TECHNICAL PRODUCT SHEET

SF & ACF

Sand and Activated Carbon Filtration Systems

MIRANDA water technologies

System Overview

Miranda Water Technologies provides advanced Sand Filtration and Activated Carbon Filtration systems, engineered to improve water quality, protect downstream processes, and seamlessly integrate into comprehensive treatment solutions. These technologies are available as standalone units or integrated into our Miracell® Plus and Miracell® Ultra systems, offering scalable, modular configurations for both municipal and industrial applications.

Key Features and Benefits

High-Performance Media

Sand Filtration: Utilizes precision-graded silica and quartz sand to capture suspended solids and reduce turbidity.

Activated Carbon: Utilizes chemically synthesized activated carbon (CSAC) for micropollutant removal and oxidized powdered activated carbon (OPAC) for larger molecules and industrial applications, selected based on specific use cases.

Advanced Contaminant and Solids Removal

Sand Filtration: Effectively removes particulates to protect downstream biological and membrane processes, preventing fouling and extending equipment life.

Activated Carbon: Efficiently adsorbs chlorine, volatile organic compounds (VOCs), dissolved organic compounds, heavy metals, dyes, and odor-causing substances for superior water purification.

Robust and Durable Construction

Sand Filtration: Built with corrosion-resistant vessels and industrial-grade valves to ensure long-term reliability in harsh environments.

Activated Carbon: Constructed with high-strength fiberglass reinforced plastic (FRP) or stainless steel (SS304/SS316) for maximum durability under demanding operating conditions.

Automated and Efficient Operation

Sand Filtration: Includes fully automatic control valves for continuous, low-intervention operation.

Activated Carbon: Delivers consistent performance with minimal operator input, making it ideal for final polishing stages.

Low Maintenance and Long Service Life

Sand Filtration: Engineered for long media life and minimal operational disruption.

Activated Carbon: Designed for sustained performance with optimized carbon life cycles, reducing the frequency of media replacement.

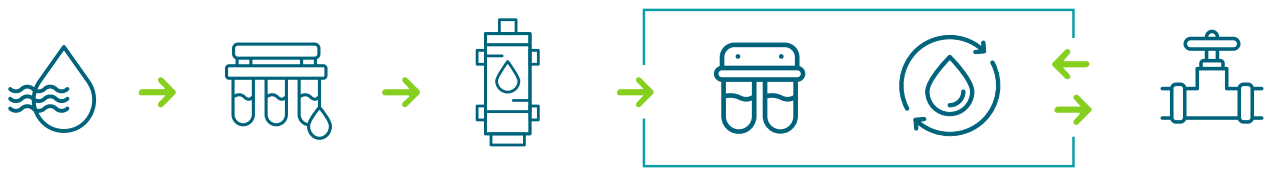
Flexible System Integration

Both systems are available as standalone units or can be fully integrated into larger wastewater treatment configurations, including Miranda's Miracell® Plus and Miracell® Ultra platforms.

Technical Specifications

PARAMETER	SAND FILTRATION	ACTIVATED CARBON FILTRATION
Flow Rate	Configurable based on system requirements	Configurable to meet specific system requirements
Filtration / Media Type	Graded silica and quartz sand with uniformity coefficient <1.7	High-grade OPAC (oxidized powdered activated carbon) & CSAC (chemically synthesized activated carbon) granular activated carbon (GAC)
Target Removal	Suspended solids, turbidity (20–50 microns)	Volatile organic compounds (VOCs), chlorine, dissolved organics, heavy metals, dyes, odours
Removal Mechanism	Physical filtration (depth media)	Adsorption (molecular-level contaminant removal)
Hydraulic Loading Rate	5 to 15 $m^3/m^2/hr$	Application-specific, dependent on media and contaminant profile
Vessel Construction	Fiberglass Reinforced Plastic (FRP) or stainless steel (SS304/SS316)	Fiberglass Reinforced Plastic (FRP) or stainless steel (SS304/SS316)
Valve Type / Controls	Fully automatic multiport or individual valve configurations; PLC compatible	Fully compatible with automated valve systems and integrated control architecture

SF & ACF | PROCESS FLOW DIAGRAM



1 Raw Water
2 Inlet Strainer
3 AC / Sand Filter Vessel
4 Filtered Water
5 Backwash Out
6 Control Valves

STAGE	DESCRIPTION
1 Inlet Water	The filtration system receives either raw wastewater, pre-treated effluent, or secondary-treated wastewater, depending on whether it is configured for primary treatment or final polishing.
2 Inlet Strainer (Optional):	Removes coarse debris to prevent clogging of downstream filtration components.
3 Activated Carbon or Sand Filter Vessel	Water flows through either a granular activated carbon (GAC) bed where dissolved contaminants are adsorbed onto the carbon's porous surface, or through a graded bed of silica or quartz sand that physically traps suspended solids.
4 Filtrate Outlet	Filtered water exits the system for further treatment or discharge.
5 Backwash System	Periodically reverses flow using clean water or air to remove accumulated solids from the media. This step may not be required in all activated carbon (AC) configurations.
6 Flow Control Modes	The system supports direct flow during filtration, standby, or backwash modes.
7 SmartCell Control System (Optional)	An automated control system used in fully integrated configurations. When connected to the Miranda Miracell® system, the SmartCell Control System manages system operation including valve sequencing, system monitoring, and performance optimization.

Optimize your water treatment with efficient sand or activated carbon filtration designed for everything from turbidity removal to final polishing.

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