Nano-Photocatalyst Ceiling Fan

Presenter: Mark Lee

New way for Ceiling Fans

Willie Energy Saving Fan

Modern people often focused on building interior space

80%- 90% of the time in the indoor environment

The place belongs to wet and high temperatures climate patterns

Particularly easy to breed mildew and bacteria

Willie Energy Saving Fan

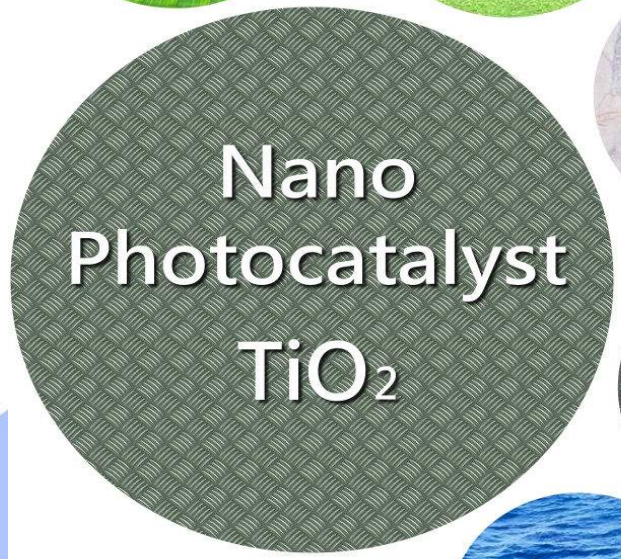
Does indoor air safe?

Willie Nano-Photocatalyst Ceiling fan provide safety air

Energy Saving Fan

T iO_2 Photocatalyst –Applications

Air cleaners, Paint



NOx Decomposition

Deodorization

Dirtiness Prevention

Anti-Bacteria

Water Treatment

Bathrooms, Air cleaners

Tile, glass, Bathroom

Bathroom, Air condition, Medical equipment

Water purifier, Medical equipment

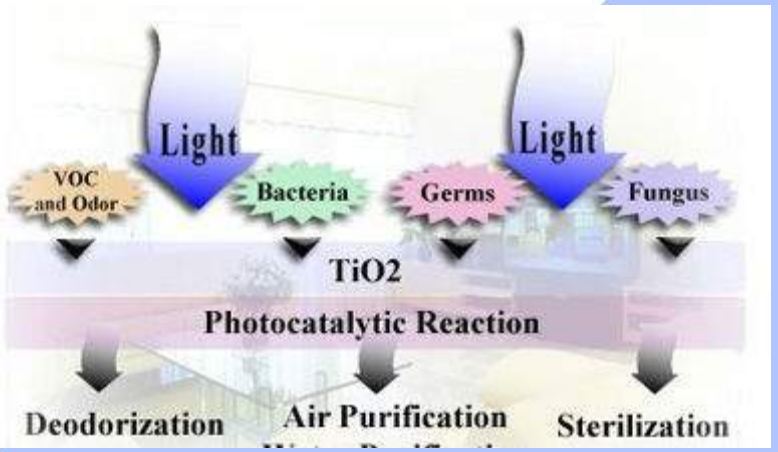
Willie

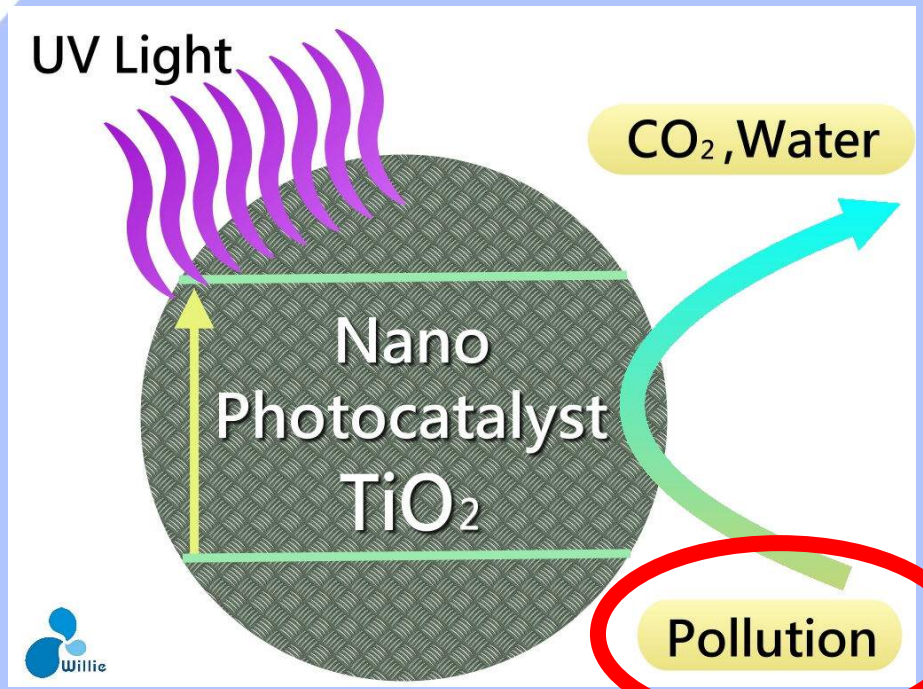
Willie Energy Saving Fan

T iO_2– Action principle

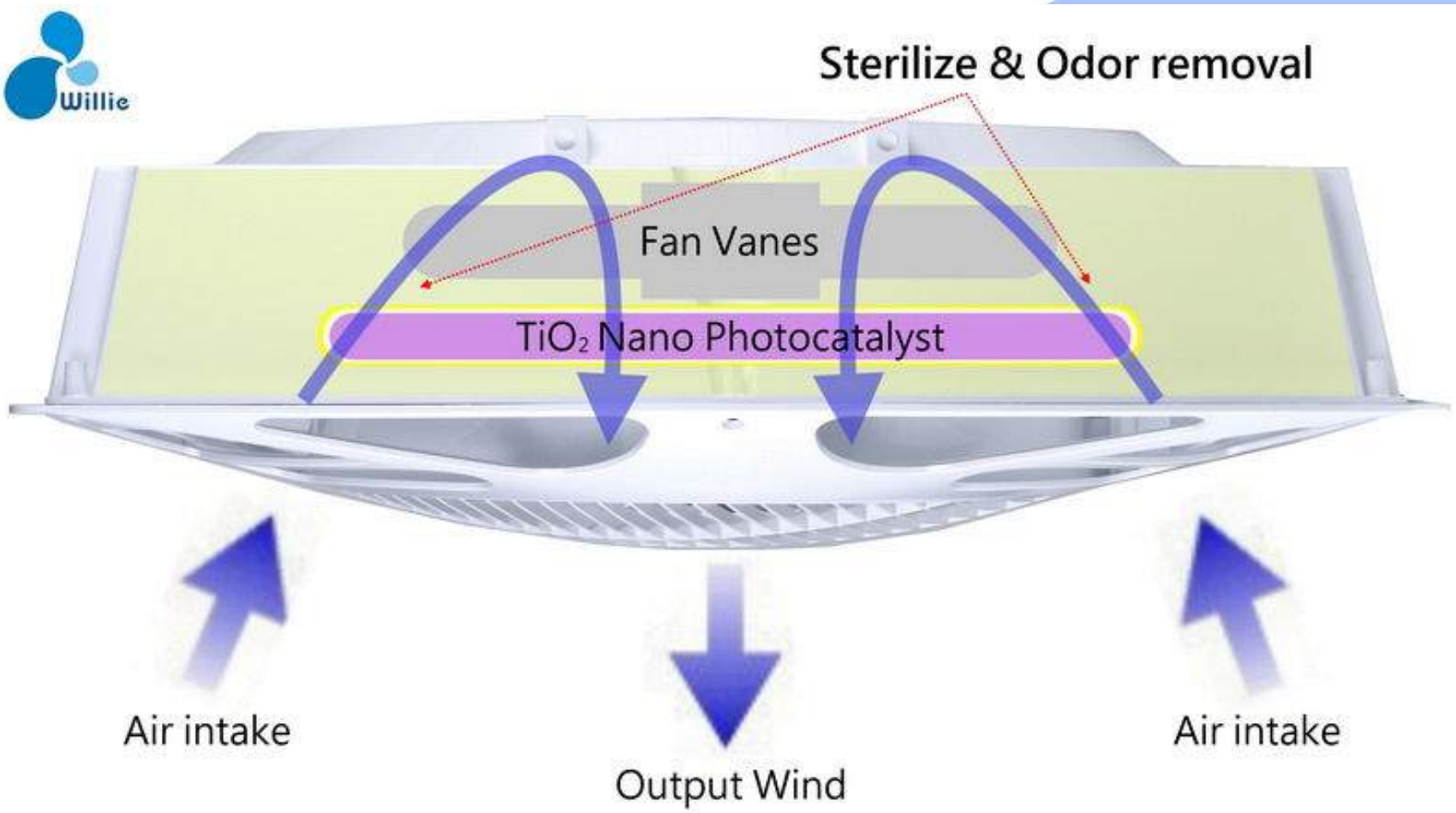
Photocatalyst ：

Light-related catalyst, chemical conversion that uses light conversion to chemical action. For this application, TiO2 is used as the catalyst agent. TiO2 itself is a catalyst with very strong oxidizing capabilities and high stability. As a Photocatalyst, TiO2 has a strong decomposing capability that is more powerful in degrading substances and safer than water treatment chlorine gas, reactive oxygen and ozone.





Air circulation to promote efficiency



TiO2 Certification 1/4

- **USA Microbio Report – Anti Enterovirus 99.99%**

MICROBAC®

MicroBioTest Division

FINAL REPORT: VIRUCIDAL SUSPENSION EFFICACY TEST – Enterovirus
Project No. 852-102

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FINAL REPORT

VIRUCIDAL ~~SUSPENSION~~ EFFICACY TEST
Enterovirus

TEST AGENT
Nanocomposite Material

Author
Zheng Chen, M.S.

Performing Laboratory
MicroBioTest
Division of Microbac Laboratories, Inc.
105 Carpenter Drive
Sterling, Virginia 20164

Laboratory Project Identification Number
852-102

Sponsor
JM Material Technology Inc
O. 5F.-3, No. 40-2, Sec. 1, Minsheng N. Rd.
Guishan Township,Taoyuan County 333
Taiwan (R.O.C.)

Page 1 of 9

RESULTS (continued)

Table 2
Neutralizer Effectiveness/Viral Interference and Cytotoxicity Controls

Dilution of the Neutralized Sample	Neutralizer Effectiveness/Viral Interference Control (with UV-A) [a]	Cytotoxicity with Control (with UV-A) [a]
10^-1	virus detected in 4 out of 4 wells	no cytotoxicity observed
10^-2	virus detected in 4 out of 4 wells	no cytotoxicity observed
10^-3	virus detected in 4 out of 4 wells	no cytotoxicity observed

[a] Sample was processed by Sephacryl column.

Table 3
Reduction Factor

Test Agent	Contact Time	Initial Viral Load ($Log_{10}TCID_{50}$)	Output Viral Load ($Log_{10}TCID_{50}$)	Log_{10} Reduction	Percent Reduction (%)
Nanocomposite Material	20 minutes	5.78	≤ 1.61	≥ 4.17	≥ 99.99

CONCLUSIONS

MicroBioTest personnel performed the inactivation procedure using Enterovirus to spike the test agent solution. Samples were taken and titrated by 50% tissue culture infectious dose ($TCID_{50}$) endpoint assay using LLC-MK2 cells.

Table 3 reports the individual Log_{10} virus reduction factor for the test article treatment procedure. All of the controls met the criteria for a valid test. These conclusions were based on observed data.

Enterovirus

Percent Reduction (%)
≥ 99.99

去除率達99.99%

TiO2 Certification 2/4

- **USA Microbio Report–** **Anti H1N1 Virus 99.99%**

MICROBAC® MicroBioTest Division

FINAL REPORT

VIRUCIDAL SUSPENSION EFFICACY TEST
Influenza A Virus (H1N1)

TEST AGENT
Nanocomposite Material

Author
Zheng Chen, M.S.

Performing Laboratory
MicroBioTest
Division of Microbac Laboratories, Inc.

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Page 1 of 9

MicroBioTest, Division of Microbac Laboratories, Inc.
105 Carpenter Drive | Sterling, VA 20164 | 703.925.0100 p | 703.925.9366 f | www.microbac.com

FINAL REPORT: VIRUCIDAL SUSPENSION EFFICACY TEST – Influenza A Virus (H1N1)
Project No. 852-101

Page 9 of 9

RESULTS (continued)

Table 2
Neutralizer Effectiveness/Viral Interference and Cytotoxicity Controls

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[a] Sample was processed by Sephacryl column.

Influenza A Virus (H1N1)

Table 3
Reduction Factor

Test Agent	Contact Time	Initial Viral Load ($Log_{10}TCID_{50}$)	Output Viral Load ($Log_{10}TCID_{50}$)	Log_{10} Reduction	Percent Reduction (%)
Nanocomposite Material	20 minutes	5.78	≤ 1.61	≥ 4.17	≥ 99.99

Percent Reduction (%)
≥ 99.99

CONCLUSIONS

MicroBioTest personnel performed the inactivation procedure using Influenza A Virus (H1N1) (A/California/04/09) to spike the test agent solution. Samples were taken and titrated by 50% tissue culture infectious dose ($TCID_{50}$) endpoint assay using MDCK cells.

Table 3 reports the individual Log_{10} virus reduction factor for the test article treatment procedure. All of the controls met the criteria for a valid test. These conclusions were based on observed data.

MicroBioTest

去除率達99.99%

TiO2 Certification 3/4

- **SGS Reduce Formaldehyde – Reduce 99%**
  (HCHO)

SGS

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

測 試 報 告

報告編號： UG/2013/60033 日期： 2013年06月27日 頁數 ：1 of 4

以下測試之樣品係由申請廠商所提供及確認：

產品名稱：	奈米光觸媒
申請廠商：	[redacted]
產品型號：	JM-TS001
送樣日期：	2013年06月05日
測試日期：	2013年06月06日
去除率物質：	甲醛
測試方法：	樣品至入 1m³ 測試箱, 並放入待測標準品氣體, 依照客戶指定時間點進行採樣。

測試結果： - 請見下頁 -

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

SGS

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

測 試 報 告

報告編號： UG/2013/60033 日期： 2013年06月27日 頁數 ：2 of 4

測試結果：

對照組

NO.	採樣時間點	分析濃度 (ppm)	自然衰減率 (%)
1	0 小時	20.0	-
2	1 小時	20.0	0.0%
3	5小時	19.0	5.0%
4	9 小時	18.3	8.5%
5	24小時	16.0	20.0%

實驗組

NO.	採樣時間點	分析濃度 (ppm)	去除率 (%)
1	0 小時	20.0	0.00
2	1 小時	11.2	44.0%
3	5小時	3.2	83.2%
4	9 小時	1.6	91.3%
5	24小時	N.D.	>99%

備註：1. 本報告不得分離，分離使用無效。

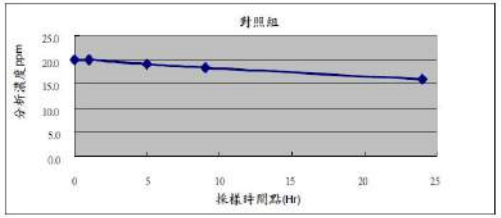
去除率 (%)
0.00
44.0%
83.2%
91.3%
>99%

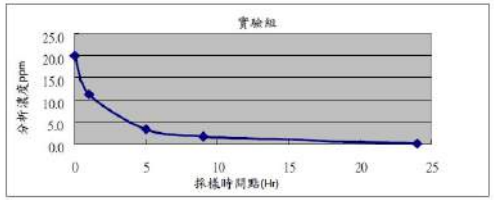
SGS

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

測 試 報 告

報告編號： UG/2013/60033 日期： 2013年06月27日 頁數 ：3 of 4





TiO2 Certification 4/4

- **SGS Reduce TVOC – Reduce 96.4%**

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

測 試 報 告

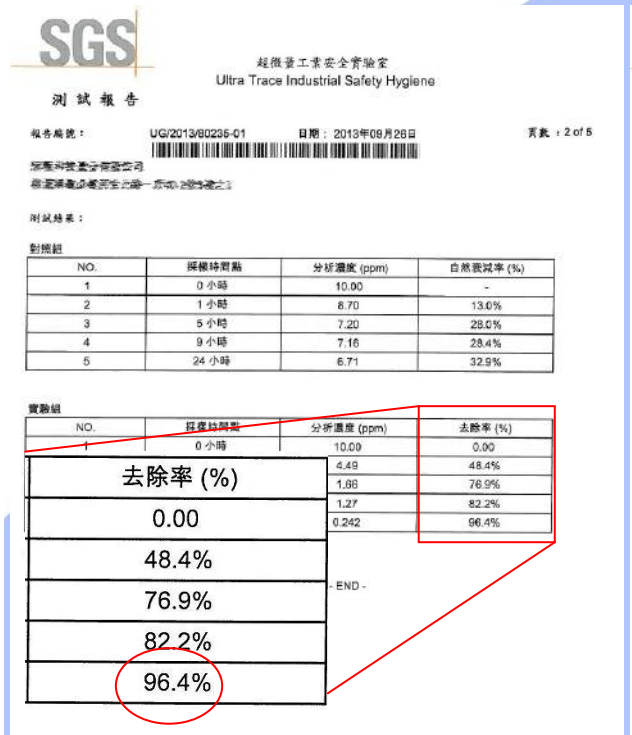
報告編號： UG/2013/80235-01 日期：2013年09月26日 頁數：1 of 5

以下測試之樣品係由申請廠商所提供及確認：

產品名稱：	奈米光觸媒
申請廠商：	[redacted]
產品型號：	JM-TTA01
送樣日期：	2013年08月22日
測試日期：	2013年08月23日
去除率物質：	總揮發性有機化合物 (包含: 苯、甲苯、乙苯、二甲苯(鄰,間,對)、四氯化碳、氯仿、1,2-二氯苯、1,4-二氯苯、二氯甲烷、苯乙烯、四氯乙烯、三氯乙烯)
測試方法：	樣品置入 1m³ 測試箱, 並放入待測標準品氣體, 依照客戶指定時間監測進行採樣。
檢測極限(MDL)：	0.005 ppm

測試結果： - 請見下頁 -

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



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

測 試 報 告

報告編號： UG/2013/80235-01 日期：2013年09月26日 頁數：2 of 5

測試結果：

對照組

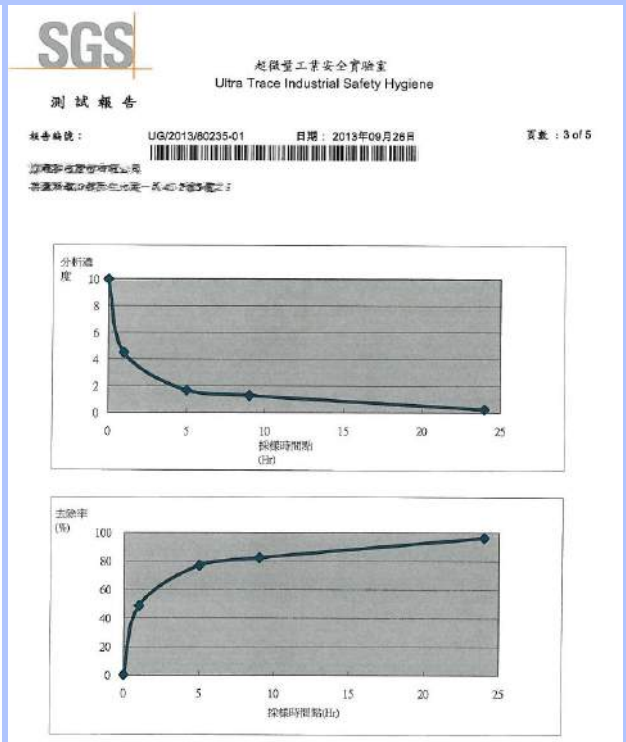
NO.	採樣時間點	分析濃度 (ppm)	自然衰減率 (%)
1	0 小時	10.00	-
2	1 小時	8.70	13.0%
3	5 小時	7.20	28.0%
4	9 小時	7.16	28.4%
5	24 小時	6.71	32.9%

實驗組

NO.	採樣時間點	分析濃度 (ppm)	去除率 (%)
1	0 小時	10.00	0.00
		6.49	48.4%
		1.86	76.9%
		1.27	82.2%
		0.242	96.4%

- END -

去除率 (%)
0.00
48.4%
76.9%
82.2%
96.4%



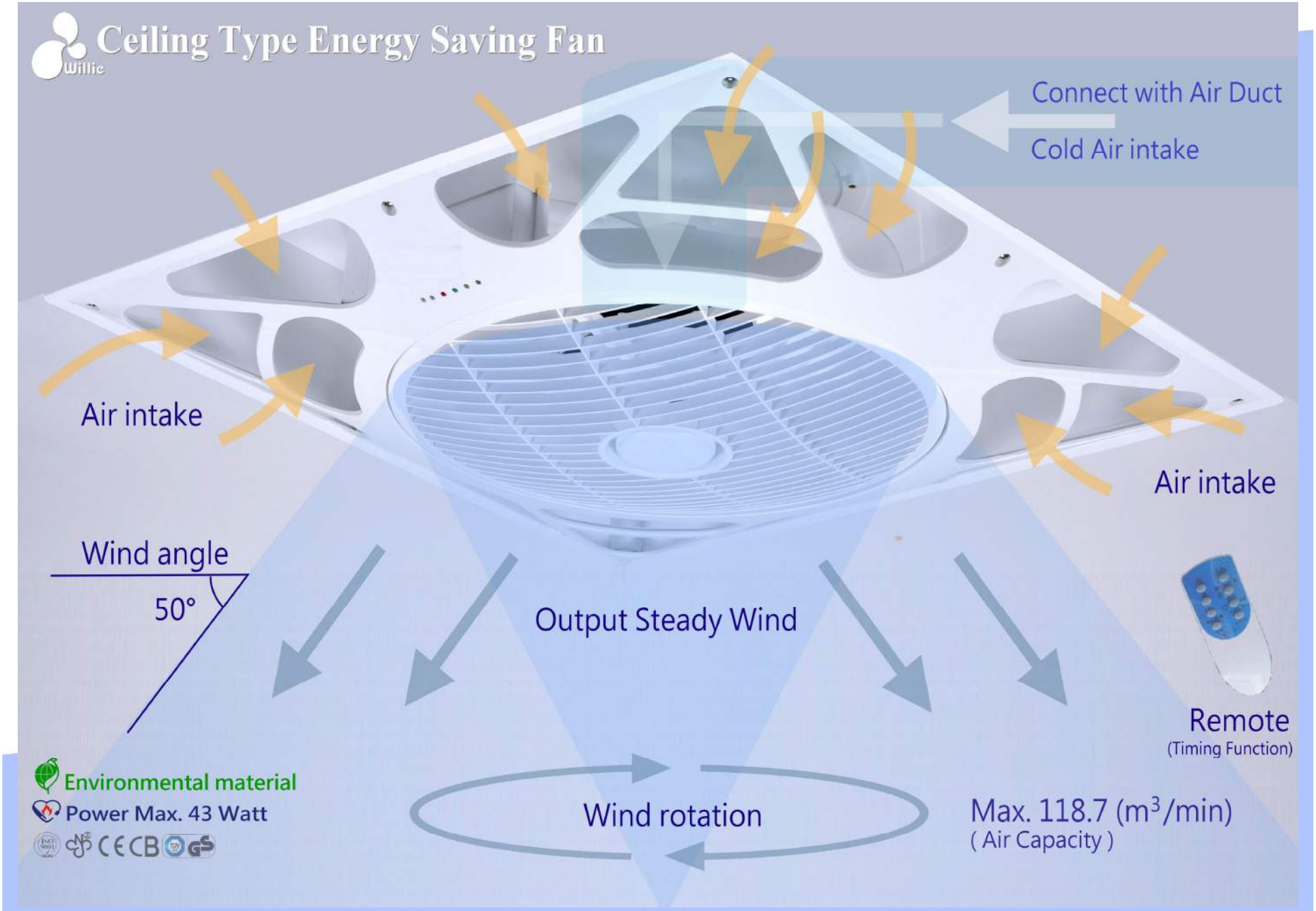
SGS 超微量工業安全實驗室 Ultra Trace Industrial Safety Hygiene

測 試 報 告

報告編號： UG/2013/80235-01 日期：2013年09月26日 頁數：3 of 5

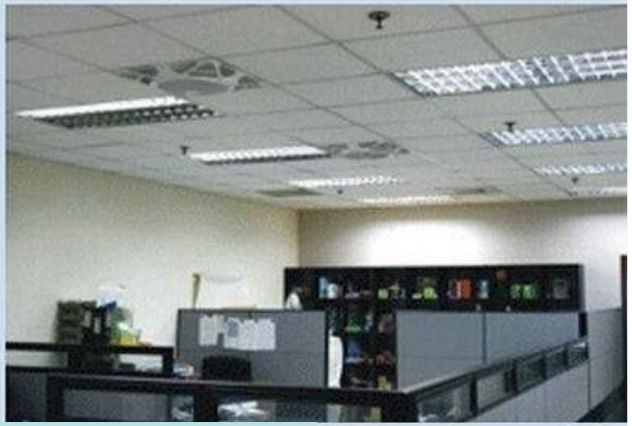
Total Volatile Organic Compounds（TVOC）Comprising benzene, toluene, ethylbenzene, xylene (o, m, on), carbon tetrachloride, chloroform, 1.2 & 1.4-dichlorobenzene, methylene chloride, styrene, tetrachlorethylene, trichlorethylene and other volatile substances.

Ceiling Type Energy Saving Fan

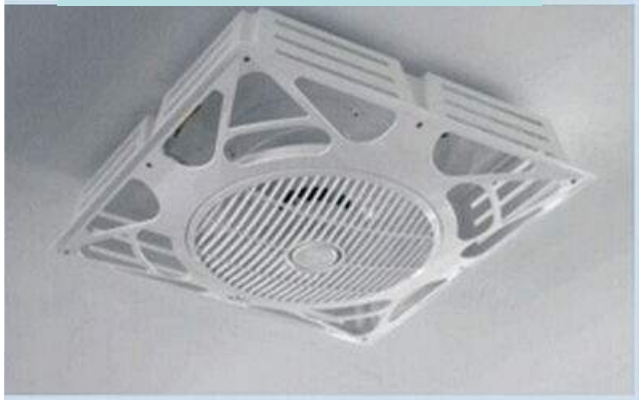


Installation Examples 1/3

【T-bar Ceiling 60x60cm】



【Ceiling Fixed】



Energy Saving Fan

Installation Examples 2/3

Installation Examples 3/3

Applications

Factory

Hospital

Kindergarten

K T V

Classroom

Elderly Care Center

Restaurant

Chain stores

GYM

1F Retail

Hotel

Office

Cinema

Smoking area

Super Market

School

Temple

Home

Nail Store

Printing room

Photocopy shop

Rehabilitation

Metro Station

Toilet

Conference Room

Energy Saving Fan

Thank You for your listening

Hope we can cooperate in near future

Willie Energy Saving Fan