Abbott Analytical

Consulting Scientists to the Disinfectant Industry

Test Report

Product name:	Toucan Eco
Batch or ref no:	
Manufacturer or supplier:	Centrego Ltd The Coach House, Newbury, Frome, BA11 3RG

Sample ref:	18A/071	**Date received:**	23 January 2018
Date tested:	24 January 2018	**Certificate date:**	26 January 2018
Certificate no:	18A.071SB.CEG	**Page:**	1 of 7

Analysis required: EN 13697:2015, Chemical disinfectants and antiseptics – Quantitative non-porous surface test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas – Test method and requirements without mechanical action (phase 2, step 2)

Storage conditions: Room temperature in darkness

Appearance of product (solution): Clear colourless liquid

Active substance(s) and their concentration(s): A solution of Hypochlorous acid generated using a single activation of Centrego's Toucan Electrochemical Activation (ECA) system

Notes

The test results in this report relate only to the sample(s) tested.
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Experimental conditions

Concentration(s) of product tested: Neat as received

Product diluent: N/A

Test organism(s):
Pseudomonas aeruginosa (DSM 939)
Escherichia coli (NCTC 10418)
Staphylococcus aureus (NCTC 10788)
Enterococcus hirae (DSM 3320)

Contact time(s):   1 min ± 5 s

Test temperature: Between 18 °C ± 1 °C and 25 °C ± 1 °C (room temperature)

Test conditions: Clean

Interfering substance: 0.3 g/l bovine albumin

Method: Dilution-neutralisation

Neutralising solution: 30 g/l Polysorbate 80 + 3g /l Lecithin + 1 g/l L-histidine + 1 g/l L-cysteine

Incubation temperature: 36 °C ± 1 °C

Remarks

The standard EN 13697:2015 method requires that clean conditions of 8.5 g/l reconstituted milk should be used for *Pseudomonas aeruginosa*, with 0.3 g/l bovine albumin for the other three obligatory organisms.

However, in line with current ECHA guidance and the requirements of EN 14885:2015, 0.3 g/l bovine albumin was used for all four organisms in this test.

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Conclusion

When tested neat this sample of Toucan Eco meets the requirements of EN 13697:2015 for bactericidal activity in 1 minute at 20 °C, under clean conditions, against the referenced strains of *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus*, and *Enterococcus hirae*.

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Results: *Pseudomonas aeruginosa* (DSM 939)

Validation and controls:

Bacterial test suspension (N)			Neutralizer toxicity control (NC)			Method validation (NT)		
	Vc1	Vc2		Vc1	Vc2		Vc1	Vc2
10^{-6}	232	228	10^{-3}	201	199	10^{-3}	207	204
10^{-7}	27	24	10^{-4}	30	27	10^{-4}	26	29
			10^{-5}	2	1	10^{-5}	2	2

$\bar{x}$(wm) = 5.81 x10^6 lg = 6.76

$\bar{x}$(wm) = 2.08 x10^6 lg = 6.32

$\bar{x}$(wm) = 2.12 x10^6 lg = 6.33

$6.57 \leq lg\ N \leq 7.10$?   ☒ yes ☐ no

$\bar{x}\ (NC) \geq 0.5\ x\ \bar{x}\ (Nc)$?   ☒ yes ☐ no

$\bar{x}\ (NT) \geq 0.5\ x\ \bar{x}\ (Nc)$?   ☒ yes ☐ no

Control of weighted mean counts (N)   Quotient = 9.02 Between 5 and 15 ?   ☒ yes ☐ no

Water control:

Nc	Vc1	Vc2
10^{-3}	197	202
10^{-4}	26	31
10^{-5}	1	4
Ntw	>100	

$\bar{x}$(wm) = 2.07 x10^6

lg Nc = 6.32

lg Nc $\geq$ 6.27 ?   ☒ yes ☐ no

Test:

Product test conc.	Contact time	Diln. step	Vc1	Vc2	Nd = $\bar{x}$(wm) x10 lg Nd =	lg R = (lg Nc – lg Nd)	Status
Neat	1 min	10^{0}	0	0	< 2.15	> 4.17	PASS
		10^{-1}	0	0			
		10^{-2}	0	0			
		Nts	0				

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Results: *Escherichia coli* (NCTC 10418)

Validation and controls:

Bacterial test suspension (N)			Neutralizer toxicity control (NC)			Method validation (NT)		
	Vc1	Vc2		Vc1	Vc2		Vc1	Vc2
10^{-6}	184	196	10^{-3}	186	222	10^{-3}	190	181
10^{-7}	20	22	10^{-4}	23	19	10^{-4}	21	20
			10^{-5}	1	2	10^{-5}	0	3

$\bar{x}$(wm) = 4.80 x10^6	$\bar{x}$(wm) = 2.05 x10^6	$\bar{x}$(wm) = 1.87 x10^6
lg = 6.68	lg = 6.31	lg = 6.27
$6.57 \leq \lg N \leq 7.10$?	$\bar{x}$ (NC) $\geq$ 0.5 x $\bar{x}$ (Nc)?	$\bar{x}$ (NT) $\geq$ 0.5 x $\bar{x}$ (Nc)?
☒ yes ☐ no	☒ yes ☐ no	☒ yes ☐ no

Control of weighted mean counts (N)	Quotient = 9.05	
	Between 5 and 15 ?	☒ yes ☐ no

Water control:

Nc	Vc1	Vc2	$\bar{x}$(wm) = 1.87 x10^6
10^{-3}	190	179	lg Nc = 6.27
10^{-4}	20	22	lg Nc $\geq$ 6.27 ? ☒ yes ☐ no
10^{-5}	3	3	
Ntw	>100		

Test:

Product test conc.	Contact time	Diln. step	Vc1	Vc2	Nd = $\bar{x}$(wm) x10 lg Nd =	lg R = (lg Nc − lg Nd)	Status
Neat	1 min	10^{0}	0	0	< 2.15	> 4.12	PASS
		10^{-1}	0	0			
		10^{-2}	0	0			
		Nts	0				

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Results: *Staphylococcus aureus* **(NCTC 10788)**

Validation and controls:

Bacterial test suspension (N)			Neutralizer toxicity control (NC)			Method validation (NT)		
	Vc1	Vc2		Vc1	Vc2		Vc1	Vc2
10^{-6}	256	218	10^{-3}	230	229	10^{-3}	231	238
10^{-7}	28	32	10^{-4}	28	31	10^{-4}	23	30
			10^{-5}	4	7	10^{-5}	2	5

$\bar{x}$(wm) = 6.07 x10^6 $\bar{x}$(wm) = 2.35 x10^6 $\bar{x}$(wm) = 2.37 x10^6

  lg = 6.78   lg = 6.37   lg = 6.38

$6.57 \leq$ lg $N \leq 7.10$? $\bar{x}$ (NC) $\geq$ 0.5 x $\bar{x}$ (Nc)? $\bar{x}$ (NT) $\geq$ 0.5 x $\bar{x}$ (Nc)?

☒ yes ☐ no   ☒ yes ☐ no   ☒ yes ☐ no

Control of weighted mean counts (N)

Quotient = 7.90

Between 5 and 15 ?   ☒ yes ☐ no

Water control:

Nc	Vc1	Vc2
10^{-3}	240	224
10^{-4}	28	26
10^{-5}	2	4
Ntw	>100	

$\bar{x}$(wm) = 2.35 x10^6

lg Nc = 6.37

lg $Nc \geq 6.27$?   ☒ yes ☐ no

Test:

Product test conc.	Contact time	Diln. step	Vc1	Vc2	$Nd = \bar{x}$(wm) x10 lg Nd =	lg R = (lg Nc − lg Nd)	Status
Neat	1 min	10^0	18	20	2.28	4.09	PASS
		10^{-1}	2	4			
		10^{-2}	0	0			
		Nts	2				

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Results: *Enterococcus hirae* (DSM 3320)

Validation and controls:

Bacterial test suspension (N)			Neutralizer toxicity control (NC)			Method validation (NT)		
	Vc1	Vc2		Vc1	Vc2		Vc1	Vc2
10^{-6}	*280*	*252*	10^{-3}	*253*	*269*	10^{-3}	*266*	*259*
10^{-7}	*26*	*24*	10^{-4}	*30*	*27*	10^{-4}	*28*	*31*
			10^{-5}	*3*	*6*	10^{-5}	*3*	*3*

$\overline{\varkappa}$(wm) = 6.61 x10^{6} lg = 6.82

$\overline{\varkappa}$(wm) = 2.63 x10^{6} lg = 6.42

$\overline{\varkappa}$(wm) = 2.65 x10^{6} lg = 6.42

$6.57 \leq$ lg $N \leq 7.10$?   ☒ *yes* ☐ *no*

$\overline{\varkappa}$ (NC) ≥ 0.5 x $\overline{\varkappa}$ (Nc)?   ☒ *yes* ☐ *no*

$\overline{\varkappa}$ (NT) ≥ 0.5 x $\overline{\varkappa}$ (Nc)?   ☒ *yes* ☐ *no*

Control of weighted mean counts (N)

Quotient = 10.64   Between 5 and 15 ?   ☒ *yes* ☐ *no*

Water control:

Nc	Vc1	Vc2
10^{-3}	*272*	*248*
10^{-4}	*32*	*29*
10^{-5}	*2*	*5*
Ntw	*>100*	

$\overline{\varkappa}$(wm) = 2.64 x10^{6}

lg Nc = 6.42

lg Nc ≥ 6.27 ?   ☒ *yes* ☐ *no*

Test:

Product test conc.	Contact time	Diln. step	Vc1	Vc2	$Nd = \overline{\varkappa}$(wm) x10 lg Nd =	lg R = (lg Nc − lg Nd)	Status
Neat	*1 min*	10^{0}	*27*	*21*	2.38	4.04	*PASS*
		10^{-1}	*4*	*3*			
		10^{-2}	*1*	*0*			
		Nts	*2*				

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