

BACTOSTAT®

百图斯达®

Bacteria Repellent Polymers

斥菌防霉塑料

龍海化工有限公司

DragonChem Limited

BACTOSTAT® 百图斯达® 斥菌防霉塑料



在我们日常家居生活、公共设施中, 不少病菌威胁着我们的健康。

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根据世界卫生组织官方数据估算，在21世纪，每年全球因交叉感染影响的人数高达5千多万。2013年在中国医院受医疗感染人数达到400万人，同年因医院感染增加的费用有90亿元~150亿元。



DISINFECTANT OR ANTISEPTIC?

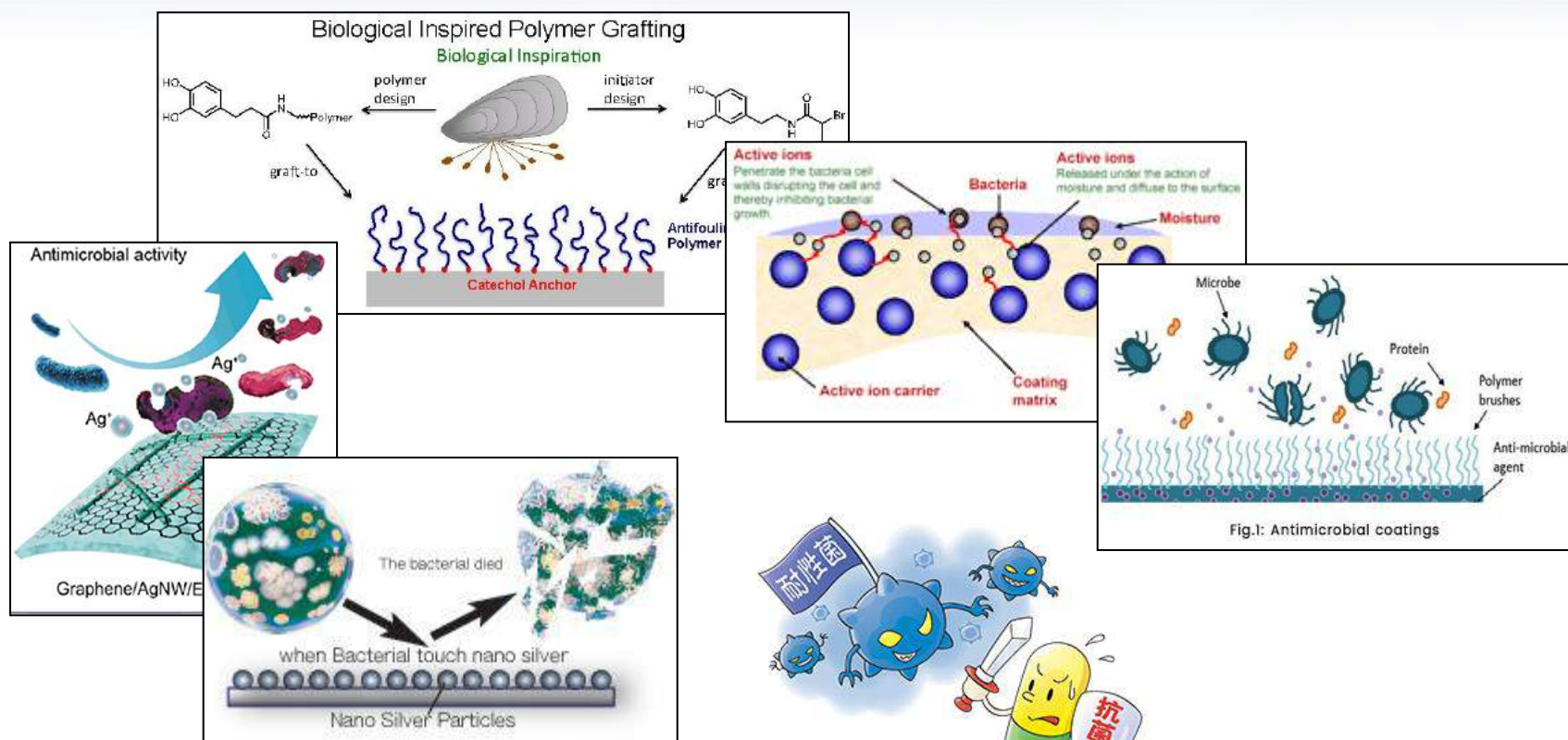


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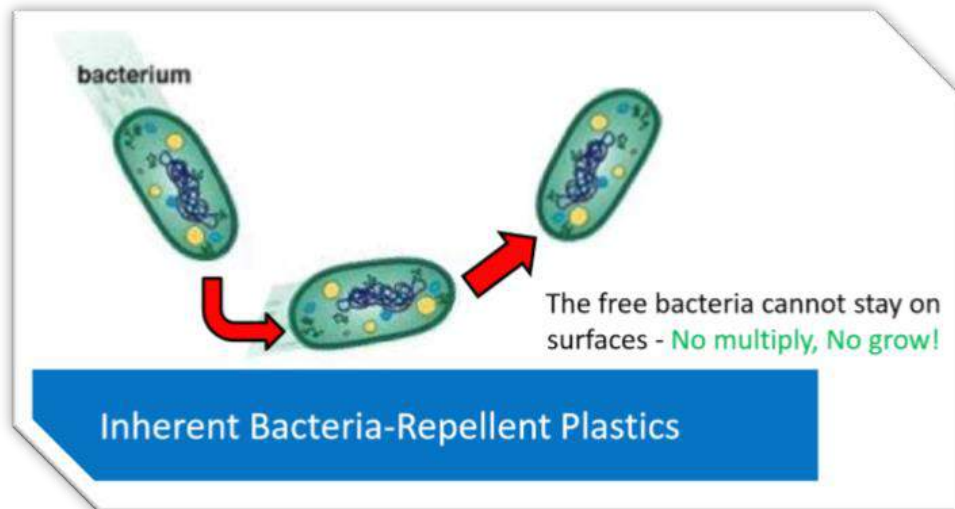
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长期以来, 人类为预防各种疾病的传染和产生推出了林林种种抗菌解决方案,



BACTOSTAT® 百图斯达™ 斥菌防霉塑料

BACTOSTAT® 百图斯达® 斥菌防霉塑料也应运而生, 与其它传统抗菌塑料技术不同的是, BACTOSTAT® 百图斯达® 通过特有的物理和化学方法改变塑料原料分子结构, 使游离细菌难以附着在塑料制品表面并形成菌落, 有效抑制细菌滋生传播。



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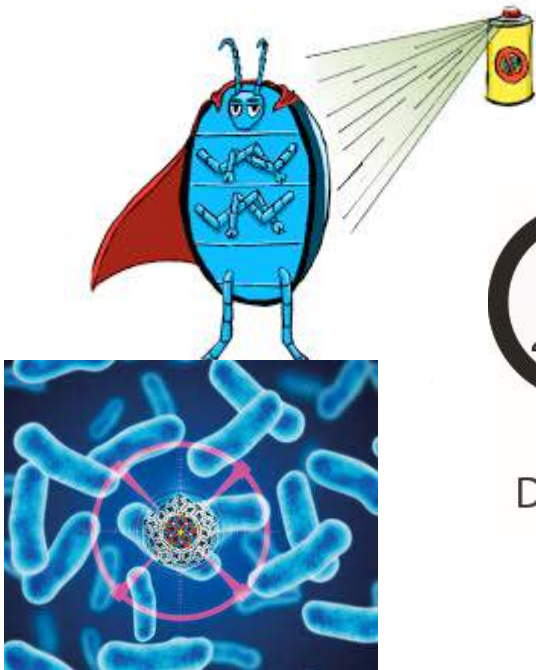
BACTOSTAT® 百图斯达®斥菌防霉塑料具有无毒、对人类和大自然生物以及环境无害的优点, 更没有生物杀伤剂以及可能影响人类和动物健康的纳米微粒、金属化合物、有机物。



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BACTOSTAT® 百图斯达® 技术不会产生超级细菌，没有析出，没有涂层，具有高达99.89%斥菌率*以及99.95%病毒活性抑制率** (*ISO22196 Repellent Test on S.Aureus, **ISO21702 on H3N2)



Durable



Exclusive Design



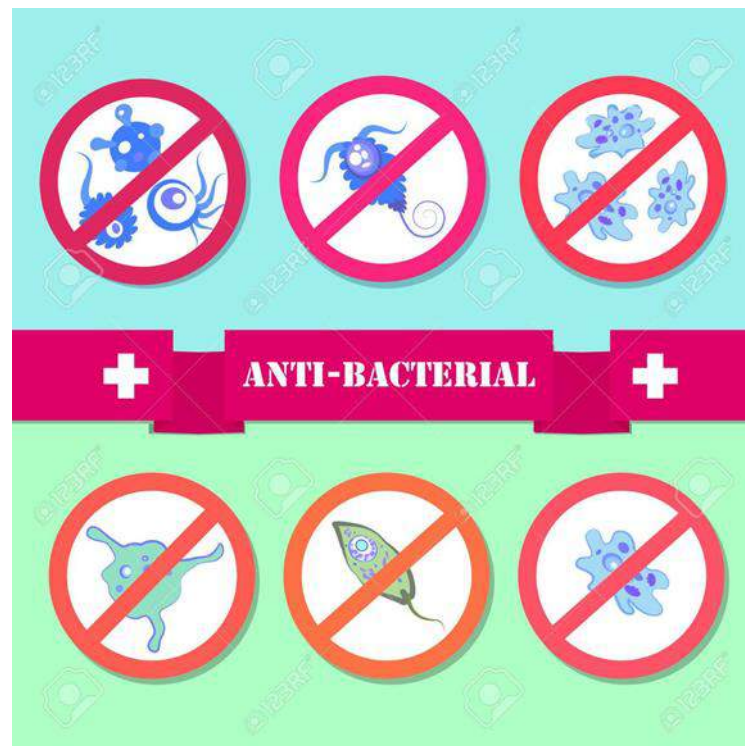
Recyclable



Easy to Use

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BACTOSTAT® 百图斯达® 斥菌防霉塑料符合多国食品接触安全和环保条例, 测试证明: 多种细菌、霉菌在BACTOSTAT® 斥菌防霉塑料制品表面的生长率趋向于零。



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抗菌技術比較

比较项目	BACTOSTAT®技术	一般纳米金属技术
对人类健康有潜在风险	否	是
会产生污染环境问题	否	是
含重金属	否	是
含杀菌剂	否	可能
有涂层脱落风险	否	可能
有纳米粒子	否	是
有迁移释出物	否	是
食物接触安全	是	不详
造成抗药性超级病菌	否	可能
效力长久不退变	是	否

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抗菌抗病毒效能

产品类别	检测方法	细菌病毒种类	斥菌/抗病毒活性率	检测机构
Random PP	ISO212702	甲型流感病毒(H3N2)	99.95%	Gmicro
Random PP	ISO22196 Repellent	金黄葡萄球菌(S.Aureus)	98.7%	SGS
Homo PP	ASTM WK66122	大肠杆菌(E.Coli)	98.4%	Intertek
Homo PP	ISO22196 Repellent	金黄葡萄球菌(S.Aureus)	99.9%	AVI
MMBS	ISO22196 Repellent	金黄葡萄球菌(S.Aureus)	98.5%	SGS
MMBS	ISO22196 Repellent	大肠杆菌(E.Coli)	88.1%	SGS
Random PP	ASTM G22 (28天)	金黄葡萄球菌(S.Aureus)	细菌增生级别=1	AVI
SEBS	ASTM G21 (21天)	5种常见霉菌	细菌增生级别=0	SGS
Random PP	ISO22196	金黄葡萄球菌(S.Aureus)	97.5%	Intertek
Nylon 6	ISO22196	金黄葡萄球菌(S.Aureus)	99.66%	AVI
Nylon 6	ISO22196 Repellent	金黄葡萄球菌(S.Aureus)	82.46%	AVI
ABS	ISO22196 Repellent	金黄葡萄球菌(S.Aureus)	80.0%	AVI

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广东省微生物分析检测中心
GUANGDONG DETECTION CENTER OF MICROBIOLOGY
分析检测报告
REPORT FOR ANALYSIS

报告编号
Report No. 2020FM10480R01D

样品名称
Name of Sample Bactostat PP #CU204172

委托单位
Applicant 龙海化工有限公司
DRAGONCHEM LIMITED

检测类型
Test Type

单位地址: 广东省广州市天河区先烈中路100号大院66号楼
Unit Address: Building 66, No.100 Central Xuan Road, Guangzhou, China

邮政编码: 510070
Postcode:

电话号码: (020)87137666
Tel:

传真号码: (020)87137668
Fax:

网址: www.gdcm.com
Website:



广东省微生物分析检测中心
GUANGDONG DETECTION CENTER OF MICROBIOLOGY
分析检测报告
REPORT FOR ANALYSIS



报告编号 (Report No.): 2020FM10480R01D 校验码 (Verification Code): 02584731

样品名称 Name of Sample	Bactostat PP #CU204172	检测类型 Test Type	委托检测 Entrustment Test
委托单位 Applicant	龙海化工有限公司 DRAGONCHEM LIMITED	地址 Address	香港九龙长沙湾道 912-914 4 信中心 9 字楼 03 室 Unit3, 9/F, Trust Centre, 912-9 Cheung Sha Wan Road, Kowlo Hong Kong
样品来源 Sample Source	委托方送检 Submitted for Testing by the Applicant	样品数量 Sample Quantity	10 片 Ten tablets Submitted
样品规格和批号 Spec and Lot No of Sample	—	样品状态和特性 State and Characteristic	片状 Flaky
接样日期 Sample Received Date	2020-04-17	检测完成日期 Completion Date	2020-05-01
检测依据和方法 Test Standard and Method	参照 ISO 21702:2019 Refer to ISO 21702:2019		
检测项目 Item Tested	病毒灭活试验 Evaluation of Virucidal activity		
检测结论 Test Conclusion	检测结果符合本检测标准的要求。 The test result of the sample(s) is attached to the page(s) of this report.		
备注 Remarks	签发日期: 2020-05-14 Issue Date: 2020-05-14		

制表: 陈颖婷 Editor
审核: 孙廷所 Verifier
批准: 村得 Approver



广东省微生物分析检测中心
GUANGDONG DETECTION CENTER OF MICROBIOLOGY
分析检测结果
ANALYSIS AND TEST RESULT

报告编号 (Report No.): 2020FM10480R01D

1. 作用浓度 Action concentration; 2. 测试结果 Results: 原样 Original

病毒名称 Virus	实验序号 No.	对照样未经抗病毒处理试样接种 24h 后病毒滴度的对数值 The logarithm of infectivity titre value after 24h contacting with the reference specimen (lgTCID ₅₀ /mL)	对照样未经抗病毒处理试样接种 24h 后病毒滴度的对数值 The logarithm of infectivity titre value after 24h contacting with the test specimen (lgTCID ₅₀ /mL)	对照样未经抗病毒处理试样接种 24h 后病毒滴度的对数值 The logarithm of infectivity titre value after 24h contacting with the test specimen (lgTCID ₅₀ /mL)
流感病毒 H3N2	1	6.20	5.50	2.38
MDCK 细胞	2	6.00	5.57	2.29
Influenza A virus H3N2	3	5.90	5.67	2.29
Host cell: MDCK				
lgTCID ₅₀ /mL 平均数 Average		6.03	5.58	2.32
平均病毒总数 Average infectivity titre of virus TCID ₅₀ /mL		1.13 × 10 ⁶	3.85 × 10 ⁵	2.10 × 10 ²
抗病毒活性值 Logarithm of antiviral activity			3.26	
抗病毒活性率 (%) Antiviral activity rate (%)			99.95	

(以下空白 Blank below)

Antiviral Activity Rate of H3N2 at 99.95% under ISO 21702:2019 test

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AVI ADVANCE VI TECH (MALAYSIA) SDN. BHD. (091121-91)
No 12, Solok Raja Lumu, Pandamaran,
42000 Port Klang, Selangor.
Tel : (603) - 3163 1162 Fax : (603) - 3163 1666

LABORATORY TEST REPORT

REPORT DATE : 14-Sept-2018
SUBJECT : Measurement of bacterial repellent and antibacterial activity properties on BACTOSTAT PP RP1034
TESTING METHOD : Modified International Standard ISO 22196 and International Standard ISO 22196
TEST CONDUCTED BY : Malaysia Laboratory

Test Product Sample : BACTOSTAT PP RESIN, GRADE RP1034
Origin of Product : Hong Kong
Product Manufacturer : The Hong Kong Polymer Science Ltd.
Product Distributor : DragonChem Limited

(1) Measurement of bacterial repellent properties on BACTOSTAT PP RP1034

Test Method: Modified International Standard ISO 22196
Incubation temperature: 37°C
Incubation period: 48 hours
Agar medium: Plate Count Agar
Test Culture: *Staphylococcus aureus* , OD value:1.5-1.6
Test Specimen: 60mm in diameter flat circle of treated and untreated samples.
Test Condition: 2ml of bacterial inoculum was added onto surface of the test specimen samples. Bacterial inoculum was 2ml of 10⁸ cfu/ml on surface of the test specimen samples. 2ml of bacterial inoculum was added onto surface of the test specimen samples. Bacterial inoculum was 2ml of 10⁸ cfu/ml on surface of the test specimen samples. Remaining bacteria on surface of the test specimen samples will be transfer to agar plate by using swab method. Growth of bacteria was recorded after another 24 hours.

AVI ADVANCE VI TECH (MALAYSIA) SDN. BHD. (091121-91)
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42000 Port Klang, Selangor.
Tel : (603) - 3163 1162 Fax : (603) - 3163 1666

(1) Test Result :

Sample	RP1034 sample 2		RP1034 sample 1
(A) Untreated *, 0 hrs	7X 10 ⁷	(A) Untreated *, 0 hrs	7X 10 ⁷
Logged means	7.84	Logged means	7.84
(B) Untreated *, 24hrs	5.7 X10 ⁴	(B) Untreated *, 24hrs	5.7 X10 ⁴
Logged means	4.75	Logged means	4.75
(C) Treated 24hrs	6 X10 ¹	(C) Treated 24hrs	2.6 X10 ³
Logged means	1.77	Logged means	2.42
Bacterial Repellency Percentage	99.89%	Bacterial Repellency Percentage	99.54%

REMARKS: OD =1.596

Formula of repellency:
(1-(treated sample's bacteria conc after 24 hrs/untreated sample's bacteria conc after 24hrs) X100%

(2) Test Result :

Sample	U ₀	U _t	A _t	R	%R
RP1034 sample 2	7.84	11.06	8.813	2.25	99.43
RP1034 sample 1	7.84	11.06	10	1.06	91.30

REMARKS: OD =1.596

AVI ADVANCE VI TECH (MALAYSIA) SDN. BHD. (091121-91)
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Tel : (603) - 3163 1162 Fax : (603) - 3163 1666

Formula: $\frac{1-10^R}{10^R} \times 100\%$

Signed and on behalf of AVI Bio-Lab


Lai K

L.K.Moh, Technical Manager

Staphylococcus aureus Bacteria Repellent Rate at 99.89% under ISO22196 repellent test

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For Question Please Contact with SGS
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超微量工業安全實驗室
Ultra Trace Industrial Safety Hygiene

Test Report

REPORT NO.: PUB20B00320



VICTAMAX LLC
Rockville Innovation Centre, 155 Gibbs Street, #556, Rockville, MD 2


The following sample(s) was/were submitted and identified by/on beh:

Sample Name : "BACTOSTAT" MMBS RESIN
Applicant : DRAGONCHEM LIMITED
Address of Applicant : ROOM 03, 9/F, TRUST CENTR
 KOWLOON, HONG KONG
Tel No./Contact Person : (852) 23190918 / Derrick Yip
Packaging Condition : Please refer to the photo for sa
 25 pieces
Storage Condition : Room temperature
Item No. : SB-1643
Lot/Batch No. : 20200620
Manufacturer/Agent/Importer : THE HONGKONG POLYMER I
Date of Manufacturing : Aug,2020
Date of Expiry : 24 months
Date of Sample Received : 2020/11/25
Date of Testing : 2020/11/25 - 2020/12/21

Test Requested: Plastic Sample Garm-repellent I

Test Method : With reference to ISO22196:20 and other non-porous surfaces.


Test Results : -Please refer to next page(s)-



Shin-Jyh Chen, Manager
Signed for and on behalf of
SGS Taiwan Ltd.

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超微量工業安全實驗室
Ultra Trace Industrial Safety Hygiene

Test Report

REPORT NO.: PUB20B00320 Date: 2020/12/21 Page : 3 of 4



VICTAMAX LLC
Rockville Innovation Centre, 155 Gibbs Street, #556, Rockville, MD 20850 USA

Test Results :

Organism	Original Inoculum (CFU/device)	Contact time	Counts of the control at contact time (CFU/device)	Counts of the sample at contact time (CFU/device)	Germ-repellent rate (%)
<i>Escherichia coli</i>	3.1 × 10 ⁷	24 hours	6.1 × 10 ⁴	7.2 × 10 ³	88.1
<i>Staphylococcus aureus subsp. aureus</i>	4.0 × 10 ⁸	24 hours	8.3 × 10 ⁷	1.3 × 10 ⁷	98.5

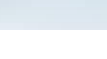
NOTE :

- The test report merely reflects the test results of the consigned matters of the client and is not a certification of the legitimacy of the related products.
- All items in this testing report is based on the request from client and we are responsible for that.
- The content of this report is invalid if it is not presented as the entire report.
- Organism No.:
Escherichia coli BCCRC 11634, ATCC 8739
Staphylococcus aureus subsp. aureus BCCRC 10451; ATCC 6538P

END


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超微量工業安全實驗室
Ultra Trace Industrial Safety Hygiene

REPORT NO.: PUB20B00320 Date: 2020/12/21 Page : 4 of 4



VICTAMAX LLC
Rockville Innovation Centre, 155 Gibbs Street, #556, Rockville, MD 20850 USA

Test Results :

PUB20B00320



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Bacteria Repellent Rate of E.Coli at 88.10% under ISO22196 repellent test

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ADVANCE VI TECH (MALAYSIA) SDN. BHD. (095118-W)
 No 12, Solok Raja Lumu, Pandamaran,
 42000 Port Klang, Selangor.
 Tel : (603) - 3163 1192 Fax : (603) - 3163 1995

LABORATORY TEST REPORT

REPORT DATE : 15-January-2019
 SUBJECT : Standard Practice for Determining Resistance of Plastics to Bacteria
 TESTING METHOD : ATSM G22 Standard Practice for Determining Resistance of Plastics to Bacteria
 TEST CONDUCTED : Malaysia Laboratory

Measurement of bacterial repellent properties on BACTOSTAT PP RP1034

Test Item/Product : BACTOSTAT PP RESIN, GRADE RP1034
 Product Manufacturer : The Hong Kong Polymer Science Ltd.
 Supplier/Distributor : DragonChem Limited
 Test Method: ATSM G22 Standard Practice for Determining Resistance of Plastics to Bacteria
 Incubation temperature: 37°C
 Incubation period: 28 days
 Agar medium: Plate Count Agar
 Test Culture: *Staphylococcus aureus* (S.A), concentration around 3.09×10^8 cells/ml
 OD value: 1.124
 Test Specimen: 60mm in diameter flat circle on treated and untreated samples.
 Test Condition: The sample material was placed in Petri dish. Test bacteria was added on Tryptone Soya Agar.

Signed for on behalf of AVI Bio-Lab

Lai Kuan

Technical Manager



ADVANCE VI TECH (MALAYSIA) SDN. BHD. (095118-W)
 No 12, Solok Raja Lumu, Pandamaran,
 42000 Port Klang, Selangor.
 Tel : (603) - 3163 1192 Fax : (603) - 3163 1995

Evaluation of results:

Observed growth rating on the surface of the test specimen.

Incubation Period	Specimen RP 1034	Growth Rating of Test Specimen	Specimen Random PP	Growth Rating of Test Specimen
Day 0-7	1	0	1	0
	2	0	2	0
Day 7-14	1	1	1	1
	2	1	2	2
Day 14-21	1	1	1	4
	2	1	2	4
Day 21-28	1	1	1	4
	2	1	2	4

- Specimen RP1034 remain the same from day 7 until day 28.
- Specimen Random PP has increasing growth of S.A on surface area from day 7 until day 14 but remain after day 14.

Rating of growth
 0 = No growth
 1 = Trace of growth (less than 10%)
 2 = Light growth (10%-30%)
 3 = Medium growth (30%-60%)
 4 = Heavy growth (60% to complete coverage)

Bacteria Growth Rating of S.Aureus at 1 under ASTM G22 in 28days Test

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Test Report No.T32020240663TC Date: APR 27, 2020 Page 1 of 3

DRAGONCHEM LIMITED
UNIT 03, S/F., TRUST CENTER, 912 - 914 CHEUNG SHA WAN ROAD,
KOWLOON, HONG KONG


The following samples were submitted and identified by/on behalf of the client as:
BACTOSTAT PP RESIN

Style Item No. : RP1034
P.O.U Ref. No. : CU204171
Supplier : CVI
Manufacturer : THE HONG KONG POLYMER SCIENCE LTD
Country of Origin : HONG KONG
Sample Receiving Date : APR 16, 2020
Testing Period : APR 16, 2020 TO APR 27, 2020

Test Requested	Conclusion
US FDA 21 CFR 177.1520 (Olefin Polymers)	-
1) Polypropylene copolymer	-
a) Density	PASS
b) Extractable fraction	PASS
c) Soluble fraction	PASS

***** FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGE(S) *****

Signed for and on behalf of
SGS Hong Kong Ltd.



To Man Wah, Po
Technical Manager

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01000 China 300 300, 33 Building 23F, Phase 1, 188 Science Park Road, New Territories, Hong Kong 41003 2300 HKT 41003 2300 HKT 41003 2300 HKT
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Test Report No.T32020240663TC Date: APR 27, 2020 Page 2 of 3

Test Results:

US FDA 21 CFR 177.1520 (Olefin Polymers)

1) Polypropylene copolymer

a) Density

Method: With reference to 21 CFR 177.1520 d(1) or ASTM D792-2008, determined at 23°C.

Test Item	Result (g/mL)	Permissible Limit (g/mL)
Density at 23°C	0.910	0.85 - 1.00
Comment	PASS	-

Sample Description :
1. Semi-Transparent Plastic (Granule)

Note : g/mL = gram per milliliter

b) Extractable fraction

Method: With reference to 21 CFR 177.1520 (c)-(j) (Sample preparation in n-hexane at 50°C for 2 hours).

Test Item	Result (% w/w)	Reporting Limit (% w/w)	Permissible Limit (% w/w)
Extractable fraction	0.7	0.1	5.5
Comment	PASS	-	-

Sample Description :
1. Semi-Transparent Plastic (Granule)

Note : 1. % w/w = percentage of weight by weight
2. ND = Not Detected
3. °C = degree Celsius

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c) Soluble fraction


Method: With reference to 21 CFR 177.1520 (d)(4)(II), Sample preparation in xylene at 25°C.

Test Item	Result (% w/w)	Reporting Limit (% w/w)	Permissible Limit (% w/w)
Soluble fraction	4.7	0.1	30.0
Comment	PASS	-	-

Sample Description :
Semi-Transparent Plastic (Granule)

Note : 1. % w/w = percentage of weight by weight
2. ND = Not Detected
3. °C = degree Celsius

Sample Photo:



SGS authenticate the photo on original report only

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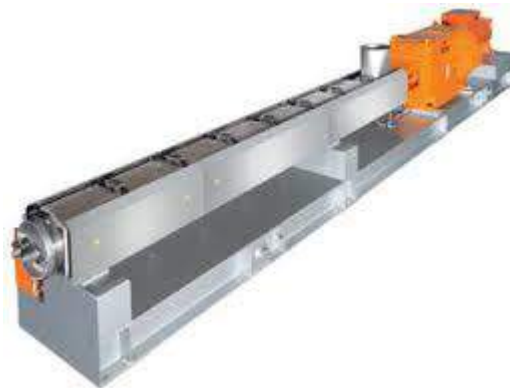
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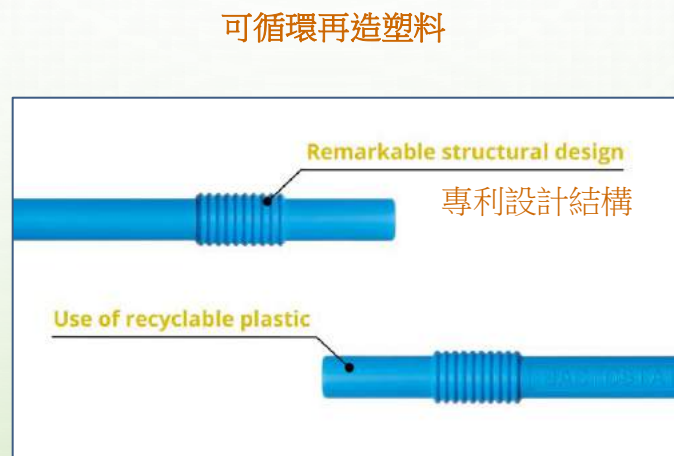
- 長度：230毫米
- 內直徑：(最大)5毫米
- 外直徑：約10毫米
- 材質：BACTOSTAT™ 聚丙烯(PP)
- 使用溫度範圍：-10°C ~ 121°C



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一項估計表明，僅在美國，每天使用 **5 億根** 一次性吸管。

早些時候發表的一項研究估計，多達 **83 億根** 一次性使用塑料吸管污染了世界各地的海灘。每年有 **800 萬噸** 塑料流入海洋，而吸管佔其中的 **0.025%**。

(來源：2019年1月國家地理)

<https://www.nationalgeographic.com/environment/2018/07/news-plastic-drinking-straw-history-ban/>





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優點：	
可重複使用	具有斥菌防霉功能*
可以開合清洗內壁	具有降低病毒活性功能^
可以用蒸氣消毒	食物接觸安全#
可以用洗碗碟機清潔	符合歐盟環保指令
可以回收循環再造	不含雙酚A和納米金屬物質
可以自由搭配變換不同顏色組合	長久耐用

測試方法：*ISO10993-Repellen(金黃色葡萄球菌). ^ISO21702(H3N2流感病毒). #GB4806.7-2016



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比較	EVERCLEAN™ 飲管	一次性塑膠飲管
產品結構	可開合中空管狀產品	密閉中空管狀產品
加工方式	注塑成型	擠出成型
抑菌功能(率)	有 (99.89%)*	沒有
降低病毒活性功能(率)	有 (99.95%)^	沒有
可見內壁潔淨度	可以	不可以
分拆清潔內壁	可以	不可以
具有環保性	是	不是
雙色變化	可以	不可以
洗碗機清潔效果	很好	很差
食物接觸安全GB 4806.7-2016	已通過	不詳

測試方法：*ISO10993-Repellen(金黃色葡萄球菌). ^ISO21702(H3N2流感病毒).



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EVERCLEAN™ Reusable Antimicrobial Drinking Straw Use Guide :



Video
Demo