciclos validados para reducción 6log Geob. Stearoth.

250 ppm - 90 min

400 ppm - 30 min

INOCUO PARA EL MEDIO AMBIENTE, CON UNA EXCELENTE SEGURIDAD,

VAPOR SECO, INODORO, INCOLORO, NO CORROSIVO,

SEGURO ELÉCTRICAMENTE, COMPLETAMENTE VALIDABLE

VHP® BIODECON

STERIS

VHP® - VAPORIZACIÓN

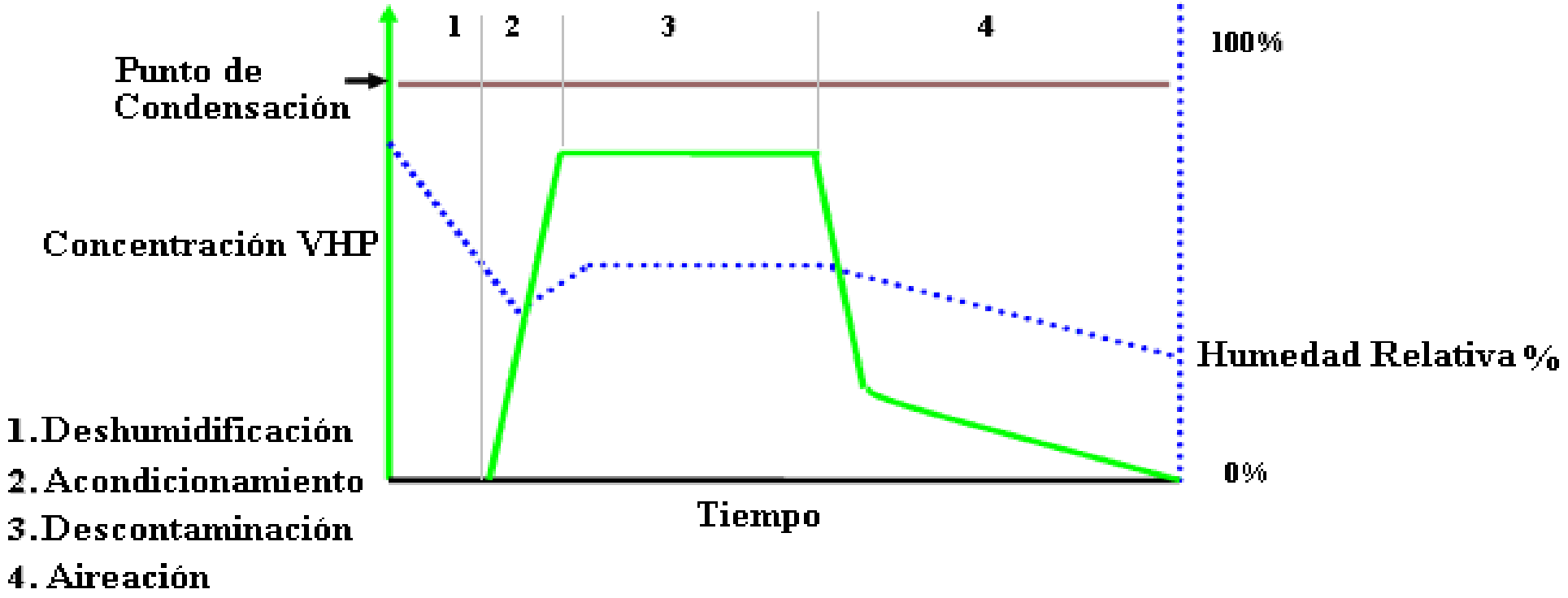
- Volumen y forma del Vaporizador
- Temperatura Vaporización 100º
- Caudal de Aire 34 m³ / hora
- Inyección de H2O2 al 35% max. 12 gr/min por medio de tres agujas con distribución espacial

- **Resultado final aire con Peróxido de Hidrógeno al 35% vaporizado sin condensación.**

CICLO TÍPICO DEL VHP® - GAS

STERIS

CICLO TÍPICO DE DESCONTAMINACIÓN CON SISTEMAVHP.



Registrado, EPA Agencia Americana Protección Ambiental, por el Ministerio de Sanidad y la AEMPS

Aprobado por la US EPA (Environmental Protection Agency)
(Registro No. 58779-4) Septiembre de 2006.

Aprobado por el Ministerio de Sanidad – Sanidad Ambiental y Salud Laboral. Nº de Registro 10-20/40-05814. Julio 2010

Permite el uso del esterilizante Vaprox y sus aplicaciones

<u>Bactericida, Fungicida, Viricida y Esporicida</u>

VHP® BIODECON
STERIS

VERIFICACIÓN DEL CICLO VHP® EN UNA HABITACIÓN

1. VHP®: Indicadores Biológicos y Químicos VAPROX

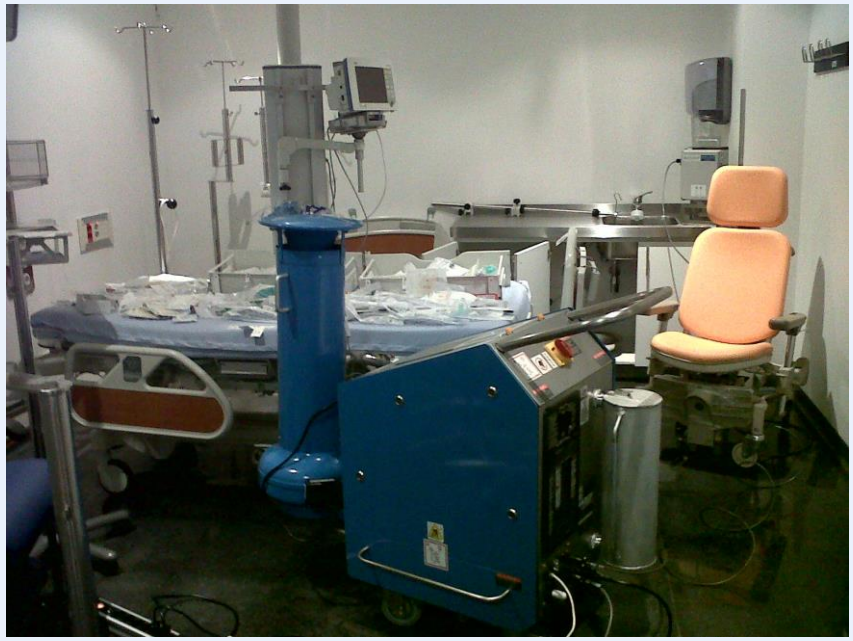
2. MONITORIZACIÓN INDEPENDIENTE DEL CICLO:
Concentración H_2O_2 de VHP®
Humedad
Temperatura
Niveles residuales de gas < 1ppm

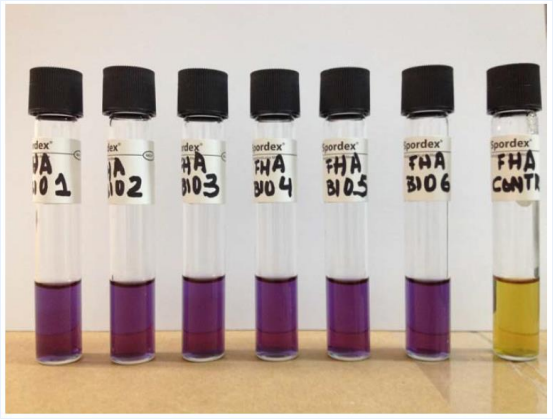
3. TOMA DE MUESTRAS DE SUPERFICIES

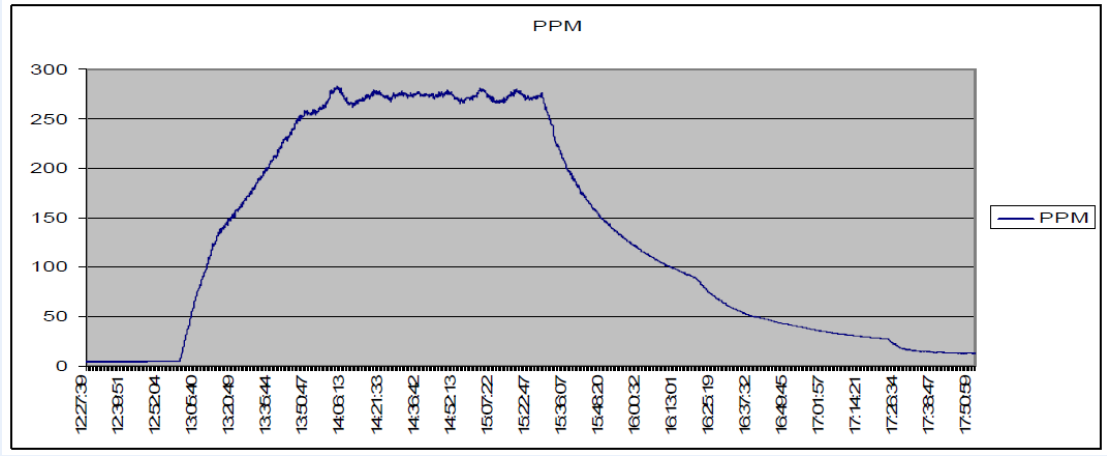
4. TOMA DE MUESTRAS DE AIRE

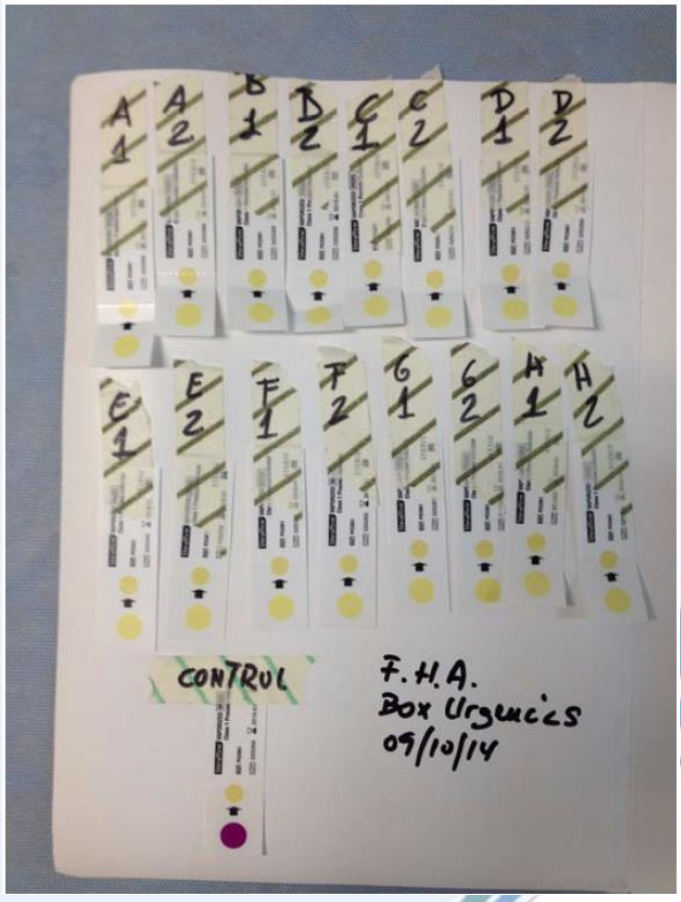
VHP® BIODECON
STERIS

VERIFICACIÓN DEL CICLO VHP® - QUIMICOS, BIOLOGICOS, UBICACIONES









VHP® Vapor de Peróxido de Hidrógeno

BIODESCONTAMINACIÓN

SISTEMAS Y PRODUCTOS DE BIODESCONTAMINACIÓN VHP® SUS APLICACIONES

Associação Portuguesa de Hotelaria Hospitalar

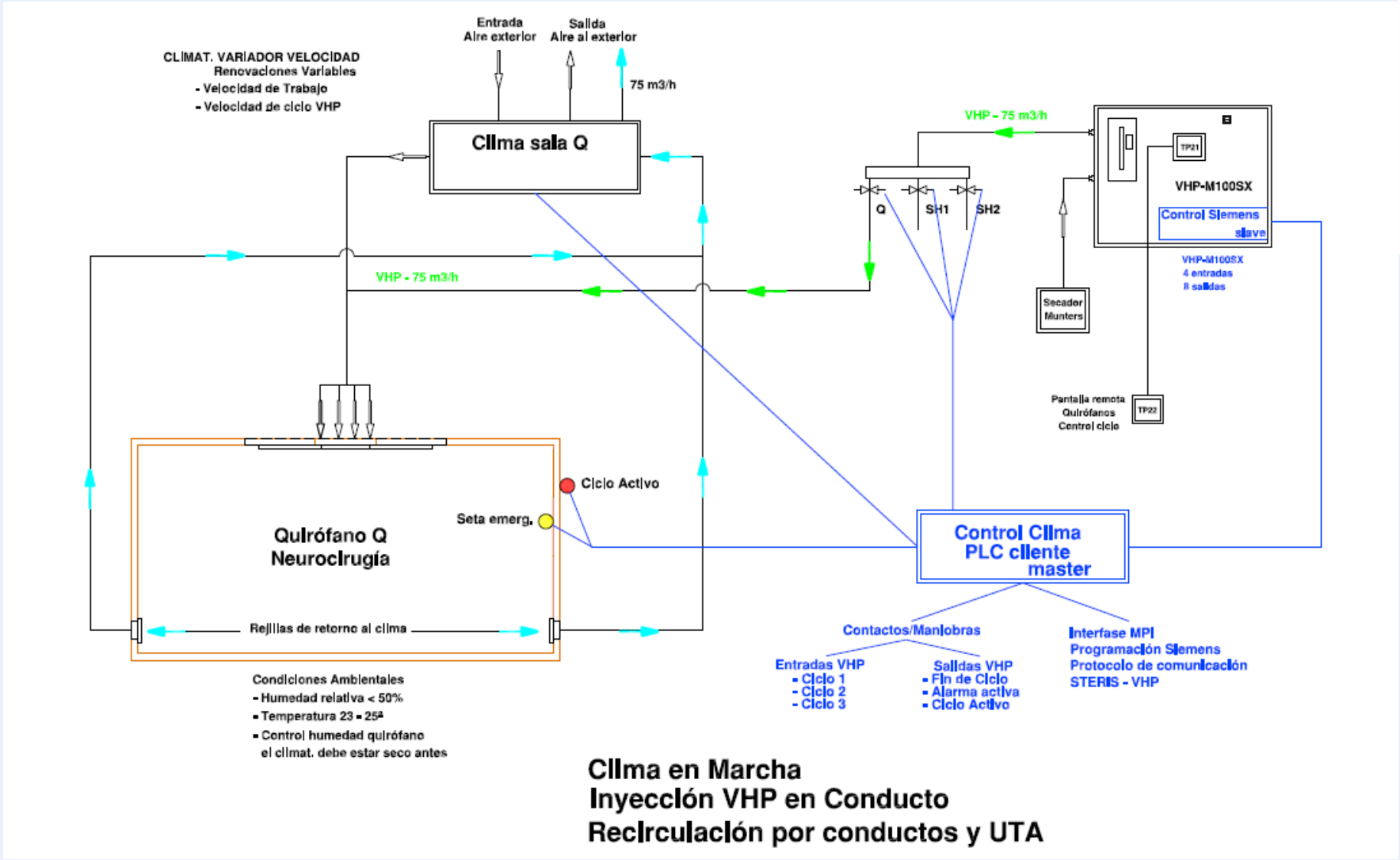
STERIS®

EQUIPO Y ACCESORIOS VHP®

CARACTERÍSTICAS BÁSICAS:

- Puede bio-descontaminar zonas de hasta 300 m^3.
- Control remoto del ciclo vía PC y visor de Windows tipo VNC.
- Registro de todos los datos del ciclo en PenDrive.
- Sistemas de red VHP® 1000-ARD para aplicaciones en áreas de gran volumen.
- Accesorios opcionales para optimizar ciclos. Aireadores, Deshumidificadores.

INTEGRADO EN LA CLIMATIZACIÓN



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VHP® Vapor de Peróxido de Hidrógeno

BIODESCONTAMINACIÓN

APLICACIONES Y ESTUDIO DE CASOS PRÁCTICOS

Associação Portuguesa de Hotelaria Hospitalar

STERIS®

NO SE TRATA DE UNA NUEVA TECNOLOGÍA

Más de 1800 sistemas VHP® en todo el mundo, incluyendo clientes tales como:

Abbott Laboratories, Abiogen Pharma, Acambis, Acusphere, Alcon, Alkermes, Alpha Therapeutics, Allergan, Altana, Alza, Amersham, Amriya, Aradigm, Asta Medica, Astra-Zeneca, Avantis Pasteur, Avantis Pharma, B.Braun, Bausch & Lomb, Baxter, Bayer, Beaumont Hospital, Dublin, Bigmar Pharma, Biochemie, Biochem Vaccines, Bioglan, Biogen, Biomet, Bioproduct Research, Bioreliance, Biotissue, Boeringher Ingelheim, Bristol-Meyers Squibb, Carbomedics, Cardinal Healthcare, Ciba Vision, Cilag, CBL, Corixa, CP Pharmaceuticals, Depuy CMW, Dey Laboratories, Dr.Kade, Dupont Merck, Eisai, Eli Lilly, Essex, Ethicon, Ferrero, Ferring, Fisons-Aventis, Fort Detrick, Fort Dodge, Fresenius, Fujisawa, GBF, G.C. Hanford, Genetech, Genzyme, Glaxo Sminth Kline,Gruenthal, Gruppo Lepetit, Haupt Pharma, Health Canade, Heinreich Pette Institut, Hemosol, Hikma Pharmaceutical, Hoffmann La Roche, Howmedica, Imperial College London,IVAX Laboratories, Karolinska University, Jackson Laboratories, Janssen, Johnson & Johnson, Knoll, Lancaster Laboratories, Leciva, Lederle laboratories, Life technologies, Lohmann Animal Health, LPI, Mallinkrodt Nuclear laboratories, Marsam Pharmaceutical, Max Plank Institut, Mead-Johnson, Mediva, Medtronic, Megabios, Merck, Merial, Meridian Medical, Monsanto, MBZ, MHH, MSD, MRC, Murinus, Nelson Labs, Nordian, Nordmark, Novartis, Nova Pharmaceutical, Novo Nordisk, Nu-Pharm, Nycomed, OJM Pharmaceutical, Oncotec, Orthivita, Osteotech, OZBT, Patheon, Pasteur-Merieux, Pfizer, Pharmacia & Upjohn, Pierre Fabre, Powderjet, PSI, Purdue Biopharma, Ribbon, Rhone Merieux, Roche Pharmaceutical, Roche diagnostics, RPR-Fisons, RVH Belfast, Sandoz, Sanofi Aventis, Schein Pharmaceutical, Schering-Plough, Sintetica, Solvay Pharma, South Dakota State University, Stowers Institute, SIFI, Sulzer Mitroflow, Systemix, Teva Pharmaceutical, Transgene, Smith & Nephew, Royal College of Surgeons Dublin, Tyco, UKE, Unilever, Union Chemique Belge, University of Bielefeld, University of Cambridge, University of Dresden, University of Durham, University of Erlangen, University of Edinburgh, University of Jena, University of Magdenburg, University of Oxford, University of Tennessee, University of Cork, University of WI, University of Zurich, US Army, Vistakon, Walter Reed Army Institute,Warner Lambert, Wyeth, Zenit.

APLICACIONES DE HOTELARIA HOSPITALAR

Dairy, Food and Environmental Sanitation, Vol. 22, No. 11, Pages 868-873

Vapor Phase Hydrogen Peroxide Decontamination of Food Contact Surfaces

Gerald McDonnell,* George Grignol, and Kathy Antloga
Research & Development, STERIS Corporation
5960 Heisley Road, Mentor, OH 44060-1834

APLICACIONES DE HOTELARIA HOSPITALAR

2007 **Steris named global supplier to Tetra Pak**

STERIS and Tetra Pak Sign Joint Development Agreement

Collaborative Efforts Will Leverage Each Company's Core Capabilities

BEBERAGE FILLING STERILIZATION

Tetra Pak tests new sterilisation systems in joint deal

APLICACIONES TÍPICAS HOSPITALARIAS

Quirófanos

Cuidados Intensivos

Neonatos / Incubadoras

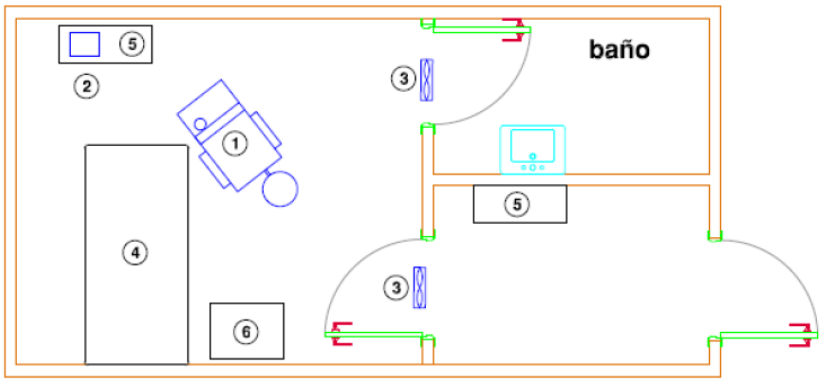
Habitaciones/salas
de aislamiento

Habitaciones/Areas de
Biodescontaminación de equipos

VHP® BIODECON
STERIS

Hospital Curry Cabral

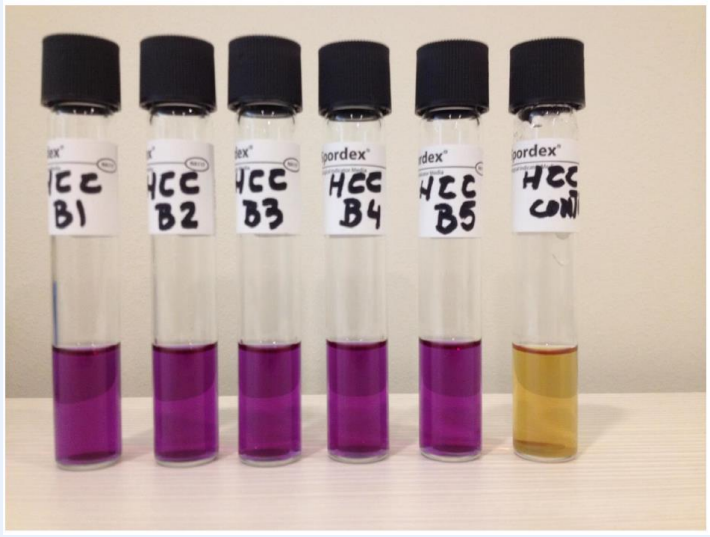
Habitación Infecciosos

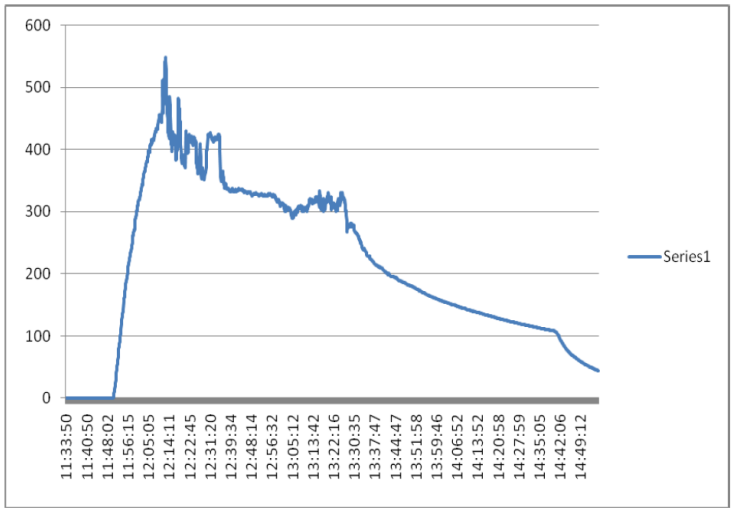


Distribuiçao e localizaçao dos equipamentos

Sistema VHP-ARD Steris
1. VHP-generador de vapor H2O2
2. Sensor de H2O2
3. Ventilador

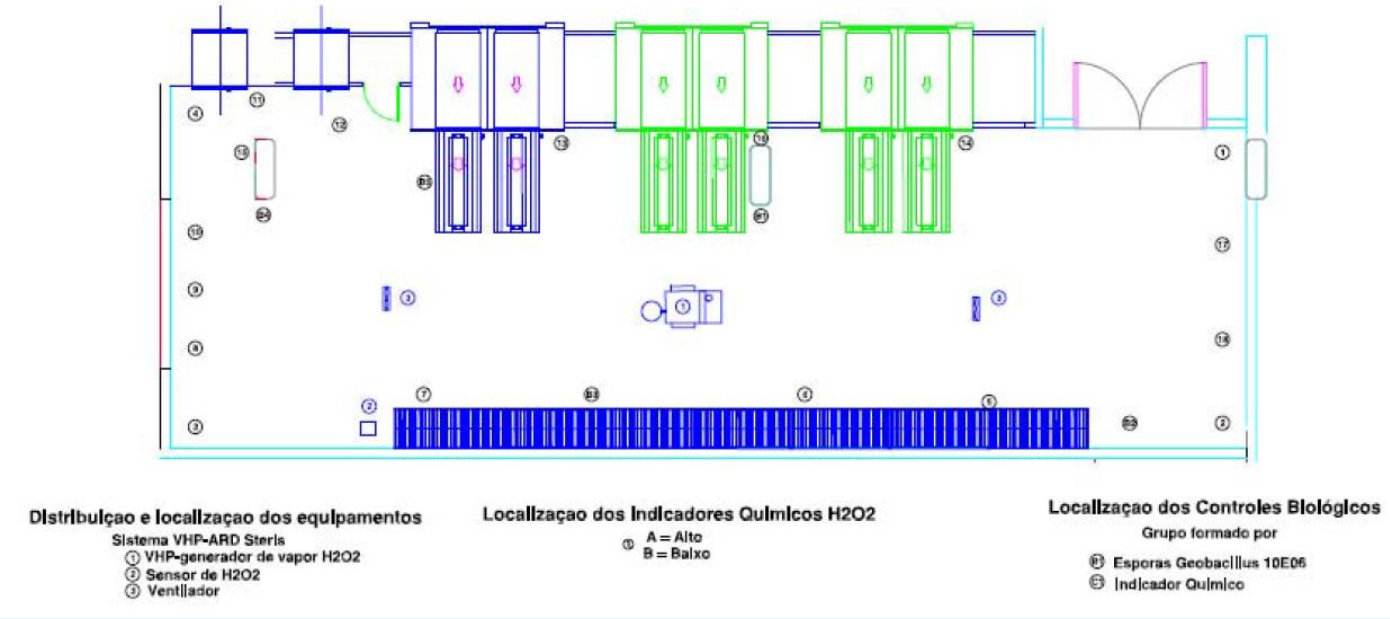
Mobiliario, equipamiento
4. Cama
5. Mesa apoio
6. Mesa e Equipamento de Monitorizaçao



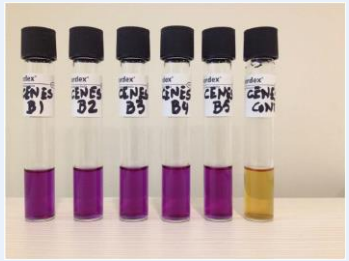


cenes
REPROCESSAMENTO DE DISPOSITIVOS MÉDICOS

Almacén de Material Estéril



280 m³

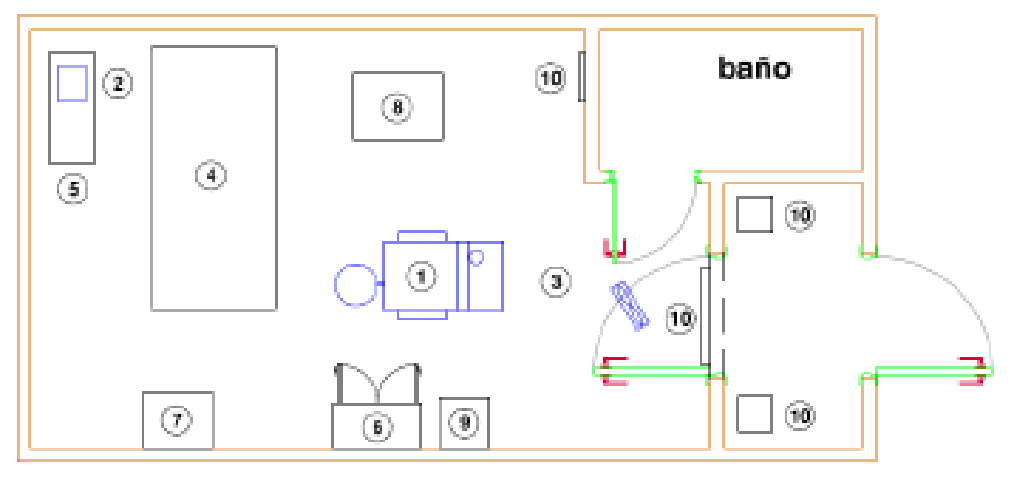


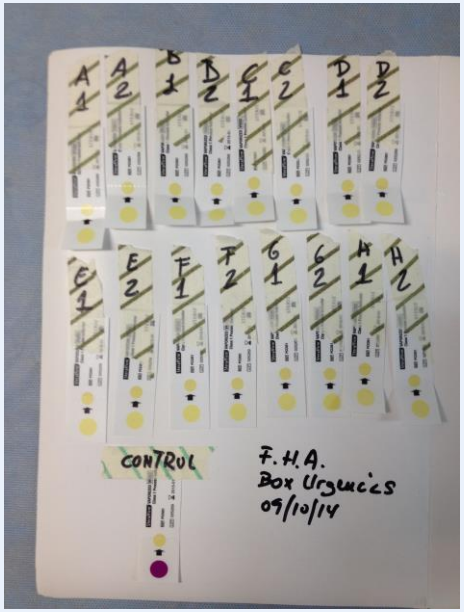
IPAC acreditação
L0323
Ensaios
Instituto Nacional de Saúde Doutor Ricardo Jorge

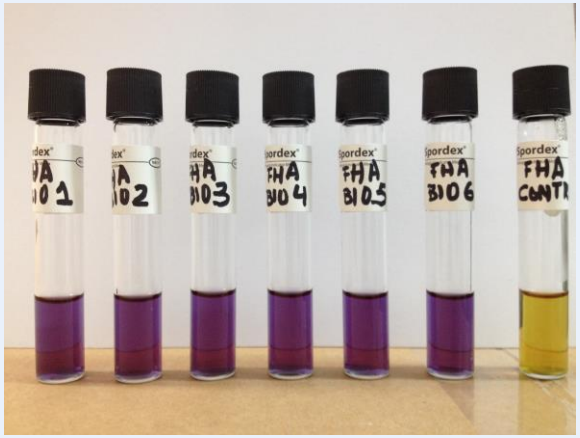
4. CONCLUSÕES

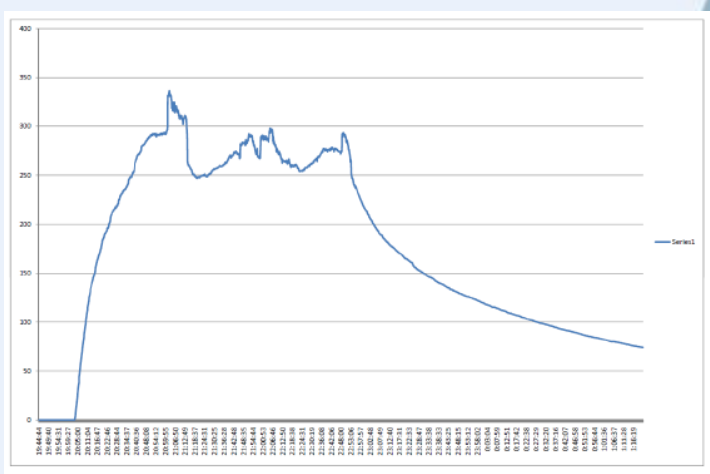
O presente estudo teve como objetivo comparar a contaminação microbiológica do ar no armazém de esterilizados, antes e após uma biodescontaminação utilizando Peróxido de Hidrogénio Vaporizado (VHP®). Os resultados obtidos indicam que a biodescontaminação levada a cabo reduziu a contaminação microbiológica do ar para níveis compatíveis com as atividades a que a sala se destina.

VHP® INFORME RESULTADOS – CICLO DESCONTAMINACIÓN EBOLA

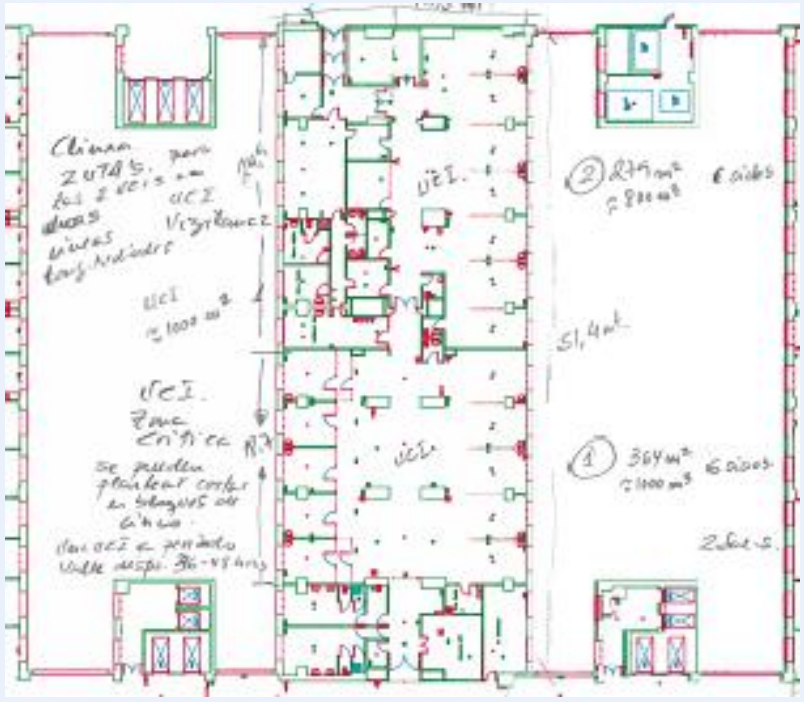


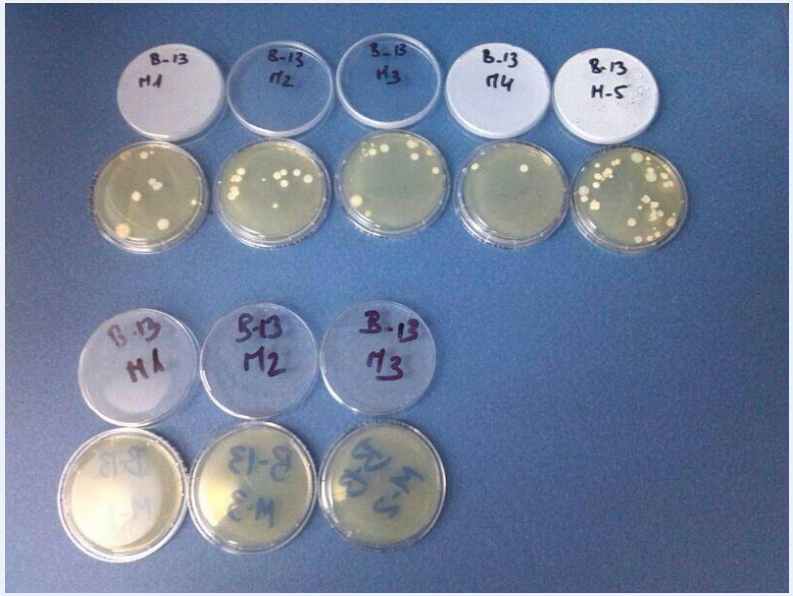




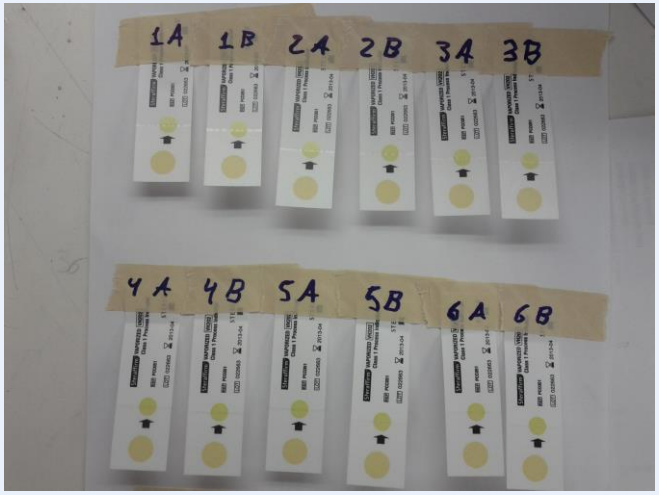


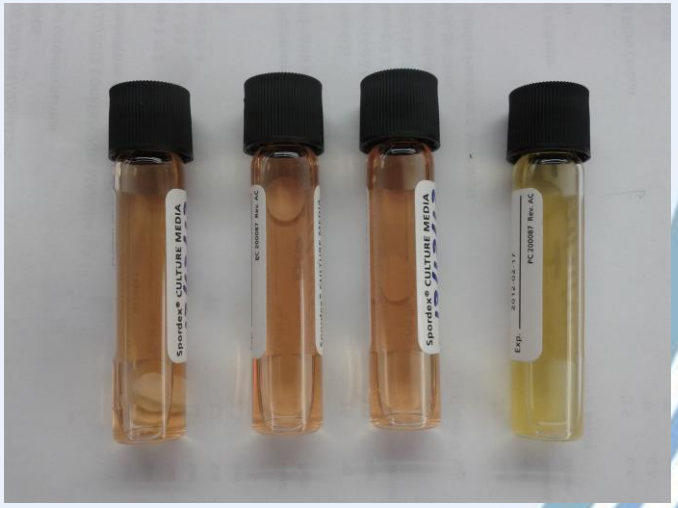
BIODECON VHP® - UCI COMPLETA

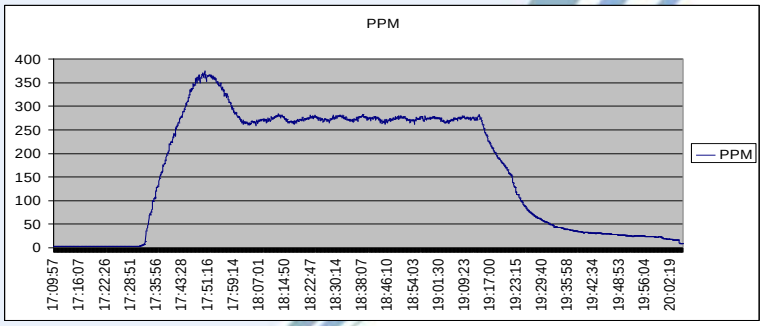




BIODECON VHP® - PEDIATRIA-NIDOS NEONATOS







USO DEL PERÓXIDO DE HIDRÓGENO EN VAPOR EN EL CONTROL DE UN BROTE NOSOCOMIAL POR *KLEBSIELLA* BLEE

Lucerna Méndez, MA; Maldonado Valverde, MC; Cabezas Fernández, T; Lozano Serrano, A; Fernández Martín, J; Cañabate Reche, F.
Agencia Sanitaria Poniente de Almería. E-mail: mariaangeles.lucerna@ephpo.es

INTRODUCCIÓN

En noviembre de 2012, se detectó un brote nosocomial por *Klebsiella pneumoniae* productora de beta-lactamasa de espectro extendido (BLEE) en la sala de neonatos del hospital de Poniente de Almería.

OBJETIVO: Evaluar el uso de la descontaminación con peróxido de hidrógeno en vapor en el control de brotes nosocomiales.

MÉTODOS

Estudio observacional descriptivo.
Se realiza investigación epidemiológica de afectados y búsqueda activa de casos.
Se han inoculado sobre distintas superficies cepas en suspensión de *klebsiella* BLEE y MRSA (10^5 ufc), muestreando tras la aplicación del peróxido para comprobar su efectividad, además se han distribuido controles químicos y biológicos en tres dependencias del área de neonatos antes de su descontaminación (sala de hospitalización de neonatos dividida en dos zonas y lactario).

RESULTADOS

Se identificaron 3 casos y 8 portadores perineales, de 110 expuestos. Se realizaron 3 descontaminaciones con peróxido de hidrógeno (un ciclo por sala).
Se repartieron 16 controles químicos y 3 biológicos en cada sala, todos presentaron resultados correctos.

De las 12 superficies inoculadas con gérmenes multirresistentes, sólo 1 fue positiva (2 ufc). Tras 3 meses de vigilancia después de la detección del último caso se consideró erradicado el brote.

Tabla 1. SUPERFICIES MUESTREADAS CON CEPAS DE *KLEBSIELLA* BLEE. SALAS DE NEONATOLOGÍA

	Previa descontaminación	Tras descontaminación
SALA 1 NEONATOS		
Equipo de radiología portátil	10^5 ufc	0 ufc
Cuna térmica	10^5 ufc	0 ufc
Soporte suero	10^5 ufc	0 ufc
Mesa de trabajo	10^5 ufc	0 ufc
SALA 2 NEONATOS		
Incubadora 1	10^5 ufc	0 ufc
Mesa de trabajo	10^5 ufc	0 ufc
Cuna térmica	10^5 ufc	0 ufc
Incubadora 2	10^5 ufc	0 ufc
LACTARIO		
Puerta entrada con teclado	10^5 ufc	0 ufc
Grifo	10^5 ufc	0 ufc
Encimera madera	10^5 ufc	0 ufc
Cuna de isolette	10^5 ufc	0 ufc

Tabla 2. SUPERFICIES MUESTREADAS CON CEPAS DE *STAPHYLOCOCCUS AUREUS* METICILIN RESISTENTE. SALAS DE NEONATOLOGÍA

	Previa descontaminación	Tras descontaminación
SALA 1 NEONATOS		
Equipo de radiología portátil	10^5 ufc	0 ufc
Cuna térmica	10^5 ufc	0 ufc
Soporte suero	10^5 ufc	0 ufc
Mesa de trabajo	0 ufc	0 ufc
LACTARIO		
Puerta entrada con teclado	10^5 ufc	0 ufc
Grifo	10^5 ufc	0 ufc
Encimera madera	10^5 ufc	0 ufc
Cuna de isolette	10^5 ufc	0 ufc

DISCUSIÓN

Además de la aplicación del peróxido de hidrógeno, se introdujeron otras medidas para el control del brote: limpieza y desinfección de incubadoras y cunas; separación de colonizados/infectados de otros pacientes; dedicación de personal exclusivo para la atención de casos; alta precoz de pacientes; aislamiento de contacto estricto y refuerzo de la higiene de manos.

CONCLUSIONES

El uso del peróxido de hidrógeno en vapor puede contribuir a la erradicación de brotes nosocomiales por *klebsiella* BLEE complementando otras medidas de control de la infección.

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Control of an outbreak of *Acinetobacter baumannii* infections using vaporized hydrogen peroxide

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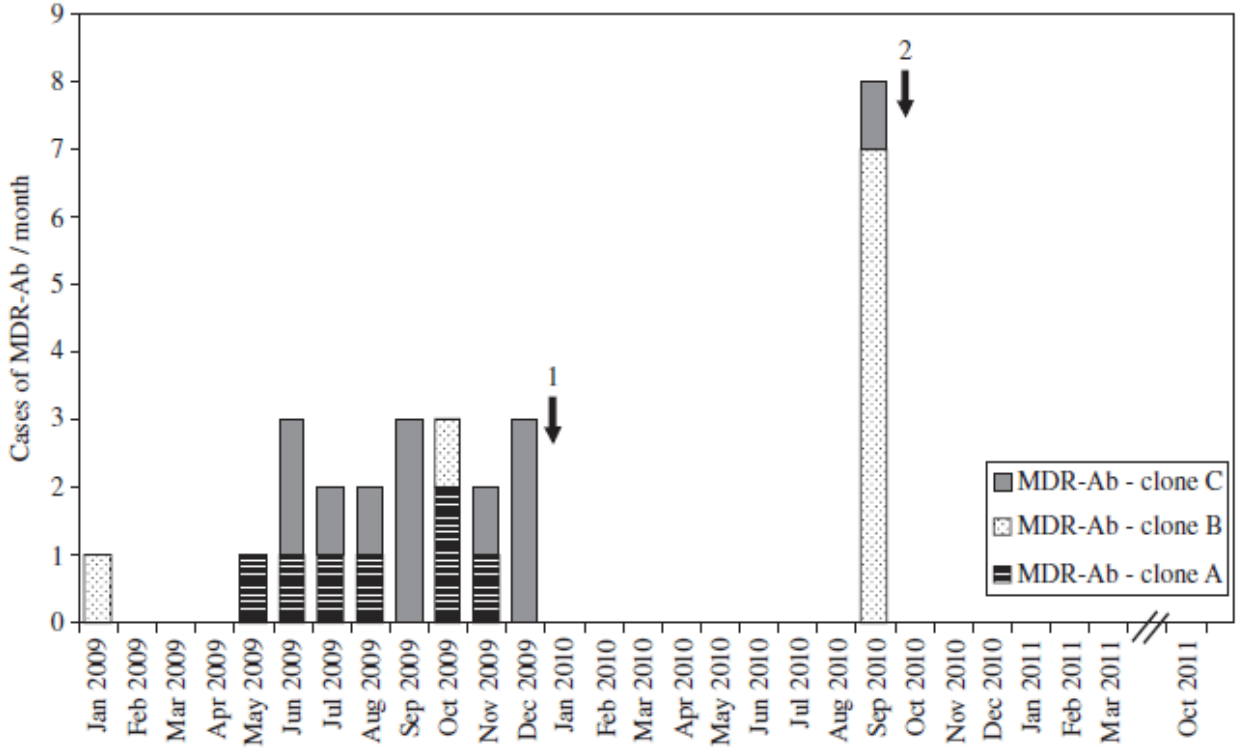


APLICACIONES DE STERIS VHP®
BIODESCONTAMINACIÓN

STERIS Defense & Industrial Group Case Study

Anthrax Remediation of U.S. State Department Mail Facility SA-32

The Challenge:

The U.S. State Department Mail Facility in Sterling, Virginia was contaminated with Anthrax spores after accepting mail from the Brentwood Post Office in Washington, D.C. in October 2001. The State Department was forced to abandon and quarantine the facility, and was seeking a safe, environmentally friendly and non-corrosive means of remediation.

The Solution:

STERIS's proprietary vaporized hydrogen peroxide technology (VHP®) was selected as the project decontaminate after the State Department's Technical Working Group (TWG) compared and evaluated available remediation technologies. The group, which included representatives from the State Department, the U.S. Environmental Protection Agency, Centers for Disease Control and Prevention, Occupational Health and Safety Administration, Army Corps of Engineers and the State of Virginia utilized criteria such as efficacy, safety, material compatibility, business continuity, and industry experience with the technology in making their selection.

In use for over a decade with STERIS's pharmaceutical and research customers, the VHP technology was modified by STERIS's Defense & Industrial (D&I) Group for application in large-scale, complex, building interiors. The VHP technology is highly effective against pathogenic organisms and bacterial spores, and unlike many other antimicrobials, it breaks down into water vapor and oxygen. Additionally, the technology will not produce hazardous substances, is environmentally friendly, non-carcinogenic, non-corrosive at use concentration, and does not leave residues.

Because the STERIS VHP system employs a low concentration, dry process, it is compatible with a wide variety of materials, including sensitive electronics, equipment, and a broad range of materials and finishes. It can be used over a wide range of temperatures, works quickly, and because of its scalability, is effective in small or spacious areas.

In addition to providing its VHP technology, the STERIS D&I Group developed a comprehensive remedial action plan and health and safety protocols that were utilized in the successful decontamination of the facility. As

A STERIS Defense & Industrial technician collects biological indicators which were used to validate the efficacy of the decontamination process.

part of its comprehensive initiative, STERIS D&I also drafted and supplied quality and sterility assurance protocols.

The Result:

Remediation of SA-32 occurred between July and August 2003, and was cleared for reuse on December 5, 2003. The approach for decontamination of SA-32 was based on the goal of treating the entire facility section by section, dividing areas into no more than 200,000 cubic feet. These zones were fumigated with VHP as part of a controlled, staged process. In preparation for fumigation, the facility was separated into 10 areas using partitions constructed from polyethylene sheeting with wooden 2" x 4" supporting structures. VHP was pumped into these zones through air intake ducts erected for this purpose.

Large scale VHP decontamination system deployed at the U.S. State Department mail processing center in Sterling, Virginia.

Measured by real-time VHP concentration monitors, the VHP process met the prescribed specifications and process variables for each of the four phases of the decontamination cycle. Prior to applying the VHP sterilant, chemical and biological indicators were placed throughout the facility. Following VHP application, chemical indicators exhibited the required colorimetric changes and biological indicators were negative for growth of the indicator organism. Numerous surfaces throughout the facility were swabbed, cultured, and analyzed by methods approved by the Naval Medical Research Center, Silver Springs, Maryland. All 619 samples were negative for Bacillus anthracis.

The Environmental Clearance Committee (ECC) stated that the remediation approach used at the facility was thorough in both design and implementation. The ECC achieved its goal of using the best science and technology available to minimize residual risk to the greatest extent possible. The ECC concluded that the decontamination process for the facility as set forth by the TWG and performed by the State Department Project Team, which included STERIS, was safely and effectively completed.

To learn more about the STERIS Defense & Industrial Group, visit www.steris.com or call Kevin Marsh at 440-392-7660.

STERIS®

POST OFFICE, WASHINGTON (US).

Contaminación: ANTHRAX

VHP® Vapor de Peróxido de Hidrógeno

BIODESCONTAMINACIÓN

SISTEMAS DE DESINFECCIÓN HOSPITALARIA

Associação Portuguesa de Hotelaria Hospitalar

STERIS®

BIODECON - STERIS Healthcare

PATHOGON™

VHP™

VHP™ Integrado

SERVICIOS

VAPROX CONTROLES

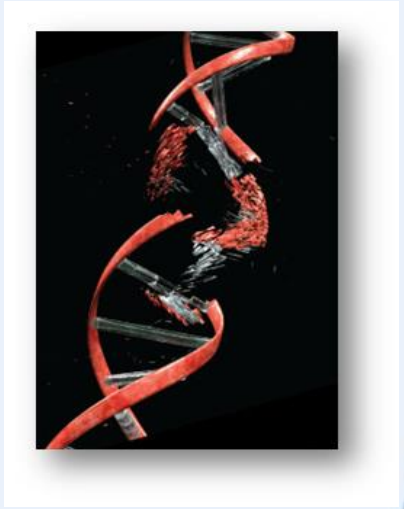
VAPROQUIP™

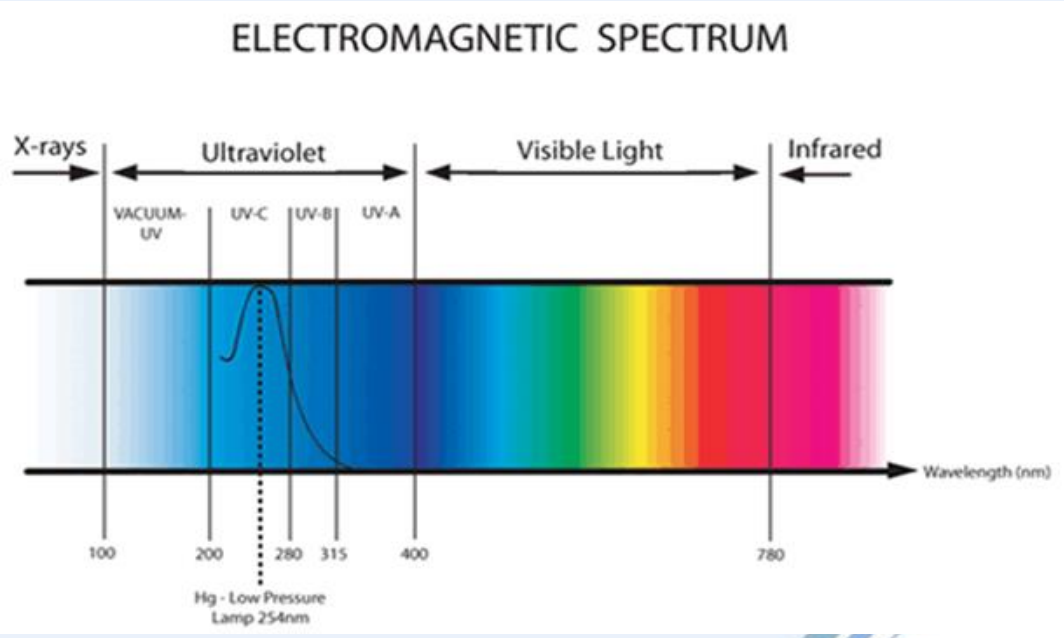
VHP® BIODECON
STERIS

PATHOGON - Desinfección por UVC

VHP® BIODECON
STERIS

•Dentro del espectro de luz UV, solo un pequeño intervalo (257 nM) esta comprobado como el mas germicida.





Tecnología STERIS VHP®

GRACIAS POR SU ATENCIÓN

Associação Portuguesa de Hotelaria Hospitalar

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