Evans Vanodine
EST. 1919

MICROBIOLOGICAL PROFILE

Peradox™

Acidic disinfectant

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Evans Vanodine

PERADOX MICROBIOLOGICAL PROFILE

INTRODUCTION

PERADOX is a clear, colourless, acidic disinfectant.

PERADOX has a broad spectrum of activity. It is bactericidal, fungicidal and virucidal.

PERADOX helps to maintain the highest standards of hygiene, is fast acting and economical in use.

PERADOX is mainly used in intensive livestock husbandry, milk production and processing and other food and beverage applications.

PERADOX is designed for use as part of an effective cleaning and disinfection (hygiene) programme.

Effective against a range of bacteria, viruses and fungi		**Use after cleaning**
Removes biofilm	**Suitable in all water types**	**Fast acting formulation**

PERADOX - EFFICACY SUMMARY

PERADOX has been tested and proven to be effective against a range of micro-organisms. European Standard (EN – European Norm*) test methods were used to prove efficacy against bacteria, viruses and fungi.

The UKAS accredited Microbiology Laboratory at Evans Vanodine International plc. (Testing number 1108) performed tests with bacteria. Other tests were performed by independent expert laboratories and included the virus test EN 14476.

The following tables include information of relevant, applicable test methods, conditions, contact times and organisms.

*EN - European Norm
Published in the UK as BS EN by the British Standards Institution.

PERADOX MICROBIOLOGICAL PROFILE

SUMMARY OF TEST RESULTS FOR FOOD, INDUSTRIAL, INSTITUTIONAL AND DOMESTIC AREAS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Aeromonas salmonicida	1:1080	EN 1276	20	5	Dirty
Carnobacterium maltaromaticum	1:1080				
Enterococcus faecium	1:1080		60		
Enterococcus hirae	1:540		10		
	1:1440		20		
	1:1080		40		
Escherichia coli	1:1080		10		Clean
	1:540				Dirty
	1:440		20		
	1:1080		40		
Escherichia coli 0157	1:1080		10		Clean
	1:540				Dirty
Lactococcus garvieae	1:1080		20		
Listeria monocytogenes	1:1080		10		Clean
	1:540				Dirty
	1:5400		20		
Pseudomonas aeruginosa	1:540		10		
	1:1440		20		
	1:1080		40		
Salmonella enterica	1:540		10		
Salmonella typhimurium	1:1440		20		
Staphylococcus aureus	1:1080		10		Clean
	1:540				Dirty
	1:1440		20		
	1:1080		40		
Methicillin resistant *Staphylococcus aureus*	1:1080		10		Clean
	1:540				Dirty
Yersinia enterocolitica	1:1080				Clean
	1:540				Dirty
Yersinia ruckeri	1:1080		20		
Enterococcus hirae	1:360	EN 13697	10	5	Clean
	1:540		20		Clean
	1:360				Dirty
	1:720		40		
Escherichia coli	1:540		10		
	1:1080		20		
Escherichia coli 0157	1:540		10		Clean
Listeria monocytogenes	1:540				
Pseudomonas aeruginosa	1:360				Dirty
	1:360		20		
	1:720		40		

PERADOX MICROBIOLOGICAL PROFILE

BACTERIAL TEST PROFILE CONTINUED

ORGANISMS	DILUTION	TEST METHOD	TEMP (°C)	CONTACT TIME (MINUTES)	SOILING LEVEL
Salmonella typhimurium	1:540	EN 13697	10	5	Dirty
Staphylococcus aureus	1:540				
	1:1080		20		Clean
	1:540				Dirty
	1:720		40		
Methicillin resistant *Staphylococcus aureus*	1:540		10		
Yersinia enterocolitica	1:540				
Bacillus subtilis	1:108	EN 13704	20		Clean
	1:1080		40	60	
Clostridium difficile	1:54		20	5	
	1:108		40	60	

FUNGI TEST PROFILE

ORGANISMS	DILUTION	TEST METHOD	TEMP (°C)	CONTACT TIME (MINUTES)	SOILING LEVEL
Aspergillus brasiliensis	1:36	EN 1650	20	15	Dirty
	1:72		40	5	
Candida albicans	1:270		10		Clean
	1:216				Dirty
	1:360		20		
	1:540			15	
	1:1080		40		
Saccharomyces cerevisiae	1:270		10		Clean
	1:216				Dirty
	1:720		20		Clean
	1:360				Dirty
Aspergillus brasiliensis	1:121	EN 13697		5	Dirty
	1:72		40	30	
Candida albicans	1:540		20	5	
	1:1080			15	
	1:540		40	15	
Saccharomyces cerevisiae	1:720		10	5	

BACTERIOPHAGE TEST PROFILE

ORGANISMS	DILUTION	TEST METHOD	TEMP (°C)	CONTACT TIME (MINUTES)	SOILING LEVEL
Lactococcus lactis subsp. lactis bacteriophage P001	1:216	EN 13610	20	15	1% whey
Lactococcus lactis subsp. lactis bacteriophage P008					

PERADOX MICROBIOLOGICAL PROFILE

SUMMARY OF TEST RESULTS FOR MEDICAL AREAS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Enterococcus faecium	1:1080	EN 13727	20	5	Dirty
Enterococcus hirae	1:540				
Pseudomonas aeruginosa	1:1080				
Staphylococcus aureus	1:1080				

FUNGI TEST PROFILE					
FUNGI	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Aspergillus brasiliensis	1:27	EN 13624	20	5	Dirty
	1:54		40		
Candida albicans	1:216		20		
	1:540		40		

VIRUS TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Adenovirus	1:216	EN 14476	20	5	Dirty
	1:1080			30	
Murine parvovirus	1:36		60	5	
	1:27		40		
Poliovirus	1:18		20		
	1:54			30	

SUMMARY OF TEST RESULTS FOR AQUEOUS SYSTEMS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Legionella pneumophila	1:1080	EN 13623	20	60	Dirty

PERADOX MICROBIOLOGICAL PROFILE

SUMMARY OF TEST RESULTS FOR VETERINARY AREAS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Enterococcus hirae	1:50	EN 1656	10	15 seconds	High
Escherichia coli	1:200				
Listeria monocytogenes	1:800		10	30	
Proteus vulgaris	1:200			15 seconds	
Pseudomonas aeruginosa	1:100				
Staphylococcus aureus	1:50				
Staphylococcus aureus Mexicana	1:50		10	15 seconds	
Streptococcus agalactiae	1:200				
Streptococcus uberis	1:200				

PERADOX MICROBIOLOGICAL PROFILE

EN TEST METHODS

There are two types of laboratory test methods for disinfectants i.e. suspension methods and surface methods.

Surface methods use different carriers depending on the application area e.g. stainless steel discs, (food), PVC tiles (medical), wood (veterinary), synthetic skin (veterinary). The inoculum is dried on to the surface before the disinfectant is applied, mechanical action is also employed in one method by using wipes.

There are 3 different claims that can be made when virus tests are used, either for full virucidal activity, limited spectrum virucidal activity or activity against enveloped viruses. It will depend on the viruses tested which claim can be applied.

The interfering substances used in EN test methods are described as dirty or clean in medical, food, industrial, domestic and institutional areas, and as low or high level soiling in veterinary areas. They simulate levels of soiling encountered in practical, real-life situations.

HARD SURFACE PRODUCT TEST METHODS

For the Biocidal Product Regulation (BPR) there are two product types applicable to hard surface disinfectants. Product Type 2; Disinfectants used for the disinfection of surfaces, materials, equipment and furniture which are not used for direct contact with food or feeding stuffs, and Product Type 4; Disinfectants used for the disinfection of equipment containers, consumption utensils, surfaces or pipework associated with the production, transport, storage or consumption of food or feed for humans and animals.

As a minimum for general purposes, products should be effective against bacteria and yeast.

The scope of food area EN test methods applies to disinfectants used in food, industrial, domestic, institutional areas, excluding areas and situations where disinfection in medically indicated, and products used on living tissue except those for hand hygiene in the above areas.

TEST REFERENCE		TEST TYPE	ORGANISM	TEST PASS CRITERIA
EN 1276	For bactericidal activity.	Suspension	Bacteria	≥5 log reduction
EN 1650	For fungicidal or yeasticidal activity.	Suspension	Fungi/Yeast	≥4 log reduction
EN 13610	For virucidal activity against bacteriophages	Suspension	Bacteriophage	≥4 log reduction
EN 13623	For activity against legionella in aqueous systems	Suspension	Bacteria	≥4 log reduction
EN 13697	For bactericidal and/or fungicidal or yeasticidal activity on stainless steel carriers.	Surface	Bacteria	≥4 log reduction
		Surface	Fungi/Yeast	≥3 log reduction
EN 13704	For sporicidal activity	Suspension	Bacterial spores	≥3 log reduction

MEDICAL AREA PRODUCT TEST METHODS

For the Biocidal Product Regulation (BPR) there is one product type applicable. Product Type 2; Disinfectants used for the disinfection of surfaces materials, equipment and furniture which are not used for direct contact with food or feeding stuff.

As a minimum for general hygiene purposes products should be effective against bacteria and yeast.

The scope of medical area EN test methods apply to hygienic and surgical, handwash and handrubs and instrument disinfection by immersion and surface disinfection by wiping, spraying, flooding or other means.

Areas and situations where disinfection or antisepsis is medically indicated for patient care e.g. hospitals, community medical facilities, dental institutions, clinics of schools, nurseries and nursing homes.

EN TEST METHODS FOR MEDICAL AREAS

TEST REFERENCE		TEST TYPE	ORGANISM	TEST PASS CRITERIA
EN 13624	For fungicidal or yeasticidal activity.	Suspension	Fungi/Yeast	≥4 log reduction
EN 13727	For bactericidal activity in the medical area	Suspension	Bacteria	≥5 log reduction
EN 14476	For virucidal activity.	Suspension	Virus	≥4 log reduction

VETERINARY DISINFECTANT TEST METHODS

Veterinary disinfectants can be used in a variety of areas e.g. the breeding, husbandry, production, transport and disposal of all animals except when in the food chain following death and entry to the processing industry.

As a minimum for general hygiene purposes, products should be effective against bacteria and yeast.

The scope of veterinary EN test methods does not specify application of the product but does include disinfection by immersion and surface disinfection by wiping, spraying, foaming or other means. It does not include aerial disinfection.

TEST REFERENCE		TEST TYPE	ORGANISM	TEST PASS CRITERIA
EN 1656	For bactericidal activity.	Suspension	Bacteria	≥5 log reduction

LOG REDUCTION

Products claiming they will kill 99.9% of bacteria sounds extremely efficient, however it does not prove that a product is an effective disinfectant.

In order to demonstrate effectiveness disinfectants should be tested using European Standard Test Methods. Depending on the applicable area and test used, relevant log reductions are specified and must be achieved to claim effectiveness with a test method. This means a reduction in microbial numbers must be seen when compared to the number of organisms at the start of the test or, for surface tests, to a water control performed at the same time. As the numbers are large it is generally accepted that they are expressed as a logarithm. The reduction can be written as either a log value or a percentage i.e. a 5 log reduction is equivalent to a 99.999% reduction, a 3 log reduction is equivalent to 99.9% reduction.

Bacteria are microscopic free living single celled organisms. A surface contaminated with raw meat, for example could have millions of bacteria per square centimeter e.g. a surface with 1,000,000 bacteria treated with a product that kills 99.9% of bacteria would still have 1000 bacteria remaining. **If the surface were treated with a product that kills 99.999% of bacteria only 10 bacteria would remain**.

Bacterial growth rates vary depending on the surface, type and degree of soiling, temperature and presence of water. For example E.coli under ideal conditions multiplies every 15 minutes. If conditions are less than ideal (lowering the temperature or drying the surface) the growth rate slows down.

e.g. 1,000 bacteria would increase to 2,000 after 15 minutes, after 30 minutes it would be 4,000 and after 1 hour 16,000 and 256,000 after 2 hours, **10 bacteria would only have multiplied to 2560 in the same 2 hour period.**

The presence of bacteria does not automatically lead to infection, susceptibility to disease and the infectious dose (number of bacteria required to cause infection) are vitally important. Some bacteria will cause an infection with less than 100 cells ingested or introduced into cuts or wounds. For this reason, it is important to reduce the number of harmful bacteria to the lowest number possible wherever the risk of infection is high.

THE FOLLOWING FIGURES APPLY IF THE NUMBER AT THE START POINT WAS 1,000,000		
LOG REDUCTION	**NUMBER REMAINING**	**PERCENTAGE REDUCTION**
1	100,000	90%
2	10,000	99%
3	1,000	99.9%
4	100	99.99%
5	10	99.999%