



Abbott Analytical



Consulting Scientists to the Disinfectant Industry

Certificate of Analysis

Sample(s): Comparison of GreenGold Concentrate vs Chlorine Tablets
(Sodium hypochlorite)

Received from: Busy Cleaning Ltd, Charter Court, Phoenix Way, Swansea, SA7 9FS

Date received: 16 May 2011 **Date tested:** 1 June 2011

Certificate no: 11E.040-KRvsCT.CLE **Certificate date:** 6 June 2011

Sample ref: 11E/040 **Page:** 1 of 3

Analysis required: EN 1276, Chemical disinfectants and antiseptics -
Quantitative suspension test for the evaluation of
bactericidal activity of chemical disinfectants and
antiseptics used in food, industrial, domestic and
institutional areas - Test method and requirements
(phase 2, step 1)

Product stored at: Room temperature

Active substance: Not declared

Test conditions: Dirty

Interfering substance: 3.0g/l bovine albumin

Product test concentration: GreenGold Concentrate: 20% v/v
Chlorine Tablets: 50ppm & 20ppm

Product diluent used during test: Sterile hard water 300mg/l CaCO₃

Contact time: 5 minutes

Test temperature: 20°C ± 0.5°C

Neutralising solution: GreenGold Concentrate:
30g/l polysorbate 80, 3g/l lecithin,
1g/l histidine, 1g/l cysteine
Chlorine Tablets:
5% Sodium thiosulpahte

Incubation temperature: 37°C ± 1°C

Identification of bacterial strain(s) used: *Pseudomonas aeruginosa* NCIMB 10421
Staphylococcus aureus NCTC 10788

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Test results: Activity against Pseudomonas aeruginosa

Test Product	Cleanitise Concentrate 20%		Free Chlorine 50ppm		Free Chlorine 20ppm	
	Vc1	Vc2	Vc1	Vc2	Vc1	Vc2
Validation Suspension (N_v)	200	154	200	154	200	154
	$\bar{x} = 177$		$\bar{x} = 177$		$\bar{x} = 177$	
Experimental Control (A)	132	116	128	146	128	146
	$\bar{x} = 124 \geq 0.5N_{v_0}$		$\bar{x} = 137 \geq 0.5N_{v_0}$		$\bar{x} = 137 \geq 0.5N_{v_0}$	
Neutraliser Control (B)	124	148	118	122	118	122
	$\bar{x} = 136 \geq 0.5N_{v_0}$		$\bar{x} = 120 \geq 0.5N_{v_0}$		$\bar{x} = 120 \geq 0.5N_{v_0}$	
Method Validation (C)	138	106	134	106	134	106
	$\bar{x} = 122 \geq 0.5N_{v_0}$		$\bar{x} = 120 \geq 0.5N_{v_0}$		$\bar{x} = 120 \geq 0.5N_{v_0}$	
Test Suspension	10^{-6}	>330	324	>330	324	>330
	10^{-7}	38	29	38	29	38
(N)	$\bar{w} = 3.26 \times 10^8$		$\bar{w} = 3.26 \times 10^8$		$\bar{w} = 3.26 \times 10^8$	
	lg N = 8.51		lg N = 8.51		lg N = 8.51	
(N₀ = 0.1N)	lg N ₀ = 7.51		lg N ₀ = 7.51		lg N ₀ = 7.51	
Results	10^0	<14	<14	<14	27	18
	(Na)	10 \bar{x} < 140		10 \bar{x} < 140		10 \bar{x} = 230
(R)	lg Na < 2.15		lg Na < 2.15		lg Na = 2.36	
Pass: lg R ≥ 5	PASS		PASS		PASS	

Vc = plate count per ml

\bar{x} = average of Vc1 and Vc2

\bar{w} = weighted mean of \bar{x}

R = reduction (lg R = lg N₀ - lg Na)

Conclusion:

This batch of GreenGold Concentrate, when diluted to 20% v/v, is more effective than 20ppm free Chlorine, and as effective as 50ppm free Chlorine, in 5 minutes at 20°C under dirty conditions against the reference organism detailed.

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Test results: Activity against Staphylococcus aureus

Test Product	Cleanitise Concentrate 20%		Free Chlorine 50ppm		Free Chlorine 20ppm	
	Vc1	Vc2	Vc1	Vc2	Vc1	Vc2
Validation Suspension (N_v)	Vc1 164	Vc2 150	Vc1 164	Vc2 150	Vc1 164	Vc2 150
	$\bar{x} = 157$		$\bar{x} = 157$		$\bar{x} = 157$	
Experimental Control (A)	Vc1 134	Vc2 128	Vc1 128	Vc2 146	Vc1 128	Vc2 146
	$\bar{x} = 131 \geq 0.5N_{v0}$		$\bar{x} = 137 \geq 0.5N_{v0}$		$\bar{x} = 137 \geq 0.5N_{v0}$	
Neutraliser Control (B)	Vc1 152	Vc2 116	Vc1 118	Vc2 122	Vc1 118	Vc2 122
	$\bar{x} = 134 \geq 0.5N_{v0}$		$\bar{x} = 120 \geq 0.5N_{v0}$		$\bar{x} = 120 \geq 0.5N_{v0}$	
Method Validation (C)	Vc1 112	Vc2 138	Vc1 134	Vc2 106	Vc1 134	Vc2 106
	$\bar{x} = 125 \geq 0.5N_{v0}$		$\bar{x} = 120 \geq 0.5N_{v0}$		$\bar{x} = 120 \geq 0.5N_{v0}$	
Test Suspension	10^{-6} Vc1 >330	Vc2 328	10^{-6} Vc1 >330	Vc2 328	10^{-6} Vc1 >330	Vc2 328
	10^{-7} Vc1 30	Vc2 41	10^{-7} Vc1 30	Vc2 41	10^{-7} Vc1 30	Vc2 41
(N)	$\bar{w} = 3.33 \times 10^8$		$\bar{w} = 3.33 \times 10^8$		$\bar{w} = 3.33 \times 10^8$	
(N₀ = 0.1N)	lg N = 8.52		lg N = 8.52		lg N = 8.52	
	lg N ₀ = 7.52		lg N ₀ = 7.52		lg N ₀ = 7.52	
Results	10^0 Vc1 <14	Vc2 <14	10^0 Vc1 <14	Vc2 <14	Vc1 15	Vc2 19
	$10\bar{x} < 140$		$10\bar{x} < 140$		$10\bar{x} = 170$	
(Na)	lg Na < 2.15		lg Na < 2.15		lg Na = 2.23	
(R)	lg R > 5.38		lg R > 5.38		lg R = 5.29	
Pass: lg R ≥ 5	PASS		PASS		PASS	

Vc = plate count per ml

\bar{x} = average of Vc1 and Vc2

\bar{w} = weighted mean of \bar{x}

R = reduction (lg R = lg N₀ - lg Na)

Conclusion:

This batch of GreenGold Concentrate, when diluted to 20% v/v, is more effective than 20ppm free Chlorine, and as effective as 50ppm free Chlorine, in 5 minutes at 20°C under dirty conditions against the reference organism detailed.

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