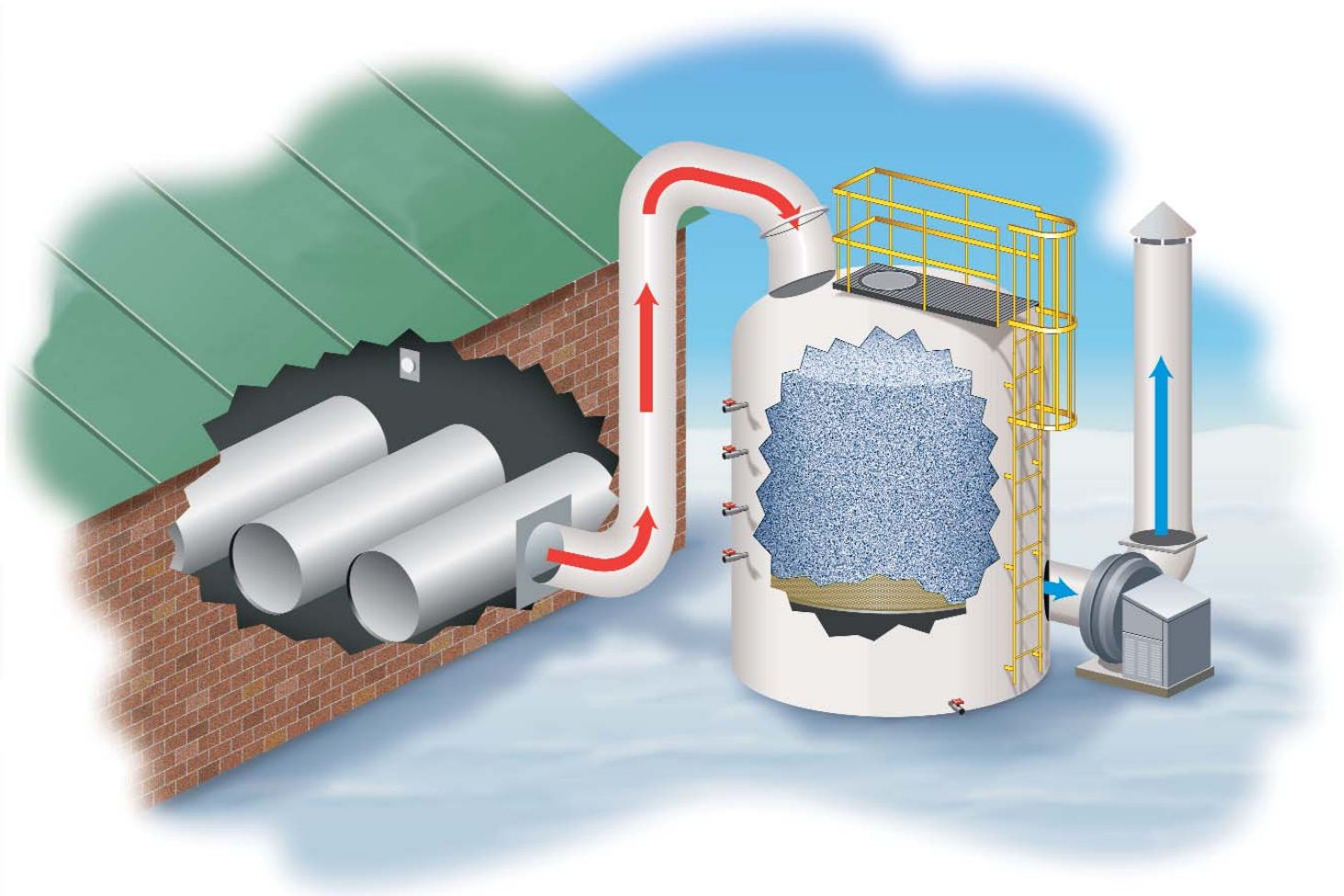


PRODUCT BROCHURE FOR THE EMERGENCY GAS SCRUBBER



PREVENTING TOXIC GAS RELEASES



WITH CHLOROSORB® ULTRA MEDIA

PURAFIL EMERGENCY GAS SCRUBBER

PURAFIL EXCEEDS DESIGN REQUIREMENTS

If a toxic gas release were to occur, the Laws of Thermodynamics suggest that approximately 400 lbs of liquid chlorine would flash into vapor and the remaining contents of the chlorine cylinder would spill out as a liquid at its boiling point. According to the AWWA RMP Guidance, the outer limit of the impact area, in a chlorine release, is drawn at a five-mile radius in all directions from the point of impact.

Facilities storing hazardous quantities of chlorine (Cl_2) or sulfur dioxide (SO_2) must invest in emergency standby equipment to prevent accidental chemical releases. The EPA's Risk Management Program for Chemical Accident Release Prevention "requires regulated facilities to develop and implement appropriate risk management programs to minimize the frequency and severity of chemical plant accidents." In addition, "a performance-based approach towards compliance with the risk management program rule is required."

The Uniform Fire Code, Article 80 states that the full contents of the single largest storage container of chlorine must be mitigated in 30 minutes. Purafil ESD's dry-chemical Emergency Gas Scrubber (EGS) is designed to remove the entire contents of a fully loaded Cl_2/SO_2 cylinder in a worst-case release scenario. The EGS is designed to neutralize the initial 400 lbs for the first minute and the remaining contents at 80 lbs/min. thereafter, which exceeds the requirements of the Uniform Fire Code.

THE PURAFIL EGS: HOW IT WORKS

Dry-Scrubbing Media

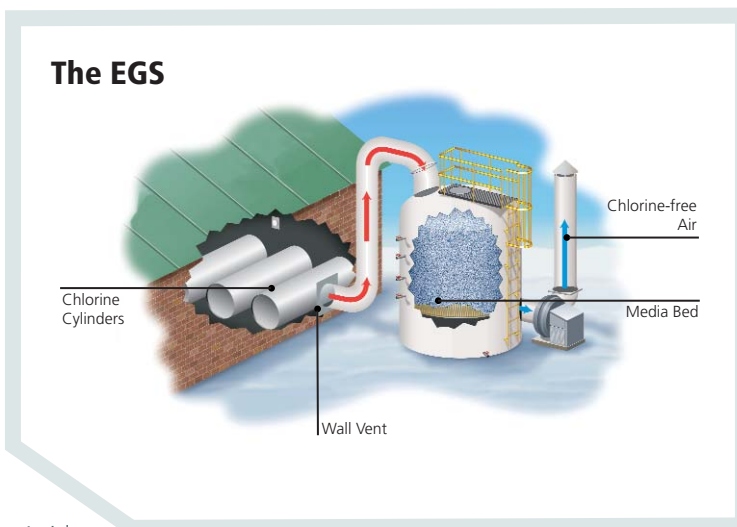
Instead of using toxic liquid caustic to neutralize gases, the EGS uses dry-scrubbing media.

The media's chemisorptive process removes Cl_2/SO_2 by means of adsorption, absorption and chemical reaction. Cl_2/SO_2 are trapped within the pellet where an irreversible chemical reaction changes the gases into harmless solids.

The chemical reaction occurs on the surface of the media throughout the volume of the pellet. The reaction front moves down the media column as the chlorine release proceeds. This allows for partial releases to consume only a proportional amount of media.

Vertical Design

The EGS is attached to a wall vent in the room containing the chlorine cylinders. In a release, the air/ Cl_2 mixture from the gas storage areas is



drawn into the top of the vessel and flows through the media bed and out the bottom to the blower. The blower discharges the chlorine-free air to the outside atmosphere.

The benefit of a vertical vessel is the fiberglass construction which may be more aesthetically pleasing to the landscape of the water treatment plant.

Horizontal Design

The EGS is attached to a wall vent in the room containing the chlorine cylinders. In a release the air/ Cl_2 mixture from the gas storage area is pushed horizontally through the vessel by a blower and then chlorine-free air is discharged to the outside atmosphere.

The benefits of a horizontal design are the aluminum construction and a smaller profile. Horizontal designs are 8' high as opposed to vertical designs that measure 18' high.

PURAFIL'S CHLOROSORB® ULTRA MEDIA

Proven Performance

Purafil Chlorosorb® Ultra media's removal capacity for chlorine gas (Cl_2) is 15% minimum by weight. For example, 100 lbs (45.36 kg) of Chlorosorb® Ultra Media will remove a minimum of 15 lbs (6.80 kg) of chlorine. Third-party laboratory testing demonstrates Chlorosorb® Ultra's ability to remove the entire contents of a fully-loaded, storage cylinder with less than 25 parts per billion at discharge. *CHLOROSORB® ULTRA MEDIA*



Benefits

Chlorosorb® Ultra offers customers the following benefits:

- Landfill disposable
- Non-toxic
- UL Classified
- Operates effectively in temperatures as low as -40° Fahrenheit
- 15% chlorine removal capacity

Physical Properties

Chlorosorb® Ultra has the following physical properties:

- Moisture content: 35% Maximum
- Crush strength: 35% - 70% Maximum
- Abrasion: 4.5% Maximum
- Bulk density: 45 lbs/ft³ (0.72 g/cc) ± 5%
- Nominal pellet diameter: 1/8" (3.2 mm)



PURAFIL VERSUS WET SCRUBBERS

Dry Scrubbers have several advantages over conventional wet scrubbers. For instance, dry scrubbers require significantly less maintenance. They have just **ONE** moving part — a blower. No need to replace pumps, spray nozzles or valves!

Dry scrubbers are much **SAFER**. Instead of using toxic caustic liquid, they neutralize gases with non-toxic dry-scrubbing media, which permanently transforms gases into harmless solids. In addition, dry-scrubbing media is landfill disposable.

Unlike toxic caustic liquid, dry-scrubbing media are immediately available for **INSTANTANEOUS** reaction, regardless of the load rate.

Dry scrubbers discharge less than 25 parts per *billion*, while wet scrubbers discharge 1-4 parts per *million*.

OPERATIONAL COMPARISONS: Purafil VERSUS Wet Scrubbers

FACTOR	PURAFIL	WET SCRUBBER
Contains liquid toxic chemicals	No	Yes
Secondary containment required	No	Yes
Liquid plumbing joints with leak potential	No	Yes
Caustic recirculation pumps with mechanical seals	None	1-2
Media reacts with other gases in air to deplete capacity	No (Chlorosorb® Ultra)	Yes CO ₂ , SO ₂ , H ₂ S
Requires a complex control panel to integrate multiple functions	No	Yes
Requires materials that resist corrosion from wet Cl ₂ and caustic	No	Yes
Requires periodic sampling to ensure optimum chlorine removal	Yes	Yes
Has the potential to release NaOCl	No	Yes
Has the potential to precipitate salts and plug nozzles	No	Yes
Spent media is landfill disposable	Yes	No

PURAFIL

ESD PRODUCT OFFERING

Purafil Emergency Gas Scrubbers are:

- Available in Fiberglass or Aluminum Construction
- Suitable for indoor or outdoor use
- Designed for chlorine, sulfur dioxide or other contaminants
- Sized for 150 lb or 1, 2, or 3 ton releases

AOC1



Aluminum Outside Chlorine Scrubber - 1 Ton Capacity

AIS1



Aluminum Inside Sulfur Dioxide Scrubber - 1 Ton Capacity

FOC5



Fiberglass Outside Chlorine Scrubber - 150 lb Capacity

AOC2



Aluminum Outside Chlorine Scrubber - 2 Ton Capacity

FOC1



Fiberglass Outside Chlorine Scrubber - 1 Ton Capacity

AOC5



Aluminum Outside Chlorine Scrubber - 150 lb Capacity

AOC5



Aluminum Outside Chlorine Scrubber - 150 lb Capacity