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## Private Sector in Canada; Pioneering in Production of Nanoproductions in Water and Wastewater Industries

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By having rich reservoirs of water, Canada has numerous companies active in the field of water and wastewater, and is the third country after the United States and China in the number of nanoproductions registered in Nanotechnology Products Database (NPD) in this industry. A number of these companies have been studied in this news.

[Canada](#) is one of the richest countries in water reservoirs. [Canada](#) is the first country in the world in possessing wetlands by having an area of 14%. However, the private sector is very concerned in having activities in the production of products in water industry. At present, [Canada](#) is the third country after the [United States](#) and [China](#) by having 20 nanotechnology products in Nanotechnology Products Database (NPD). A number of the advanced Canadian companies in the production of nanotechnology products in water industry have been studied hereafter.

### 1- Bionomic Technologies

[Bionomic Technologies](#) is one of the Canadian companies active in the production of nanotechnology products in water industry. There are 5 nanotechnology products of this company in NPD. Bionomic Technologies has exclusive license to distribute AquaNano™ technology in America. This company presents nanoproductions in water industry in both home and industrial applications. The company possesses high reactivity carbon mixture (HRCM) technology, in which carbon nanosorbents have been used. In fact, the sorbent contains carbon nanostructures.

AquaNano™ ZF-02 Slim Line filter is one of the products of this company in NPD. This product is a type of thin filter that improves transparency of water, removes agents that make water stink, and provides pure water. The filter is also able to control common pollutants in urban water, tiny particles, organic compounds, sulfates, sulfides, fluorides, chlorides, nitrites, and elements such as copper, zinc, aluminum, manganese, lead, molybdenum, heavy metals, active free chlorine, and chlorine organic compounds in water. Studies on the filter show that

it can be used in the elimination of oil and ether at very low concentrations in water. One of the characteristics of the filter is the presence of coatings made of silver and iodine at nanometric scale on its carbon nanosorbent. The coating results in antibacterial behavior of the filter. Viruses and bacteria in water can be eliminated through this method without adding iodine compounds to the solution.

AquaNano™ ZF-05 Table Top is another product of the company, which is considered a filter for home applications. The filter has a tank of 7 liters, and the purified water is stored in this tank. AquaNano™ ZF- 20 Big Blue 20 is another product of the company, in which HRCM technology has been used. The filter has been designed in a way that is attached to urban water directly, and it produces drinking water after the filtration. This filter contains carbon nanosorbent with silver and iodine nanoparticles, which are able to eliminate bacteria and viruses.

## **2- Fluval**

[Fluval](#) is the most serious rival to Bionomic Technologies among all Canadian companies, by having four nanotechnology products in NPD. This company has an experience of 35 years activity in water industry, and it produces various products such as water purification filters. Carbon cartridge is one of the products of the company, which contains a type of nanofilter. Porous carbon has been used in this cartridge, which is able to eliminate unpleasant smell and pollutants. The filter is also able to remove heavy metals and organic compounds due to its high specific area. This company has also produced a specific pad that can be used next to filters in order to eliminate very small particles. The pad has been designed to have a long lifetime with low possibility of blockage.

## **3- Ecochem International**

[Ecochem International](#) is another Canadian company active in the field of water industry, and it has three nanotechnology products in NPD. This company produces water purification units based on nanofiltration, in which silver, zinc oxide, silicon dioxide, and titanium dioxide nanoparticles have been used. Contrary to the previous two companies that focused on the production of filter for water purification, this company produces small and medium water purification units, and presents them to the market.