Evans Vanodine
EST. 1919

MICROBIOLOGICAL PROFILE

V18™

Iodophor based disinfectant

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V18 MICROBIOLOGICAL PROFILE

INTRODUCTION

V18 is a powerful iodophor based disinfectant.

V18 has a broad spectrum of activity. It is bactericidal, fungicidal and virucidal.

V18 is an authorised biocide, UK-2019-1179-02-02. DEFRA approved.

V18 is recommended for use in all types of livestock housing and for foot and wheel baths.

V18 is designed for use as part of an effective cleaning and disinfection (hygiene) programme.

Effective in the presence of heavy organic soiling and low temperatures		**Use after cleaning**
For use in foot trays	**Powerful and fast acting**	**Colour coded to indicate activity**

V18 - EFFICACY SUMMARY

V18 has been tested and proven to be effective against a range of micro-organisms. European Standard (EN*) 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 and fungi.

V18 has also been tested against Leptospira, Mycobacteria and viruses at independent expert laboratories using appropriate methods.

V18 is approved in the UK by the Department for Environment, Food and Rural Affairs (DEFRA), for disinfection where an approved product is required https://www.gov.uk/guidance/get-your-disinfectant-approved-by-defra. This approval is also mirrored in Northern Ireland and Ireland by DARDNI and DAERA respectively.

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.

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SUMMARY OF TEST RESULTS AGAINST AVIAN PATHOGENS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Escherichia coli	1:100	EN 1656	10	30	High
Pasteurella multocida	1:400				
Proteus hauseri	1:200				
Salmonella arizonae	1:100				
Salmonella gallinarum	1:100				
Salmonella pullorum	1:200				
Salmonella typhimurium	1:200				
Staphylococcus aureus	1:100				
Mycobacterium avium	1:200	EN 14204	10	5	Low
Proteus hauseri	1:100	EN 14349	10	30	High
	1:400				Low
Staphylococcus aureus	1:100				High
	1:250				Low
Proteus hauseri	1:400	EN 16437	10	60	3g/l bovine albumin

VIRUS TEST PROFILE					
VIRUS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Avian Adenovirus	1:33	In-house	25	30	None
Infectious Bursal disease virus	1:50	In-house	30	30	High
Infectious Bronchitis virus	1:55	In-house	4	120	Yeast
Infectious Laryngotracheitis virus	1:100	In-house	10	30	None
Avian influenza virus Taiwan strain H6N1	1:145	In-house	4	30	Yeast
Avian influenza virus H5N3	1:145	In-house	4	30	Yeast
Avian influenza reassortant virus H3N2	1:200	In-house	4	30	Organic
Newcastle Disease virus	1:100	DEFRA	4	30	5% yeast
Turkey Rhinotracheitis virus	1:100	In-house	10	30	None
Avian Reovirus	1:50	In-house	10	30	None

In-house tests use protocols specific for each virus.

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SUMMARY OF TEST RESULTS AGAINST BOVINE PATHOGENS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Corynebacterium pseudotuberculosis	1:100	EN 1656	10	30	High
Escherichia coli	1:100				
Klebsiella aerogenes	1:200				
Pseudomonas aeruginosa	1:100				
Staphylococcus aureus	1:100				
Pseudomonas aeruginosa	1:200	EN 14349	10	30	High
	1:300				Low
Staphylococcus aureus	1:100				High
	1:250				Low
Staphylococcus aureus	1:100	EN 16437	10	240	3g/l bovine albumin
Leptospira interrogans	1:200	In-house	Room Temp	2	None
Mycobacterium fortuitum	1:20	DEFRA	4	60	5% yeast

VIRUS TEST PROFILE					
VIRUS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Bovine enterovirus	1:100	EN 14675	10	30	Low
Foot and Mouth Disease Virus 0l British field strain 1860/UK167	1:550	DEFRA	4	30	1% Foetal bovine serum
Bovine rotavirus	1:75	In-house	4	30	Yeast

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SUMMARY OF TEST RESULTS AGAINST PORCINE PATHOGENS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Enterococcus hirae	1:100	EN 1656	10	30	High
Escherichia coli	1:100				
Pasteurella multocida	1:400				
Pseudomonas aeruginosa	1:100				
Salmonella enteritidis	1:200				
Staphylococcus aureus	1:100				
Streptococcus suis	1:200				
Mycobacterium avium	1:200	EN 14204	10	5	Low
Enterococcus hirae	1:100	EN 14349	10	30	High
	1:250				Low
Pseudomonas aeruginosa	1:200				High
	1:300				Low
Staphylococcus aureus	1:100				High
	1:250				Low
Enterococcus hirae	1:100	EN 16437	10	180	3g/l bovine serum
Pseudomonas aeruginosa	1:100			60	
Staphylococcus aureus	1:100			240	
FIELD ISOLATES					
Actinobacillus pleuropneumoniae (App)	1:800	EN 1656	10	30	High
Bordetella bronchiseptica	1:200				
Brachyspira hyodysenteriae	1:200				
Haemophilus parasius (Hps)	1:100				
Pasteurella multocida	1:400				
Staphylococcus hyicus	1:100				
Streptococcus suis	1:400				

VIRUS TEST PROFILE					
VIRUS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
PRRS Virus	1:200	In-house	Room Temp	30	None
African Swine Fever virus	1:200	In-house	20	30	Organic
Porcine Circovirus Type 2	1:100*	In-house	10	30	Organic
PED Virus	1:200	In-house	4	60	None
PED Virus	1:200	In-house	25	15	None
TGE Virus	1:50	In-house	Not Recorded	Not Recorded	Not Recorded
Suid herpesvirus (Aujesky's)	1:200	EN 14675	10	30	Low
Foot and Mouth Disease virus 0l British field strain 1860/UK167	1:550	DEFRA	4	30	1% Foetal bovine serum
Swine Vesicular Disease Virus	1:100		4	30	None
Porcine rotavirus	1:100	In-house	Room Temp	30	None

* V18 passed the virucidal effectiveness test according to the US EPA regulatory agencies as a greater than 3 log (10) reduction demonstrated.

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SUMMARY OF TEST RESULTS AGAINST HUMAN PATHOGENS

BACTERIAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Escherichia coli	1:100	EN 1656	10	30	High
Pseudomonas aeruginosa	1:100				
Salmonella enteritidis	1:200				
Salmonella typhimurium	1:200				
Shigella sonnei	1:100				
Staphylococcus aureus	1:100				
Streptococcus pyogenes	1:200				
Pseudomonas aeruginosa	1:200	EN 14349	10	30	High
	1:300				Low
Staphylococcus aureus	1:100				High
	1:250				Low

SUMMARY OF TEST RESULTS AGAINST PATHOGENIC FUNGI

FUNGICIDAL TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOILING LEVEL**
Candida albicans	1:50	EN 1657	10	30	High
Fusarium oxysporum f.sp. cubense	1:100		20		

THE EFFECT OF CONTACT TIME AND TEMPERATURE ON BACTERICIDAL ACTIVITY

EN 1656 was carried out with 5 and 30 minute contact times, at a standard 10°C temperature and at 20°C and 30°C to determine the effect on the bactericidal dilution with a range of bacteria.

BACTERIA	TEST TEMPERATURE (°C)			
	TIME	10°C	20°C	30°C
Entercoccus hirae	5 Minutes	1:25	1:50	1:50
	30 Minutes	1:100	1:100	1:100
Escherichia coli	5 Minutes	1:50	1:100	1:100
	30 Minutes	1:100	1:100	1:100
Proteus hauseri	5 Minutes	1:200	1:100*	1:200
	30 Minutes	1:200	1:200	1:200
Pseudomonas aeruginosa	5 Minutes	1:100	1:100	1:100
	30 Minutes	1:100	1:100	1:100
Salmonella enterica	5 Minutes	1:100	1:100	1:100
	30 Minutes	1:200*	1:100	1:100
Staphylococcus aureus	5 Minutes	1:25	1:25	1:25
	30 Minutes	1:100	1:100	1:100

The results indicate that the bactericidal dilution of V18 increases when the temperature is increased from 10°C to 20°C, when tested with a contact time of 5 minutes and only *Enterococcus hirae* and *Escherichia coli*. A further increase to 30C had no additional effect.

The results indicate that the bactericidal dilution of V18 is not affected by temperature when tested with a contact time of 30 minutes.

V18 would need to be used at considerably higher concentrations if the contact time is reduced from 30 minutes to 5 minutes (based on the most resistant bacteria tested)

*Two unexpected results were obtained but are not considered to be significant.

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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.

There are two types of laboratory test methods for livestock disinfectants, suspension and surface methods. Surface methods use different carriers depending on the application area. The inoculum is dried on the surface before testing. As a minimum for general hygiene purposes, products should be effective against bacteria and yeast. 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 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.

The interfering substances used in EN test methods are described as low or high level soiling for disinfectants and as pre and post milking for teat disinfectants in veterinary test methods. They simulate levels of soiling encountered in practical, real-life situations.

EN TEST METHODS

TEST REFERENCE		TEST TYPE	ORGANISM	TEST PASS CRITERIA
EN 1656	For bactericidal activity.	Suspension	Bacteria	≥5 log reduction
EN 1657	For fungicidal and/or yeasticidal activity.	Suspension	Fungi/Yeast	≥4 log reduction
EN 14204	For mycobacterial activity.	Suspension	Mycobacteria	≥4 log reduction
EN 14349	For bacterial activity on stainless steel carriers.	Surface	Bacteria	≥4 log reduction
EN 14675	For virucidal activity.	Suspension	Virus	≥4 log reduction
EN 16437	For bacterial activity on wood carriers.	Surface	Bacteria	≥4 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 centimetre 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 numbers 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%