Evans Vanodine International
GLOBAL HYGIENE SOLUTIONS

MICROBIOLOGICAL PROFILE

Est-eem®

Cleaner sanitiser

Edition 8: March 2021

EST-EEM MICROBIOLOGICAL PROFILE

INTRODUCTION

EST-EEM is a concentrated quaternary ammonium based cleaner and multi-surface disinfectant.

EST-EEM is bactericidal and yeasticidal. It is also effective against enveloped viruses including coronavirus.

EST-EEM is unperfumed and can be used in the food industry, as well as nursing homes and schools.

EST-EEM is suitable for use on work tops, chopping boards, tables, refrigerators, kitchen equipment and all washable hard surfaces.

Unperfumed	**Applied using ready-to-use spray bottles**	**Non-tainting and non-staining**
Proven to kill a wide range of bacteria, viruses and yeast		**Non-corrosive to surfaces**

EST-EEM - EFFICACY SUMMARY

EST-EEM 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 yeast.

The UKAS accredited Microbiology Laboratory at Evans Vanodine International PLC. (Testing number 1108) performed tests with bacteria and yeast. In addition, Virus tests EN 14476 and EN 16777 have been performed by an independent expert laboratory.

*EN - European Norm

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

EST-EEM MICROBIOLOGICAL PROFILE

ACTIVITY AGAINST BACTERIA

BACTERIA TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOIL LEVEL**
Campylobacter jejunii	1:200	EN 1276	20	5	Dirty
Enterococcus hirae	1:200			30 Seconds	Dirty
	1:400			5	Dirty
	1:200			5	Clean
Escherichia coli	1:25			30 Seconds	Dirty
	1:50			5	Dirty
	1:100			5	Clean
Escherichia coli "0157"	1:50			5	Dirty
Listeria monocytogenes	1:200			5	Dirty
Methicillin resistant Staphylococcus aureus	1:100			5	Dirty
Pseudomonas aeruginosa	1:25			30 Seconds	Dirty
	1:25			5	Dirty
	1:25			5	Clean
Salmonella pullorum	1:50			5	Dirty
Salmonella typhimurium	1:25			5	Dirty
Shigella sonnei	1:50			5	Dirty
Staphylococcus aureus	1:50			30 Seconds	Dirty
	1:200			5	Dirty
	1:200			5	Clean
Enterococcus hirae	1:100	EN 16615	Room temperature	1	Dirty
Escherichia coli	1:100				
Pseudomonas aeruginosa	1:25				
Staphylococcus aureus	1:100				

ACTIVITY AGAINST YEAST

YEAST TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOIL LEVEL**
Candida albicans	1:25	EN 1650	20	1	Dirty
	1:50	EN 16615	Room temperature	1	Dirty

ACTIVITY AGAINST ENVELOPED VIRUSES

VIRUS TEST PROFILE					
ORGANISMS	**DILUTION**	**TEST METHOD**	**TEMP (°C)**	**CONTACT TIME (MINUTES)**	**SOIL LEVEL**
Vaccinia virus	1:15	EN 14476	20	5	Clean
	1:25	EN 16777	Room temperature	1	Clean
	1:15	EN 16777			Dirty

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 in 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.

There are 3 claims that can be made when virus tests are used, full virucidal activity, limited spectrum virucidal activity and activity against enveloped viruses. The virucidal claim will depend on the viruses tested.

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

All EN test methods define test conditions specific for the areas where disinfectant will be applied.

Contact times in general are between 1 minute and 60 minutes depending on the application of the product. e.g. products to be sprayed and wiped off will have shorter contact times.

The interfering substance used in EN test methods is described as dirty or clean in medical, food, industrial, domestic and institutional areas, They simulate levels of soil encountered in practical and real-life situations.

Generally disinfectant activity improves in warm water, under clean conditions. If the temperature is less than 20°C with dirty conditions a longer contact time may be necessary.

There are two types of laboratory test method for disinfectants i.e. suspension methods and surface methods. They are both quantitative and involve adding a test inoculum (mixture of test organism and interfering substance) adding the disinfectant, sampling at specified times, neutralising the sample and then calculating the number of surviving organisms.

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

EN TEST METHODS

TEST REFERENCE		TEST TYPE	ORGANISM	TEST PASS CRITERIA
EN 1276	For bactericidal activity in the food, industrial, domestic and institutional areas.	Suspension	Bacteria	≥5 log reduction
EN 1650	For fungicidal or yeasticidal activity in the food, industrial, domestic and institutional areas.	Suspension	Fungi	≥4 log reduction
EN 14476	For virucidal activity in the medical area.	Suspension	Virus	≥4 log reduction
EN 16615	For bactericidal and/or yeasticidal activity in the medical area. For products used to disinfect non-porous surfaces with a mechanical action. Modified to use stainless steel carriers, interfering substance and *Escherichia coli* parameters from food, industrial, domestic and institutional areas.	Surface	Bacteria	≥5 log reduction
		Surface	Yeast	≥4 log reduction
EN 16777	For virucidal activity in the medical area. For products used to disinfect non-porous surfaces.	Surface	Virus	≥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 was 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. E.coli (under ideal conditions) multiplies in 15 minutes. If conditions are less than ideal e.g. 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 256 in the same 2 hour period.**

The presence of bacteria does not automatically lead to infection, the vulnerability of the person and the infectious dose (number of bacteria required to cause infection) are vitally important. Susceptible individuals such as the very young, elderly and sick are more at risk from an opportunistic infection. 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	100,00	90%
2	10,000	99%
3	1,000	99.9%
4	100	99.99%
5	10	99.999%-