EST
Dry Emergency Gas Scrubber Systems

Severn Trent Services - EST Dry Emergency Scrubbers™ are engineered to meet national codes for the mitigation of hazardous gas releases from pressurized 150-pound cylinders and one-ton containers of chlorine, sulfur dioxide and other toxic gases.

The Type DES - Dry Emergency Scrubber is used to neutralize the entire contents of an overfilled one-ton container at rates up to 7000 CFM. For smaller containers like 150-pound cylinders, the Type DSH - Dry ScrubHouse system will exhaust and clean air from the contaminated room at rates up to 650 CFM. Both types are fabricated from industrial grade fiberglass reinforced plastic - FRP - to provide internal as well as external corrosion resistance over many years of operation and exposure to harsh weather conditions.

- No Chemical Maintenance
- New and used media is non-hazardous
- One moving part - fan
- No chemical recirculation pumps
- Chemical Leak containment is not required
- No heaters required in cold climates
- Safe
- User-friendly
The EST Dry Emergency ScrubHouse™, Type DSH, is Severn Trent Services’ standard dry emergency scrubber system engineered and tested for use in municipal and industrial applications where the potential exists for the accidental release of heavier-than-air hazardous gases such as chlorine and sulfur dioxide.

Dry scrubbers are safe, user-friendly, low maintenance systems that consist of a fan and a vertical cylindrical FRP vessel containing a bed of chemically impregnated 1/8” diameter dry pellet media. The only moving part, the fan, produces a vacuum on the contaminated room and draws the gas-laden air from top to bottom through the media bed and out to atmosphere. The media reacts with the gas and reduces the concentration at the scrubber discharge to within the guidelines as set forth by the prevailing codes. The media substrate permanently bonds the chemical impregnate and salt products from the gas reaction, allowing clean, non-toxic landfill disposal. In addition, dry scrubbers do not require liquid chemical leak containment or double wall vessel construction and operate at sub-zero temperatures without the use of heaters.

The EST Type DSH is designed to neutralize a leak from an overfilled one-ton portable tank in accordance with the Uniform Fire Code worst-case release of hazardous gas through a fusible plug. For one-ton applications, three model sizes are offered corresponding with the required room exhaust rate and type of dry media utilized. The Type DSH 300 has a room exhaust rate of 3000 cubic feet per minute. Higher exhaust rates such as 5000 or 7000 cubic feet per minute are normally considered when the gas capacity needs to be split between two or more rooms or when a single room volume exceeds 50,000 cubic feet. When sulfur dioxide is present and needs to be scrubbed either alone or in conjunction with chlorine, the model suffix will be “PHD” indicating the kind of chemical media to be used. The “STS” media is considered when chlorine is the lone containment gas present.

Larger multi-ton scrubber applications for 17 ton trailers, 55 ton stationary tanks and 90 ton railcars are more economically serviced by EST wet scrubber systems found in Bulletin 300 entitled “Emergency Scrubber Systems”. For 150-pound cylinders normally stored in small rooms or FRP shelters, please consider the EST Dry ScrubHouse™ Type DSH described below.

EST’s Type DSH offers all the benefits of the larger Type DES with the additional advantage of low profile operation. It is capable of treating an accidental release of a 3000 cubic foot volume exceeds 2500 cubic feet. Typically, a 2500 to 4000 cubic foot room volume would require a Type DSH 400 while a Type DSH 650 would be used to reduce a 6500 cubic foot room to acceptable entrance-level concentrations in less than two hours after leak cessation. When sulfur dioxide is present and needs to be scrubbed either alone or in conjunction with chlorine, the model suffix will be “PHD” indicating the kind of chemical media to be used. The “STS” media is considered when chlorine is the lone contaminant gas present.

The EST Dry ScrubHouse™, Type DES, is designed to neutralize a leak from an overfilled one-ton portable tank in accordance with the Uniform Fire Code worst-case release of hazardous gas through a fusible plug. For one-ton applications, three compact model sizes are offered corresponding with the required room exhaust rate and type of dry media utilized. The Type DES 300 has a room exhaust rate of 3000 cubic feet per minute. Higher exhaust rates such as 5000 or 7000 cubic feet per minute are normally considered when the gas capacity needs to be split between two or more rooms or when a single room volume exceeds 50,000 cubic feet. When sulfur dioxide is present and needs to be scrubbed either alone or in conjunction with chlorine, the model suffix will be “PHD” indicating the kind of chemical media to be used. The “STS” media is considered when chlorine is the lone containment gas present.

The EST Type DES is designed to neutralize a leak from an overfilled one-ton portable tank in accordance with the Uniform Fire Code worst-case release of hazardous gas through a fusible plug. For one-ton applications, three compact model sizes are offered corresponding with the required room exhaust rate and type of dry media utilized. The Type DES 300 has a room exhaust rate of 3000 cubic feet per minute. Higher exhaust rates such as 5000 or 7000 cubic feet per minute are normally considered when the gas capacity needs to be split between two or more rooms or when a single room volume exceeds 50,000 cubic feet. When sulfur dioxide is present and needs to be scrubbed either alone or in conjunction with chlorine, the model suffix will be “PHD” indicating the kind of chemical media to be used. The “STS” media is considered when chlorine is the lone containment gas present.

Type DSH

Dry ScrubHouse for 150# Cylinders

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
<th>WT LBS</th>
<th>Horsepower</th>
</tr>
</thead>
<tbody>
<tr>
<td>650</td>
<td>5’ x 6’2” x 10”</td>
<td>1300</td>
<td>5.75</td>
</tr>
<tr>
<td>400</td>
<td>4’ x 6’0” x 12”</td>
<td>900</td>
<td>3.5</td>
</tr>
<tr>
<td>250</td>
<td>3’ x 5’10” x 6”</td>
<td>600</td>
<td>2.3</td>
</tr>
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</table>

Size 250 is only offered with “PHD” media; sizes 400 & 650 are available with “STS” or “PHD” media. The model size numbers indicate the scrubber exhaust rate in CFM. Weight is based on an empty single fan system.

Type DSH

Dry Emergency Scrubber for One-Ton Containers

<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions</th>
<th>WT LBS</th>
<th>Horsepower</th>
</tr>
</thead>
<tbody>
<tr>
<td>7000</td>
<td>12’ x 15’6” x 24”</td>
<td>4500</td>
<td>20-25</td>
</tr>
<tr>
<td>5000</td>
<td>10’ x 14’6” x 20”</td>
<td>3500</td>
<td>15-20</td>
</tr>
<tr>
<td>3000</td>
<td>8’ x 14’0” x 18”</td>
<td>3000</td>
<td>10-15</td>
</tr>
</tbody>
</table>

Size 3000 is only offered with “PHD” media; sizes 5000 & 7000 are available with “STS” or “PHD” media. The model size numbers indicate the scrubber exhaust rate in CFM. Weight is based on an empty single fan system.

www.severntrentservices.com
**DRY EMERGENCY SCRUBBER SYSTEMS - APPLICATION DATA SHEET**

Make a copy of this form and submit as much information as possible about your application. This will enable Severn Trent Services to provide the best evaluation and recommendation to fulfill your requirements. This is an inquiry only - not an order - and involves no obligation. Please fax this form to: (215) 997-4062 or e-mail to: marketing@severntrentservices.com

<table>
<thead>
<tr>
<th>Exhaust Rate CFM</th>
<th>Recommended Duct Size</th>
<th>Inches WC Drop per 100' EQ Duct</th>
<th>Specify Actual EQ FT of Ducting*</th>
<th>Exhaust Rate CFM</th>
<th>Recommended Size Duct</th>
<th>Inches WC Drop per 100' EQ Duct</th>
<th>Specify Actual EQ FT of Ducting*</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>6&quot;</td>
<td>0.5</td>
<td></td>
<td>3000</td>
<td>18&quot;</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>8&quot;</td>
<td>0.3</td>
<td></td>
<td>5000</td>
<td>20&quot;</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>650</td>
<td>10&quot;</td>
<td>0.3</td>
<td></td>
<td>7000</td>
<td>24&quot;</td>
<td>0.3</td>
<td></td>
</tr>
</tbody>
</table>

*Combine inlet and outlet ducting.

**Contact Information**

Company __________________________ Phone ( ) __________ Fax ( ) __________

Address _________________________________________________________________

Customer Contact __________________________ Reference No. __________ Date __________

**General Operating Conditions**

- Chlorine (Cl₂) IDLH 10 ppm
- Sulfur Dioxide (SO₂) IDLH 100 ppm
- Anhydrous Ammonia (NH₃) IDLH 300 ppm
- 150# Cylinders _____ qty. stored
- 150# Cylinders _____ qty. stored
- 150# Cylinders _____ qty. stored
- 10,000# Stationary Tank
- Ton Portable _____ qty. stored
- Ton Portable Tank _____ qty. stored
- Multi Ton Tank _____ Tons stored
- Other Gas (Specify) __________; Pounds to neutralize __________

**Leak Rate**

- One ton fusible plug relief rate
- 0.34" valve orifice
- Entire contents of largest container over 30 minutes

- Largest container is ___ lbs. or ___ lbs. overfilled: Actual leak rate is ____ lbs/min. LIQUID or ___ lbs/min. GAS

- Excess flow valve rate: 7,000 lbs/hr 15,000 lbs/hr __________ lbs.

**Gas Room Features**

Specify type of room(s) to be scrubbed and the volume(s):

- Storage Room __________ (CU FT)
- Vaporizer Room __________ (CU FT)
- Feed Room __________ (CU FT)
- Other (specify type) __________ (CU FT)
- Feed Room __________ (CU FT)

**Room Exhaust Rate**

- 150# Cylinders
- 250 CFM 450 CFM 650 CFM
- One-Ton Cylinders
- 3000 CFM 5000 CFM 7000 CFM
- Other __________

**Estimate Ducting Losses**

- *Combine inlet and outlet ducting.

**Scrubber Design Features**

- Indoor Installation - room size restrictions __________ Height; __________ Width; __________ Length
- Outdoor Installation - size restrictions __________ Height; __________ Width; __________ Length
- Standby-by fan required
- Control panel required
- Exhaust stack required
- Sensor required in exhaust stack
- Level gauge w/switches
- Double wall
- Heater
- Other __________
- Materials of construction: FRP (standard) Other (specify) __________

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*Combine inlet and outlet ducting.*
Ask for other EST products available from Severn Trent Services

Solids Conveyors
- Transport solids with gases or liquids
- Mix solids and liquids
- Handle slurries

Emergency Scrubber Systems
- Protection against accidental gas releases
- Scrub Chlorine, Ammonia and Sulfur Dioxide

Eductors, Syphons & Mixers
- Liquid pumping, heating and mixing applications
- Liquid and gas motive source
- Specialized designs for erosive or corrosive applications

Heaters
- Inline steam heating
- Tank steam heating
- Direct contact heaters
- Shell & tube heaters

Exhausters & Compressors
- Liquid jet exhausters handle gases with liquid motive sources
- Gas jet compressors handle gases with gas motive sources

Vacuum Systems
- Handle gases under vacuum using steam
- Multi-stage ejectors
- Non-condensing and condensing systems
- Shell & tube and direct contact condensers

Desuperheaters
- Desuperheating steam
- Gas cooling
- Waste heat recovery

Wet Scrubber Systems
- Ejector venturi scrubbers
- Packed tower scrubbers
- High energy scrubbers
- Packaged systems

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