

TEST REPORT

LAB NO. : 2003039/ 1

DATE: 18/09/2020

NAME OF CUSTOMER : M/S. REAL RELIEF
ADDRESS : Essen 26,
6000 Kolding, Denmark
REFERENCE : Letter Ref. dated August 18, 2020
Kind Attention: Torben Holm Larsen
DATE OF RECEIPT : 24/08/2020
DATE OF INITIATION : 24/08/2020
DATE OF COMPLETION : 18/09/2020
SAMPLE DESCRIPTION : Towel Sample labeled as – (Samples attached)

Sr. No.	Description
1.	Super Towel
Untreated lab control	



Name of Test:Determination of Antibacterial activity and efficacy of textile products by JIS L 1902: 2015 - **Quantitative Absorption****Method****ANTIBACTERIAL ACTIVITY****Super Towel**

Test Bacteria	Staphylococcus aureus		Klebsiella pneumoniae	
Strain Number	ATCC 6538		ATCC 4352	
Concentration of inoculums (cfu/ ml)	1.90 x 10 ⁵		2.10 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition < 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.017	0.065	0.017	0.075
Difference of Extremes for three Test specimens (log) (Condition < 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.013	0.000	0.008	0.030
Growth value of F (F = log C ₁ – log C ₀)	+1.504 : (log C ₁ : + 6.51, Log C ₀ :+5.01)		+1.531 : (log C ₁ : +6.54, Log C ₀ :+5.01)	
Growth value of G (G = log T ₁ – log T ₀)	-4.016 : (log T ₁ : +<1.00 Log T ₀ :+5.01)		-2.559 : (log T ₁ : +2.46, Log T ₀ :+5.02)	
Antibacterial activity value (A = F - G)	>5.52		4.09	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 rs.			

Super Towel

Test Bacteria	Vibrio cholerae 01		Shigella flexneri	
Strain Number	MTCC 3904		ATCC 9199	
Concentration of inoculums (cfu/ ml)	2.00 x 10 ⁵		1.80 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition< 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.008	0.088	0.016	0.125
Difference of Extremes for three Test specimens (log) (Condition< 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.016	0.301	0.029	0.000
Growth value of F (F= log C ₁ – log C ₀)	+1.502 : (logC ₁ : + 6.52, Log C ₀ :+5.02)		+1.531 : (logC ₁ : +6.55, Log C ₀ :+5.02)	
Growth value of G (G= log T ₁ – log T ₀)	-2.548 : (logT ₁ : +2.47 Log T ₀ :+5.02)		-4.021 : (logT ₁ : +<1, Log T ₀ :+5.02)	
Antibacterial activity value (A= F - G)	4.05		>5.55	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 hrs.			

Super Towel

Test Bacteria	Salmonella typhi		Streptococcus faecalis	
Strain Number	ATCC 10749		ATCC 9790	
Concentration of inoculums (cfu/ ml)	1.70 x 10 ⁵		1.60 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition< 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.029	0.053	0.029	0.048
Difference of Extremes for three Test specimens (log) (Condition< 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.029	0.089	0.008	0.079
Growth value of F (F= log C ₁ – log C ₀)	+1.494 : (logC ₁ : + 6.51, Log C ₀ :+5.01)		+1.536 : (logC ₁ : +6.55, Log C ₀ :+5.01)	
Growth value of G (G= log T ₁ – log T ₀)	-0.640 : (logT ₁ : +4.38, Log T ₀ :+5.02)		-0.586 : (logT ₁ : +4.43, Log T ₀ :+5.01)	
Antibacterial activity value (A= F - G)	2.13		2.12	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 hrs.			

Super Towel

Test Bacteria	Enterococcus faecalis		Escherichia coli	
Strain Number	NCIM 5443		ATCC 25922	
Concentration of inoculums (cfu/ ml)	1.50 x 10 ⁵		2.00 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition < 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.029	0.053	0.021	0.040
Difference of Extremes for three Test specimens (log) (Condition < 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.029	0.089	0.017	0.036
Growth value of F (F= log C ₁ – log C ₀)	+1.495 : (logC ₁ : + 6.50, Log C ₀ :+5.01)		+1.494 : (logC ₁ : +6.51, Log C ₀ :+5.01)	
Growth value of G (G= log T ₁ – log T ₀)	-0.640 : (logT ₁ : +4.38, Log T ₀ :+5.02)		-1.849 : (logT ₁ : +3.16 Log T ₀ :+5.01)	
Antibacterial activity value (A= F - G)	2.13		3.34	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 hrs.			

Super Towel

Test Bacteria	Pseudomonas aeruginosa		Meticillin Resistant Staphylococcus aureus	
Strain Number	ATCC 9027		ATCC 43300	
Concentration of inoculums (cfu/ ml)	1.90 x 10 ⁵		1.60 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition < 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.013	0.054	0.017	0.054
Difference of Extremes for three Test specimens (log) (Condition < 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.013	0.089	0.012	0.097
Growth value of F (F= log C ₁ – log C ₀)	+1.528 : (logC ₁ : + 6.54, Log C ₀ :+5.01)		+1.512 : (logC ₁ : +6.53, Log C ₀ :+5.02)	
Growth value of G (G= log T ₁ – log T ₀)	-0.629: (logT ₁ : +4.38, Log T ₀ :+5.01)		-1.771 : (logT ₁ : +3.25 Log T ₀ :+5.02)	
Antibacterial activity value (A= F - G)	2.15		3.28	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 hrs.			

Super Towel

Test Bacteria	Clostridium sporogenes	
Strain Number	AATCC 19404	
Concentration of inoculums (cfu/ ml)	2.00 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition< 1)	Immediately after inoculation	Immediately after incubation
	0.016	0.088
Difference of Extremes for three Test specimens (log) (Condition< 2)	Immediately after inoculation	Immediately after incubation
	0.012	0.079
Growth value of F (F= log C ₁ – log C ₀)	+1.502 : (logC ₁ : + 6.52, Log C ₀ :+5.02)	
Growth value of G (G= log T ₁ – log T ₀)	-0.985: (logT ₁ : +4.05, Log T ₀ :+5.02)	
Antibacterial activity value (A= F - G)	2.48	
Measuring Method	Plate Count Method	
Type of Sample Material	Towel Sample	
Sterilisation Method	Autoclave	
Incubation Time	20 rs.	

Super Towel

Test Fungus	Aspergillus niger		Aspergillus brasiliensis	
Strain Number	ATCC 6275		ATCC 16404	
Concentration of inoculums (cfu/ ml)	1.60 x 10 ⁵		1.50 x 10 ⁵	
Difference of Extremes for three control specimens Untreated lab control (log) (Condition< 1)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.020	0.040	0.033	0.014
Difference of Extremes for three Test specimens (log) (Condition< 2)	Immediately after inoculation	Immediately after incubation	Immediately after inoculation	Immediately after incubation
	0.008	0.062	0.008	0.114
Growth value of F (F= log C ₁ – log C ₀)	+1.484 : (logC ₁ : + 6.50, Log C ₀ :+5.02)		+1.488 : (logC ₁ : +6.50, Log C ₀ :+5.01)	
Growth value of G (G= log T ₁ – log T ₀)	-0.871 : (logT ₁ : +4.14, Log T ₀ :+5.01)		-1.950 : (logT ₁ : +3.06, Log T ₀ :+5.01)	
Antifungal activity value (A= F - G)	2.35		3.43	
Measuring Method	Plate Count Method			
Type of Sample Material	Towel Sample			
Sterilisation Method	Autoclave			
Incubation Time	20 hrs.			

Antibacterial Efficacy:

Antibacterial Value A	Antibacterial Efficacy
2.0 ≤ A < 3.0	Effect
A ≥ 3.0	Full effect

COMMENT:

When tested as specified, Towel labeled as **Super Towel** has shown **Effective Antibacterial Efficacy** by Quantitative Assessment of activity by **JIS L 1902: 2015 Test Method**.

For BIOTECH TESTING SERVICES

Dr Shilpa U. Nair
Quality Manager
(Authorized Signatory)