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FILTRALITE®

# Filtralite®:

## The Innovative and High Efficient Media Behind Better Water Quality and Less Filtration Energy


Special Issue
January 2026

www.filtralite.com

# Issue Content

## Filtralite®







## Filtralite® Pure









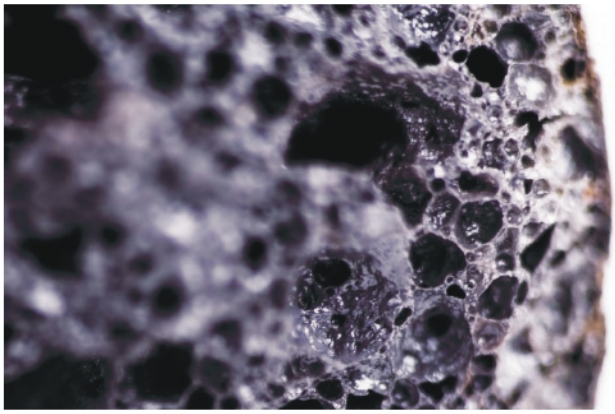



## Filtralite® Clean



## Filtralite® Air





## Filtralite®



# Filtralite®: Unlocking the Future of Sustainable Water Treatment in the MENA Region

This series of articles highlights the significance of Filtralite® solutions as an innovative approach to addressing water challenges in the MENA region. Beginning with the introduction of Filtralite® as a high-performance filter media made from expanded clay, it has proven its ability to enhance the efficiency of water treatment plants while reducing operational costs. Filtralite® has been successfully implemented in over 750 plants worldwide, reinforcing user confidence in its effectiveness.

Furthermore, the articles explore how Filtralite® can improve water quality by effectively removing iron and manganese, contributing to compliance with health standards. Additionally, they address the environmental benefits of using Filtralite®, as it helps reduce carbon footprints and enhances sustainability in water treatment processes.

The future of Filtralite® in the Saudi and Egyptian market is also discussed, where the demand for sustainable water solutions is on the rise. Through partnerships with local companies like Al-Mousa Trading and Flotech, Filtralite® aims to expand its application in new projects. In summary, this series provides a comprehensive overview of how Filtralite® can contribute to water security in the region, reflecting the commitment of companies to innovation and sustainability in water treatment.


Mohammed Kastawy

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**Mohammed Kastawy, Area Sales Manager for the region, discusses the importance of Filtralite® in boosting production efficiency and minimizing water loss, particularly amidst rapid urbanization. The articles also spotlight successful case studies, such as the Beni Saf desalination plant in Algeria, which achieved significant operational cost reductions through the use of Filtralite®.**


# Filtralite®: Redefining Water Treatment Excellence for a Brighter Future



Filtralite® is a leading solution in the water treatment sector, offering innovative technologies to enhance the efficiency and effectiveness of filtration processes. With the increasing demand for clean water in the Middle East, the importance of utilizing high-performance filtration media like Filtralite® becomes evident. Made from expanded clay, Filtralite® provides numerous benefits, including reduced energy consumption, improved water quality, and lower operational costs.

Backed by Saint-Gobain's extensive expertise in materials, Filtralite® has been successfully implemented in over 750 facilities worldwide. By optimizing filtration efficiency and minimizing maintenance needs, Filtralite® helps meet the growing demands of communities facing environmental challenges. Additionally, the use of this technology reflects a commitment to sustainability and enhances countries' capabilities to address water scarcity issues.

Practical applications and case studies demonstrate Filtralite®'s effectiveness in treating both wastewater and drinking water, making it an ideal choice for the future.


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**Filtralite® revolutionizes water treatment by combining innovative technology with unmatched efficiency, ensuring cleaner water and a sustainable future for communities facing the challenges of water scarcity.**

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# Stay Updated with Filtralite®

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# Filtralite's Media reduce the Size and Cost of Water Treatment Plants

As the MENA region's water market embraces innovation, Filtralite® — a high-performance filter media — is gaining momentum. Mohammed Kastawy, Area Sales Manager - MENA region, shares insights on Filtrate's impact, challenges, and growth potential in the Middle East.

Filtralite®, the filter media made of expanded clay, started its journey in Europe, 45 years ago. After strengthening its presence in Europe, such as in France, United Kingdom, Norway and Spain, Filtralite is expanding further in the Middle East. Filtralite has recently made its debut in the MENA market, supported by Saint-Gobain, a company with 360 years of industrial experience. Filtralite is more than just a product; it's a proven solution with a successful track record in over 750 plants worldwide. It is designed to replace traditional materials like sand and anthracite in water treatment facilities, providing numerous benefits for sectors such as desalination, wastewater and drinking water production.

In MENA region, Filtrate's benefits include enhanced filtration efficiency, reduced energy consumption, and better water quality. Its porous structure allows for higher water flow rates and longer filtration cycles while reducing the need for backwashing, which saves up to 75% in energy costs and cuts water loss by 60%. Additionally, Filtralite has a lower carbon footprint compared to traditional methods and can last twice as long as sand, up to 30 years in some cases. Filtralite is well adapted to the MENA market, due to the rapid urbanization which entails a need for more production capacity without building new facilities. Furthermore, when new facilities need to be built, Filtralite allows the size of the plant to be reduced to deliver the same amount of water. Filtralite is well adapted to reduce operation costs and improve production capacity and the efficiency of water treatment plants, all over the globe.

We had the opportunity to interview Mohammed Kastawy, Area Sales Manager - MENA region, whose commitment has been crucial to advancing Filtrate's development in Middle East.

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*Mohammed Kastawy, Area Sales Manager for the MENA region, is collaborating with the new team at our distributor, Al-Mousa Trading.2025*

## Can you describe Your Career, Your Current Role, and Your Level of Involvement within Saint-Gobain?

With over 20 years of experience in sales and development with several International Organizations, I currently serve as the Area Sales Manager for the MENA region at Saint-Gobain. Saint-Gobain is an exceptional company with a global presence, offering excellent opportunities to enhance skills and knowledge in a positive work environment.

I achieve goals through strategic business planning and innovative sales initiatives. I enjoy collaborating with my colleagues and harnessing our collective energy to reach our objectives year after year. The new challenge with Filtralite presents a valuable opportunity for me to expand my expertise in the water sector, particularly in filtration.

## How long have you been involved in the Development of Filtralite in Middle East?

My team and I have dedicated years to developing the market for Filtralite, an expanded clay solution used in filtration. Increasingly, various stakeholders are recognizing this innovative solution for its ability to reduce operating costs in drinking water and wastewater treatment plants.

**"With such a strong and capable team on board, I'm confident that this partnership will drive significant growth and expand Filtralite's footprint in KSA"**

I thrive on challenges, and it's rewarding to be part of the journey with such an outstanding product that meets the needs of the MENA market.

Each year, we have seen a rise in satisfied customers in the Middle East. To build on this success, we are now distributing Filtralite throughout the region in collaboration with Al-Mousa Trading, which brings over twenty years of expertise in providing innovative engineering solutions in water, energy, and infrastructure.

We look forward to driving significant growth and expanding Filtralite's presence in KSA. This is just the beginning of what promises to be a successful and impactful 2025.

**"Filtralite, a high-performance filter media, has been optimizing water treatment for over 40 years—delivering efficiency, sustainability, and long-term cost savings"**

## How would you describe the Water Market in MENA Region?

The MENA water market is growing very fast. Compared to other areas in the world, we do not lack raw water resources, but the need for desalination, wastewater and drinking water is rising alongside the country's increasing urbanization. More people are going to live in cities, and this puts additional pressure on water resources in these areas. This is why we need to rethink and enhance our approach to filtration in urban regions.

As cities expand quickly, the size of water treatment plants becomes small for the growing demand. This is where Filtralite can play a great role, by increasing the water production capacity and thus reducing the need to build new facilities. In addition, with its superior performance, Filtralite allows to reduce the size and thus the cost of new water treatment plants.

## What is the Most Common Filter Media?

The most common filter media in MENA region are sand, and sand combined with anthracite. In the past, the priority in MENA was to have enough water treatment plants, both for drinking water and wastewater, but more and more the performance of those plants is also being considered. Again, Filtralite can have a major impact here: compared to sand, we can increase the production capacity and decrease the operation costs, keeping the same output qualities. The same happens with the combination of sand and anthracite; we are outperforming this dual-layer solution, with better production capacity, and fewer backwashes needed; this means a significant decrease in operating costs, but with the same water quality as the output of the filters.

**The lifetime of our products is more than double that of Anthracite, and it is 4 to 6 times longer than sand.**

## How did the MENA Markets React to the Introduction of Filtralite Filter Media?

A common point with the rest of the world is that the water market is conservative. Sand has been used for thousands of years to filter water, dating back to ancient Egypt, so it is a well-known solution, and it can be difficult to change this established mindset. Also, in engineering schools specializing in water treatment, Filtralite is not mentioned, traditional solutions like sand and anthracite are most frequently discussed. We have an outsider position for now. So it is very important for us to educate and reassure customers and to clearly convey how easy it is to implement Filtralite.

**"Filtralite outperforms the combination of sand and anthracite solution, with better production capacity, and fewer backwashes needed"**

Filtralite has been used for more than 40 years now, and we have a strong reference list of more than 750 references in drinking water and wastewater, and many case studies around the world. For sure, every water plant is different with different characteristics and needs, but the market is reacting very positively to Filtrate's deployment. Of course, we need time to be well known in a big country such as KSA and even more in the whole of Middle East, but the economy is stable in the country and the market has an appetite for innovation and high-performance products. It is a very good moment for Filtralite to be implemented in the whole of Middle East.

We started to have several references in MENA with very positive results, which has increased market interest in Filtralite.

Also, we have presented Filtralite at several exhibitions in the Middle East, and we can feel the public's interest in the product, which motivates us even more.

## What Synergies can you find between Al-Mousa Trading and the Filtralite Area?

Al-Mousa Trading is specialized in water distribution and Filtralite focuses on the production side. The great synergy we have is that often we can share our contacts. It was the starting point for combining our strengths to be even better, together. Also, we share the same processes, the same values, and the same goals, aligned with Saint-Gobain policies. This helps us to focus on the most important questions, and to respond to the needs of our customers.

**"Filtralite has been used for more than 40 years, with a strong reference list of more than 750 references in desalination, drinking water and wastewater"**

As you may know, Saint-Gobain Group is one of the leading companies in building materials. This way, we focus on high-performance materials to offer our customers comfort and security.

With Al-Mousa Trading, which specializes in Water Pumps, Boilers, Media Filter and Piping Systems Solutions, we are following the same preference for high-performance products to bring the best solution to our customers. I am proud to work for a company that delivers good solutions to meet our customers' needs.

Filtralite fits perfectly with our goals. It is a high-performance filter media designed to reduce operating costs during the filtration stage and is made to last.

## What are the Main Challenges you are facing when presenting Filtrate's Advantages?

As I mentioned earlier the water market around the world is conservative, especially concerning drinking water, but MENA is keen to experiment with new solutions in water treatment. The high number of case studies we have around the world, and now in MENA, have provided us with extensive results and performance tests.

**"We need time to be well known in a big country such as KSA, but the market has an appetite for innovation and high-performance products"**

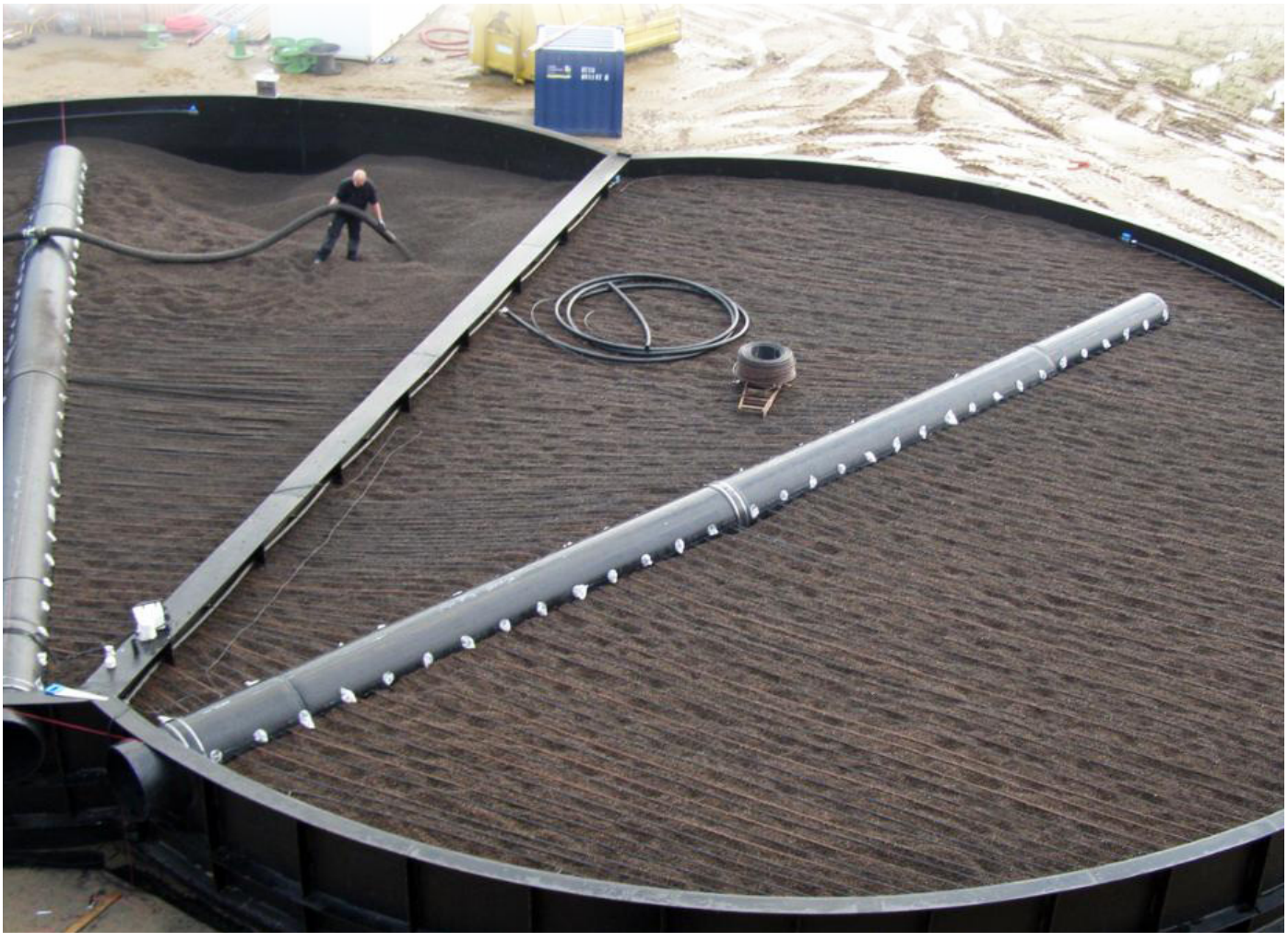
When plant managers, plant designers, and even consultants look at our case studies around the world, they want to conduct a trial – either in a column or directly in one of their filters – to see if this new generation solution can apply to their plant.

When the set-up is correctly established in the pilot, they can replicate in local settings the same results as in our case studies, and want to proceed with a deployment. The stock we have in MENA helps us to answer quickly to customer needs.

## How do you see the Future with Filtralite and What are the Next Steps in its Development?

I see a bright future with Filtralite. Sand and anthracite are still the most commonly used products, but Filtralite has significant growth potential in MENA. We still have work ahead to make Filtralite as well-known as our two competitors, but given the performance results we're achieving, we're confident in Filtrate's expansion.

**In the next steps of our development, we want all actors in the water market to be aware of Filtralite and mainly about its advantages – the benefits they can gain with Filtralite, and what they miss out on by not using it. We hope our example can support our colleagues in Middle East and all around the world.**



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# FILTRALITE®

**In addition to its low density and high porosity, Filtralite® offers high abrasion and impact resistance**

**Filtralite develops and manufactures quality filter media for all water and air treatment applications:**

**Filtralite® Pure for drinking water solutions,both for physical filtration and biological treatment.**

**Filtralite® Clean for wastewater treatment, both for biological process and tertiary filtration.**

**Filtralite® Air is a premium filtering product which removes odour and results in clean air**

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# Filtralite® – High-Performance Filter Media from Saint-Gobain

Filtralite® delivers superior water and wastewater treatment efficiency with proven performance across global utilities.

## Why Filtralite®?

- Up to 2–4× fewer backwashes
- Higher filtration rates up to 20 m/h (vs. 4–12 m/h traditional media)
- Long lifespan: 20–25 years without replacement
- Lower OPEX & CAPEX: smaller footprint, smaller pumps, less maintenance
- Superior removal of iron, manganese & ammonia
- Bulk density: 800–900 kg/m³ with surface area >1500 m²/m³

## Products:

| Filtralite® Pure | Filtralite® Clean | Filtralite® Air |
|---|---|---|
| Drinking water & Desalination | Wastewater Treatment | Odor control |

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Filtering The Water For Tomorrow

# FILTRALITE®

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**With Filtralite® filter media, made from lightweight expanded clay aggregates, you can do more with less — more pure water with less energy, less space, and without the need to rebuild existing facilities.**

- Increased water production without extending existing installations
- Save on operating costs
- Reduce the amount of water taken from the environment
- Average ROI 3 years until less than 6 months

Visit Filtralite® Website

www.aquaenergyexpo.com

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FILTRALITE®

# Filtralite®: The Next-Gen Filtration Media Reshaping Water and Air Treatment Industries

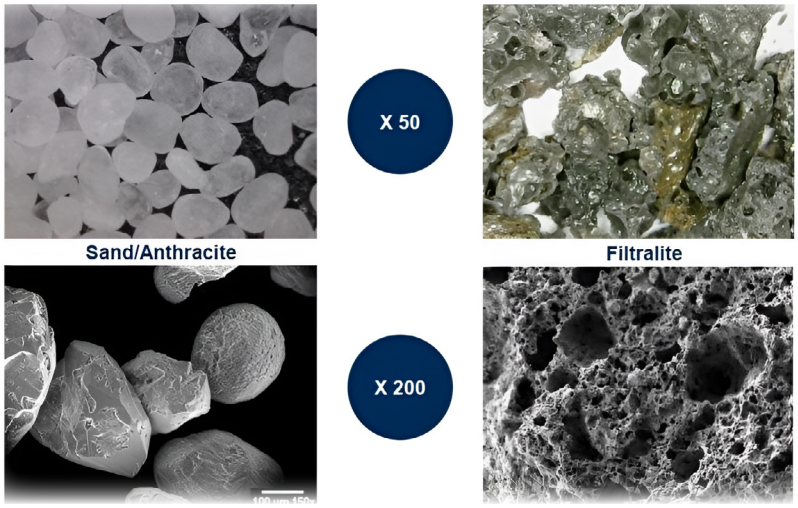
www.aquaenergyexpo.com

In an era where water scarcity and environmental pollution pose significant challenges, advanced filtration technologies are critical for sustainable industrial operations. Filtralite®, a market-leading porous ceramic and high-performance filter media developed by Saint-Gobain, stands at the forefront of innovation in water and air purification. With applications spanning drinking water treatment (Filtralite® Pure), wastewater purification (Filtralite® Clean), and odor control (Filtralite® Air), this expanded clay aggregate offers superior efficiency, durability, and cost-effectiveness compared to conventional filtration media.

Saint-Gobain, a global industrial leader with a $50 billion turnover in 2024, has leveraged its century-long expertise in clay-based solutions to develop Filtralite®. Manufactured in Norway, Finland, and Portugal, this media is engineered to enhance filtration rates, reduce maintenance costs, and improve water quality—making it an indispensable asset for desalination plants, wastewater treatment facilities, and air purification systems.

## From Challenges to Opportunities

Filtration is a crucial aspect of water treatment, directly influencing the quality and efficiency of the final product. Historically, filtration systems have relied on conventional materials such as sand, anthracite, and pumice. These traditional media have provided filtration rates ranging from 4 to 12 meters per hour but are often plagued by issues such as frequent clogging, increased maintenance requirements, and suboptimal water quality. The Silt Density Index (SDI) for these systems typically ranges from 3.5 to 4, which can complicate downstream processes like reverse osmosis that necessitate finer pre-treatment.




***In contrast, Filtralite® emerges as a superior alternative, boasting a porous and lightweight structure that allows for filtration rates of up to 20 meters per hour.***

The key benefits of Filtralite® include:

- Reduced Clogging: This media addresses the clogging issues common with traditional materials, leading to less downtime and lower operational interruptions.
- Water Savings: Filtralite® requires less frequent backwashing, resulting in significant water savings.
- Enhanced Water Quality: With an SDI consistently below 3, Filtralite® improves compatibility with sensitive downstream processes.

Traditional filtration systems, whether mono or dual media, face inherent limitations, including reduced efficiency in treating poor water quality, mixing of media layers, and increased head loss at higher filtration rates. These systems primarily rely on surface retention, which restricts filtration depth and effectiveness, leading to higher operational and maintenance costs. Filtralite®'s increased porosity accelerates water movement, enhancing filtration rates and retaining more suspended solids.

This depth filtration capability prevents clogging at the surface, allowing for more effective treatment. Moreover, Filtralite® can be seamlessly integrated into existing filtration systems, requiring minimal modifications. This adaptability makes it an ideal solution for both new installations and system upgrades.

## Advancing Water Treatment Techniques with Filtralite®

Filtralite® is characterized by its tiny, dark-brown to black clay granules, sourced from the cold climates of Northern Europe. The extraction process involves drilling a 3–5 meter hole underground, followed by the removal of impurities using renewable energy sources like biomass. The clay is then subjected to a 58-meter-long rotary kiln, heated to 1200 degrees Celsius, which transforms the clay into a porous media by converting organic materials into volatile gases.

### Filtralite® is versatile in its applications:

- Drinking Water Treatment: It can be employed as a single layer with sand or in dual layers without sand, known as mono-multi systems. This differentiates Filtralite® Pure from anthracite, which cannot function effectively as a standalone alternative.
- Desalination: In the pre-treatment stage, Filtralite® can be utilized in single or dual-layer configurations, optimizing the treatment process based on specific requirements.
- Wastewater Treatment: Filtralite® Clean excels in tertiary treatment, leveraging its high number of macropores to reduce ammonia and lower Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) values.

## Filtralite®: Effective Air Purification Solutions

Odor treatment relies on a straightforward yet effective approach: directing contaminated air through a filtration medium, either upstream or downstream, often accompanied by water sprinkling.

Filtralite® Air Filter Material excels in this process due to its unique porous structure, which promotes promotes biofilm growth while ensuring optimal airflow.

### Key Advantages of Filtralite® Air

#### Enhanced Odor Adsorption

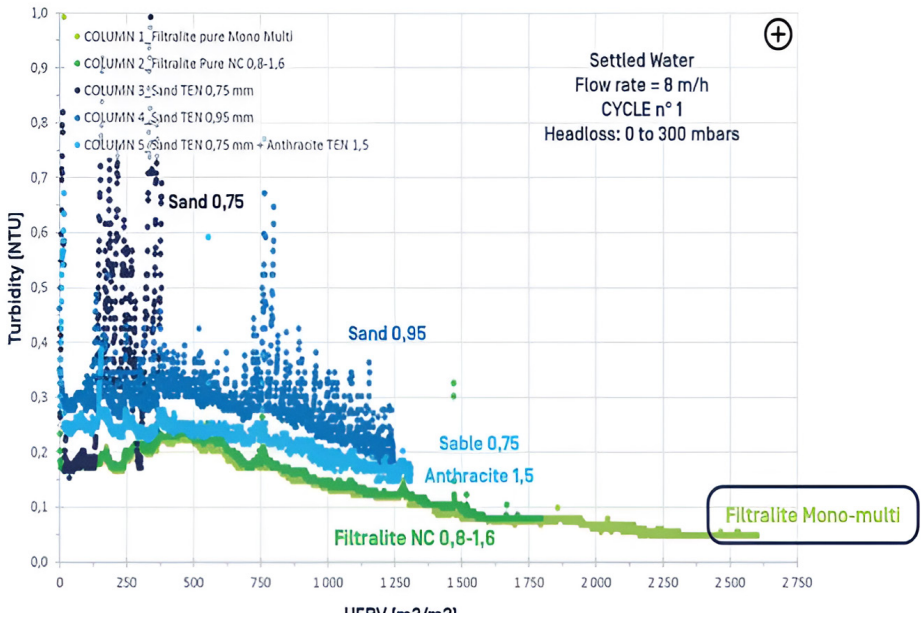
- The material's high porosity maximizes contact area, allowing greater air volumes to be filtered efficiently.
- Effectively adsorbs H□S and other odorous compounds, reducing unpleasant smells even before biofilm develops.

#### Durability & Structural Efficiency

- Made from natural clay, Filtralite® Air is stable, long-lasting, and free from hazardous additives.
- Its lightweight design exerts five times less structural pressure than conventional materials, lowering construction and removal costs.

#### Optimal Filtration Performance

- High surface area and permeability ensure low pressure loss, extended service life, and efficient filtration.
- Creates an ideal habitat for biofilm, boosting biological filtration effectiveness.




## Case Studies Demonstrating Filtralite®'s Efficacy

### Evaluating Filtralite® Performance: Insights from Suez Tests

- **Objective of the Study**

A comprehensive study was conducted to assess the performance of Filtralite® media in particle retention compared to conventional filter media, as well as to examine the impact of raw water quality and filtration flow rate on filtered water quality and filter productivity.

- **Testing Site and Methodology**

This evaluation took place at the CIRSEE in Le Pecq, where a pilot system comprising five filtration columns was utilized. The pilot was successively fed with two types of water:
Coagulated Seine River water with turbidity < 20 NTU
Settled water with turbidity ranging from 0.5 to 5 NTU
Two filtration rates were tested during the study: 8 m/h and 15 m/h.

- **Performance in Turbidity Removal**

The results demonstrated that both conventional filters (sand and sand/anthracite) and Filtralite® media exhibited excellent performance in removing particles, maintaining a filtered water turbidity of 0.2 ± 0.1 NTU. Notably, Filtralite® media achieved the lowest turbidity levels among all tested options.

- **Filter Productivity (UFRV)**

The study also focused on filter productivity (UFRV), revealing that Filtralite® media, especially the Mono-Multi variant, was 1.5 to 2 times more efficient than the best conventional media. Importantly, increasing the filtration rate did not negatively impact the performance of Filtralite®.

## Raw Water Quality and Monitoring

Online monitoring revealed the following characteristics of the influent water:

- Average turbidity (raw water): 7.6 NTU (range: 5–20 NTU)
- Average turbidity (settled water): 1.5 NTU (range: 0.5–5 NTU)
- Iron concentration: < 0.05 mg/L
- Natural organic matter: UV254 absorbance = 2.6 m□¹ for raw water and 0.6 m□¹ for settled water.

Overall, both conventional and Filtralite® filters effectively maintained turbidity at 0.2 ± 0.1 NTU for inlet turbidity levels ranging from 0.5 to 20 NTU. The findings complied with French regulations and SUEZ internal objectives, ensuring that filtered water turbidity remained below 0.5 NTU 100% of the time and below 0.2 NTU 95% of the time, highlighting the effectiveness of Filtralite® as a superior filtration media.

## Industrial air purification in EnergoUtil Plant in Ełk, Poland

### • Background: Initial Challenges with Traditional Biofilter Media

In 2017, the EnergoUtil plant in E□k, Poland, faced recurring issues in its air treatment system, which relied on a biofilter media composed of composted materials and bark chips. These materials frequently caked and collapsed over time, reducing permeability, increasing flow resistance, and necessitating frequent and costly media replacement.

### • Implementation of Filtralite® Air

Seeking a more reliable and sustainable solution, plant engineers conducted a thorough review of available technologies and literature. Their goal was to find a medium that could stabilize operations, reduce maintenance, and maintain high performance over time.

The plant introduced 400 m³ of Filtralite® Air 10–20 into its biofilter system—about half the total volume of the filter bed. A layer of birch bark was placed on the surface, and the system was adapted to sprinkle process water over the media three times daily for 20 minutes. This maintained consistent humidity throughout the bed, a critical factor for the biological removal of sulfur compounds.

### • Results and Operational Improvements

Thanks to the high water retention capacity and structural stability of Filtralite® Air, the plant no longer faced issues of drying or media collapse. According to the plant engineer, "After using the expanded clay fill, we managed to overcome the operational problems we experienced with the previous media. However, the most important thing is that we get stable parameters of biofilters and satisfactory efficiency."

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## 24–26 September 2025

# Filtralite® at Aqua Energy Expo MEA 2025

- Filtralite® showcased its high-performance filtration media designed for efficient and sustainable water treatment.
- The company highlighted its role as a key innovator in advanced filtration solutions.
- Visitors explored Filtralite's proven ability to deliver fast filtration and long-lasting performance.

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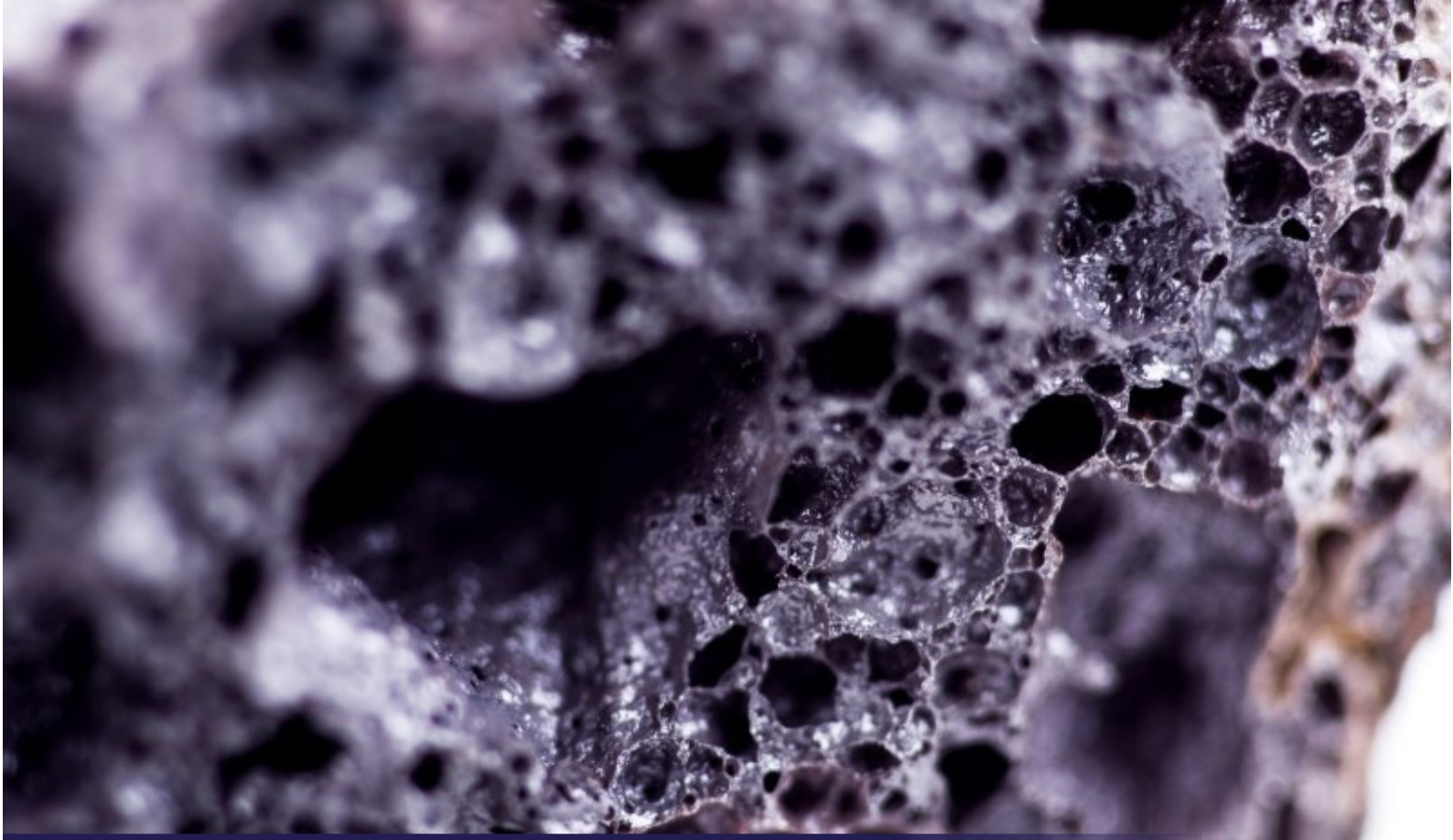

# FILTRALITE®: Sustainable Filtration of Water for Better Future

For utilities and water authorities, managing iron and manganese levels in drinking water is a growing challenge. These elements, if untreated, can lead to the clogging of pipes, discoloration, and reduced efficiency in water distribution networks. Traditional treatments often demand extensive facilities and increased maintenance, pushing operational costs higher and impacting overall sustainability. Filtralite provides a high-efficiency solution that can tackle these issues at their core. Its innovative filter media enhances the biological filtration process, enabling higher filtration rates and effectively removing iron and manganese without requiring costly infrastructure upgrades. Through case studies, the article demonstrates Filtralite's ability to effectively remove iron, manganese, and other contaminants, while also reducing maintenance requirements and improving overall treatment efficiency, making it a compelling choice for both wastewater and drinking water treatment applications.

## The Urgent Challenge

Water Utilities face numerous challenges in managing iron and manganese in drinking water. These metals can discolor water, leading to customer complaints and the need for additional treatment to restore clarity. They also form solid precipitates that clog pipes, filters, and valves, reducing water flow and increasing maintenance costs. Over time, this accumulation can damage infrastructure, raising repair and replacement expenses. Iron and manganese contribute to the corrosion of metal pipes and equipment, shortening their lifespan and causing further contamination. They can also diminish filtration system efficiency, increasing operational costs and potentially lowering water quality.

While iron and manganese pose minimal risks at low levels, elevated concentrations, particularly of manganese, can present health hazards, necessitating additional monitoring and treatment. Removing these metals often involves costly processes, including chemical treatments and filtration, adding to operational expenditures. Furthermore, the removal process generates sludge that requires proper disposal, leading to environmental and financial challenges. Overall, managing iron and manganese requires robust treatment systems, regular maintenance, and long-term planning to ensure safe, high-quality water.

## Performance Improvement & Efficiency Gains

Filtralite's filter media differs significantly from traditional filtration solutions like sand, gravel, or activated carbon.

In terms of composition, Filtralite is made from a type of expanded clay that is fired at high temperatures, making it lightweight, chemically stable, and highly resistant to degradation, unlike traditional media that can become clogged or less effective over time. The structure of Filtralite is unique, with highly porous, irregularly shaped particles that create an extensive surface area for filtration. This open, porous structure allows water to flow through more easily, reducing the risk of clogging compared to the more uniform, compact grains of traditional media.

In terms of filtration efficiency, Filtralite outperforms traditional solutions. Its high porosity and large surface area enable it to trap a wide range of particles, from larger debris to finer suspended solids, resulting in superior contaminant removal. Additionally, Filtralite's unique structure helps reduce backwashing requirements, improving operational efficiency and lowering water and energy consumption during maintenance cycles, unlike traditional media that can suffer from intermixing between layers and low efficiency for poor water quality. Overall, Filtralite's innovative composition and structure provide significant advantages over traditional filtration solutions, offering higher efficiency, better flow rates, and reduced maintenance needs.

**Filtralite's filtration rates range between 4 m/h and 12 m/h, whereas traditional dual media filters experience high head loss at these rates and are more expensive to operate and maintain**

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## Key Advantages

Filtralite® is an innovative filter media that offers significant operational and capital expenditure (OPEX and CAPEX) savings, as well as superior filtration performance compared to traditional options like sand or anthracite.

**Mohammed Kastawy, Area Sales Manager for Filtralite in the Middle East and Egypt, "A traditional filter media typically consists of sand or anthracite, or a combination of the two, forming mono-media or dual-media filters. Filtralite, on the other hand, stands out with its high porosity compared to conventional options. While standard media like sand may need replacement every 4 to 5 years, Filtralite can operate for up to 25 years without replacement, maintaining its quality throughout its lifespan," he explained.**

Key OPEX advantages of Filtralite® include:

- 2 to 4 times fewer backwashes
- Higher filtration velocity, allowing more water treatment in the same period
- In reverse osmosis (RO) plants, Filtralite® produces more biologically stable water, reducing membrane fouling and extending RO membrane lifetime
- Less cleaning and replacement of cartridge filters

Ability to handle higher suspended solids (SS) rates in the input water

- Filtralite® can support filtration rates of up to 20 m/h, significantly higher than the 4-12 m/h range of traditional media.

In terms of CAPEX, Filtralite® offers:

- Smaller footprint, requiring half the filtration cells compared to sand
- Savings in backwash pumps, concrete, steel, and other infrastructure
- Smaller backwash pumps needed due to Filtralite®'s lightweight nature
- Long lifetime of up to 25 years, significantly outlasting traditional media

## Filtralite Application

Filtralite is a highly versatile ceramic material manufactured from expanded clay in Norway, making it an optimal choice for wastewater and drinking water treatment. The manufacturing process involves heating the clay to temperatures up to 1200°C. The crushing and sieving to achieve a grain size of 0.8 - 5.0 mm.

Filtralite's key physical properties include a bulk density ranging from 800-900 kg/m$^3$, a highly porous structure with a specific surface area exceeding 1500 m$^2$/m$^3$, an irregular shape and uniform size resulting in a high voids volume, a Mohs hardness of over 5.5 for high attrition resistance, and an effective operational lifespan of more than 20 years.

Within wastewater treatment, Filtralite can be used in both biological filtration and granular filtration processes. The naturally occurring bacteria in the wastewater form a biofilm on the porous Filtralite beads, enabling efficient biological treatment through nitrification and denitrification. Geir Norden, Research and Development Manager at Filtralite, Stated "Filtralite is a ceramic material that is crushed and sieved into particle sizes typically ranging from 0.8 to 5.0 mm. Due to its highly porous structure, we recommend soaking before use. With a specific surface area exceeding 1500 m$^2$/m$^3$, Filtralite is exceptionally well-suited as a biofilm carrier." For drinking water treatment, Norden emphasized Filtralite's ability to simultaneously remove ammonia, iron, and manganese through the development of biofilms on its surface. The biofilm contains bacteria that oxidize dissolved iron and manganese, causing them to precipitate and get trapped in Filtralite's pores. The material's unique properties also enable high-rate biofiltration, with biofilters using Filtralite capable of operating at filtration rates up to 20 m/h.

## Case in Point

### • Wastewater Treatment

In Norway's largest wastewater treatment plant, VEAS in Oslo, Filtralite filter media has proven to be an exceptionally durable and efficient solution for both bio-substrate and filtering purposes. After 25 years of continuous operation with daily backwashing, there has been no need for replenishing the Filtralite media.

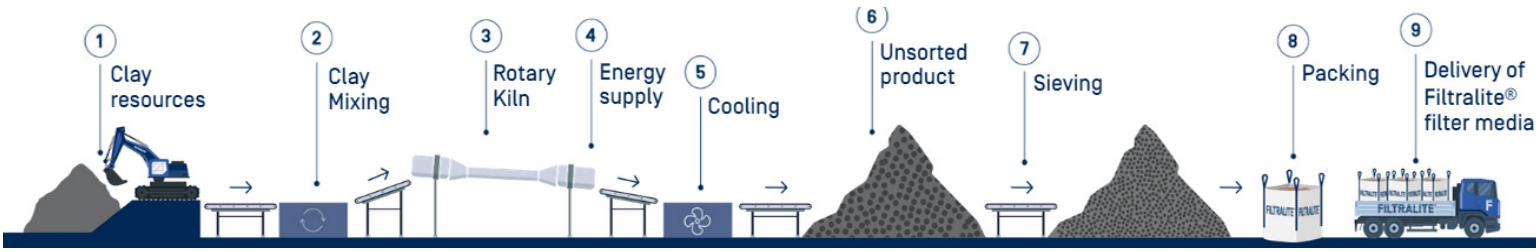
**The Vestfjorden Wastewater Plant (VEAS) serves a population of 600,000 people, processing a maximum of 11 m$^3$ of wastewater per second, with an annual volume of 100 million m$^3$**

Removal of nitrogen is a crucial objective, and Filtralite plays a leading role in the nitrification and denitrification processes. The unique biofiltering process at VEAS consists of eight "nitrification" bio-filters, each followed by "denitrification" bio-filters, where Filtralite HC 2.5-5 and Filtralite HR 3-6 act as both a substrate and a filtering medium, maintaining a robust bioculture. The exceptional durability and performance of Filtralite have led VEAS to expand its use, demonstrating its reliability and suitability for large-scale water treatment applications.

### • Drinking Water Treatment

To meet the increasing demand for drinking water in Hong Kong, the new Tai Po Water Treatment Works was built with a production capacity of 1200 Ml/day. The plant draws raw water from the Dongjiang River, which has an average turbidity of around 11 NTU and contains ammonia and manganese. During the planning phase, the use of primary aerated biological filters (PABF) was selected for the removal of ammonia and manganese, and pilot tests showed that the expanded clay filter media Filtralite® Pure was the best solution.

The test column containing Filtralite® Pure HC (High-density, Crushed) 2.5-5 mm achieved a stable ammonia removal of 80-90% and a manganese removal of 75% . Leca Norge AS delivered 3000 m$^3$ of Filtralite® Pure HC 2.5-5 mm to the total 12 PABFs at the Tai Po Water Treatment Works, and the plant's operating data has shown that the PABFs effectively remove both ammonia and manganese to levels below the specified requirements, demonstrating Filtralite's suitability for addressing the challenges of water quality and treatment in high-demand urban areas.



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FILTRALITE®

**In addition to its low density and high porosity, Filtralite® offers high abrasion and impact resistance**

## Filtralite develops and manufactures quality filter media for all water and air treatment applications:

### FILTRALITE® PURE

Filtralite® Pure for drinking water solutions,both for physical filtration and biological treatment.

### FILTRALITE® CLEAN

Filtralite® Clean for wastewater treatment,both for biological process and tertiary filtration.

### FILTRALITE® AIR

Filtralite® Air is a premium filtering product which removes odour and results in clean air

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# Filtralite® Webinars

# Innovative Filter Media for Sustainable Water Solutions

## Mohamed Kastawy

Area Sales Manager – MENA Region

- Discover how Filtralite® boosts plant performance and improves water quality
- All through the first webinar for Filtralite® on the Aqua Energy Expo platform.

Scan the QR code to watch the full session.

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# FILTRALITE®:

# ENERGY SAVING AND OPTIMISING OPERATING COSTS IN DESALINATION

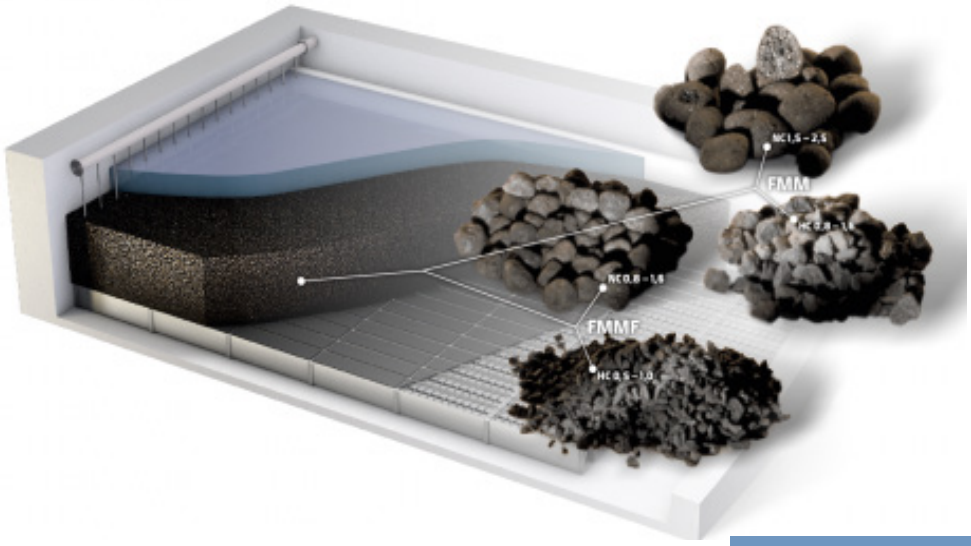
Desalination serves as a comprehensive solution for providing drinking water in regions facing water scarcity. This technology generates additional resources that were previously unavailable, and the produced effluent meets quality standards suitable for human consumption, which is crucial for effective water resource management.

The increasing investments in desalination across areas like the Middle East, the United States, and Latin America underscore this reality.

> **The Global Water Desalination Market size is expected to reach US$ 36.98 billion by 2032, up from US$ 16.19 billion in 2023, with a CAGR of 9.61% from 2024 to 2032.**

The viability of a desalination process, both from a technical and economic standpoint, largely hinges on the pretreatment of the sourced water. Effective pretreatment is essential to prevent and minimize issues such as membrane fouling, incrustation, and damage. Thus, ensuring high-quality water for the osmosis units is critical. Moreover, it is vital to lower operating costs during this phase to maintain sustainable pricing per cubic meter by reducing energy and reagent consumption, as well as equipment maintenance expenses.

Filtralite® Pure addresses these needs by enhancing water quality and minimizing operating costs while increasing production capacity and reducing head loss.




# FILTRALITE® PURE Media Options

Filtralite solutions can be applied in mono media filters as well as in dual media configurations, These solutions combine two types of Filtralite Pure filter media with different densities and sizes, further enhancing filter run durations and production capacity.

## Developing the Right Solution

The Filtralite® Pure filter media substitutes conventional granular materials—sand and anthracite—used for filtering suspended solids (SS) during the pretreatment phase before desalination. Filtralite® Pure is an advanced expanded clay product created by Leca, Saint Gobain. Designed specifically for this application, it provides exceptionally high-efficiency filtration, enhancing both effluent quality and cost savings. The reasons behind this superior performance and extended filter lifespan are found in the material's structural properties and composition. Filtralite® Pure boasts high porosity with a significant specific surface area of approximately 3 $m^2/g$ and exhibits low hydraulic resistance; many pores in the material facilitate flow. In summary, it serves as the ideal filtering medium: it captures most SS with minimal head loss accumulation, delivering deep filtration and prolonged clogging intervals.

### Filtralite® Pure performance in numbers

- In single media filters, the interval between backwashes can be increased by as much as 500%.
- In dual media filters, backwashing can occur up to eight times less frequently.
- In biofilters, Filtralite® Pure achieves up to 98% iron removal, 80% manganese removal, and 90% ammonia removal.
- Current Filtralite filters function at flow rates ranging from 1 $gpm/ft^2$ to 8 $gpm/ft^2$ for physical filtration, and up to 13 $gpm/ft^2$ for biofilters.

### • Filtralite® Pure NC 1,5-2,5

Filtralite® Pure NC 1,5-2,5 is a high-quality filter media made from expanded clay, used in drinking water treatment. Its porous structure enhances filtration efficiency, allowing longer filter runs between backwashes, which reduces energy and water consumption. This results in higher water production and lower operating costs, making it an effective choice for water treatment applications.

### • Filtralite® Pure HC 2,5-5

Filtralite® Pure HC 2,5-5 is ideal for biological treatment in drinking water facilities. Made from crushed clay aggregates with high density, ranging from 2.5 to 5 mm, this media features a highly porous structure that provides a substantial surface area for microbial growth, enhancing biological filtration while lowering operational costs.

### • Filtralite® Pure NC 0,8-1,6

Filtralite® Pure NC 0,8-1,6 is a high-quality filter media made from expanded clay, used for drinking water treatment and desalination pre-treatment. With crushed clay aggregates of 0.8-1.6 mm, its porous structure enhances filtration efficiency, allowing longer filter runs between backwashes. This results in lower energy and water consumption, increased water production, and reduced operating costs.

### • Filtralite® Pure HC 0,8-1,6

Filtralite® Pure HC 0,8-1,6 is a high-quality filter media made from expanded clay, used in drinking water treatment. When combined with Filtralite Pure NC 1,5-2,5, they create the Filtralite Pure Mono-Multi solution. Its porous structure enhances filtration efficiency, allowing longer runs between backwashes.

*" Filtralite® MC 1.5-2.5 significantly extends filter run lengths by 50-150% compared to conventional setups."*

## Efficient Desalination by Filtralite® Pure

Mohammed Kastawy, Area Sales Manager for Filtralite in the Middle East, highlighted the operational and capital expenditure savings provided by Filtralite in desalination processes. Filtralite reduces backwash frequency by two to four times, allows for higher filtration velocities, and produces biologically stable water, which decreases biofouling and extends the lifespan of reverse osmosis (RO) membranes. This innovation also lowers the frequency of cartridge filter cleaning and replacement while effectively managing higher suspended solids in input water.

On the capital expenditure side, Filtralite's lighter weight and higher efficiency lead to fewer required filtration cells, resulting in savings on pumps, concrete, and steel.

Filtralite® Pure offers two dual media solutions for desalination. The first solution combines Filtralite® MC 1.5-2.5 in the top layer with sand (1.0-0.8 mm) in the bottom layer, serving as a natural alternative to anthracite in traditional dual media systems. This configuration extends filter run lengths by 50-150% compared to conventional setups and improves effluent quality, achieving a 0.5-1 reduction in the silt density index (SDI), especially effective during turbidity peaks.

The second solution, Filtralite® Pure Mono-Multi, combines Filtralite® Pure HC (0.8-1.6 mm) and Filtralite® Pure NC (1.5-2.5 mm). This combination boosts filter efficiency, allowing for longer intervals between backwashes, thereby reducing operational costs and making it ideal for low turbidity and low SDI conditions in desalination pre-treatment.

# Shared Success

## • Filtralite® Media Boosts Beni-Saf Desalination Efficiency

The Beni Saf desalination plant in Algeria, owned by the Beni Saf Water Company and operated by Tedagua (Grupo Cobra), produces 200,000 $m^3$/day, making it one of the largest in the Mediterranean. To address challenges posed by increased suspended solids (SS) from concentrated rainfall, the plant replaced sand in its first filtration stage with Filtralite® filter media made from expanded clay.

This change aimed to minimize downtime during high SS events and optimize operating costs through reduced backwashing and improved filtration quality. The replacement was executed in two phases: 24 filters in October 2020 and the remaining 24 in October 2021. A comparison between Filtralite® and sand revealed that the filtration cycle with Filtralite® lasted 200% longer during intense rain events from November 2020 to February 2021. Additionally, the maturation period for filters using Filtralite® decreased by nearly 66%.

Production losses during this period dropped significantly, from 673,000 $m^3$ in 2019-2020 to 380,000 $m^3$ in 2020-2021, marking a 45% reduction. With the second phase completed, further reductions in downtime are anticipated, potentially exceeding 85%.Water quality improved by 0.3 to 0.5 SDI points, leading to less frequent cartridge filter replacements.

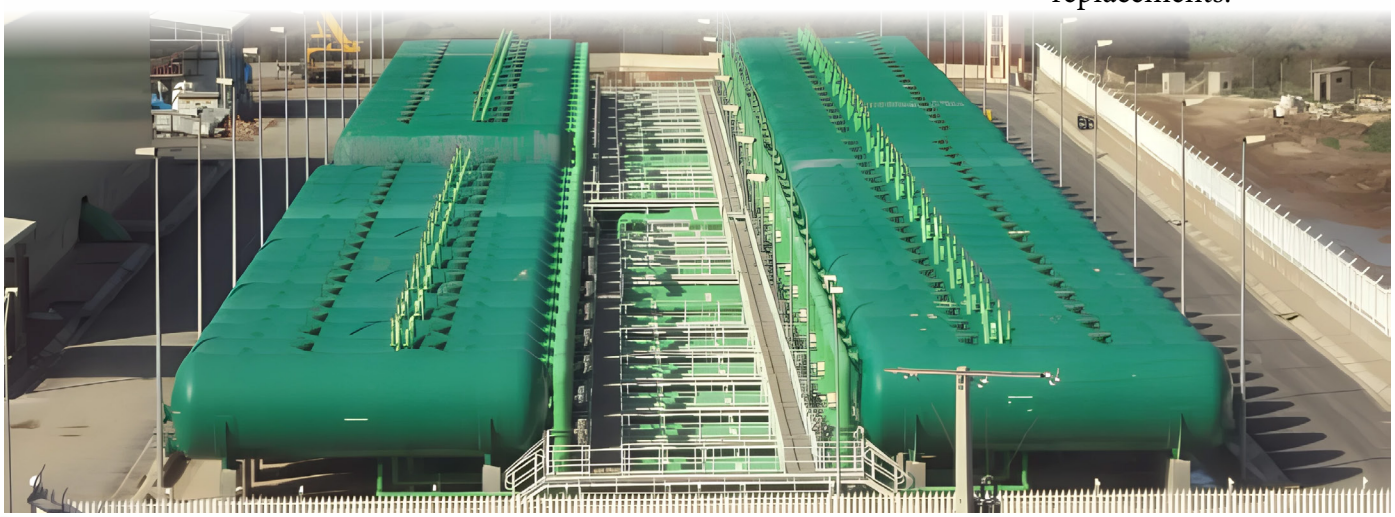
**“The amount of energy saved in the pre-treatment area is estimated at around 10%. It is thousands of dollars we can save every year. Our estimated return on investment is 4 years due to the increase in the SS limit.’’ Mr Mohamed Chaffi, Director of the Beni Saf desalination plant stated that.”**

## • Filtralite® Powers Thames Gateway Water Desalination

Built to lessen the possibility of a water shortage in the London area, the new Thames Gateway Water Treatment Plant is the first large-scale desalination facility in the United Kingdom. It is situated at Beckton, outside of London. It takes the raw water from the outlet of the River Thames, which means that the water is brackish water.

The salinity changes by the tide and the maximum salinity is about 11 000 ppm. The plant is built by the Spanish contractor Acciona Agua, and was opened in June, 2010. Before the salt is removed by RO membranes the water is pre-treated in a three stage process. The first stage is coagulation, flocculation and lamella clarification. The second stage is horizontal single media pressure filters where Filtralite Pure is used as filter media. As a third pre-treatment step Ultra Filtration membranes are used.

The desalination plant have a production capacity of 150 000 m3/day and will provide water for around 900 000 people in London. The single media pressure filter consists of 17 filters containing a bed of Filtralite® Pure HC 0.8-1.6 mm. These filters each have a filtration area of 50 m2 and operate at a peak filtration rate of 12 m/h. This filtration step is to remove the carryover of fine suspended solids not removed by the lamella clarifiers.Production losses during this period dropped significantly, from 673,000 $m^3$ in 2019-2020 to 380,000 $m^3$ in 2020-2021, marking a 45% reduction. With the second phase completed, further reductions in downtime are anticipated, potentially exceeding 85%.Water quality improved by 0.3 to 0.5 SDI points, leading to less frequent cartridge filter replacements.



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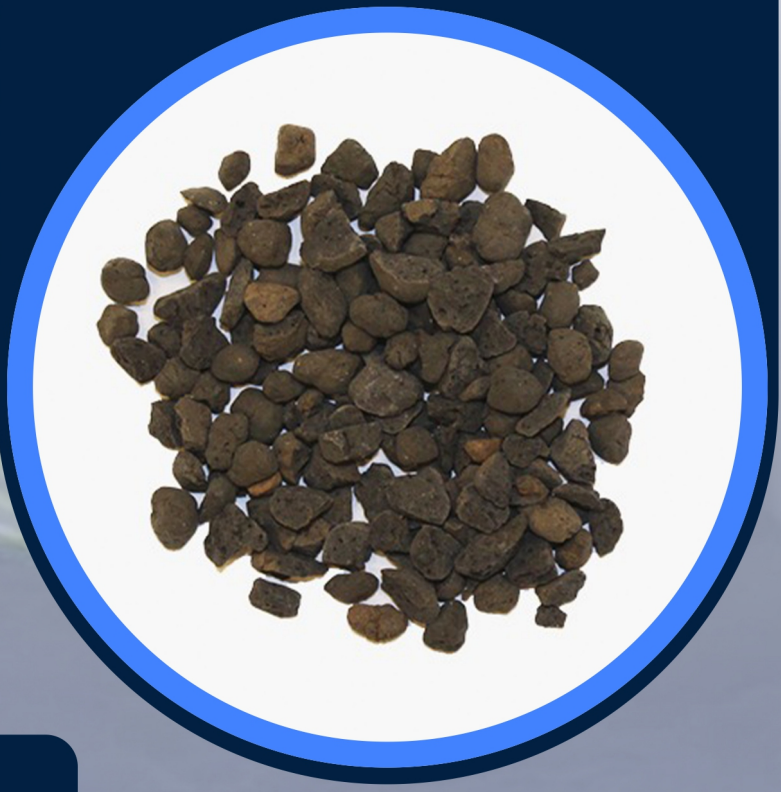
# Filtralite® Pure

## Why to switch your water treatment and desalination conventional filtering to Filtralite® Pure ?



- Over 60% porosity
- Can be used as a single layer or in dual layers
- Reduced backwash rates
- Lower initial head loss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# Filtralite®: Enhancing Energy Efficiency and Cost-Effectiveness in Desalination

Filtralite® filter media reduces the amount of water taken from the environment and the cost of running the desalination plant

Algeria, like other countries around the world, is facing increasing problems in managing its water resources. The country already has 14 seawater desalination plants, with a further 5 under construction. In order to cope with this new technology, which requires specific skills, the country is also launching a training and scientific research program in 4 of the country's universities.

**The 5 new, larger plants currently under construction will increase the amount of desalinated water produced by Algeria from 17% to 42%**

They will, also, make more water available for agriculture. The water situation in Algeria is characterised by major challenges. The country, located in an arid and semi-arid region, faces limited water resources and frequent drought conditions. In Algeria, water availability per person is relatively low, which poses challenges not only for drinking water supply but also for agricultural irrigation and industry. Water resources used to come mainly from rainfall, groundwater, and dams.

However, rainfall is irregular and groundwater recharge is limited. In response, the Algerian government has introduced policies and programmes to improve water management, such as the construction of new dams and the expansion of drip irrigation. Yet problems of access to quality drinking water remain a reality for some rural and remote regions. It is in this climate of widespread scarcity of water resources that Algeria is raising awareness of the need to conserve water, while at the same time looking for new outlets.

Desalination is therefore part of this development strategy chosen by the government. Desalination plants play an essential role in diversifying sources of drinking water in Algeria, particularly in coastal areas where fresh water is scarce. They help to improve drinking water supplies for local populations.

Desalinating seawater requires major investment in terms of infrastructure and energy. It is against this backdrop that the solution offered by Filtralite® filter media is an interesting one for reducing the amount of water taken from the environment and the cost of running the plant.

## Mr Mohamed Chaffi

Director of the Beni Saf Desalination Plant

**The Beni Saf desalination plant can produce up to 200,000 m3/day. It belongs to the Beni Saf Water Company and is operated by Tedagua. It is one of the largest water desalination plants in the Mediterranean. Filtralite® was implemented in the plant in two stages: 24 filters in October 2020 and the rest in October 2021.**

The first replacement in 2020 enabled a comparison of filters with Filtralite® versus sand. In recent years, Algeria's coastal zone has experienced frequent episodes of high rainfall, resulting in high levels of suspended matter in the raw water. This suspended matter is mainly of mineral origin and is causing difficulties in the production of drinking water and an increase in operating costs. To improve the situation, while minimising investment, the sand in the first filtration stage, 48 filters, was replaced with Filtralite®. The primary objective was to reduce rack downtime when TSS levels are high and to optimise operating costs by reducing the frequency of backwashing. In addition, this change of media improved the quality of the filtered water and reduced pressure drops.

Production losses for the same period, from November 2019 to February 2020, have been compared with those for 2020-2021. Production losses fell from 673,000 m3 to 380,000 m3: a reduction of 45%. With the replacement of the remaining 24 filters, it is expected - based on 2020 data - that the reduction in production losses will be 85%. As well as being a highly competitive scenario, replacing sand with Filtralite® reduces production losses due to frequent backwashing, cuts the water needed for backwashing, and optimises operating costs - energy, cartridges, chemical cleaning, O&M.

**Desalination plants play an essential role in diversifying sources of drinking water in Algeria, particularly in coastal areas**

## Can you present your career, your current role, and your degree of involvement in the Beni Saf project?

Mr Chaffi Mohamed, General Manager of Benisaf Water Company Spa, a joint venture between Grupo ACS and AEC Spa. I am an engineer in urban hydraulics and I have been working in the seawater desalination sector since 2008. As General Manager of BWC Spa since 2014, I have participated in several improvements in the plant including the change of the filtration sand by Filtralite®.

## Can you give us a few figures on the characteristics of your plant? What solutions did you have for the filtration stage before the installation of Filtralite®?

The Beni Saf seawater desalination plant has been in operation since 2010 and has produced a total of 830 million cubic metres as of 31 December 2022. Prior to the installation of Filtralite®, the plant's process used filter sand.

**"I learned about Filtralite® during a professional event. The characteristics of the product and the advantages offered attracted my interest"**

**Replacing sand with Filtralite® reduces production losses, cuts the water needed for backwashing, and optimises operating costs**

## How did you hear about the Filtralite® solution? What made you decide to take the plunge into this innovative filtering media? What barriers did you eventually encounter during this project?

I learned about Filtralite® during a professional event with Baptiste Rogeau at WEX Lisbon 2016. The characteristics of the product and the advantages offered attracted my interest in this product. At that time, I found a barrier regarding the product's marketing certificate as it was not yet used in seawater desalination plants, but on the other hand the advantages were numerous. So, we decided to invest in the Filtralite® filter media and certainly no regrets.

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## What problems justified the choice of Filtralite® media? Were you able to solve these problems with Filtralite®?

The problem encountered in the pre-treatment of the plant is the suspended solids (SS) which are limited by the process to 25 mg/l which obliges us to stop the plant to secure the equipment. We were able to partially solve this problem by increasing the SS limit to 40 mg/l with Filtralite® corresponding to a more than 62.5% increase on our rates.

## Were you able to discover any unexpected results, positive or otherwise?

The results are positive because, since the installation of the Filtralite®, we have far exceeded this initial process limit. We have even continued to produce, partially, with SS reaching a level of 70 mg/l in 2022.

## How would you describe the main aspects of Filtralite® and its advantages over your original solution?

The main aspects of Filtralite® are:

- Reduction of washing sequences
- Operation with SS above 25 mg/l
- Energy saving

## Do you have any idea how much energy you are saving with the Filtralite® solution? What would be your estimated return on investment? Could you give us more details on this calculation?

The amount of energy saved in the pre-treatment area is estimated at around 10%. It is thousands of dollars we can save every year. Our estimated return on investment is 4 years due to the increase in the SS limit.

## If you had to do it all over again, would you choose the Filtralite® solution? Would you recommend it to your colleagues?

Yes, I would do it again with pleasure. I have already recommended it to other stations.

## What are the next projects in your factory?

Our next projects are the certification of our integrated system with the ISO 9001/ISO 45001/ISo 14001/ISO 50001 standards, the installation of 11 variable speed drives, and the installation of solar panels on all the factory's roofs to produce 1.5 MWp.

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**Filtralite® Pure filter media has a unique porous structure that creates ideal conditions for water to flow through the filter bed, enhancing its ability to retain contaminants.**

**This characteristic, inherent to the lightweight expanded clay material, allows for larger volumes of water to be filtered through the same space by increasing the contact area.**

## Higher porosity leads to:

- Lower initial head loss
- Slower head loss build-up
- Higher storage capacity
- Reduced backwash rates

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# Elevating Pretreatment Performance with Filtralite®: A High Efficiency Media for Modern Desalination Challenges

Desalination and advanced water treatment plants face increasingly unstable feedwater conditions—fluctuating salinity, high suspended solids, tidal-driven variability, and sudden spikes in turbidity. These challenges put significant strain on ultrafiltration (UF) and reverse osmosis (RO) systems, accelerating fouling and raising operational costs.

In this environment, robust and reliable pretreatment becomes essential. Filtralite® provides a high-performance solution that stabilizes feedwater quality, protects membranes, and improves overall system efficiency.

## About Filtralite®: High-Performance Expanded Clay Media

Filtralite® is engineered from lightweight expanded clay aggregates, offering:

- Typically provides high porosity and a macropore structure
- Generally enables higher filtration velocities compared to conventional sand/anthracite
- Can reduce backwash frequency, often requiring 2–4× fewer cycles depending on system conditions
- Helps improve the removal of fine suspended solids
- Can extend media life while reducing overall energy and water consumption

These performance characteristics make it an ideal media for desalination pretreatment, especially in high-variability environments.

## Case Study: Beckton Desalination Plant, UK

### • Background: A Highly Variable Estuarial Water Source

The Beckton desalination plant in the UK treats estuarial water with rapidly changing turbidity levels, suspended solids, and salinity driven by tidal conditions.

These fluctuations made it critical to develop a pretreatment solution that could protect the UF and RO stages reliably.

### • Pretreatment Configuration at Beckton

The pretreatment train consists of:

1. Coagulation & Flocculation
2. Clarification
3. Pressure Filtration using Filtralite® Pure HC 0.8–1.6 mm
4. Ultrafiltration
5. Reverse Osmosis (RO)

Raw Water → Coagulation → Clarification → **Filtralite® Pressure Filters** → UF → RO → Product Water

## • Filtration System Details

• 17 pressure filters
• 50 m² filtration area per filter
• **Filtration velocity:** 12 m/h
• **Media used:** Filtralite® Pure HC (0.8–1.6 mm)

## • Performance Results

The use of Filtralite® significantly improved pretreatment stability:

• Consistent turbidity reduction even during raw water fluctuations
• Stable UF membrane performance with reduced clogging
• Lower fouling rate for RO membranes
• Reduced backwash water and energy consumption
•High-quality filtrate meeting strict plant and regulatory standards

The plant achieves a production capacity of **150,000 m³/day**, serving nearly **900,000 people.**

## • Table: Performance Comparison

| Parameter | Conventional Media | Filtralite® | Improvement |
|---|---|---|---|
| **Filtration rate** | 6–8 m/h | 10–12 m/h | +50–70% |
| **Backwash frequency** | High | Low | 2–4× reduction |
| **Fine particle removal** | Moderate | High | Significant improvement |
| **UF fouling** | Frequent | Reduced | Lower OPEX |

"Data reflects common operating conditions in reference filtration systems."

## Why Filtralite® Is Ideal for MENA Desalination Plants

Plants in the Middle East & North Africa can benefit from Filtralite® due to:

- Ability to handle high-turbidity or variable raw water
- Reduced operational cost through fewer backwashes
- Enhanced UF and RO membrane protection
- Upgrade potential for existing plants without new construction
- Lower carbon footprint and improved sustainability

## Additional Insights: Operational & Sustainability Advantages

> Filtralite® improves filtration performance while supporting broader plant efficiency. Its lower head-loss development enables longer filtration cycles, reducing backwash water, chemical use, and energy demand.

At sites like Beckton—where environmental compliance and operational stability are essential—these reductions become impactful. The media's lightweight composition also eases structural loadings and cuts transportation-related emissions, offering a more sustainable and cost-effective solution for large desalination and estuarial facilities.

## Enhanced Applicability in Different Water Treatment Contexts

Filtralite® delivers reliable performance across municipal drinking water, industrial reuse, and tertiary polishing, especially in plants facing variable turbidity. Its robustness has driven increased adoption in the Middle East, Europe, and Asia, where stricter standards require stable filtration. In many retrofits, it can replace conventional media without structural changes, allowing capacity and performance upgrades using existing infrastructure.

## Conclusion

Filtralite® enables desalination and water treatment plants to achieve stable, efficient, and high-quality pretreatment performance—even under challenging feedwater conditions. The Beckton case demonstrates how advanced media can transform plant reliability, reduce OPEX, and extend membrane life. This makes Filtralite® a strategic, future-focused choice for pretreatment systems across the globe, especially in high-demand regions like the Middle East.

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# Upgrade Your Pretreatment.Protect Your Membranes. Boost Your Performance.

In today's challenging desalination environment—where turbidity spikes, salinityshifts, and feedwater instability are the new norm —traditional filtration is no longer enough.

**Filtralite® delivers a next-generation solution built for reliability, efficiency, and long-term membrane protection.**

- -Higher filtration rates
- -Lower energy and water consumption
- - 2–4× fewer backwashes
- - Stronger UF & RO protection

From Europe to the Middle East, Filtralite® is proving to be the future of pretreatment.

Filtralite® — Smarter. Stronger. More Sustainable.

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# Biological Filtration: A Sustainable Solution for Drinking Water Treatment Challenges

As global populations expand and urbanization accelerates, ensuring access to safe and clean drinking water has become one of the most critical global challenges. The growing demand for potable water, combined with the degradation of natural sources, is pushing utilities and industries to seek more advanced and sustainable treatment technologies.

## Limitations of Conventional Treatment

Traditional water treatment methods such as chlorination and chemical oxidation are effective for basic disinfection but have notable limitations. They often involve high operational and maintenance costs, generate harmful disinfection by-products, and are less effective in removing pollutants like ammonia, organic matter, and dissolved nutrients. These drawbacks have increased the need for more sustainable, efficient, and cost-effective alternatives.

## The Rise of Biological Filtration

Biological filtration (biofiltration) has emerged as a powerful solution to these challenges. This process uses naturally occurring microorganisms that grow on a filter medium to break down organic matter, convert ammonia into less harmful compounds, and reduce turbidity all without relying heavily on chemicals. The result is cleaner, safer water produced through a natural, biological process that supports both water quality and environmental sustainability.

## Filtralite® Pure: Redefining Drinking Water Filtration

At the forefront of this innovation is Filtralite® Pure, a specialized biofiltration media developed by Filtralite®, a leading European brand known for high-performance filtration solutions. Made from expanded clay aggregates, Filtralite® Pure combines lightweight structure, exceptional porosity, and long-term durability, creating an ideal environment for biofilm growth and efficient pollutant removal. Filtralite® Pure is designed specifically for drinking water treatment and desalination applications, providing stable performance, longer filter runs, and reduced backwash frequency compared to conventional sand or anthracite filters.





“Filtralite® media are produced in several grades and particle sizes to suit different treatment goals. From lightweight, highly porous NC grades ideal for biological filtration, to denser HC types designed for deeper and faster filtration, each variant ensures reliable performance and adaptability to diverse water qualities.”

# Case Study: Filtralite® Core Bio-filtration at Putatan II Drinking Water Treatment Plant

## • Project Overview

Located in Metro Manila, the Putatan II Drinking Water Treatment Plant was developed to supply safe and reliable drinking water to over one million residents. With a production capacity of 150,000 m³ per day, the facility plays a crucial role in addressing the region's growing water needs.

The plant sources its water from Laguna de Bay, a highly polluted lake affected by urban runoff, industrial effluents, and agricultural discharge. This raw water poses major challenges, including high turbidity, elevated ammonia concentrations (up to 7 mg/L), and occasional salinity.

## • Design Challenges and Requirements

Key constraints included limited land, highly variable raw water quality, and the need for a stable, low-chemical process. To meet these demands, engineers selected an aerated biological filtration (BAF) system incorporating Filtralite® HR 3–6, part of the Filtralite® Core range. This media was chosen for its exceptional porosity, mechanical strength, and proven capability in ammonia and organic removal.

## • Treatment Process

The treatment line combines several advanced processes to ensure high-quality output:

**1. Screening:** removal of large solids

**2. Pre-coagulation and flocculation:** aggregation of fine particles

**3. Dissolved Air Flotation (DAF):** separation of suspended matter

**4. Post-DAF Coagulation:** additional clarification

**5. Aerated Biological Filtration (BAF):** key stage using Filtralite® media for ammonia and organic removal

**6. Ultrafiltration and Reverse Osmosis:** polishing and salinity control

**7. Final Disinfection:** ensuring microbiological safety

The BAF unit includes 14 biofilters (12 operating + 2 standby) running in an upflow configuration with a hydraulic loading rate of 10.5 m/h, reaching 12 m/h during backwashing—providing compact design and superior performance compared to conventional sand filters.

## • Performance and Results

Using Filtralite® HR 3–6, the Putatan II plant achieved outstanding operational results:

**1. Ammonia Removal:** Effluent levels consistently below 0.1 mg/L (≈90% removal).

**2. Organic Matter and Solids Reduction:** Influent BOD (6–10 mg/L) and TSS (~100 mg/L) reduced to below 2 mg/L and 5 mg/L, respectively.

**3. Operational Benefits:** Lower chlorine demand, reduced OPEX, and minimized formation of harmful by-products.

**4. Sustainability Impact**

By adopting Filtralite® Core biofiltration technology, the Putatan II plant demonstrated how sustainable filtration solutions can deliver both high efficiency and environmental responsibility. The use of Filtralite® Pure and Core media enabled a high-capacity system within a limited footprint, while reducing energy and chemical consumption making it a model for future eco-efficient drinking water treatment plants worldwide.

## Conclusion

The pressing challenges of water scarcity and pollution highlight the urgent need for innovative treatment solutions. Traditional methods often struggle with high operational costs and inefficiencies in removing specific contaminants.

The Putatan II Drinking Water Treatment Plant exemplifies the advantages of biological filtration using Filtralite® Pure media. This advanced system effectively addressed the complexities of polluted raw water from Laguna de Bay, achieving impressive reductions in ammonia and organic matter. With ammonia levels consistently below 0.1 mg/L and significant decreases in BOD and TSS, the plant demonstrates the effectiveness of biological filtration in producing high-quality drinking water.

Additionally, the operational benefits, such as reduced chlorine demand and lower costs, underscore the economic viability of this technology. By minimizing chemical usage and energy consumption, Filtralite® Pure not only enhances water quality but also promotes environmental sustainability, serving as a model for future water treatment initiatives worldwide.

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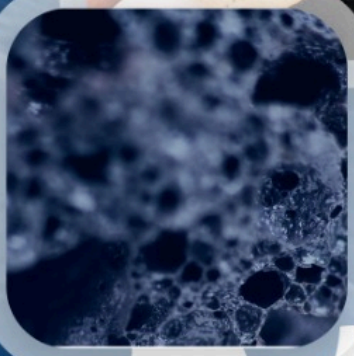
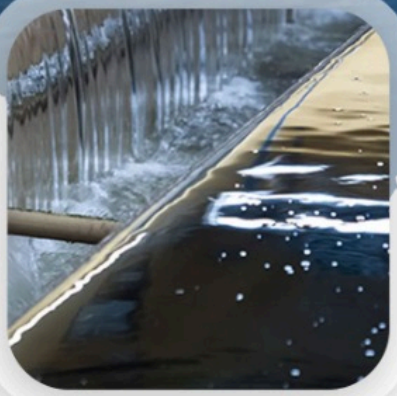
FILTRALITE®

# Filtralite® — Smarter. Cleaner. Sustainable.

## Redefining Drinking Water Filtration

Developed from high-quality expanded clay aggregates, Filtralite® Pure offers a new generation of biofiltration media.





## Why Choose Filtralite®?

**Exceptional Porosity**
Supports rapid biofilm growth and efficient removal of ammonia, organic matter, and suspended solids

**Extended Filter Runs**
Longer operational cycles with reduced backwash frequency — saving water, energy, and maintenance time.

**Lightweight & Durable**
Easy to handle and install, yet mechanically strong for long-term stability in large treatment systems.

**Chemical-Free Process**
Enables natural purification with minimal chemical use, lowering OPEX and environmental impact.

**Proven Results**

**At the Putatan II Drinking Water Treatment Plant (Philippines), Filtralite® HR 3–6 achieved:**

- >90% ammonia removal (effluent <0.1 mg/L)
- BOD reduced from 6–10 mg/L to <2 mg/L
- TSS reduced from ~100 mg/L to <5 mg/L

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# Filtralite® Webinars

## Achieve Higher Filtration Performance and Lower Operating Costs with Filtralite®

**MOHAMED KASTAWY**

Filtralite® MENA Region Sales Manager

- Discover how water treatment plants around the world unlock higher performance and lower OPEX using Filtralite®.
- Real case studies showcase tangible results from global installations.

Scan the QR code to watch the full webinar.

www.aquaenergyexpo.com


# How Filtralite® Is Transforming Water Treatment in Spain – A Model for the Middle East?

As the Middle East faces growing water scarcity and increasing demands on aging infrastructure, innovative solutions from around the world offer new hope. Spain, a country with a similarly diverse and challenging water landscape, has taken major strides in water treatment and resource management.

At the heart of this progress is Filtralite®, an advanced filtration media developed by Saint-Gobain, made of expanded clay that is commonly used in water treatment and filtration processes, now used at the Llobregat Drinking Water Treatment Plant in Barcelona. Expanded clay is a lightweight aggregate material that is produced by heating natural clay to high temperatures, causing it to expand. Filtralite®, in particular, is known for its high porosity, durability, and efficiency in water filtration applications.

The Plant Manager, Santiago Gonzalez Avellana, was given the possibility to share what he thinks about Filtralite® products and how they help him in his daily work. This interview reveals how Filtralite® is helping optimize energy use, reduce maintenance costs, and extend filter lifespan — lessons that may prove valuable for water utilities across the Arab region.

## Can you describe your career and your current role at ATL?

I am an industrial engineer specializing in industrial chemistry and I have been working for 22 years in the drinking water treatment sector.

I became part of the technical team of ATL in 2005 and I have been in charge of the Llobregat Drinking Water Treatment Plant since 2016.

## Can you give us some facts and figures about your plant? What solutions did you have for the filtration stage before installing Filtralite®?

The Llobregat Drinking Water Treatment Plant was commissioned around 1978. Currently, it has a maximum production capacity of 3.2 cubic metres per second, and two very different water treatment lines. On the one hand, we have a more conventional treatment that starts with pre-oxidation of the water with potassium permanganate ($KMnO_4$), followed by a pH adjustment with carbon dioxide ($CO_2$) and a coagulation-flocculation-decantation process. Chlorine dioxide ($ClO_2$) is then dosed as an oxidant and the water is passed through a double filtration stage, the first with silica sand as a filter bed and the second through a 150 cm bed of activated carbon grains.

> **"To optimize the filter run and reduce washing costs, Filtralite was tested on an industrial scale on one of the 12 filters of the plant."**

> **"The results showed that with the Filtralite® solution, the filtration run times were increased, reducing the number of washes by 66%."**

Finally, much of the filtered water goes through advanced treatment, using reverse electrodialysis membranes, prior to final dis- infection and re-chlorination with sodium hypochlorite (NaClO) at the inlet and outlet of the storage tanks. The initial solution implemented to date for the filtration stage was the original one, that is, sand filtration.

## How did you learn about the Filtralite® solution and what made you decide to try this innovative filtration media?

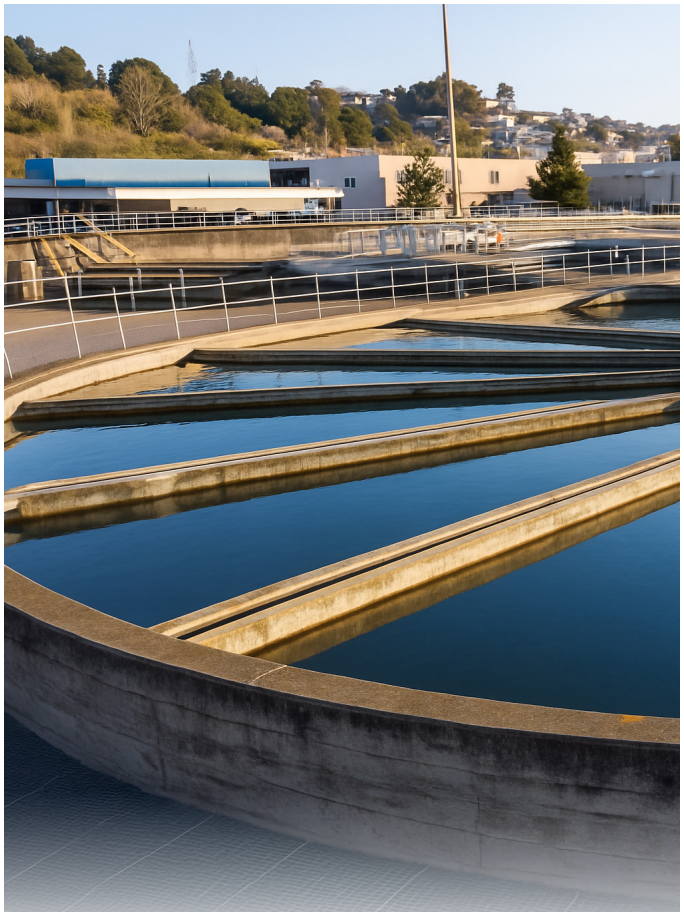
In 2017, and after the involvement of Filtralite® technicians with ATL's re- search, development and innovation department, initial meetings were held to learn about the characteristics and properties of Filtralite® media.

We then assessed the possibility of trying it at the plant, either on a pilot scale or on an industrial scale. In order to optimize the filter run and reduce washing costs, we decided to carry out the test directly on an industrial scale on one of the 12 filters of the plant. Before replacing the existing sand with Filtralite®, it was necessary to adapt the filter by increasing the dis- charge level of the wash water. The performance of Filtralite® was evaluated by operating the filter against a sand filter under equivalent conditions for more than 10 months.

## How would you describe the main features of Filtralite® and its advantages compared to your initial solution?

After almost a year of testing, the results obtained showed that with the Filtralite® solution, the filtration run times were in- creased, reducing the number of washes by 66%. This reduction in the number of washes translates into significant economic savings for the operations: savings in the energy consumed while at the same time, the filter operating time increases, thus increasing the treatment capacity. The reduction in the number of procedures with the equipment involved in the washing process reduces the maintenance costs of such equipment and will extend its useful life.

> **"With the Filtralite® solution it was possible to work with higher filtration velocities than with conventional sand, even exceeding 15 m/h."**



Finally, it should be noted that throughout the test it was possible to verify that the water quality obtained using Filtralite® was similar to that provided by sand filters, both in terms of turbidity and in terms of a barrier effect.

## Did you encounter any unexpected results, positive or not, during the industrial test performed?

Yes, we did. We were able to verify that with the Filtralite® solution, it was possible to work with higher filtration velocities than with conventional sand, even exceeding 15 m/h while maintaining part of the increase in the filtration runs.

## Do you know how much energy you are saving thanks to the Filtralite® solution? What is the estimated return on your investment? Could you give us a more detailed calculation?

In the filter where Filtralite® is installed, we estimate that we are saving about 60% of energy compared to using sand. In addition, by having longer filtration runs, the reduction in the number of washes resulted in a savings of

65% of washing water. Taking these and other aspects into account, we have calculated a return on investment of approximately 2.3 years.

## If you had to do it all over again, would you choose Filtralite® again? Would you recommend it to your colleagues?

Yes, indeed. In fact, tests are planned for other ATL production sites to evaluate the performance of this filtering material.

## What are the next projects for your plant?

The plant's next projects are aimed at increasing the production capacity of the plant to 4 cubic metres per second. Two more clarifiers will be built and the 12 sand filters and the 15 activated carbon filters will be remodelled. The sand filter remodelling project includes the replacement of the sand filters with Filtralite®.

## What are the characteristics of the current water market in Spain, and more specifically around Barcelona and Catalonia?

I sincerely believe that hand in hand with innovation and technological advances we are moving towards more sustainable and efficient water services, and towards treatments that allow us to obtain higher water quality. All this focused on making the best possible use of water resources that are becoming increasingly scarce.

## Spain's national government has promised a water resources action plan worth 12 billion euros. How will this plan affect you? What do you consider to be the main areas of development?

I believe that the main areas to be developed are the increase in desalination capacity, the use of reclaimed water and the upgrading of existing treatment plants, as well as heavy investments in the digitalisation of the different processes.

> "Taking into account savings in energy, washing water and other aspects, we have calculated a ROI of approximately 2.3 years."

Filtralite® Pure – Transform Your Water Treatment Without Reconstruction

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Upgrade your existing drinking water filters instantly—no expansion needed. Filtralite® Pure's lightweight, ultra-porous media boosts capacity and performance simply by switching out conventional sand.

FILTRALITE®

## Key Advantages

- **Up to 500% longer filter runs (mono-media) & 8× fewer backwashes (dual-media).**
- **Lower head loss & slower pressure buildup thanks to high porosity.**
- **Filtration rates up to 20 $m^2$/h, even 30 $m^2$/h in biofilters.**
- **Up to 90% ammonia removal & 98% iron removal via biological filtration.**
- **ROI in under 3 years due to reduced energy, water, and maintenance costs.**

**Discover full case studies and technical datasheets:**

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# Filtralite® Pure: Safe and Sustainable Nitrate Removal

Access to clean and safe drinking water is one of the most pressing global challenges. Across the world, communities are struggling with groundwater contamination particularly from nitrates caused by intensive agricultural activity. Traditional solutions such as reverse osmosis or ion exchange often come with high costs and complex operation, making them less practical for small and medium-sized water treatment facilities.

This is where Filtralite® Pure makes a difference. As an advanced filter media made from expanded clay aggregates, manufactured in Finland and used worldwide,, it enables highly efficient biological denitrification, delivering safe drinking water while lowering both operational and investment costs. By combining performance, durability, and sustainability, Filtralite® Pure is redefining how utilities approach nitrate removal in drinking water treatment plants.

## Why Biological Denitrification?

Biological denitrification has emerged as one of the most advanced, selective, and cost-effective solutions. This process removes nitrate through dissimilatory reduction, transforming it into harmless nitrogen gas.

It has already been applied successfully in wastewater treatment and contaminated groundwater, with biofilm-based technologies achieving the highest nitrate removal rate per volume.

For drinking water treatment plants (DWTP), biological denitrification has proven to deliver outstanding results.

## How the Process Works

Biological denitrification relies on the biological oxidation of organic substrates in water, using nitrate or nitrite as the electron acceptor instead of oxygen.

To achieve this, an organic carbon source (such as methanol, ethanol, acetic acid, or glucose) must be added to the water. In the absence or limitation of dissolved oxygen (DO), the nitrate reductase enzyme is activated, helping transfer hydrogen and electrons to nitrate as the terminal electron acceptor.

This step-by-step reduction ultimately converts nitrate into nitrogen gas.

In a DWTP, this entire process can be achieved inside an anaerobic biofilter filled with the right filter media.

**"Here, Filtralite® Pure serves as the optimal carrier for the denitrifying biofilm, ensuring reliable, efficient, and long-lasting performance"**

## Filtralite performance: 60% nitrate removal & cost savings

## Filtralite® Pure in Action: Nitrate Removal at the Formiche Alto Drinking Water Plant, Spain

A practical example of this technology can be found in the Drinking Water Treatment Plant of Formiche Alto in Teruel Province, Spain.

Built in 2017 by Ingeobras, the plant was designed to treat groundwater that otherwise meets Spanish regulations for drinking water quality (RD 140/2003), except for nitrate levels of around 60 mg/L (variable depending on the season).

Since the regulatory limit in Spain is 50 mg/L, the municipality needed a reliable, small-scale solution. A 5 $m^3/h$ DWTP was therefore built with four treatment stages:

1. Anaerobic Denitrification Biofilter with Filtralite® Pure for nitrate removal.
2. Physical Filtration to remove suspended solids.
3. Biological Aerated Filter to eliminate remaining organic matter.
4. Chlorine Disinfection to kill any bacteria or pathogens from the biological steps.

DWTP INDOOR: View of the DWTP indoor with the Bio-filers and the PLC.

THE SMALL PLANT: View of the small plant with the sedimentation tank outside.

## Performance Results

The Formiche Alto DWTP was designed to achieve a “60% nitrate removal rate, bringing the final concentration down to below 25 mg/L”. This ensures compliance with Spanish regulations while maintaining a safe margin for public health.

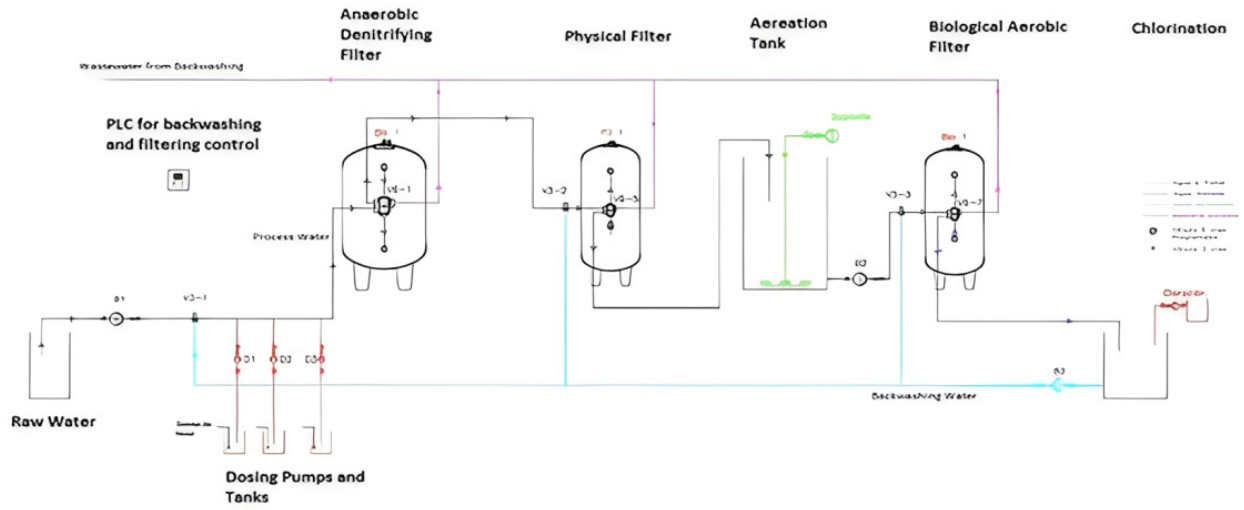
## Backwash and Water Reuse

**The backwash water produced accounts for 5–10% of the total filtered water. Its quality allows safe discharge into the sewage network or reuse in agriculture”.**

Since the DWTP is located far from the sewage system, the wastewater is instead collected in a sedimentation tank, where it is stored and managed accordingly.

## Automation and Operating Costs

The plant operates automatically, reducing the need for continuous supervision and minimizing labor costs.




"According to Ingeobras, for a DWTP treating 60 mg/L of nitrates at a daily flow of 1,000 m³, the total operating cost is around €0.16/m³"

**Divided as follows:**

- €0.08/m³ for reagents (mainly organic matter),
- €0.04/m³ for energy,
- €0.04/m³ for maintenance.

## Filtralite® Pure: Long-Term Durability

"The heart of the system is Filtralite® Pure, which offers a lifespan of more than 20 years. This long durability minimizes the need for replacement, reducing both costs and environmental impac".

## Advantages of Filtralite® Pure

- High nitrate removal efficiency (70–95%).
- Low operating & investment costs.
- Long lifespan (20+ years).
- Lightweight, porous structure for strong biofilm growth.
- Reliable, simple operation with low energy use.
- Environmentally sustainable (backwash reuse, low impact).

## Comparing with Alternative Technologies

When compared with conventional nitrate removal technologies,

"the CAPEX and OPEX of the Formiche Alto plant is significantly lower due to the simplicity of the biological design".

## Typical removal efficiencies are as follows:

- Biological Denitrification: 70–95%
- Ion Exchange: 80–90%
- Chemical Reduction: 33–90%
- Electro-dialysis: 30–50%
- Reverse Osmosis: 50–96%

"This makes biological denitrification with Filtralite® Pure one of the most reliable and efficient solutions for nitrate removal".

## Sustainability and Environmental Benefits

In addition to technical and economic advantages, the system also contributes to environmental sustainability. Its low energy use, minimal maintenance needs, and potential for reusing backwash water support both ecological responsibility and cost savings.

## Conclusion

The Formiche Alto DWTP demonstrates the real-world benefits of using Filtralite® Pure in drinking water treatment. It delivers:

- Safe water quality well within regulations.
- Lower capital and operational costs.
- Long-lasting performance with minimal maintenance.
- Strong environmental sustainability.

This project stands as a model for small communities worldwide, showing how innovative filtration media can ensure safe, sustainable, and affordable drinking water for future generations.

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# Filtralite® at AquaEnergy Expo MEA 2025

## Proudly showcased sustainable Filter Media solutions at the Middle East & Africa International Water & Energy Exhibition & Conference, Cairo – 24–26 September 2025.


| FILTRALITE® PURE | FILTRALITE® CLEAN | FILTRALITE® AIR |
|---|---|---|
| Drinking water & Desalination. | Wastewater treatment. | Air quality & Odor control. |

## Why Filtralite®?

- Made from Expanded Clay – lightweight & highly porous.
- Superior filtration with reduced backwashing frequency.
- Saves water, energy & operational costs.
- Durable & long-lasting (for up to 30 years) with minimal maintenance.
- Backed by Saint-Gobain's global expertise in sustainable innovation.

Explore more about Filtralite® filter media via Aqua Energy Virtual Expo

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# “Filtralite® Clean Is Redefining Wastewater Filtration Standards”

Around the globe, communities and industries are facing mounting challenges in securing clean, safe water. Rapid urbanization, climate change, aging infrastructure, and rising energy costs are placing unprecedented pressure on water utilities and treatment plants. In response, there is a growing demand for sustainable, high-performance filtration technologies that can not only improve water quality, but also reduce environmental and operational burdens.

In this context, Filtralite®, a filtration media brand developed by Saint-Gobain, has emerged as a game-changer. With a focus on innovation, efficiency, and sustainability, Filtralite® offers a range of filter media products tailored to meet the evolving needs of modern water treatment systems. One of its standout products, Filtralite® Clean, is a leading solution for wastewater treatment applications. Let's have a focus

## What is Filtralite® Clean?

Filtralite® Clean is a high-performance filter media produced from expanded clay aggregates, made through a carefully controlled thermal process that transforms natural clay into a highly porous and lightweight material. This unique structure provides a significantly larger surface area than traditional media, allowing for superior retention of suspended particles and contaminants.

Available in various grain sizes, the product is adaptable to a wide range of filtration setups, whether in mono-media or dual-media configurations. It is especially valued for its longer filter runs, enhanced removal efficiency, and lower frequency of backwashing, all contributing to cost savings and operational resilience.

## Engineered for Performance

Filtralite® Clean is specifically developed cifically developed for biological treatment and tertiary filtration in wastewater treatment plants. Its unique porous structure offers ideal conditions for biofilm growth and improved water flow through the filter bed. This translates into more contaminants being retained and adsorbed, greater filtration capacity, and significantly reduced operational costs.

In biological reactors, Filtralite® Clean sup-

ports both aerobic (nitrification and organic matter removal) and anoxic (denitrification) processes. Its high surface area and void ratio promote robust biomass development, while its mechanical filtering ability efficiently captures suspended solids. These features contribute to a process that is not only more effective but also more durable, boasting a media lifespan of up to 30 years in biological filters.

For tertiary filtration applications, Filtralite® Clean stands out with its high porosity, enabling:

- Lower initial and slower-building head loss
- Higher particle storage capacity
- Extended intervals between backwashes (by approximately 25%)
- Reduced backwash water use and energy consumption

Existing systems using Filtralite® Clean already achieve filtration rates of 15–20 m/h, a benchmark that showcases the media's superior efficiency.

## A Tailored Solution for Every Need

Filtralite® Clean is available in both round and crushed forms, with various grain sizes and densities to suit specific design and performance requirements. These customizable properties make it a versatile solution for a wide range of wastewater treatment settings, from compact urban systems to large-scale municipal installations. Additionally, Filtralite® Clean complements other products in the Filtralite® range, like Filtralite® Pure that's designed for drinking water treatment.

## The Sustainable Choice

Filtralite® media is manufactured by heating clay to around 1200°C, followed by controlled crushing and sieving. This process results in a material that combines low density with high durability, impact resistance, and porosity, hallmarks of a long-lasting and environmentally responsible product.

As wastewater treatment facilities evolve to meet the demands of the 21st century, Filtralite® Clean offers a proven, forward-looking solution that supports sustainable water management, operational efficiency, and urban resilience.

## Case Study (1): Filtralite® Clean Enhances Wastewater Treatment in Dalian, China

In 2000, the city of Dalian, China, inaugurated a new wastewater treatment plant designed to serve a population of 432,000 people, treating up to 120,000 cubic meters of wastewater per day. To meet the stringent effluent standards

set for the facility, a biological treatment system with fixed-bed technology was implemented powered by Filtralite® Clean filter media.

## Treatment Process Overview

The treatment process begins with standard pre-treatment, including screening and grit/grease removal. This is followed by primary sedimentation in four tanks using lamellar sedimentation technology.

The core biological treatment system is composed of two stages:

1.First Stage – Organic Matter Removal

• Consists of BOD, COD and SS removal in 12 biofor filters.

• In these filters round expanded clay aggregates, Filtralite® Clean, are used as carriers for the biofilm.

• Process air blowers aerate the filters.

2.Second Stage – Nitrification

• Another 12 biofor filters, with the same surface area, are dedicated to nitrification.

• These filters use crushed Filtralite® Clean as the filter media.

• Air is supplied by blowers to promote biological activity.

## Performance Results

| Parameter | Influent (mg/L) | Required Effluent (mg/L) | Achieved Effluent (mg/L) |
|---|---|---|---|
| $BOD_5$ | 216 | < 10 | 3 |
| COD | 480 | < 40 | 30 |
| SS | 350 | < 10 | 8 |
| $NH_4$-N | – | < 5 | 1.1 |

These results demonstrate Filtralite® Clean's effectiveness in consistently surpassing treatment targets, particularly for organic matter and ammonium removal. Approximately 40% of the treated effluent is disinfected with chlorine and reused as industrial water, significantly reducing freshwater demand in the region a strong step toward circular water use and sustainability.

## Case Study (2): How Filtralite® Clean is Helping Keep the Mediterranean Sea Clean

Malta, an island nation surrounded by the pristine waters of the Mediterranean, once faced a critical challenge: the majority of its domestic wastewater was discharged untreated into the sea. In 2005, only 6.4% of household wastewater was being treated, leaving the rest to pollute the marine environment.

To meet the standards of the Urban Wastewater Treatment Directive and the European Regulation on water protection, Maltese authorities embarked on an ambitious mission: to build three modern wastewater treatment plants across the island. One of the most significant was the Malta South Sewage Treatment Plant, located in Ta' Barkat, Xgħajra.

## A National Milestone: 80% of Malta's Wastewater Treated

Commissioned in January 2011, the Malta South STP was designed to treat 51,000 m³ of sewage daily, covering nearly 80% of Malta's total wastewater output. This project became a turning point in Malta's environmental stewardship, vastly improving seawater quality, reducing pollution-related odors, and enhancing the overall health of coastal ecosystems.

## The Role of Filtralite® Clean: Biofiltration at its Best

At the core of the treatment process lies 6,000 m³ of Filtralite® Clean, a highly porous and lightweight ceramic filter media tailored for biological wastewater treatment. In this facility, Filtralite® is integrated into BIOFOR®, a compact fixed-bed process developed and patented by Suez, where it's branded as Biolite®.

## This setup includes:

- 12 filters for the removal of organic compounds and nitrogen.
- 8 filters dedicated to denitrification.

Thanks to Filtralite® Clean's high specific surface area, excellent void ratio, and superior abrasion resistance, it enables the robust development of biofilms that degrade contaminants efficiently and reliably.

## Beyond Filtration: A Full Treatment Chain

After biological treatment with Filtralite®, the wastewater undergoes:

- Sand filtration for fine particle and bacterial removal
- UV disinfection to eliminate residual microorganisms

Approximately two-thirds of the treated water is safely discharged into the Mediterranean, while the remaining one-third is reused for agricultural irrigation, supporting sustainable water resource management on the island.

This project not only highlights Malta's environmental progress but also illustrates how advanced filter media like Filtralite® Clean can play a crucial role in meeting regulatory standards, promoting water reuse, and protecting natural ecosystems.

By embracing innovative technologies, Malta has transitioned from a nation discharging untreated wastewater to a model of sustainable urban water management and Filtralite® has been central to that transformation.

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# FILTRALITE® CLEAN – SMARTER BIOFILTRATION FOR WASTEWATER TREATMENT

**The unique porosity of Filtralite® Cleen facilitates biofilm growth while allowing water to pass easily through the filter, improving contaminant removal. It is an advanced expanded clay media designed for high-performance biological filtration and sustainable wastewater treatment, featuring high efficiency, low environmental footprint, and sustained performance.**

**As utilities and operators seek greener, more cost-effective filtration,Filtralite® Clean stands out with:**

- **Fast & effective biofilm growth**
- **High filtration rates (15–20 m/h)**
- **Fewer backwashes & lower energy use**
- **25+ year media lifespan**

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# How can Filtralite® Clean -a highly porous filter media from Saint-Gobain- turn your wastewater challenges into clean, reusable water?

CASE STUDY
**FILTRALITE CLEAN**
WASTEWATER TREATMENT

## A case study in Malta South Wastewater Treatment Plant which treats 51,000 m³/day—covering 80% of the nation's wastewater:

### Before Filtralite® Clean

- Less than 7% of wastewater treated (2005).
- Over 90% discharged untreated into the Mediterranean.
- Serious pollution of seawater + bad odors.
- No reuse, wasted water resource

### After Filtralite® Clean

- New Malta South WWTP (51,000 m³/day) with 6,000 m³ of Filtralite® Clea
- 80% of Malta's wastewater treated
- ⅔ of water released back to the sea at bathing water quality
- ⅓ reused for irrigation in agriculture
- Compliance with EU standards + cleaner Mediterranean

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FILTRALITE®

# Filtralite® Air Technology: A Breakthrough in Biofiltration for Odor-Free, Cleaner Air

Air pollution remains one of the most pressing environmental challenges worldwide, especially in urban, industrial, and agricultural settings. Traditional air filtration systems often struggle with high costs, energy consumption, and limited long-term effectiveness. In response, Filtralite® Air emerges as an innovative and sustainable solution for biofiltration of polluted air.

## What is Filtralite® Air?

Developed by Leca International, Filtralite® Air is a lightweight, porous filter media made from expanded clay aggregates. It is specifically engineered to support microbial activity that breaks down harmful airborne pollutants like hydrogen sulfide ($H_2S$), ammonia ($NH_3$), and volatile organic compounds (VOCs). Its unique structure offers high surface area, excellent airflow, and strong water retention, making it ideal for use in biofilters and biotrickling filters.

By enabling efficient odor control and air purification in wastewater treatment plants, agriculture, industry, and biogas facilities, Filtralite® Air represents a major step forward in the field of environmentally friendly air treatment technologies.

Odours are often results of a complex mixture of chemical compounds and the effect of dilution is different for various compounds, not only quantitatively but also qualitatively. Sources for odour can be manure, waste water plants, industry and waste fillings. Thus, Filtralite® Air is engineered to balance mechanical strength, water retention, and porosity.

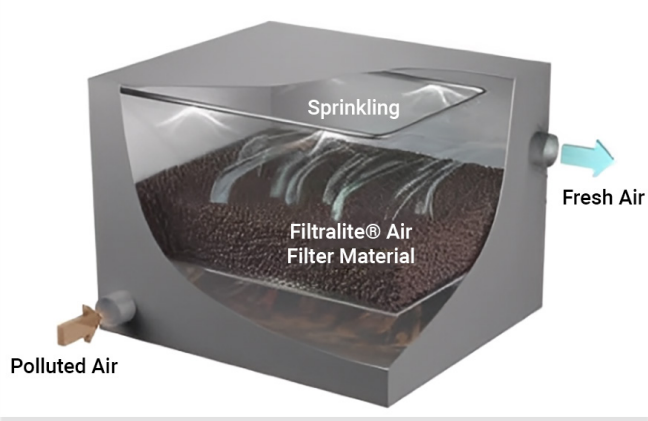
## Composition and Manufacturing Process

Filtralite® is produced by heating naturally occurring clay at temperatures exceeding 1100°C, causing it to expand and form lightweight granules with a hard outer shell and porous internal structure. Media Chemical Composition is Mainly alumino-silicates, with high structural stability. Moreover, pH Neutrality ensures compatibility with microbial life. This structure supports airflow with minimal resistance while providing a large surface area for biofilm attachment and microbial growth.

## How Filtralite® Air Works: Mechanism of Biofiltration

The simple principle of treating odour is to pump the gas through a filter media upstream or downstream with water sprinkling.

- **Upstream System:** Polluted air is pushed upwards through the filter while sprinkling water drip downwards.




- **Downstream System:** Polluted air is pushed downwards through the filter together with sprinkling water.

### Here's a breakdown of the process:

- **Initial Gas Contact**

Polluted air is passed through a bed of moistened Filtralite® Air. The media captures and adsorbs water-soluble gases such as $H_2S$ and $NH_3$.

- **Biofilm Formation**

A thin layer of water on the surface of the media supports the growth of bacteria, fungi, and other microbes. These microbes form a biofilm that metabolizes and degrades pollutants.

- **Pollutant Degradation**

- Hydrogen Sulfide ($H_2S$) is oxidized to elemental sulfur or sulfate by sulfur-oxidizing bacteria (e.g., Thiobacillus).
- Ammonia ($NH_3$) is converted to nitrites and nitrates by nitrifying bacteria.
- VOCs are broken down through enzymatic pathways, depending on their structure.

> **"The moisture-retaining properties of Filtralite® ensure long-term stability and activity of the microbial community."**

## Physical and Functional Properties of Filtralite® Air

- **Type of Material:** Expanded clay
- **Appearance:** Round particles, smooth surface with micro pores
- **Bulk Density:** 250-360 kg/m³ (lightweight)
- **Particle density:** 430- 650 kg/m³
- **External volumetric air content:** 43%
- **Water Retention:** Porous structure holds water, enhancing trickling efficiency
- **Chemical composition, approx. Values:**

| | |
|---|---|
| $SiO_2$ | 63% |
| $Al_2O_3$ | 17% |
| $Fe_2O_3$ | 7% |
| $K_2O$ | 4% |
| CaO | 2% |
| $Na_2O$ | 2% |

- **Stable & Durable:** Natural clay structure that won't collapse – no hazardous or artificial additives.
- **Lightweight:** 5x less pressure on structures than ordinary materials = lower construction and removal costs.
- **Porosity:** highly porous structure
- **Consistent Quality:** Precisely graded for uniform particle size, ensuring predictable and reliable filtration performance.
- **High Surface Area:** Provides an ideal environment for biofilm growth, enhancing biological treatment efficiency.
- **Excellent Permeability:** Promotes smooth airflow with low pressure loss, contributing to energy efficiency and longer media lifespan.
- **Water Retention Capacity:** Porous structure absorbs and holds water, improving trickling efficiency and supporting biofilm hydration.
- **Early Odor Removal:** Possesses natural sorption capacity for hydrogen sulfide ($H_2S$), allowing odor reduction to begin even before biofilm is fully developed.

## Applications and Use Cases

- **Wastewater Treatment Plants (WWTPs)**

Used in odor control units for sludge handling, aeration tanks, and headworks. Helps reduce community complaints and improve regulatory compliance.

- **Industrial and Chemical Plants**

Effective in treating exhaust from food processing, fertilizer production, and chemical reactors.

- **Composting and Biogas Plants**

Filtralite® Air media is used in biofilters to treat gases from organic waste, significantly reducing odor and harmful emissions.

## Filtralite® Air in Action: Case Studies and Practical implementations

### 1. Air purification at Novozymes Fermentation unit in Kalundborg (DK)

**Novozymes faced issues with their old filter media:** high pressure drops, uneven water distribution, and high energy use. In 2005, engineer Anders P. Jensen found that Filtralite® Air was used successfully at other Danish plants.

They replaced the old media with 350 m³ of Filtralite® Air 4–10, known for its large surface area (580 m²/m³) and low-pressure loss.

To speed up biofilm formation, they mixed in some of the old media containing bacteria. Installation was quick using blower trucks (1 m³/min).

**Results:**
- Lower, stable pressure drop
- Better humidity control and air purification
- Increased capacity
- Saved 100,000 kWh/month

**After 5 years, the media remained effective and stable.**

## 2. Odour treatment filter in Bogense biogas plant (DK)

Leca Danmark A/S supplied 750 m³ of Filtralite® Air 10–20 mm for odor treatment.
- The media's 40–45% porosity allows efficient air distribution and low pressure drop, saving energy.
- Its porous surface supports biofilm growth and effective odor removal without clogging.
- The system treats 40,000 m³ of air per hour, with bacteria forming naturally within weeks to break down odor compounds.

**Compared to bark-based filters, Filtralite® Air:**
- Holds moisture better
- Remains structurally stable
- Saves up to 60% water annually

**Lifespan: 8–10 years without replacement.**

The Bogense plant produces 10 million m³ of biogas/year, supplying 6,000 homes with heat.

## Conclusion

As air pollution continues to impact human health and the environment, the need for effective, sustainable purification technologies has never been greater. Filtralite® Air offers a powerful solution by combining the natural advantages of expanded clay with modern biofiltration principles.

Its high porosity, moisture retention, and microbial support enable efficient removal of harmful gases such as $H_2S$, $NH_3$, and VOCs, while its lightweight and stable structure reduces operational and maintenance costs. With proven success in real-world applications—like the Novozymes plant in Denmark and Bogense biogas plant (DK) —Filtralite® Air stands out for its long-term durability, energy efficiency, and odor control performance.

In a world demanding cleaner air and greener technologies, Filtralite® Air is not just a filter media—it's a smart investment in the future of sustainable air purification.

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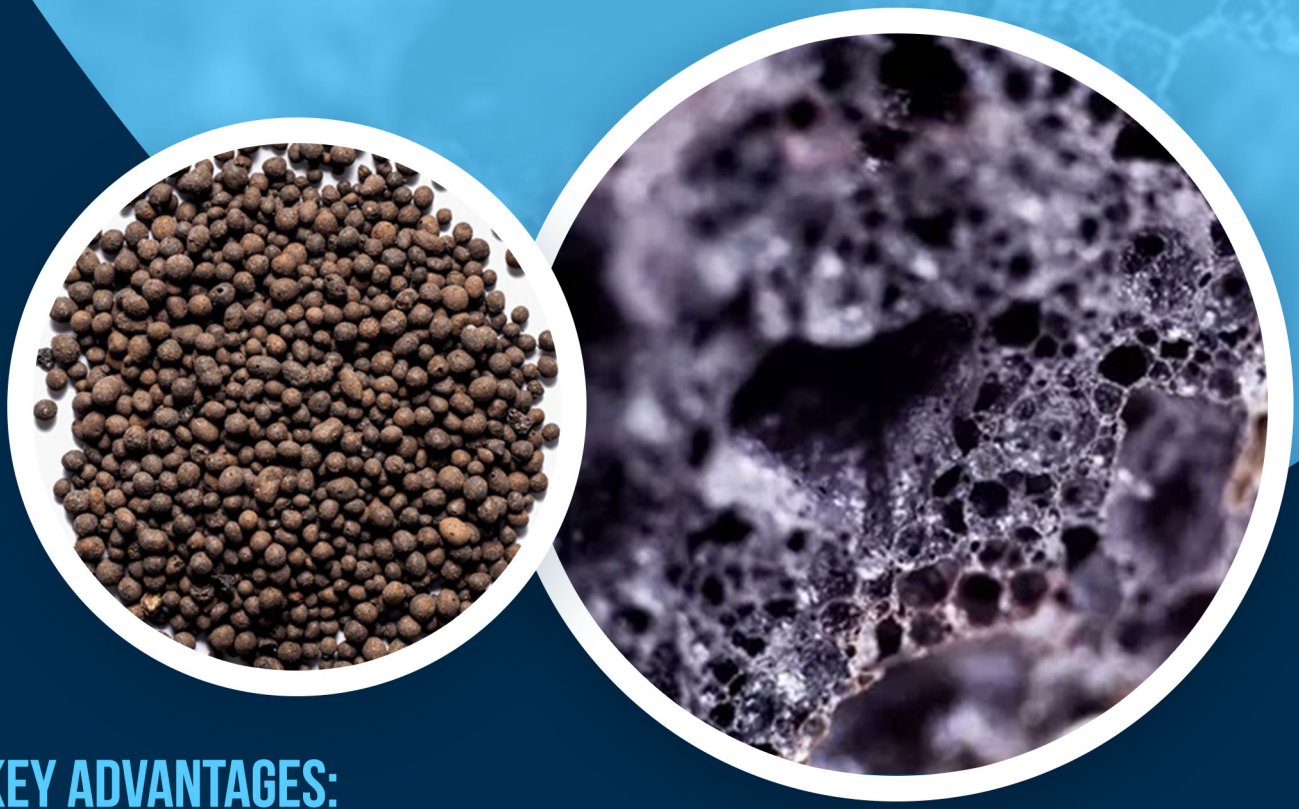
FILTRALITE®

# ODOURS FROM INDUSTRY, FARMING, AND WASTEWATER TREATMENT CAN NOW BE PURIFIED WITH BIOFILM IN BIO FILTERS

**With its unique porosity, Filtralite® Air Filter Material is conducive to biofilm growth and allows air to flow through the filter bed in order to retain and adsorb more odours. This feature allows for larger volumes of air to be filtered through the same volume as contact area is increased.**



## KEY ADVANTAGES:

- Stable structure – does not collapse
- Durable and resistant natural clay mineral material without any hazardous or artificial components.
- Low weight means reduced construction, filling and removal costs
- The horizontal and vertical pressure on walls and structure is 5 times lower than that of ordinary minerals.
- Good storage capacity for biofilm and excellent permeability results in low pressure loss and long service life.
- Large surface area results in an efficient carrier for biofilm.
- Water reservoir – the porous structure absorbs and holds water which improves the efficiency of water trickling.
- An adsorbent with good properties will help bio-filtration.
- Has sorption capacity towards H2S so the filter will start removing odour even before the biofilm is established.

Scan to view case studies and more about the products

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# HOW FILTRALITE® AIR ENHANCED ODOUR TREATMENT EFFICIENCY IN DENMARK

Filtralite® Air provides an effective and sustainable solution for odour removal at Nature Energy Nordfyn Biogas Plant, ensuring cleaner air, lower water use, and long-term performance.

## EFFICIENCY OUTCOMES :

- 750 m³ of Filtralite® Air installed
- 40-45% porosity for optimal airflow
- 60% less water consumption
- 8-10 years media lifespan
- Treats 40,000 m³/h of air
- Cleaner environment and reduced maintenance

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# Filtralite® Air – The Smart Choice for Air Filtration

FILTRALITE® AIR

- **Odour Control :** Adsorbs $H_2S$, reducing odours even before biofilm forms.
- **Stable & Durable :** Natural clay structure that won't collapse – no hazardous or artificial additives.
- **Lightweight :** 5x less pressure on structures than ordinary materials = lower construction and removal costs.
- **Efficient Filtration :** High surface area and excellent permeability for low pressure loss and long service life.
- **Biofilm Friendly :** Ideal environment for biofilm growth, boosting filtration performance.
- **Water Retention :** Porous structure holds water, enhancing trickling efficiency.

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# FILTRALITE CAN INCREASE FILTRATION RATES AND REDUCE THE NECESSITY TO BUILD NEW TREATMENT PLANTS

Water pollution is a growing global issue driven by rapid urbanization and agricultural intensification. Addressing the challenge of treating and purifying contaminated water requires efficient and cost-effective solutions. Filtralite's advanced porosity enhances contaminant retention, increasing filtration efficiency and contributing to sustainable water management. Mohammed Kastawy, Area Sales Manager MENA region, at Filtralite, discussed with Aqua Energy Expo Magazine the advantages and innovative technology behind this forward-looking filter media.

## Can you describe your career, your current role, and your level of involvement with Filtralite®?

I hold a BEng in Mechanical Engineering and am pursuing my MBA from Liverpool University. With over 20 years of experience in the Middle East, I've worked in various roles: 3 years as a Mechanical Engineer, 4 years as a Senior Sales Engineer, and 9 years as an Area Manager. Most recently, I served as the Area Sales Manager for Grundfos for 4 years. Currently, I serve as Filtralite's Area Sales Manager for the Middle East at Saint-Gobain, driving sales and promoting innovative filtration solutions.

## What is Filtralite®'s position within the Saint-Gobain Group?

Saint-Gobain Group has been a leader in building materials for over 360 years, focusing on high-performance products that ensure customer comfort and security. Filtralite aligns with this commitment by offering durable and cost-efficient filtration media designed to optimize water treatment.

## How does your team ensure that its innovations meet the needs of the market and consumers?

Filtralite offers a variety of water treatment solutions, including Filtralite Pure, Filtralite Clean, and Filtralite Air. These products engage with desalination, drinking, and wastewater treatment globally, adhering to all required certifications. Our sales team continuously broadens their market understanding and skills to anticipate future demands, customizing solutions to meet specific customer needs. Challenges vary by country; some focus on improving water quality, while others aim to boost water production.

## What are the biggest challenges you face when developing new products or technologies?

A key challenge is adapting Filtralite to diverse water treatment methods across the Middle East and Africa, including Saudi Arabia, Oman, UAE, and Egypt. To address this, we have created different filter material particle densities and sizes in our products to accommodate a broad range of filtration processes. This versatility enables us to efficiently filter different types of water and combat numerous forms of water pollution.

## How do you manage collaboration with external partners, such as universities or other companies, on R&D projects?

We foster substantial partnerships with universities and companies focused on research and development. Recently, I visited advanced desalination and wastewater treatment plants in Oman, connecting with esteemed partners in the region, including Nama Group, GS Inima Environment, Aqualia, Oman Sustainable Water Services SAOC, and OWWSC.

We collaborate with leading companies such as Suez, Aqualia, and Saur, as well as universities supporting PhD research on filtration efficiency. Our partners validate Filtralite's performance through independent laboratory testing, reinforcing our commitment to innovation.

## What types of pollutants do Filtralite®'s solutions remove and how effectively?

Filtralite is a ceramic material crushed and sieved into particle sizes ranging from 0.8 to 5.0 mm, recommended for soaking before use due to its highly porous structure.

> **"With a specific surface area exceeding 1500 m²/m³, Filtralite is exceptionally well-suited as a biofilm carrier. Filtralite's high specific surface area supports robust biofilm growth, optimizing biological processes like nitrification and denitrification"**

Its unique design prevents clogging, maintains flow rates, and reduces the need for chemicals and frequent backwashing, offering a sustainable solution for removing iron and manganese from water.

For instance, the Jäniksenlinna plant in Finland replaced sand with Filtralite, maintaining the same removal efficiency for iron and manganese while reducing backwashing frequency from every two days to once a week. In the Philippines, the Putatán II drinking water plant faced ammonium issues, previously requiring 15 tonnes of chemicals daily. After testing Filtralite, they shifted from chlorination to aerated biofiltration, achieving the same ammonium removal without chemicals. This transition significantly lowered operational costs and minimized the environmental impact of chemical use, showcasing Filtralite's potential for sustainable water treatment solutions.

## What benefits does Filtralite® offer water utilities compared to other companies in the market?

Filtralite's 61% porosity allows greater contaminant retention and bacterial activity, significantly improving filtration efficiency compared to traditional sand. In contrast, sand is characterized by its rounder shape and smoother surface, which results in lower porosity and reduced water cleaning efficiency. Simply put, sand cannot capture all the residues present in the water as well.

As a result, our filter media requires less frequent backwashing, leading to fewer filter stops and significant savings in both water and energy used for this process.

***Filtralite doubles the water flow rate up to 20 m/h much higher than traditional media, effectively increasing plant output.***

Additionally, our media allows for the filtration of more water in the same amount of time, providing our clients the option to deliver more water or reduce operational costs by using fewer filters.

## Where in the Middle East is Filtralite® active? Could you tell us a bit about the projects you are working on?

Filtralite is actively engaged in the Middle East, and we're proud to produce a product that meets global needs.

Thanks to our esteemed customers, Ajman Sewerage and MOALAJAH, Filtralite® is utilized at the Ajman Wastewater Treatment Plant in the United Arab Emirates, which is the largest treatment facility in Ajman, boasting a capacity of 147,000 $m^3$/day.

In addition to wastewater treatment, we have achieved excellent results with desalination plants. Filtralite enhances the lifespan of membranes in the reverse osmosis process and accommodates higher levels of suspended solids in the inlet water. This capability allows the plant to maintain water production even during heavy rainfall, which is crucial for operational efficiency.

**In RO plants, the water from the filter is more biologically stable, which means less biofouling on the membrane and an increased lifespan for the RO membrane**

Furthermore, we have been involved in a project in Beni Saf, Algeria. Previously, the plant had to halt production when suspended solids exceeded 25 mg/l with sand filtration. However, after installing Filtralite, they can now produce water with suspended solids levels up to 40 mg/l and have even managed partial production at 70 mg/l. This significant improvement has been transformative for the plant manager, as it prevents costly production stoppages and enhances overall efficiency in water treatment processes.

## Population growth, strict water treatment regulations and the growing demand for new water resources are some of the factors driving the water and wastewater treatment market's growth. How do you see the water and wastewater sector evolving in the next decade?

Rapid urbanization increases the necessity to boost the production capacity of existing water treatment plants in cities. Filtralite can enhance filtration rates and minimize the need for new facilities. In many areas worldwide, where water scarcity makes every drop valuable, Filtralite is essential in conserving this critical resource.

The rising demand for food compels farmers to use more fertilizers, which often end up in water sources. Filtralite has shown effective results in phosphorus removal. At the Kakolanmäki wastewater plant near Turku, Finland, Filtralite eliminates 50% of total phosphorus and over 80% of nitrogen pollution in the water. Additionally, backwashing efficiently removes all particles trapped in Filtralite's voids.

**Production losses during this period dropped significantly, from 673,000 $m^3$ in 2019-2020 to 380,000 $m^3$ in 2020-2021, marking a 45% reduction. With the second phase completed, further reductions in downtime are anticipated, potentially exceeding 85%.Water quality improved by 0.3 to 0.5 SDI points.**

## A large portion of operating costs for drinking water systems can be for energy. How can Filtralite® contribute to energy savings?

Our solution requires significantly less backwashing, a process that rinses the filter media with air and/or water, typically consuming considerable amounts of water and energy. By drastically reducing the frequency of this operation, we lower the water and energy needed for pumping and disposal. Due to its porosity, we can retain between 3 and 4 times more suspended solids, decreasing annual backwash costs by the same factor. As mentioned earlier, all suspended solids captured during the filtration cycle are released during backwashing to maintain filtration efficiency.

Additionally, our media facilitates a higher volume of water filtration, further lowering energy consumption over the same timeframe. With a 100% customer retention rate, our clients consistently choose Filtralite over previous filtration methods, achieving an average return on Investment in under three years.

## How can Filtralite® help reduce the carbon footprint of water treatment?

Filtralite significantly reduces the carbon footprint of both new and existing water treatment facilities by requiring less energy to process the same volume of water. This allows for smaller facility designs and lowers the overall cost associated with water pricing. In regions where energy is predominantly generated from fossil fuels, using Filtralite leads to a lower carbon footprint. Additionally, our media enables higher filtration speeds, allowing for fewer filters, thereby reducing the need for concrete and other resources. To learn more about how Filtralite can enhance your water treatment processes and contribute to sustainable solutions, contact the Filtralite team today on their website, www.filtralite.com

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Scan to view "Innovative Filter Media for sustainable Water Solutions Webinar"

# Lower OPEX and CAPEX, plus better quality with same grain size as sand/anthracite

## OPEX

- 2 to 4 times less backwashes
- Higher filtration velocity, more water in the same period
- In RO plant, more biologically stable water is out from the filter, which means less biofouling in the membrane, and increased lifetime of the RO membrane.
- Less cleaning/replacement of cartridge filter
- Higher SS rates allowed in input water

## CAPEX

- Less footprint. Half filtration cells needed with Filtralite vs. sand
- Saving in BW pumps, concrete, steel, etc
- Smaller BW pumps cause Filtralite to be a much lighter material than sand
- Lifetime up to 25 years.

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# Filtralite® at Aqua Energy Expo MEA 2025

## 24–26 September 2025

- Filtralite® is a high-performance filtration media made from expanded clay with exceptional porosity.
- The company showcased its innovative, energy-efficient filtration solutions for water and wastewater treatment.
- Filtralite® drew strong attention at the expo for its blend of innovation, reliability, and superior filtration results.

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