

Quantitative suspension test for the evaluation of bactericidal activity of chemical disinfectants and antiseptics used in food, industrial, domestic and institutional areas (Phase 2 Step 1)

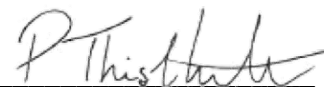
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Scope

The standard method BS EN 1276:2019 describes a suspension test method for establishing whether a chemical disinfectant or antiseptic has or does not have bactericidal activity in the fields described.

The test takes into account practical conditions of application of the product, including contact time, temperature, test organisms and interfering substance, i.e. conditions which may influence its action in practical situations.

The conditions are intended to cover general purposes and to allow reference between laboratories and product types. Each utilization concentration of the chemical disinfectant or antiseptic found by this test corresponds to defined experimental conditions. However, for some applications, the recommendations of use of a product may differ and therefore additional test conditions may need to be used.

Outline of Test Method (Obligatory Test Conditions)

A sample of the test product is diluted in synthetic hard water for products diluted at point of use (or distilled water in the case of ready to use products). A test suspension of bacteria and interfering substance is then added to the dilutions and maintained at 20°C for 1-60 minutes (general purpose disinfection) or 30-60 seconds (hand hygiene products) At the end of the contact time an aliquot is taken, and the bacterial / bacteriostatic activity is immediately neutralised or suppressed by the validated method. The numbers of surviving bacteria in each sample are determined and the reduction is calculated.

The test is performed using *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus* and *Enterococcus hirae* as standard organisms.

Products can only be tested at a concentration of 80 % or less, as some dilution is always produced by adding the test organisms and interfering substance.

Acceptance Criteria

The product when tested as above shall demonstrate at least a 5 log₁₀ (3 log₁₀ hand washes) reduction in viable bacterial counts. The test is deemed valid where all control requirements are met.

UKAS Accreditation

A UKAS accredited testing laboratory No. 4045.

Test information		Deviation
Name of Product	Nanox Anti-Microbial Hand Sanitizer	/
Batch Number & Expiry Date	N/S	
Date of Delivery	14/04/2021	
Period of Analysis	10/05/2021	
Manufacturer / Supplier	Shimyatech Limited	
Storage Conditions	Ambient	
Appearance of the Product	Clear Gel	
Neutraliser	N6	
Neutralisation Method	Dilution	
Product Diluent	Distilled water	
Test Concentrations	Neat (80%), Mid-range (50%), Non active (0.1%)	
Experimental Conditions	Clean	
Interfering Substance	Clean 0.3g/l Bovine Albumin	
Test Temperature	20°C ± 1°C	
Temperature of Incubation	Bacteria – 37°C ±1°C for 24hr to 48hrs	
Identification of the Bacterial Strains:	<i>Pseudomonas aeruginosa</i> NCTC 13359 (ATCC 15442) <i>Staphylococcus aureus</i> NCTC 10788 (ATCC 6538) <i>Enterococcus hirae</i> NCTC 13383 (ATCC 10541) <i>Escherichia coli</i> NCTC 10418 (ATCC 10536)	
Contact Times	1 minute ± 10s	
Stability and Appearance During Test	No Change Observed	

Deviations from Standard Method

There were no deviations from the standard method

Test Result Summary

The test product received has achieved a >5 log reduction against all bacterial test isolates, when tested under the condition stipulated in this report.

See page 2 for acceptance criteria and raw data tables below for complete test results.

Validation and Controls

Validation suspension (N _{v0})				Experimental condition controls (A)				Neutraliser or Filtration Control (B)				Method Validation (C)			
		$\bar{x} =$				$\bar{x} =$				$\bar{x} =$				$\bar{x} =$	
Vc1	Ps.	55	45	Vc1	Ps.	60	56	Vc1	Ps.	68	66	Vc1	Ps.	74	73
	Sa.	34			Sa.	39			Sa.	34			Sa.	33	
	Ec.	35			Ec.	22			Ec.	28			Ec.	32	
	Ent.	30			Ent.	34			Ent.	18			Ent.	28	
Vc2	Ps.	34	32	Vc2	Ps.	51	35	Vc2	Ps.	63	30	Vc2	Ps.	71	33
	Sa.	33			Sa.	34			Sa.	35			Sa.	36	
	Ec.	34			Ec.	35			Ec.	31			Ec.	34	
	Ent.	33			Ent.	36			Ent.	28			Ent.	29	
30 ≤ \bar{x} of N _{v0} ≤ 160?				\bar{x} of A ≥ 0.5 N _{v0}				\bar{x} of B ≥ 0.5 N _{v0}				\bar{x} of C ≥ 0.5 N _{v0}			
Yes				Yes				Yes				Yes			

Test Results

MSL SOLUTION PROVIDERS		Test Procedure at concentrations % (V/V)			
Test Organism	Suspension N	Neat	50	0.1	
<i>Pseudomonas aeruginosa</i> ATCC 15442	10 ⁶ >330 ; >330	10 ⁰ 0 ; 0	10 ⁰ 0 ; 0	10 ⁴ >330 ; >330	
	10 ⁷ 22 ; 22	Na ; < 2.15	Na ; < 2.15	Na ; > 7.52	
	N ₀ : 7.34 Valid	R > 5.20	R > 5.20	R < -0.18	
<i>Escherichia coli</i> ATCC 10536	10 ⁶ 176 ; 196	10 ⁰ 0 ; 0	10 ⁰ 0 ; 0	10 ⁴ 155 ; 156	
	10 ⁷ 15 ; 18	Na ; < 2.15	Na ; < 2.15	Na ; > 7.19	
	N ₀ : 7.27 Valid	R > 5.12	R > 5.12	R 0.07	
<i>Staphylococcus aureus</i> ATCC 6538	10 ⁶ 211 ; 200	10 ⁰ 0 ; 0	10 ⁰ 0 ; 0	10 ⁴ 168 ; 151	
	10 ⁷ 23 ; 17	Na ; < 2.15	Na ; < 2.15	Na ; > 7.20	
	N ₀ : 7.31 Valid	R > 5.17	R > 5.17	R 0.11	
<i>Enterococcus hirae</i> ATCC 10541	10 ⁶ 187 ; 173	10 ⁰ 0 ; 0	10 ⁰ 0 ; 0	10 ⁴ 127 ; 128	
	10 ⁷ 18 ; 17	Na ; < 2.15	Na ; < 2.15	Na ; > 7.11	
	N ₀ : 7.25 Valid	R > 5.11	R > 5.11	R 0.15	

KEY

N_0	Log_{10} number of cfu/ml at the beginning of the contact time = $N/10$
N_{v0}	is the number of cfu/ml in the validation test suspension at the beginning of the contact time
A	is the verification of experimental conditions control
B	is the neutraliser toxicity control
C	is method validation
V_c	is the colony forming units counted per 1ml of sample
\bar{x}	is the average of V_{c1} & V_{c2}
\bar{x}_{wm}	is the weighted mean of N
N_a	Log_{10} number of surviving cfu/ml in the test mixture
R	$(\lg N_0 - \lg N_a = \lg R)$ is the calculation for reduction in viability
$>$	Greater than
\geq	Equal to or greater than
$<$	Less than
\leq	Equal to or less than