MARKET SEGMENT BROCHURE: WATER & WASTEWATER TREATMENT

COMMON PITFALLS OF MANAGING WATER & WASTEWATER FACILITIES

Preventing Odors & Corrosion: Mitigating the Risk of Toxic Gas Releases

purafil
Filtration Group®

Major Problems Faced In Water & Wastewater Treatment Facilities

Odor Control

What Can You Do To Preserve Your Reputation In The Commuity and Prevent Odor Complaints?

Gases and contaminants, such as hydrogen sulfide (H_2S), sulfur dioxide (SO_2), volatile organic compounds (VOCs), and mercaptans, can cause unpleasant odors at low concentrations. The shrinking distance between residential areas and treatment facilities requires an odor control solution. Using a large bio-scrubber to treat odors at an entire plant is costly, requiring an enormous amount of energy to maintain airflow through extensive ductwork. Distributed odor control is a decentralized solution that allows smaller scrubbers to be installed in critical locations such as inlets, dewatering systems, clarifiers, and digesters. Systems designed specifically for these unique applications require less energy to operate, allows each scrubber to contain engineered media selected specifically for the target odor and airflow, and provide a low maintenance solution.

Purafil Solutions: Deep Bed Scrubbers, Drum Scrubbers, and Purafil Media

How Can You Address Odor Sources Outside of Your Facility?

Other sources of odors such as lift stations, pump stations, wet wells, and sewage vents may not be located inside your treatment plants, but they are often close enough to commercial and residential spaces to cause odor complaints. Bio-scrubbers cannot handle the large fluctuations in odor levels and require constant maintenance. Dry media scrubbers are ideal low maintenance odor control solutions, with the increased removal capacity from patented engineered media that will eliminate odors before you receive a complaint.

Purafil Solutions: Drum Scrubbers and Purafil Media

Corrosion Control

Are You Experiencing Equipment Failure?

H_2S isn't just a source of nuisance odors. It is also the leading factor in the failure of control systems due to accelerated corrosion on sensitive electronics. Prevent downtime, reduce maintenance costs, and avoid replacement expenses by protecting your control rooms. Custom equipment can maintain a clean and pressurized environment to ensure zero downtime due to corrosion. Contact us for a free assessment of your critical spaces.

Purafil Solutions: Positive Pressurization Units, Corrosive Air Units, and Purafil Media

Toxic Gas

What is Your Plan in the Case of a Hazardous Gas Release?

In the case of an unanticipated release of chlorine, or other toxic gas, from a 1-ton cylinder, the lives of employees and residents within a 5-mile radius are at risk. The Emergency Gas Scrubber is designed to mitigate the risk of any release event of up to 2 tons, whether caused by operator error during cylinder changeout, or equipment failure during storage. Purafil is a proven and trusted provider of safety equipment, also offering solutions for toxic levels of ammonia, SO_2 and H_2S. Ensure your compliance with safety regulations. Nothing is more important than protecting the safety of the people working and living nearby.

Purafil Solutions: Emergency Gas Scrubbers, Chlorine Drum Scrubbers, and Purafil Media

CARBON vs WET vs BIOLOGICAL SCRUBBERS

Choosing between **carbon, wet, and biological** scrubbers depends primarily on the concentration of odorants (such as H_2S), the need for flexibility, and operating costs.

Wet scrubbers offer the highest efficiency for high-concentration, variable loads, while carbon scrubbers are best suited for polishing or low-concentration applications. Biological scrubbers provide the lowest long-term operating costs but require consistent load management.

(CO_2, H_2S) FEATURE	Carbon Scrubber (Dry)	Wet Scrubber (Chemical)	Biological Scrubber
Best Application	Low-medium odor, VOCs, "polishing"	High, high-intensity or variable odor	Consistent, medium-high
Removal Efficiency	**95 - 99%+** (dependent on load)	**> 99%** (very high)	**>99%** (with acclimation)
VOC Removal	**High** (adsorption)	**Moderate** (23–64%)	**Moderate-High** (71–99%)
Responses to Spikes	**Good** (shortens media life)	**Excellent** (chemical feed)	**Poor** (bacteria require stability)
Capital Cost	Low - Moderate	Moderate - High	High
Operating Cost	**High** (frequent media change)	**High** (chemical usage)	**Low** (negligible chemicals)
Maintenance	**Low** (change carbon)	**High** (pump/chemical management)	**Moderate** (pH & nutrient monitoring)
Footprint	**Small / Compact**	**Moderate** (requires tanks)	**Large**

Key Differences in Technology

- **Carbon Scrubber (Adsorption):** Uses physical adsorption to capture odor molecules, making it ideal for low-load applications or as a polishing step after other treatments.
- **Wet Scrubber (Absorption/Reaction):** Uses liquid reagents (e.g., caustic soda or bleach) to neutralize gases, making it highly effective for treating high concentrations of hydrogen sulfide in industrial environments.
- **Biological Scrubber (Biotrickling Filter):** Uses live bacteria (microorganisms) on a filter media to break down odorants, offering a sustainable, low-operating-cost solution, but with limited ability to handle sudden, high concentration spikes.

Selection Guide

- **Choose Carbon:** For low concentrations, small footprint, or plug-and-play operation without water or chemicals.
- **Choose Wet Scrubbing:** For low concentrations, small footprint, or plug-and-play operation without water or chemicals.
- **Choose Biological:** You have a consistent, steady load of odors and want to minimize long-term operating costs and chemical handling.

Purafil Provides the Solution

ELIMINATING ODOR COMPLAINTS IN A MAJOR METROPOLITAN CITY

The Louisville and Jefferson County Metropolitan Sewer District (MSD) treats about 153 million gallons of wastewater every day, serving more than 600,000 people in this booming area of Kentucky. When residents started complaining about bad odors at the end of a street in the Forest Springs neighborhood, MSD found that the odors were caused by a hydrogen sulfide buildup in the sewer. Louisville MSD's project engineers teamed up with Purafil to develop a system that would solve the neighborhood's odor complaints at a competitive cost.

"Since the initial installation, no more complaints of bad odors have been reported from the Forest Springs neighborhood."

Purafil, Inc. is the leading manufacturer of dry-chemical media, scrubbers, and monitors in the water and wastewater industries. Our products and solutions identify and remove harmful and unpleasant odors, gases, and particulates from the environment. The results are increased comfort levels, better equipment reliability, and confidence that environmental safety regulations are being met and exceeded.

Purafil's Dry-Scrubbing Media Advantage

Purafil Engineered Media

Our patented media formulations are manufactured using special chemicals that react with odorous gases and remove them from the air stream. Contaminant gases are chemically transformed into harmless solids that remain trapped inside the media. Known as chemisorption, this process converts odors and toxic fumes into harmless salts. Once the gases are removed from your environment, they cannot re-enter the air stream.

Purafil's media perform well at all temperatures and humidity levels, are non-flammable, UL certified, and remove a broad range of contaminants. Our media provides more than double the removal capacity of equivalent competitor products for key target gases. As a complimentary service, our laboratory technicians analyze samples from your system(s) and provide a report indicating the recommended media replacement date based on the specific conditions in your facility.

Purafil's dry-scrubbing media may be bulk-filled within our engineered equipment or provided in different forms such as our MediaPAK™ modules and PuraGRID® filters to best fit your application. We offer a variety of patented dry-scrubbing granular media formulations to eliminate odorous, toxic, and corrosive gases.

Purafil's Odor Control, Corrosion Control, and Toxic Gas Media

MEDIA	DESCRIPTION	LANDFILL- DISPOSABLE	THE PURAFIL MEDIA
ODORCARB™ ULTRA	Primary media for removal of hydrogen sulfide. Contains Media Life Indicator Pellets for a visual indication of remaining media life.	Yes	Best In Class 47% Removal Capacity for Hydrogen Sulfide (H_2S)
SP BLEND	Broad spectrum control of odors, including mercaptans, amines, aldehydes, organics and sulfur dioxide.	Yes	Unmatched Polishing Capability with 12% Impregnated Sodium Permanganate
PURACARB®	Recommended for removal of chlorine and sulfur dioxide gases.	Yes	The Only Available Alumina Based Media for Removal of Chlorine (Cl_2) and Sulfur Dioxide (SO_2) Gases
PURAFIL CSO	Removes chlorine gas; operates effectively in below freezing temperatures without special heaters.	Yes	Highest Removal Capacity Available in the Industry with 10% Minimum by Weight Capacity for Chlorine Gas (Cl_2)
PURACARB® AM	Removes ammonia gas.	Yes	The one and only UL Certified media for ammonia (NH_3) removal.

Purafil Custom Equipment

LOW AIRFLOW ODOR CONTROL DRY-MEDIA SCRUBBERS

DRUM SCRUBBER
Pump stations, lift stations, and wet wells
up to 1,000 CFM

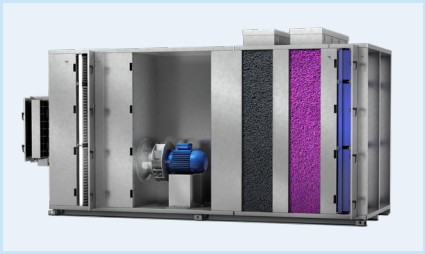
MEDIUM TO LARGE AIRFLOW CORROSION CONTROL DRY-MEDIA SCRUBBERS

POSITIVE PRESSURIZATION UNIT AND CORROSIVE AIR UNIT
Protects control and server rooms from corrosion
500 - 4,000 CFM

PURAFIL SIDE ACCESS SYSTEM
Protects the HVAC system in control rooms
500 - 50,000 CFM

MEDIUM TO LARGE AIRFLOW ODOR & CORROSION CONTROL DRY-MEDIA SCRUBBERS

TUB SCRUBBER SYSTEM
Small headworks, large pump stations, and
screening rooms: 500 - 6,000 CFM



DEEP BED SCRUBBER
Small headworks, large pump stations,
and screening rooms: 400 - 10,000 CFM

PARALLEL BED SCRUBBER
Large headworks and full treatment plants
15,000 - 30,000 CFM

TOXIC GAS DRY-MEDIA SCRUBBERS

CHLORINE DRUM SCRUBBER
Low-level chlorine applications
up to 500 CFM

EMERGENCY GAS SCRUBBER
Contain catastrophic toxic gas releases
for 150 lb, 300 lb, or 1 ton Chlorine
applications.

AIR QUALITY ASSESSMENT AND MONITORING

AIR QUALITY ASSESSMENT

Monitoring air quality is an essential part of your corrosion control program. Passive monitoring using Purafil's Corrosion Classification Coupon (CCC) involves the installation of a one-time use copper and silver coupon that accumulates corrosion over a 30-day period. This easy to install and inexpensive process is measured to determine your environment's specific air quality level.

AIR QUALITY MONITORING

Purafil's OnGuard® Smart (OGS) Monitor helps protect your equipment by measuring and transmitting the level of corrosion in your facility, allowing for action to be taken before problems develop. Purafil's OGS can transmit real-time data to your SCADA system via a 4-20 mA output signal, and is accessible over ethernet. In addition, the Purafil OGS contains internal temperature, humidity, and room pressure sensors. In remote applications, it can be operated as a data logger using battery power.

All measurements are directly related to ISA Standard 71.04-2013, which defines an environment as either G1, G2, G3, or GX based on the corrosion severity level and potential effects on equipment reliability.

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