

Vitaqua – Advanced Zeolite-Based Catalyst for Industrial Water Treatment

Product Overview

Vitaqua is an advanced water purification catalyst engineered from high-performance **natural zeolite**. Through precise **nano-structuring and ion-exchange optimization**, Vitaqua effectively adsorbs a broad spectrum of industrial water contaminants, including **ammonia (nitrogen compounds), peroxides, PFAS (per- and polyfluoroalkyl substances), heavy metals, and organic pollutants**.

Its mechanism of action is both **physical and chemical**, utilizing **Van der Waals forces** and **ion exchange** to capture and neutralize toxic substances. During this process, it gradually releases beneficial trace minerals (e.g., **calcium, potassium, magnesium**) which contribute to water stabilization post-treatment.

Key Benefits for Industrial Use

- **PFAS and VOC Removal:** Equivalent performance to reverse osmosis membranes and ion exchange resins at a lower cost
- **Multi-Contaminant Adsorption:** Simultaneously targets multiple industrial pollutants, including bacteria and viruses
- **Scalable Integration:** Customizable for large-scale installations including tanks, filtration beds, or cartridge systems
- **Eco-Friendly & Safe:** Made from natural ores, non-toxic, with no chemical byproducts
- **Cost-Effective:** Long lifecycle (up to 36 months) and regenerable options available

Performance Specifications

Parameter	Specification
Base Material	Natural nano-engineered zeolite
Specific Surface Area	Enhanced (5x standard natural zeolite)
Adsorption Efficiency	Up to 95% (depending on contaminant type)
Particle Size	0.1 – 0.8 mm (customizable)
Application Form	Bulk granules, cartridge inserts, powder

Parameter	Specification
Regeneration	Optional (thermal or pressure-based)
Shelf Life	36 months (dry)

Key Features

Property	Description
Base Material	Specially treated natural zeolite
Mechanism	Nanoporous adsorption + ion exchange (van der Waals interaction)
Target Contaminants	Peroxides, Ammonia (NH ₃), PFAS, bacteria, viruses
Mineral Enrichment	Releases sodium, potassium, magnesium, calcium
Adsorption Capacity	5x improvement over untreated raw natural zeolite
Specific Surface Area	Significantly increased (nano-engineered particle structure)
Performance Equivalent To	Reverse osmosis membranes, ion exchange resins (e.g., PFAS removal)
Cost Efficiency	Low-cost natural ore base with competitive performance
Customization	Tunable composition for varied application needs

Recommended Applications

1. Industrial Wastewater Treatment Plants

- Ammonia and PFAS capture
- Effluent polishing and pre-discharge purification
- Compatible with existing tank or columnar systems

2. Municipal Water Sanitation Systems

- Backup filtration for emergencies and resilience upgrades
- Legionella, E. coli, and virus suppression

3. Closed-Loop Cooling Systems

- Inhibition of scale, biofouling, and organic contamination
- Mineral balancing and long-term water stabilization

Large-Scale Water Quality Control

- Applicable for office buildings, hotels, condominiums
- Complies with hygiene regulations for water storage tanks
- Installed in water reservoirs with optional activation system
- Validity: 1-3 year depending on continuous use

Deployment Guidelines

- **Dosage:** Approx. 5–10 kg/m³ of water (adjust based on concentration levels)
 - **Configuration:** Use in fixed-bed reactors, tank modules, or inline filters
 - **Maintenance:** Recommended inspection after 24 months
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Figure 1 samples available for small testing

Conclusion

Vitaqua presents a scalable, low-cost, and highly efficient solution for industries seeking to meet increasingly strict water quality regulations, especially concerning emerging contaminants like PFAS. Whether as a primary solution or integrated enhancement to existing treatment infrastructure, Vitaqua bridges the gap between **natural mineral intelligence** and **modern engineering demands**.