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Bactericidal activity of GAMA Healthcare Ltd. handrub(Clinell) determined using the European Standard Test method BS EN 1276:1997 against: *Escherichia coli* 8879 (NCIMB); *Enterococcus hirae* 8191 (NCIMB); *Pseudomonas aeruginosa* 10421 (NCIMB) and methicillin-resistant *Staphylococcus aureus* (MRSA) (Oxoid)

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Microbiological Tests

Test Method British/European Standard BS EN 1276:1997

Test Procedures Full details of all the test and control procedures used are given in the Test Method

Disinfectant GAMA Healthcare Ltd Handrub (Clinell)

Interfering Substance (Organic Challenge)

1. Simulated clean conditions:
   0.3 g l^{-1} bovine albumin (final concentration)

2. Simulated dirty conditions:
   3.0 g l^{-1} bovine albumin (final concentration)

Temperature 20 °C (± 1 °C)

Contact Time Tested 1 (± 10 s) minutes

Test Organisms *Escherichia coli* 8879 (NCIMB); *Enterococcus hirae* 8191 (NCIMB); *Pseudomonas aeruginosa* 10421 (NCIMB) and methicillin-resistant *Staphylococcus aureus* (MRSA) (Oxoid)

Culture Medium Tryptone Soya Agar, LabM

Incubation Plates were incubated at 37 °C for 24 - 48 h

Diluent Tryptone Sodium Chloride Solution

Neutraliser "Universal" neutraliser containing polysorbate 80, L-histidine, lecithin and sodium thiosulphate in diluent. Tests were carried out to verify that this neutraliser was satisfactory.

General Method

A standard suspension of test organisms containing 1.5 – 5.0 x 108 cells ml-1 of bacteria was prepared. 1 ml of interfering substance was pipetted into a Universal bottle. 1 ml of test organism suspension was

added, mixed and left for 2 minutes. 8 ml of disinfectant was then added and mixed. After contact time of 1 minute, a 1 ml sample of the reaction mixture was pipetted into 9 ml of neutraliser and left for 5 minutes. A 1 ml sample was pipetted into 2 Petri dishes and mixed with 15 ml of culture medium tempered at 47 °C. After setting the Petri dishes were incubated at 37 °C. Colony forming units were counted after 1-2 days incubation and the fraction of surviving organisms calculated.

Results

Serum concentration.	Contact Time (minutes)	Log_{10} Reduction Achieved
0.3 g l^{-1} (clean)	1	>5[1]
3.0 g l^{-1} (dirty)	1	>5[1]

[1]See full results table page 4

Summary and Conclusion

Tests were carried out according to BS EN 1276:1997

Requirements of this standard

The product, when tested as stipulated under simulated clean conditions (0.3 g l^{-1} bovine albumin) or dirty conditions (3 g l^{-1} bovine albumin) under the required test conditions (20 °C, 1 minute contact, for selected reference strains), shall demonstrate at least a 5 $\log_{10}$ reduction in viable counts.

Interpretation of the Results

GAMA Healthcare Ltd. handrub (Clinell) tested against *Escherichia coli* 8879 (NCIMB); *Enterococcus hirae* 8191 (NCIMB); *Pseudomonas aeruginosa* 10421 (NCIMB) and methicillin-resistant *Staphylococcus aureus* (MRSA) (Oxoid) for a contact time of 1 minutes at 20 °C, under simulated clean and dirty conditions, met the requirements of this Standard.

Test results EN 1276:1997

Referenced Organism	Starting conc. (CFU ml^{-1})	Final conc. (CFU ml^{-1}) clean 0.3 g l^{-1} Albumin bovine	Final conc. (CFU ml^{-1}) dirty 3.0 g l^{-1} Albumin bovine
Escherichia coli 8879 (NCIMB	1.54×10^8 (141,166)[1]	0, 0. Actual 8 $\log_{10}$ reduction	0, 0. Actual 8 $\log_{10}$ reduction
Enterococcus hirae 8191 (NCIMB)	1.89×10^8 (189, 189)[2]	0, 0. Actual 8 $\log_{10}$ reduction	0, 0. Actual 8 $\log_{10}$ reduction
Pseudomonas aeruginosa 10421 (NCIMB)	1.50×10^8 (144, 156)[3]	0, 0. Actual 8 $\log_{10}$ reduction	0, 0. Actual 8 $\log_{10}$ reduction
methicillin-resistant *Staphylococcus aureus* (MRSA) (Oxoid)	7.6×10^8 (79, 73)[4]	0, 0. Actual 8 $\log_{10}$ reduction	0, 0. Actual 8 $\log_{10}$ reduction

CFU ml^{-1} colony forming units (viable count of bacterial colonies, 1 ml sample)
[1] Mean of 10^{-6} dilution
[2] Mean of 10^{-6} dilution
[3] Mean of 10^{-6} dilution
[4] Mean of 10^{-7} dilution