Activated Carbon Filter

Domestic
Commercial
Industrial

Rethinking Water
ACTIVATED CARBON FILTERS

THE MEDIA

Activated carbon is a specialised filter media used principally for removing chlorine or organic compounds from water. Most of the activated carbon used for water treatment is made from baking crushed coconut shell until it produces a charcoal type material. This is then activated with high pressure steam, leaving the carbon with many minute active pores on its surface. The ability of activated carbon to remove contaminates from raw water is dependent upon the length of time the water spends in contact with the media. Therefore sizing the filters correctly is crucial for effective performance.

ORGANIC

Organic compounds are often responsible for taste, odour, and colour problems in surface waters. Contamination may occur from dead, decaying vegetable matter, agricultural runoff containing herbicides & pesticides or leakage of underground gasoline containers. With organic removal, the contaminant molecules are trapped and retained on the carbon surface, and eventually all of the media will become exhausted and will need to be changed. The frequency of changing will again depend upon the level of water contamination. The effectiveness of carbon at removing organic compounds such as pesticides and solvents varies according to the precise nature of the contaminant.

CHLORINE REMOVAL

Chlorine removal with carbon is a “catalytic” process in which the media does not become exhausted, but instead it acts as a trigger to the dechlorination process. The active sites on the surface of the media do eventually become exhausted by other contaminants in the raw water (such as Iron or organic material) which means that the media will need to be changed every 1 to 3 years depending on the water quality. Carbon filters are often used to remove chlorine on the inlet to reverse osmosis systems, avoiding potential oxidation of the membrane flat sheet.
The table overleaf shows flow rate information for each size of filter. These figures are based on removal of organics which is a slower process than the removal of chlorine. A range of different vessel sizes are available along with a range of valves from clack. If the carbon filter is being used just to remove chlorine then it’s possible to use a manual system with no backwash. This consists of a manual head with either 3/4” or 1” female ports, vessel and internals.

**ADVANTAGES OF CARBON FILTERS**

- natural filter media
- improves taste
- minimizes health hazards
- protects water treatment units
- low-cost & easy maintenance

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SYSTEM MANAGEMENT

During service, the filter media will need to be backwashed to remove debris that accumulates on the surface of the carbon and to ‘reclassify’ the media to prevent channelling of water through the media bed. The backwash and rinse cycle takes approximately 20 minutes in total. Backwashing frequency is usually controlled by a timer, which will backwash the system at preset intervals.

For sites where there is high organic contamination of the water, the carbon media may need to be changed frequently. On larger systems, dome-hole tanks are available with additional ports to speed up the replacement process and eliminate the need to disturb the internal distribution system.

TECHNICAL DETAILS

<table>
<thead>
<tr>
<th>Carbon filter size</th>
<th>1054</th>
<th>1354</th>
<th>1465</th>
<th>1665</th>
<th>1865</th>
<th>2162</th>
<th>2472</th>
<th>3072</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate m³/h</td>
<td>0.4</td>
<td>0.7</td>
<td>1.0</td>
<td>1.4</td>
<td>2.0</td>
<td>2.25</td>
<td>3.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Backwash Flow Rate m³/h</td>
<td>0.5</td>
<td>1.0</td>
<td>1.2</td>
<td>1.50</td>
<td>2.2</td>
<td>2.6</td>
<td>3.4</td>
<td>5.3</td>
</tr>
<tr>
<td>Connections Clack</td>
<td>1”BSP</td>
<td>1”BSP</td>
<td>1”BSP</td>
<td>1”BSP</td>
<td>1.25”BSP</td>
<td>1”BSP</td>
<td>1.5”BSP</td>
<td>2”BSP</td>
</tr>
<tr>
<td>Total Height (mm)</td>
<td>1607</td>
<td>1601</td>
<td>1988</td>
<td>1988</td>
<td>2088</td>
<td>2038</td>
<td>2288</td>
<td>2512</td>
</tr>
<tr>
<td>Diameter (mm)</td>
<td>254</td>
<td>330</td>
<td>356</td>
<td>406</td>
<td>458</td>
<td>533</td>
<td>610</td>
<td>762</td>
</tr>
</tbody>
</table>

VALVE EXAMPLE

![Valve Example Image](image-url)