

# AIR-O-FILTER

ENVIRONMENT SYSTEMS, INC.

[www.air-o-filter.com](http://www.air-o-filter.com)



No. 611-6, Fengzhou Rd., Shengang Dist., Taichung City, **Taiwan**

# OUTLINE

- 1. Introduction of AOF company
- 2. Sales and Service Organization
- 3. Introduction of sales and service team
- 4. Concept of environmental protection
- 5. AOF specification
- 6. Examples of installation
- 7. Figures/Videos of efficiency test
- 8. Test report of TTRI (Taiwan Textile Research Institute)
- 9. Description of filtrating materials and HEPA classification

# 1. Introduction of AOF company



AOF company is established in early 2015; it's located in Fong-Zhou Industrial Area of Taichung City, Taiwan.

The main product of AOF company is oil mist collector. AOF's design concepts are: **Environmental protection**  
**Energy Saving**  
**Green Environment",**  
in order to achieve consistent operation.

AOF's enterprise spirits are:

- **Specialization**
- **Quality**
- **Service**
- **Creativity**



## 2. Sales and Service Organization

**There are 6 members in AOF administration**

- Victor Wang is the CEO
- Kees Karsten is the general manager for European market.
- Alpha Wang is the sales director for Taiwan and China regions.
- James Hu is the senior consultant.
- The other 2 persons are both experts in CNC machine and oil mist collectors industry.

# 3. Introduction of sales and service team

- **CEO –Victor Wang:**

Victor Wang established L&W Machine Tools, Inc. in 1995 for manufacturing and selling CNC machine tools, he has the experience in this industries for more than 20 years and started to developed the products of oil mist collectors since 5 years ago.

## **General manager of European market - Kees Karsten**

Kees Karsten established DORMAC CNC SOLUTIONS in 1995 for selling CNC machines and established DORMATEC ENVIRONMENT SYSTEMS in 2010 for selling environmental products.

- **Sales director -Alpha Wang :**

Alpha Wang has been involved in the CNC industry for more than 10 years and well versed on manufacturing/assembling/maintenance of oil mist collectors. Alpha Wang has a team of technicians in Taiwan that will offer immediate support for any after sales service .

- **Senior Consultant –James Hu:**

James Hu is involved in the CNC industry for more than 30 years; he is considered an expert in this industry and become the senior consultant of AOF company.

## 4. Concept of environmental protection

- What are Particulate Matters?
- Where do Particulate Matters come from?
- Particulate Matters do harm to health
- The standards issued by World Health Organization(WHO)
- The standards issued by European Union (EU)

# 4. Environmental Protection Concept

What are Particulate Matters?

## 可吸入懸浮粒子

紡織產業綜合研究所  
Taiwan Textile Research Institute



GRAPHIC 圖表

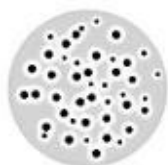
PM<sub>10</sub>：可吸入懸浮粒子，微粒子粒徑在10  $\mu\text{m}$ 以下的懸浮粒子濃度 ( $\mu\text{g}/\text{m}^3$ )

PM<sub>2.5</sub>：可入肺顆粒物，微粒子粒徑在2.5  $\mu\text{m}$ 以下的懸浮粒子濃度 ( $\mu\text{g}/\text{m}^3$ )

### 圖解 PM2.5 致病全過程

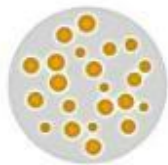
資料來源：sina weibo

北京嚴重空氣污染本週持續，PM2.5 濃度值處極高水平，大部分地區達 700 微克/立方米以上。醫院呼吸器官病例激增。



PM 2.5

大氣中直徑小於或等於 2.5 微米的顆粒物



PM 2.5 ~ 10

大氣中直徑 2.5 微米至 10 微米的顆粒物



PM 10+

大氣中直徑等於或大於 10 微米的顆粒物

直徑小於 2.5 微米的顆粒物可以直接進入支氣管以及肺泡，從而被人體吸收。

被人體吸收的微塵可以損害血紅蛋白的輸送氧能力，使人體喪失血液。並且引發全身各系統疾病



PM 2.5 ~ 10

PM 2.5

PM 2.5

進入肺泡的微塵會迅速被吸收，並且不經過肝臟解毒迅速進入血液循環，遍布全身

資料來源：新浪微博

TTRI  
紡織所

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# 4. Environmental Protection Concept

Where do Particulate Matters come from?

## 霾害之主要發生源

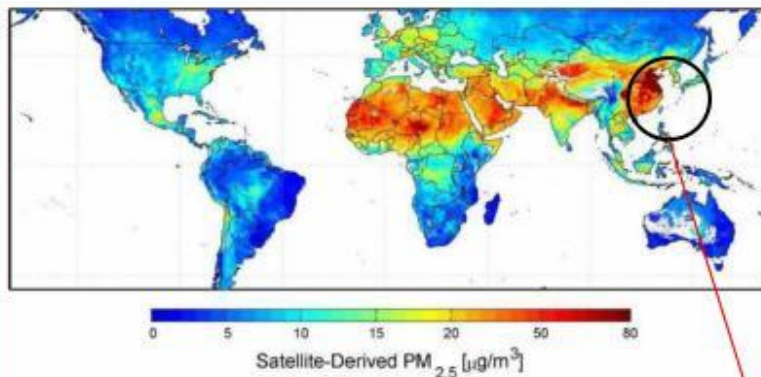
紡織產業綜合研究所  
Taiwan Textile Research Institute



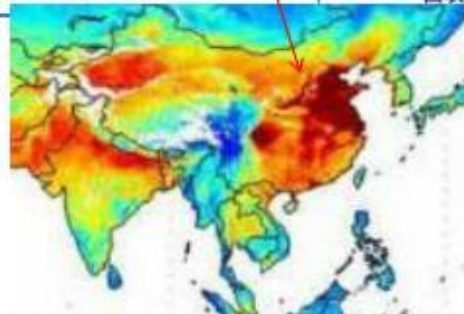
### 全球PM2.5濃度情況

数据来源：世界卫生组织

世界PM2.5浓度情况



資料來源：世界衛生組織



中科院大气物理研究所研究员张仁健课题组与同行合作，对北京地区PM2.5化学组成及源解析季节变化研究发现，北京PM2.5有6个重要来源



圖表：北京霧霾6大主要貢獻源 新華社記者 馮琦 編制



# 4. Environmental Protection Concept

The standards issued by WHO and EU

## 空氣品質標準



資料來源：台灣環保署

空氣品質標準		WHO <sup>1</sup>				歐盟	美國		加拿大	澳洲	日本	南韓	香港	中國大陸		泰國	我國 台灣
		IT-1	IT-2	IT-3	AQG		聯邦	加州						一級	二級		
PM <sub>10</sub> µg/m <sup>3</sup>	年平均值	70	50	30	20	40	-	20	70	-	-	50	55	40	70	50	65
	24小時 平均值	150	100	75	50	50	150	50	120	50	100	100	180	50	150	120	125
PM <sub>2.5</sub> µg/m <sup>3</sup>	年平均值	35	25	15	10	25 <sup>2</sup>	12	12	-	8	15	-	35*	15	35	25	15
	24小時 平均值	75	50	37.5	25	-	35	-	30	25	35	-	75*	35	75	50	35

- PM 2.5懸浮微粒易吸附有毒物質，如戴奧辛、多環芳香烴及重金屬等，長期吸入會引起過敏、氣喘、肺氣腫、肺癌、心血管疾病、肝癌、血液疾病等。
- 濃度每增加10 µg/m<sup>3</sup>的 PM 2.5，會增加8%肺癌死亡率風險、6%的心肺疾病死亡率、4%總死亡率。

超過35µg/m <sup>3</sup> 對人體有害	
濃度 µg/m <sup>3</sup>	空氣品質
1.<15	良好，一年每天的平均濃度不能超過15µg/m <sup>3</sup> (WHO)
2.16-35	中度，一天中PM2.5的濃度最高不能超過35µg/m <sup>3</sup> (WHO)
3.36-65	對敏感體質的人：如老人、小孩、有肺病、心血管等疾病等人的健康有害
4.>65	對所有人體健康都有害

(資料取自世界衛生組織)

# 5. AOF specification –AE-15 series



AIR FILTRATION SYSTEM

## OIL MIST COLLECTORS

油霧回收空氣清淨機

標配型



AE-15 系列

第一道 吸油過濾棉  
第二道 樹脂纖維網

過濾水霧粒子  $\geq 10 \mu\text{m}$

過濾油霧粒子  $\geq 3 \mu\text{m}$

清洗方便，可長期重覆使用



圓型高效能精密水性分離器  
AE-15S (300MM長)

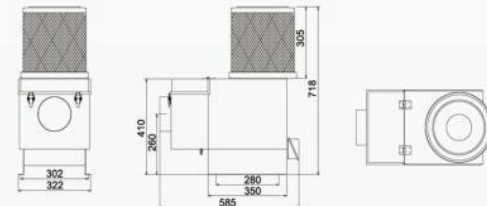
過濾水霧粒子  $\geq 0.5 \mu\text{m}$



圓型高效能精密油風分離器  
AE-15P (350MM長)

過濾油煙粒子  $\geq 0.03 \mu\text{m}$

機器尺寸



MODEL	電源	馬力	風量 (m <sup>3</sup> /min)	噪音值 db(A)	吸入口徑	建議使用空間
AE-15S/P	AC220V 或 380V 3Ø 50/60HZ	0.4KW	15 / 18	70 / 73	Ø148	<10m <sup>3</sup>



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# 5. AOF specification –AE-20 series



**油霧回收 ▶▶▶**  
空氣淨化機  
**OIL MIST**  
AIR CLEANER

AE-20系列



**前置過濾筒**  
獨創70°斜角之飛碟形構造，利用風切原理分離油霧、煙、霾及有毒氣體。

**八方旋葉**  
八方旋葉可吸進懸浮氣體，並利用龍捲風原理，將大顆粒油霧氣聚合成油滴滴落回收。

過濾油氣、水氣、油霧粒子 ≥ 2 μm




**圓型高效能精密水性過濾筒**  
AE-20S (300MM長)  
過濾水霧粒子 ≥ 0.5 μm



**圓型高效能精密油煙過濾筒**  
AE-20P (500MM長)  
過濾油煙粒子 ≥ 0.03 μm

**機器尺寸**



Dimensions: 302, 328, 415.5, 238, 597, 315, 278

型號 MODEL	電源 POWER	馬力 MOTOR	風量(m³/min) 50Hz/60Hz	噪音值db(A) 50Hz/60Hz	吸入口徑	過濾效果空間	重量kg
AE-20S	三相380V/50Hz或220V/60Hz	0.4KW	18 / 21	68 / 72	6"	<10m³	36
AE-20P							39

**AIR FILTRATION SYSTEM**



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AOF-2015-04-2006-0309-2015-12



# 5. AOF specification -AF series

## AOF'S CUTTING-EDGE TECHNOLOGY

### Integrated with Several Patented Technologies

AOF has applied advanced air-purified technology to develop the high performance oil mist air cleaner, which is excellent for filtering oil mist, haze, aerosol and smoke. The oil and air separation design follows the European standard. The oil mist air cleaner integrates many innovative designs and provides the best possible oil mist filtration and collection effect.

### 99%-99.97% Filtrating Efficiency Surpasses European Environmental Protection Standard

AOF oil mist air cleaner features higher air flow rate, greater temperature resistance as well as better acid/alkali resistance. Its filtrating efficiency reaches 99%-99.97%. In addition, an actual environmental protection compliance test indicates that it can achieve E11.E12, surpassing the European standard of F8.F9. It also strengthens the fact that AOF oil mist air cleaner is unique in terms of efficiency and zero pollution.

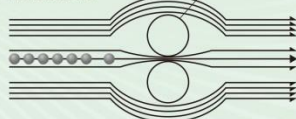
### Pre-Filtering System



Filtering oil mist / water mist particle  $\geq 2 \mu\text{m}$

The innovative flying saucer structure with 70° design applies the wind shear principle to completely separate oil mist, smoke, haze and toxic aerosol.

#### INTERCEPTING FILTRATION



Highly efficient fiber glass



#### 8-blade Disk

The 8-blade disk catches fine particulate matters and works with the tornado principle to condense big particles into oil drops for recycling.

#### UNIQUE DESIGN

Designed with multi-layer filtration to thoroughly capture fine particles. Interception capability is over  $0.1 \mu\text{m}$ .

### Description of After-Filters

Filtrating area increased by 20% (Compared to general round after-filter)

- Oil capture efficiency: 99-99.97%
- Filtrating accuracy:  $0.01 \mu\text{m}$
- The AOF purification equipment works with the principle of air excitation → mitigation → filtration. This may effectively enhance the settlement speed of oil mist, smoke and haze, while exhibiting high efficiency and high accuracy features.



#### S series (Standard type)

- For soluble coolant
- Filtering water mist, particle  $\geq 0.5 \mu\text{m}$
- 300 mm long



#### P series (Practical type)

- For oil-based coolant
- Filtering oil mist, particle  $\geq 0.03 \mu\text{m}$
- 400 mm long



(Custom-made)

#### PL series (Long-acting type)

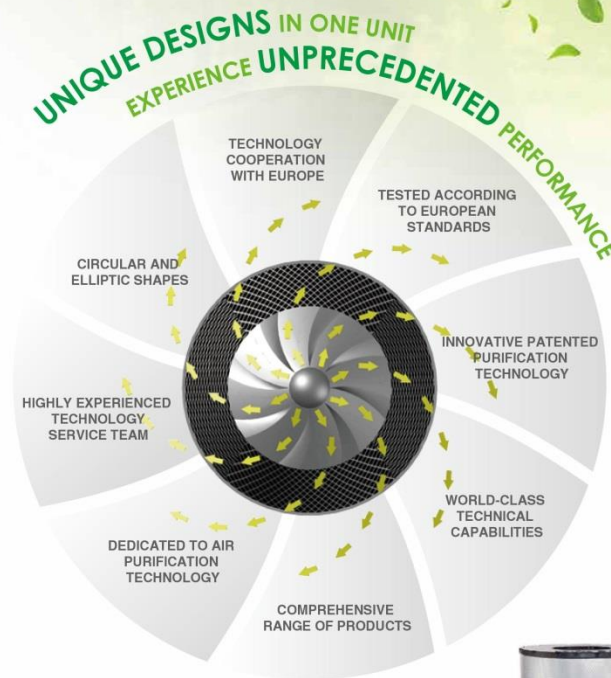
- For oil-based coolant
- Filtering oil mist, particle  $\geq 0.02 \mu\text{m}$
- 600 mm long
- Filtrating area increased by 200% (Compared to P series).



(Custom-made)

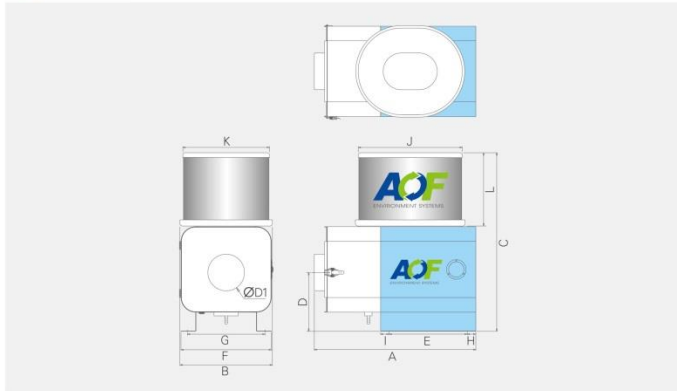
#### PM series (High efficiency type)

- For toxicant oil-based coolant
- Filtering oil mist, particle  $\geq 0.01 \mu\text{m}$
- 600 mm long
- With active carbon ingredients.



# 5. AOF specification -AF series

## SPECIFICATIONS

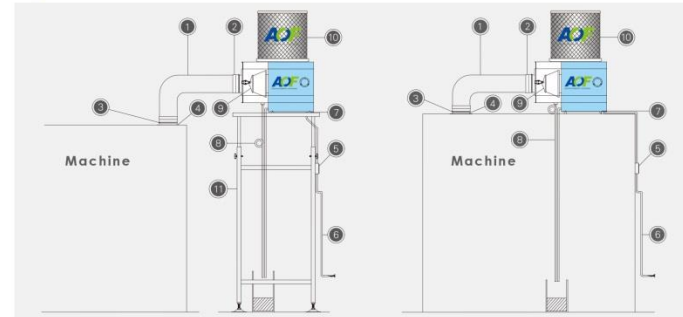


Model	Power Source	Motor	Air Flow Rate (m <sup>3</sup> /min) (50Hz / 60Hz)	Static Pressure (kPa) (50Hz / 60Hz)	Noise Value db (A) (50Hz / 60Hz)	Filtering Effect	Weight (Kg)	Air Inlet Port	Applicable Space
AF-10P	3 PHASE AC220V or AC380V	0.2 KW	11 / 13.5	0.65 / 1.05	65 / 68	99.97% EU E12 Standard	42	Ø150	< 6m <sup>3</sup>
AF-20P		0.4 KW	18 / 20.5	0.88 / 1.38	69 / 73		47	Ø150	< 12m <sup>3</sup>
AF-30P		0.75 KW	29 / 32.5	1.15 / 1.65	70 / 74		65	Ø200	< 24m <sup>3</sup>
AF-40PL	50/60HZ	1.15 KW	40 / 48.5	1.45 / 1.95	71 / 75		80	Ø250	< 32m <sup>3</sup>

Model	A	B	C	D	D1	E	F	G	H	I	J	K	L
AF-10P	615	379	831	236	148	300	335	283	25	25	426	355	413
AF-20P	652	379	851	234	148	320	350	298	25	25	426	355	413
AF-30P	765	432	908	299	200	388	420	368	25	25	492	408	413
AF-40PL	792	490	1153	316	250	388	480	428	33.5	33.5	540	430	613

■ Above figures are tested with the models of P / PL series.

## DESCRIPTION OF PARTS



No.	Part Description	Model	AF-10	AF-20	AF-30	AF-40
1	Flexible hose (Standard accessories x 1)	Type	TW-H150	TW-H150	TW-H200	TW-H250
		Outside dia.	Ø150	Ø150	Ø200	Ø250
2	Sleeve for flexible hose (Standard accessories x 2)	Type	JP-HC150	JP-HC150	JP-HC200	JP-HC250
		Outside dia.	Ø150	Ø150	Ø200	Ø250
3	Flexible hose clamp (Standard accessories x 2)	Type	BP-HB165	BP-HB165	BP-HB215	BP-HB265
		Outside dia.	Ø150	Ø150	Ø200	Ø250
4	Air inlet adaptor (Standard accessories x 1)	Type	PM-150	PM-150	PM-200	PM-250
		Outside dia.	Ø150	Ø150	Ø200	Ø250
5	Power switch (Standard accessories x 1)	Type	E0-220/380/415			
		Outside dia.	158 × 85 × 105mm			
6	Oil resistant cable (Standard accessories 3.3M x 1)	Type	CA-1.25mm <sup>2</sup> × 4C			
		Outside dia.	1.25mm <sup>2</sup> × 4C			
7	Anti-vibration mount (Standard accessories x 4)	Type	WL-M8 × 20L		WL-M10 × 15L	
		Outside dia.	M8-20L Ø30 × 30L		M10-15L Ø50 × 50L	
8	Oil drain hose (Standard accessories 3M x 1)	Type	OH-R12			
		Outside dia.	Ø12			
9	Pre-filtering system (Standard accessories x 1)	Type	FC-250-O	FC-250-O	FC-300-O	FC-300-O
		Outside dia.	Ø250	Ø250	Ø300	Ø300
10	After-filter (Standard accessories x 1)	Type	S: Standard type, 300mm long P: Practical type, 400mm long PL: Long-acting type, 600mm long PM: High efficiency type, 600mm long			
11	Telescopic stand (Choice of a stand or castors) (Optional accessories)	Type	PV-SU-1800			
			Height: 1100mm, Extension: 1800mm			

# 6. Examples of installation

- With single machine





# 6. Examples of installation

- With telescopic stand



# 6. Examples of installation

- With telescopic stand



# 6. Examples of installation

- Whole plant equipment





# 7. Figures of efficiency test

## 安裝實錄及油煙霧檢測表

受測單位： 宇\*科技股份有限公司                      安裝日期： 104-04-07                      安裝機型： AF-20P  
 受測單位監督人： 利\*\*                                      檢測日期： 104-04-22  
 聯絡電話： 04-26\*7-\*7\*0  
 受測單位地址： 台中市\*\*區中港加工出口區區\*\*路\*\*號

		受測安裝機型		安裝實錄	
檢測機型	AF-20P	MA005 VF-2SS 			
主要檢測值	PM 2.5				
懸浮粒子 Ug/m3	過濾前	過濾後	過濾前	過濾後	
	1375.2	3.9	 	 	
環境值 Ug/m3	235.2				

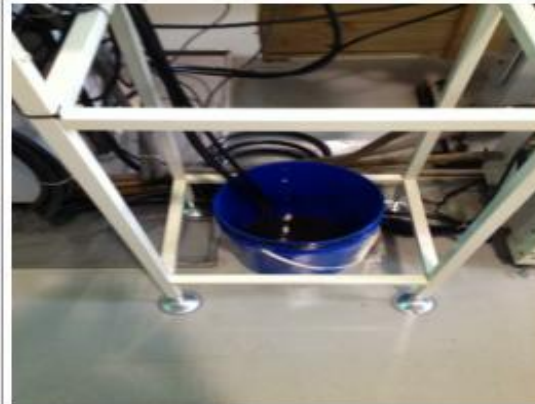


# 7. Figures of efficiency test

## 油煙霧 - 懸浮粒子檢測表

受測單位：宇\*科技股份有限公司                      檢測日期： 103-09-11  
受測單位監督人：蔡\*\*  
聯絡電話： 04-26\*7-\*7\*0  
受測單位地址： 台中市\*\*區\*\*加工出口區區\*\*路\*\*號

檢測機型	AE-15P	於 103/9/9 約 11:30 安裝後，到檢測日期 103/9/11 下午 3 點為止，油霧回收量已達 1/4 桶(如下圖)。
檢測區域	LS005 SR-20J TYPEN	












# 7. Figures of efficiency test

油霧回收機懸浮粒子檢測表

受測單位：宇*科技股份有限公司		檢測單位：皇*國際		檢測日期：103/9/25	
受測單位監督人：蔡*揚課長		檢測人員：王建華		產品型號：AE-15P	
聯絡電話：04-26*7-*7*0		受測單位地址：台中市**區**加工出口區**路**號			
檢測日期	103/9/11		103/9/25		福森綠能科技 AE-15P 於103/9/11安裝使用 二星期後，於 103/9/25進行第二次 檢測。
檢測區域【機號】	LS005 SR-20J TYPEN		LS005 SR-20J TYPEN		
使用品牌	福森綠能科技 AE-15P		福森綠能科技 AE-15P		
檢測值	PM 2.5		PM 2.5		
懸浮粒子 數量/m <sup>3</sup>	過濾前	過濾後	過濾前	過濾後	
	10527390	30		10	
數據圖片					
環境值	前：482980 中：310720 後：211430 		308150 		

# 7. Figures of efficiency test

\* The example of machine **WITHOUT** AOF unit

- Static Electricity machine

The oil is full of the air outlet bracket and oil sludge spreads on the floor everywhere.



# 7. Figures of efficiency test

\* The example of machine **WITHOUT** AOF unit

- Static Electricity machine

It's only quipped with an exhaust fan, there's no oil drain pipe to exhaust the unnecessary oil, so the oil sludge spreads on the floor everywhere.





# 7. Figures of efficiency test

## \* The example of machine **WITH** AOF unit

AOF unit is equipped with an after-filter, which is capable of thoroughly removing oil mist and purify the air, so the machine doesn't leak oil and the floor is clean.

Also, the collected oil could be recycled for reuse .

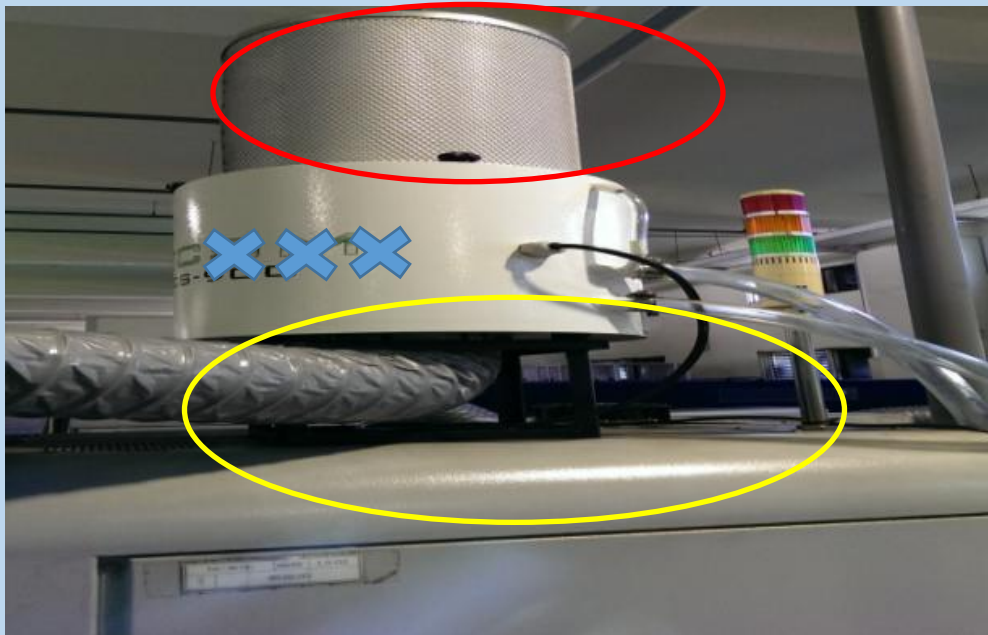




# 7. Figures of efficiency test



\* The example of machine WITH other brand filter

This machine is equipped with a filtration unit with after-filter; the filtering efficiency is not bad, but the oil is leaking from bottom. Also, the oil can't be recycled.



# 7. Figures of efficiency test

## Comparison with other brands

Comparison chart					
Example	Recycled oil /per day	machine Tested	Consumption material	Selling price	Conclusion
<b>A</b>	3.6 L per day	LS06	NIL	About NT\$60,000	It just exhausts the air out, no filtering function. Oil leaks seriously with big noise. It saves only NT\$324.- / per day
<b>B</b>	0	LS01	Have to replace the active carbon every 1 month	About NT\$ 55,000	No oil recycling function. Bad performance in air exhausting and oil recycling
<b>C</b>	5 L per day	LS05	The pre-filter is washable The replacement cycle of after-filter is about 7200 working hours	About NT\$55,000	Good performance in oil recycling and air flow rate . It saves NT\$5000.-/ per day 
<b>D</b>	0	LS02	The first 3 filter screw must be replaced ( in an uncertain period) The after-filter must be replaced in 720~2160 working hours	About NT\$42,000 	No oil recycling function. Big air flow rate, but with big noise.

\*\* remark: supposed the oil cost is 1L =NT\$100 \*\*

# 8. Test report of TTRI (Taiwan Textile Research Institute)

 <b>財團法人紡織產業綜合研究所</b> <b>Taiwan Textile Research Institute</b>				正本 ORIGINAL	
日期: Apr. 20, 2015      收件日期: Mar. 27, 2015 Date:                      Date of Receipt:		<b>試驗報告</b> 土城場區 TEST REPORT      TUCHENG			
報告編號 Report No.:	數量 Quantity:	報告頁次/頁數 Page Order/Pages:	(PI) 委文字號 Ref. No.:	NIL	
報告抬頭 Report Title:	AIR-O-FILTER ENVIRONMENT SYSTEMS, INC.(U0431)		試件類別 Item:	Filter	
地址 Address: 611-6 FENGZHOU RD., SHENGANG DIST., TAICHUNG CITY 42949 TAIWAN					

### Filter Testing Report

**1. Filter Descriptions**

- (1) Test requested by : COIN ROKAKI ENTERPRISE CO., LTD.
- (2) Filter Type : AOF S-140L\*D AF20 Air/Oil Separator Filter
- (3) Media Material : Glass fiber
- (4) Filter Color : White

**2. Test Conditions**

- (1) Test Method : EN 779:2012
- (2) Volume airflow rate : 700 CFM
- (3) Temperature : 23±2°C
- (4) Humidity : 45±5%
- (5) Aerosol Type : DEHS

**3. Testing Results**

- (1) Initial pressure drop : 478.0 Pa
- (2) Testing dimensions : Inner diameter 222/151 mm ; Outside diameter 426/355 mm ; High 607 mm

Test Filter



\*NOTE: The Picture is provided by the client

  
**Director,**  
**Department of Testing and**  
**Certification**


財團法人紡織產業綜合研究所 所長授權核發人:  
 Authorized by president of  
 Taiwan Textile Research Institute

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(Taiwan Textile Research Institute)



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**試驗報告**      土城場區  
**TEST REPORT**      TUCHENG

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報告編號: TFF4C41      數量: 1 PC      報告頁次/頁數: (P2/Ref. No.): NIL  
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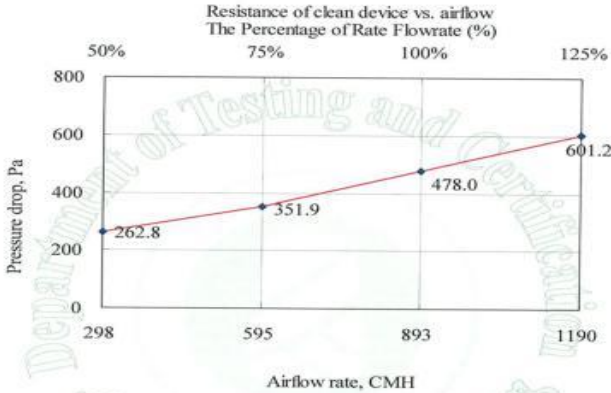
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(3) Measurement of pressure drop vs. airflow

Resistance of clean device vs. airflow  
The Percentage of Rate Flowrate (%)



Airflow rate in % of rated airflow	Airflow rate		Resistance	
	CFM	CMH	Pa	in. H <sub>2</sub> O
50%	350	595	262.8	1.06
75%	525	893	351.9	1.41
100%	700	1190	478.0	1.92
125%	875	1488	601.2	2.41

  
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# 8. Test report of TTRI (Taiwan Textile Research Institute)



**TTRI** 財團法人紡織產業綜合研究所  
Taiwan Textile Research Institute



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**試驗報告**      土城場區  
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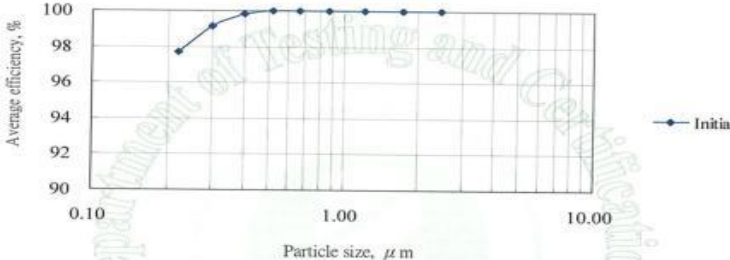
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 Address:

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(4) Initial Efficiency(0.4  $\mu$ m) : 99.95 %

Average efficiency at different final pressure drops



Particle size ( $\mu$ m)	0.20-0.25	0.25-0.35	0.35-0.45	0.45-0.60	0.60-0.75	0.75-1.00	1.00-1.50	1.50-2.00	2.00-3.00
Composite Min.	0.22	0.30	0.40	0.52	0.67	0.87	1.22	1.73	2.45
Initial 478.0 Pa	99.44	99.76	99.95	99.98	99.99	100.00	100.00	100.00	100.00

*Sheng-fu chin*

Director,  
Department of Testing and  
Certification

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# 8. Test report of TTRI

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## ASHRAE 52.2 濾網評級

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Taiwan Textile Research Institute



Standard 52.2 Minimum Efficiency Reporting Value (MERV)	Composite Average Particle Size Efficiency, % in Size Range, $\mu\text{m}$			Average ASHRAE Arrestance, %, by Standard 52.1 Method	Minimum Final Resistance	
	<b>E1</b> Range 1 (0.3 - 1.0)	<b>E2</b> Range 2 (1.0 - 3.0)	<b>E3</b> Range 3 (3.0 - 10.0)		PA	Inches of Water
1	n/a	n/a	E3 < 20	Aavg < 65	75	.3
2	n/a	n/a	E3 < 20	65 ≤ Aavg < 70	75	.3
3	n/a	n/a	E3 < 20	70 ≤ Aavg < 75	75	.3
4	n/a	n/a	E3 < 20	75 ≤ Aavg	75	.3
5	n/a	n/a	20 ≤ E3 < 35	n/a	150	.6
6	n/a	n/a	35 ≤ E3 < 50	n/a	150	.6
7	n/a	n/a	50 ≤ E3 < 70	n/a	150	.6
8	n/a	n/a	70 ≤ E3	n/a	150	.6
9	n/a	E2 < 50	85 ≤ E3	n/a	250	1.0
10	n/a	50 ≤ E2 < 65	85 ≤ E3	n/a	250	1.0
11	n/a	65 ≤ E2 < 80	85 ≤ E3	n/a	250	1.0
12	n/a	80 ≤ E2	90 ≤ E3	n/a	250	1.0
13	E1 < 75	90 ≤ E2	90 ≤ E3	n/a	350	1.4
14	75 ≤ E1 < 85	90 ≤ E2	90 ≤ E3	n/a	350	1.4
15	85 ≤ E1 < 95	90 ≤ E2	90 ≤ E3	n/a	350	1.4
16	95 ≤ E1	95 ≤ E2	95 ≤ E3	n/a	350	1.4

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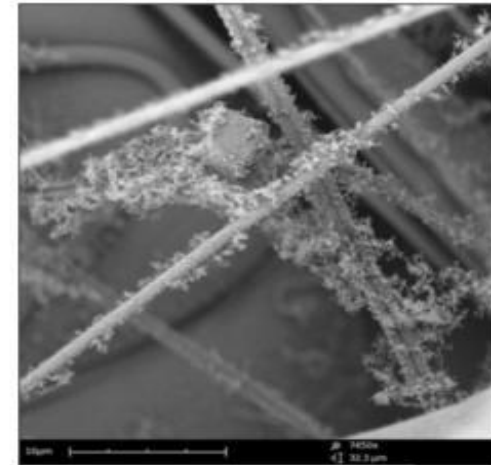
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## 濾網等級 EN 779:2012

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終端壓損 Pa		Average Arrestance	Average Efficiency on 0.4um
250	G1	< 65%	
	G2	65~80%	
	G3	80~90%	
	G4	>90%	
450	M5		40~60%
	M6		60~80%
	F7		80~90%
	F8		90~95%
	F9		>95%



MTE: 最小測試效率  
Minimum Testing Efficiency

MTE ≥ 35%

MTE ≥ 55%

MTE ≥ 70%

# 8. Test report of TTRI

(Taiwan Textile Research Institute)

## Eurovent 4/11 :2011 Energy Efficiency Class Limits



Class	G4	M5	M6	F7	F8	F9
MTE	—	—	—	MTE ≥ 35%	MTE ≥ 55%	MTE ≥ 70%
	M <sub>G</sub> =350g	M <sub>M</sub> =250g ASHRAE		M <sub>F</sub> =100g ASHRAE		
A	0-600 kWh 0 - 53.0 Pa	0-650 kWh 0- 57.4	0-800 kWh 0 - 70.6	0-1200 kWh 0 - 105.9	0-1600 kWh 0 - 141.2	0-2000 kWh 0-176.6
B	>600 - 700 53.0 - 61.8	>650 - 780 57.4 - 68.9	>800 - 950 70.6 - 83.9	>1200 - 1450 105.9 - 128	>1600 - 1950 141.2 - 172.1	>2000 - 2500 176.6 - 220.7
C	>700 - 800 61.8 - 70.6	>780 - 910 68.9 - 80.3	>950 - 1100 83.9 - 97.1	>1450 - 1700 128.0 - 154.5	>1950 - 2300 172.1 - 203.0	>2500 - 3000 220.7- 264.8
D	>800 - 900 70.6 - 79.4	>910 - 1040 80.3 - 91.8	>1100 - 1250 97.1 - 110.3	>1700 - 1950 154.5 - 172.1	>2300 - 2650 203.0 - 233.9	>3000 - 3500 264.8 -309.0
E	>900 - 1000 79.4 - 88.3	>1040 - 1170 91.8 - 103.3	>1250 - 1400 110.3 - 123.6	>1950 - 2200 172.1- 194.2	>2650 - 3000 233.9 - 264.8	>3500 - 4000 309.0 - 353.1
F	>1000 - 1100 88.3 - 97.1	>1170 - 1300 103.3 - 114.8	>1400 - 1550 123.6 - 136.8	>2200 - 2450 194.2 - 216.3	>3000 - 3350 264.8 - 295.7	>4000 - 4500 353.1 - 397.2
G	>1100 >97.1	> 1300 > 114.8	> 1550 > 136.8	> 2450 > 216.3	>3350 > 295.7	>4500 > 397.2
Δ kWh/ Δ Pa	100/8.8	130/12	150/13	250/22	350/31	500/44

# 8. Test report of TTRI

(Taiwan Textile Research Institute)

## Classification of EPA, HEPA, and ULPA filters

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Filter Class (Group)	Overall value		Local value		Filter Class (Group)
	Efficiency (%)	Penetration (%)	Efficiency (%)	Penetration (%)	
ISO 29463					EN 1822
	$\geq 85$	$\leq 15$	--	--	E10
ISO 15 E	$\geq 95$	$\leq 5$	--	--	E11
ISO 20 E	$\geq 99.0$	$\leq 1$	--	--	
ISO 25 E	$\geq 99.5$	$\leq 0.5$	--	--	E12
ISO 30 E	$\geq 99.90$	$\leq 0.1$	--	--	
ISO 35 H	$\geq 99.95$	$\leq 0.05$	$\geq 99.75$	$\leq 0.25$	H13
ISO 40 H	$\geq 99.990$	$\leq 0.01$	$\geq 99.95$	$\leq 0.05$	
ISO 45 H	$\geq 99.995$	$\leq 0.005$	$\geq 99.975$	$\leq 0.025$	H14
ISO 50 U	$\geq 99.9990$	$\leq 0.001$	$\geq 99.995$	$\leq 0.005$	
ISO 55 U	$\geq 99.9995$	$\leq 0.0005$	$\geq 99.9975$	$\leq 0.0025$	U15
ISO 60 U	$\geq 99.99990$	$\leq 0.0001$	$\geq 99.9995$	$\leq 0.0005$	
ISO 65 U	$\geq 99.99995$	$\leq 0.00005$	$\geq 99.99975$	$\leq 0.00025$	U16
ISO 70 U	$\geq 99.999990$	$\leq 0.00001$	$\geq 99.99995$	$\leq 0.00005$	
ISO 75 U	$\geq 99.999995$	$\leq 0.000005$	$\geq 99.999975$	$\leq 0.000025$	U17

# 9. Description of filtrating materials and HEPA classification

- **Filtration materials**

AOF after-filters are mainly made of complex glass fiber cotton.

- **Description of HEPA Filter classification**

- **High-efficiency particulate arrestance (HEPA)** is a type of air filter. Filters meeting the HEPA standard have many applications, including use in medical facilities, automobiles, aircraft and homes. To qualify as HEPA, an air filter must remove (from the air that passes through) 99.97% of particles that have a size of 0.3  $\mu\text{m}$ . A filter that is qualified as HEPA is also subject to interior classifications

- 1) Normally, the filters in Europe meets F8/F9 standard. (test with 0.4  $\mu\text{m}$  particular)
- 2) AOF after-filter has achieved the E12 standard (test with 0.2  $\mu\text{m}$  test particular, that is better than F standard. )
- 3) So far, we don't find other brand of oil mist collector uses the E12 standard after-filter, except AOF.



**Thanks for your time.**

