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## Production of Nanofiltration Membranes for Water and Wastewater Treatment

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Hunan Keensen Technology Co has produced and introduced to the market 16 nanofiltration membranes to meet a part of the need in the purification of water and industrial and household waste water. The membranes have various properties and they have been designed in accordance with varied industry and home needs.

[Hunan Keensen Technology Co](#) has registered [16 products](#) in Nanotechnology Products Database ([NPD](#)) until the end of January 2017. Hunan Keensen Technology Co is a Chinese company in Changsha province, which is active in the field of water and waste water. This company has produced nanotechnology based filters since 2008, which can have many applications from purifying drinking water at home to purifying industrial waste water.

### Some of the company's products include:

- 1- [Industrial Nanofiltration Membrane Elements 2200GPD](#): It is a nanofiltration membrane designed to purify surface and underground water and it can work with low pressures. This membrane has a high permeability and can let a large current pass through. The membrane has been classified in industrial waste water purification section.
- 2- [Industrial Nanofiltration Membrane Elements 1750GPD](#): This membrane is used for industrial waste water and it has been designed in a way that it can be used to remove paint and heavy metals from industrial waste water. It can also remove salt, and the protein in cheese water can be separated with it too.
- 3- [Household Nanofiltration Membrane Elements 400GPD](#): This membrane is among household products. This nanofiltration membrane is used to purify water in houses and can provide purified water with a higher level of purity for the consumers. It works at a temperature of approximately 25° C and a pressure of 70Psi. The active area of this membrane is 1.48 square meters.

Analyses of Nanotechnology Products Database show that the nanofiltration membranes of this company for household uses have a passing capacity of 75 to 400 gallons per minute, while the number is 1750 to 9000 gallons per minute for the industrial products.

The company has been designated in the five-year development plan of environment friendly national industries of [China](#), and it is among the job creating companies in [China's](#) environment section. Hunan has succeeded in receiving financial support from the Chinese government to develop nanofiltration technology. The company's project to produce industrial filters has been recognized as a revolutionary project in water and waste water industry.

The ranking of nanoproducts manufacturers in water and waste water section shows that Hunan Company ranks 5<sup>th</sup> with regard to the quantity of products. [TriSep Company](#) with [26 products](#), [Dow Chemical](#) with [24 products](#), [Nanostone Water Company](#) with [23 products](#), and [Applied Membranes](#) with [16 products](#) rank 1<sup>st</sup> to 4<sup>th</sup> respectively.

It must be added that until the end of January 2017, 278 nanoproducts in [water and wastewater](#) section have been registered in Nanotechnology Products Databank, which belong to 91 companies from 20 different countries. The most shares in this field belong to nanomembrane (150 products), water filter (54 products), nanofiltration assembly line (27 products), water purifier (14 products), and water cooler (7 products). Silver nanoparticles have been used in 40 products of the database, and titanium dioxide ranks 2<sup>nd</sup> with 16 products. Morphologically speaking, nanoparticle has the most shares in the database with 52 products.

The database's analyses show that 165 products belong to [United States](#), and [China](#) ranks 2<sup>nd</sup> with 26 products. [Canada](#) with 18 products, Holland with 17 products, and [Germany](#) with 15 products have the next ranks.

Analysis of the properties and characteristics of the products in Nanotechnology Products Database shows that among the nanoproducts in water and wastewater section, 40 products remove organic chemical materials and 30 products have antibacterial properties. 35 products can work in low pressures and 33 products can control the ions in water.