



# 包覆式活性炭濾網

## Carbon Loaded Web Type Activated Carbon Filter

Various media types are available for different chemicals selection to achieve the best efficiency.

1. According to pollutions to select appropriate absorbent material.
2. High Removal Efficiency.
3. Lower Pressure Drop for reducing blower' s load.
4. Lower Dust Emission.
5. Low Volatile Gases.
6. Easy of installation and with light weight.
7. Reduce the number of replacement times, ensure the cleanliness of process environment.
8. Longer Life Span.

### 選用要則：

針對不同的化學氣體，可選用不同的濾材型式，以達到最好的處理效果。

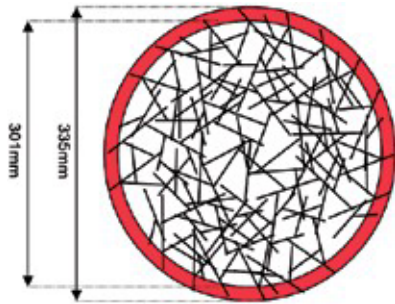
1. 針對所要過濾的污染物選擇適當的吸附劑材料
2. 去除效率高
3. 低壓損以降低風機的負載
4. 低發塵量
5. 低揮發性氣體
6. 便於安裝要求質輕
7. 針對要求的效率下去除容量要大即壽命長，以減少更換次數也確保製程環境的潔淨度



The classifying method of AMC (Airborne Molecular Contamination) is the organization of SEMI (Semiconductor Equipment and Materials International) bases on SEMI F 21-95 to classify the AMC gaseous pollutants. Gaseous pollutant is including of Acids, Bases, Condensables and Dopants.

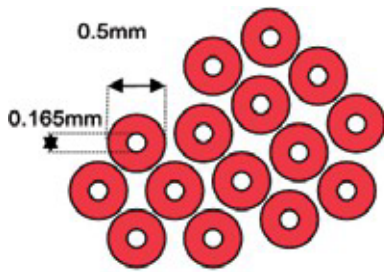
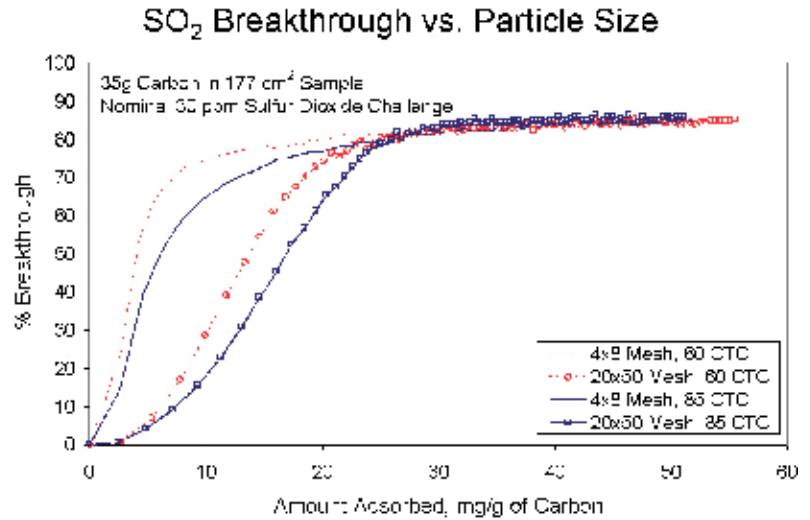
AMC (Airborne Molecular Contamination) 分類方法為SEMI (Semiconductor Equipment and Materials International) 組織在SEMI F21-95中對AMC氣態污染物所做的分類，包括酸性(Acids)、鹼性(Bases)、可凝結物(Condensables)及植入物(Dopants)，所屬污染物質如下：

Classification 分類	Composition 化合物
<p style="text-align: center;"><b>酸 (MA, Acids)</b></p> <p>Corrosive gases which react chemically as acids and play a role of electron acceptor. The intensity of reaction is depending on hydrogen ion concentration.</p> <p>具腐蝕性並在化學反應中扮演接受電子，其反應的強弱依其離子化造成的氫離子濃度而定。</p>	Hydrochloric Acid ( 氟氫酸 )
	Hydrofluoric Acid ( 氟氫酸 )
	Nitric Acid ( 硝酸 )
	Sulfuric Acid ( 硫酸 )
	Phosphoric Acid ( 磷酸 )
	Acetic Acid ( 醋酸 )
	Nitrogen Dioxide ( 二氧化氮 )
	Sulfur Dioxide ( 二氧化氮 )
	HF ( 氟化氫 )
	HCL ( 氯化氫 )
	HNO3
H3PO4	
HBr	
<p style="text-align: center;"><b>鹼性 (MA, Bases)</b></p> <p>Corrosive gases which react chemically as bases and play a role of electron donor.</p> <p>具腐蝕性並在化學反應中扮演供給電子。</p>	Ammonia ( 氨 )
	N-methyl Pyrrolidione ( NMP )
	Amine
	HMDS
<p style="text-align: center;"><b>可凝結物 (MC, Condensables)</b></p> <p>Condensables whose boiling point is typically above room temperature and is capable of condensing on the wafer surface.</p> <p>污染物沸點在室溫以上，且會凝結於晶圓表面者，包含有矽化物與碳氫化合物類 ( 沸點大於或等於65.6℃ ) 。</p>	Acetone ( 丙酮 )
	Toluene ( 甲苯 )
	Silicone
	Hydrocarbons
	DOP
	DBP
	DEP
	BHT
<p style="text-align: center;"><b>植入物 (MD, Dopants)</b></p> <p>Contaminants that modify the electrical properties of semiconductor material. Contaminants consist of Boron (Boric acid), Phosphorous (Organophosphate) and Arsine (Arsenate).</p> <p>污染物會造成電性改變，包含硼 ( 通常為硼酸 )、磷 ( 通常為有機磷酸鹽 ) 及砷 ( 通常為砷酸鹽 ) 。</p>	Boric Acid ( 硼酸 )
	Phosphorous ( 磷 )
	Arsine ( 砷 )
	B2H6
	BF3
	ASH3
	TEP
	TCEP
	TPP



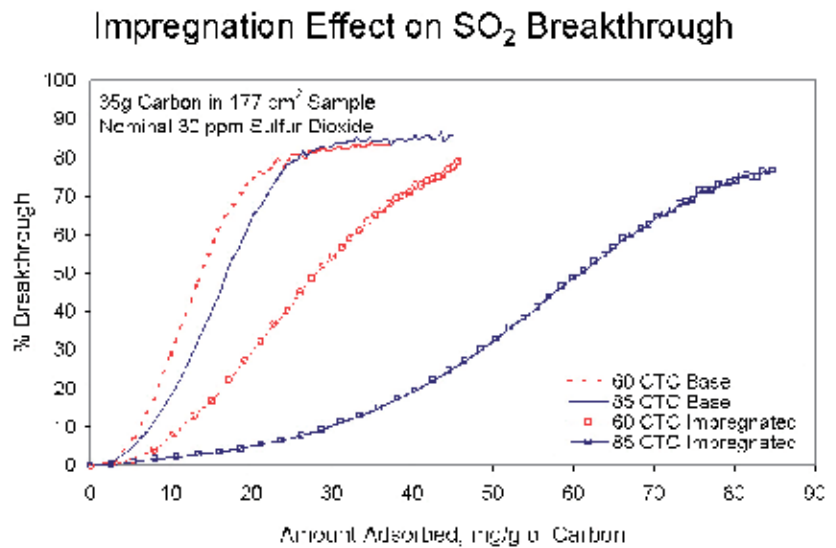
### 6 Mesh Particle

- Penetration to 5% Depth From Surface Uses 27% of Carbon Volume



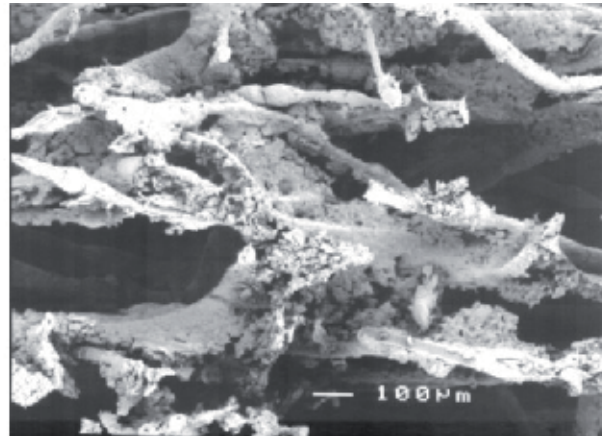
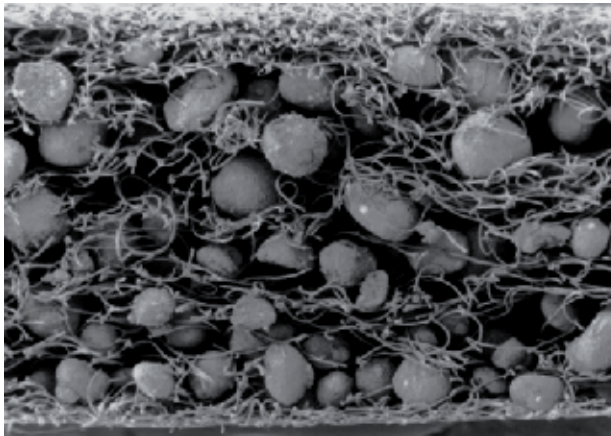
### 32 Mesh

- Takes 300+ Particles To Get Equal Weight
- This Gives 6x Outside Surface Area



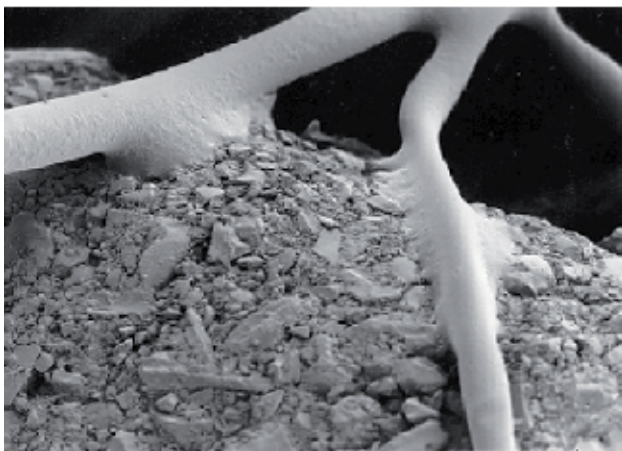


## Carbon Slurry vs. Novel Carbon-Loaded Nonwoven



- 3-D spaced placement and immobilization of functional particles
- Maximization of accessibility to particles

Novel Carbon-Loaded Nonwoven Technology



500 x magnification



100 x magnification

- Fiber-to-fiber bonding, fiber-to-particle bonding (no adhesive)

Minimal cover of the particle surface



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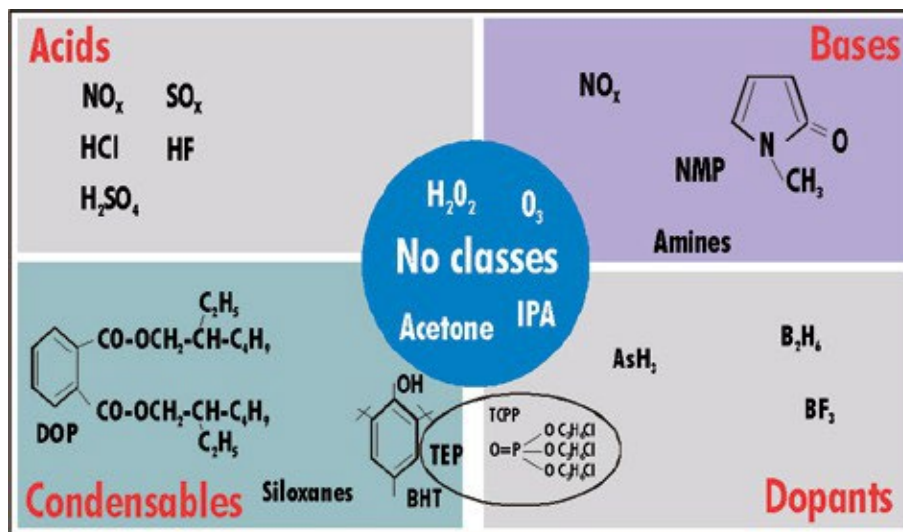
E-Mail：ks.best@msa.hinet.net

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1. 控制臭味和氣體污染之的四種方式：防毒面具、燃燒、通風與移除。
2. 顆粒狀濾材用來控制氣體污染物有兩種方式：吸附與氧化。
3. 化學濾網以吸附與吸著原理來移除氣體污染物分子。
4. 吸附：當氣體或液體分子碰到吸附體表面被抓著且無發生化學反應。
5. 吸著：當氣體或液體分子碰到吸附體表面被抓著且發生化學反應。
6. 被吸附物質的沸點、蒸氣壓及活性是影響初效率的主要因素。一般沸點大於100°C的物質室溫下的狀態為液態，其蒸氣較易於吸附凝結在吸附劑的表面。
7. 分子性污染物系統，最初的污染物去除效率，並非由活性碳顆粒大小、重量及活性決定。決定初效率的兩個因素為吸收體及化學物的表面積。
8. 活性碳顆粒越細，其表面積越大。活性碳顆粒可以非常小，甚至為碳塵。此將會隨氣流溢散或因填充密實而產生高壓損等缺點。
9. 不同分子量的污染物均可競爭相同的吸附表面，由於溼氣會佔據吸附表面。通常潮濕的天氣下吸附效率會較差。溫度亦會影響吸附效率，溫度越高物理吸附能力越低。
10. 分子量小、沸點在常溫為氣態的物種，因吸附劑表面無法凝結液化，不易穩定附著在吸附劑表面，容易脫離氧化或被其他分子取代。

Typical Compounds of Class A, B, C, D (according SEMI F21-95)



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## Activated Carbon Filter Performance Data - Carbon Loaded Web Type

## 活性炭濾網性能表 - 包覆式活性炭濾網

Nominal Size 通稱尺寸 (W*H*D) (inch)	Actual Size 實際尺寸 (W*H*D) (mm)	Rated Capacity 額定風量 (CMH)	Initial Resistance 初壓損 (Pa)	Remove Efficiency 去除效率 (%)
12*24*6	289*595*150	850	100	Depending on field condition 依現場條件而定
20*24*6	492*595*150	710		
24*24*6	595*595*150	1700		
12*24*12	289*595*292	1700	93	
20*24*12	492*595*292	2850		
24*24*12	595*595*292	3400		

\* Special Sizes are available upon request.

※特殊規格可生產製造。

- Four main techniques for controlling odor and gas contaminants: Gas Mask, Combustion, Ventilation and Removal.
- Granular Media is used for controlling gas contaminants by Adsorption and Oxidation.
- Chemical Filter can be used to remove molecular contaminants by Adsorption and Oxidation.
- Adsorption: When gaseous or liquid molecules reach adsorbent surface but without any chemical reaction, the phenomenon is called physical adsorption or physisorption.
- Sorption: When gaseous or liquid molecules reach adsorbent surface and happen chemical reaction, the phenomenon is called Sorption.
- The boiling Point of adsorptive materials, vapor pressure and active are the main factor affecting the initial efficiency. The materials which boiling point higher than 100 °C, will be in the liquid state at room temperature, and is easily to be adsorbed and condensed in the adsorbent surface.
- In molecular contaminant system, initial contaminant removal efficiency is not depending on particle weight, size, total surface area or carbon activity. Two important parameters for determining initial efficiency is the total surface area of chemicals and absorbents.
- The surface area increased when the dimensions of carbon are getting smaller. Particle size can be very small, even though it just becomes carbon dust. It also creates problems of escaping into the air, or due to packing tightly and causes high pressure drop.
- Temperature also can affect adsorption efficiency. The higher the temperature the lower the adsorption efficiency. Moisture will occupy carbon' s adsorption surface, therefore adsorption efficiency is poor in wet weather (like rainy day).
- For Material with small molecular weight or boiling point lower than ambient temperature, they cannot condensate as liquid; thus cannot attach on the surface of adsorbent, and they will be oxidized in air or substituted by other materials on the surface of adsorbent.

**Frame:**

5-7/8" & 11-1/2" thickness is available for Aluminum, Galvanized steel and Stainless Steel.

2" & 4" thickness is available for Paper, Aluminum, Galvanized Steel and Stainless Steel.

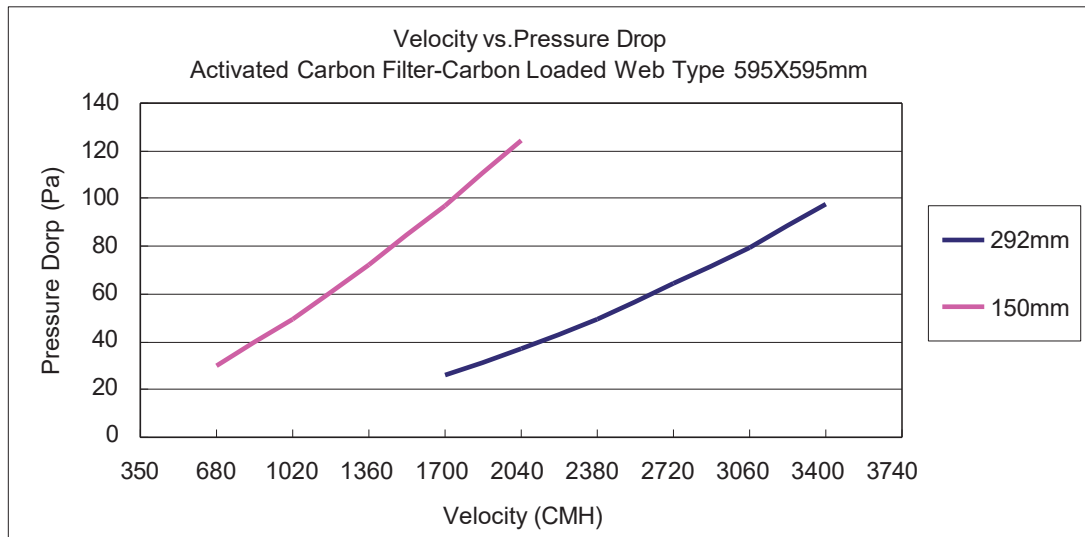
**Header Design:**

Box Type, Single/Double Header.

**外框：**框材可選用紙框、鍍鋅鐵框或不銹鋼框。

**外框設計：**箱型, 單法蘭, 雙法蘭。

Performance Parameter 執行變數	Carbon Slurry Coated Type Activated Carbon Filter 植入性濾網	Tray Type Activated Carbon Filter 填充式濾網	Honey-Comb Type Activated Carbon Filter 蜂巢式濾網	Carbon Loaded Web Type Activated Carbon Filter 包覆式濾網
Low Pressure Drop 低壓損	+	+ or -	+ or -	+
Weight of Activated Carbon 活性炭重量	-	++	++	+++
Optimal Activated Carbon Size 最理想的活性炭尺寸	+	-	+	++++
Overall Adsorption Efficiency 整體吸附效率	---	+	+	+++
Low Dust 低灰塵	+	--	-	++
Pleated Ability 壓褶能力	+	N/A	N/A	++++
Easy of Replacement 更換簡易	+	--	+	+

**Material and Service Conditions**

材質、使用條件

Type 型式	Description 說明
Media 濾材	Non-Woven + Activated Carbon 不織布包覆活性炭粒
Frame Material 外框材質	Metal Frame 金屬框
Frame Type 外框型式	Box Type, Single/Double Header Type 箱型
Support Grid 支撐材	Separator 隔板
Sealant 密封膠	PU BASE
Packing Material 墊片材質	Neoprene Rubber 新平橡膠



## Media

## 濾材：

Type 型式	Description 說明		
Media 濾材	853 (2750) Remove VOCS 去除揮發性有機物	147 (2752) Remove ammonia and amines 去除氨及胺類	875 (2751) Remove Acid 去除酸類
Media Thickness 濾材厚度 (mm)	2.2	2.2	2.2
Basis Weight 基重 (g/m <sup>2</sup> )	600	600	600
Using Guidance 使用指導	Boron 硼	NMP	Acid 酸
	Ozone 臭氧	HMDS	H2SO4 硫酸
	H2S 硫化氫	Ammonia 氨	Ozone 臭氧
	SO2 二氧化硫	Amines 胺類	HCL 氯化氫
	NO2 二氧化氮	Monoethylamine	HF 氟化氫
	Paint Odor 油漆味	Morpholine	H2S 硫化氫
	VOC 揮發性有機物	Cyclohexylamine	SO2 二氧化硫
	Food Aromas 食品香味	Dimethylamine	NO2 二氧化氮
	Commo Outdoor Pollutants 一般室外污染物	Trimethylamine	VOC 揮發性有機物
	Tobacco Smoke Odors 煙味	Diethylamine	
		Animal Odor 動物氣味	
		Bathroom Smells 浴室氣味	

※ 853(2750) – Used for removing VOCS, SO2, NO2, ozone, H2S. The 853 media is most effective for VOCS, and it has considerable capacity for common outdoor pollutants such as SO2, NO2, ozone, H2S. The 853 media is also very effective for removing boron (e.g., emission from conventional HEPA/ULPA filters)

※ 147(2752) – Used for removing ammonia and amines (nitrogen-containing organic compounds such as NMP, monoethylamine, morpholine, cyclohexylamine, dimethylamine, trimethylamine, diethylamine, HMDS and etc.)

※ 875(2751) Media - Used to remove acids such as HCl, HF, H2SO4, and is also very effective for removing SO2, NO2, ozone, H2S. This media is better than 853 media.

※ Both 147 and 875 media can remove VOCS. However, the life span of 147 media is reduced to 1/2 as compared to 853 media.

※ 853 (2750) 濾材 - 去除揮發性有機物、二氧化硫、二氧化氮、臭氧、硫化氫。此濾材為最有效去除揮發性有機物的濾材，同時它對一般室外的污染物有相當可觀的容量，如二氧化硫、二氧化氮、臭氧、硫化氫。此濾材對於去除硼也非常有效 (例如：常用的HEPA及 ULPA濾網)。

※ 147 (2752) 濾材 - 用於去除氨及胺類(含有氮的有機化合物，如NMP, monoethylamine, morpholine, cyclohexylamine, dimethylamine, trimethylamine, diethylamine, HMDS 等)

※ 875 (2751) 濾材 - 對除二氧化硫、二氧化氮、臭氧、硫化氫也非常有效。【比853 (2750) 濾材效果還好】。

※ 147 (2752) 及875 (2751) 兩種濾材都可以去除揮發性有機物。然而，使用壽命與853 (2750) 濾材相較減少了一半。