

# 過濾 + 殺菌 潔淨好水的關鍵

## Purification and Disinfection – the Path to Quality Water

為保障家人的健康，同時確保飲用水不受二次污染影響，裝置淨水器是安心又方便的選擇，但是淨水器技術多不勝數，該怎麼選擇比較好？有人說購買附設活性炭過濾技術的淨水器就已足夠，但是你或許不知道，同樣是活性炭濾心，效能卻大有不同，更會直接影響淨水的品質。

Many families choose to install a water purifier in order to prevent issues relating to secondary contamination in household water supplies. The carbon filter used will affect the filtration ability of a water purifier so it's important we understand more about the characteristics of carbon filters and how they affect drinking water quality.

### 活性炭濾心 有效過濾水中污染物

交通大學環境工程研究所黃志彬教授說，一般的活性炭只能去除異味，只有特別種類及經過特殊生產過程的活性炭才具備去除水中污染物的能力。在材料方面，含碳量高的物質可產生活性碳，目前市面上活性炭濾心的原料中，以椰子殼製成的品質最佳，堅固、耐壓且不易碎，較適合作為高效能活性炭的材料。

不僅如此，「活性炭必須經過高溫活化與高密度加壓特殊處理後，才能產生多微孔體積及高表面積的特性，提供足夠吸附污染物的空間。」台北科技大學環境工程與管理研究所陳孝行教授分析製造方法對活性炭濾心效能的重要性，指出微孔洞孔徑越小，分佈越密，吸附力會更高，這樣的活性炭濾心才可處理水中各種不同的污染物。不過，活性炭濾心並非萬能；黃志彬教授指出，理想的淨水科技應兼具水質處理與殺菌兩大功能，從效能、成本及保養作綜合考慮，活性炭濾心配搭紫外光殺菌，可說是最理想的組合。



台北科技大學環境工程與管理研究所陳孝行教授指出，活性炭濾心的效能取決於微孔洞的大小及分佈，消費者應小心選購。



淡江大學水資源及環境工程學系李奇旺主任建議應選擇同時具備過濾及殺菌兩大功能的淨水器。

## 雙淨化2合1 安心喝好水

淡江大學水資源及環境工程學系李奇旺主任建議，除了活性碳濾心外，淨水器需配搭紫外線殺菌功能，這樣能有效去除水中的污染物、細菌及病毒，才能完整建構家居飲用水安全的最後一道防線。

紫外線是太陽光線的一部分，波長達254nm，能破壞細菌的DNA結構，除去細菌的活性，使之成為普通的碳水化合物，對人體無害外，也是飲用水殺菌的最好方法。台北科技大學環境工程與管理研究所陳孝行教授提醒大家要注意紫外線的殺菌能力，如果水中細菌病毒的含量達10,000個，而殺菌力為99%，那就表示在10,000個細菌中只殺死了9,900個細菌，卻仍有100個細菌存在於飲用水當中。所以，紫外線殺菌效能要達到99.99%，才能消滅水中絕大部分的細菌跟病毒。要達到99.99%的殺菌力，應特別注意紫外線的殺菌強度是否足夠。陳孝行教授表示，一般來說，紫外線強度若達到每平方公分16,000微瓦秒，可以殺菌；強度達到每平方公分40,000微瓦秒以上，才能夠消滅病毒。

交通大學環境工程研究所黃志彬教授提醒消費者，以紫外線殺菌配搭活性碳濾心之組合，可有效去除水中有機物、餘氯、臭味及細菌病毒，不但保障飲用水安全，而且可提高飲用水之口感。



欲了解更多有關淨水器的資訊，請即掃描QR碼，以觀看陳孝行教授的講解。

## Filter Quality Affects Purification Performance

Chi-pin Huang, Chair Professor of the Institute of Environmental Engineering at National Chiao Tung University in Taiwan, said that only an activated carbon filter produced using special manufacturing procedures is effective in removing waterborne contaminants. He also pointed out that an activated carbon filter with a high carbon content will have a better filtration performance, and that the hard and long-lasting coconut shell is the best material for manufacturing an effective carbon filter.

Shiao-Shing Chen, Professor of the Institute of Environmental Engineering and Management at National Taipei University of Technology in Taiwan explained that an activated carbon filter will be more effective if it undergoes certain special procedures. "An activated carbon filter with small holes and a large surface area is the most effective in removing waterborne contaminants," Professor Chen explained. Professor Huang added that ideal water purification technology should possess purification and disinfection functions. Performance, cost and maintenance are other factors that need to be taken into consideration.

## Combined Technology Works Best

Chi-Wang Li, Professor of the Department of Water Resources & Environmental Engineering at TamKang University in Taiwan, said that an ultraviolet light working in conjunction with a carbon filter is the most effective purification method. "The combined technology helps to purify water and remove waterborne contaminants, viruses and bacteria, ensuring higher water quality," Prof. Li said.

UV light destroys the DNA structure of bacteria, effectively turning them into harmless carbohydrate forms. "It's important to choose a carbon filter that's 99.99% effective, ensuring the least-possible number of waterborne contaminants," Professor Chen said. He added that UV light of 16,000  $\mu\text{Ws}/\text{cm}^2$  intensity can help with sterilization, while UV light reaching 40,000  $\mu\text{Ws}/\text{cm}^2$  can help eliminate viruses.

Professor Huang added that a water purifier featuring both UV light and carbon filter mechanisms can also effectively remove materials such as organic substances, chlorine, odor, bacteria and virus. This two-in-one technology provides more reassurance to customers looking for clean, safe drinking water.

## 選購淨水器有妙法

挑選設置活性碳濾心的淨水設備時，應了解濾心是否以椰子殼為原料，並經過高溫活化與高密度加壓的程序，最小濾淨孔徑能達到0.2微米，才可有效去除達140種以上的有害物質，包含鉛、汞等重金屬，讓淨水品質更上一層樓。在選擇設置紫外光燈的淨水設備時，建議選擇觸發式紫外線燈管設計，在開啟水龍頭時，立刻啟動紫外光燈管，節省能源，亦可提供即開即飲的食水。