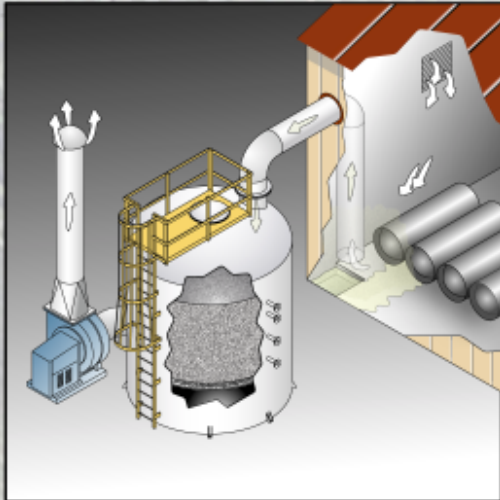


# *Dry* Emergency Gas Scrubber Systems



- ♦ **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**



## EST

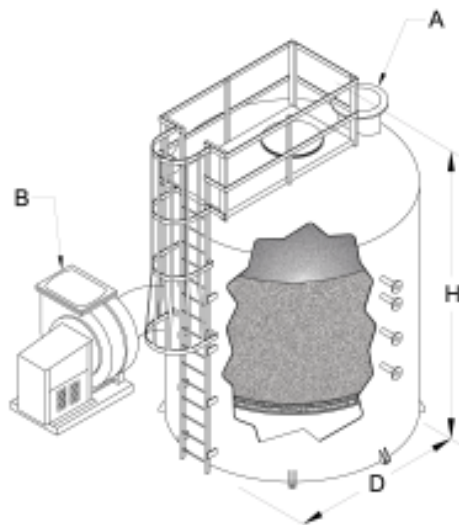
Severn Trent Services - EST Dry Emergency Scrubbers™ are engineered to meet national codes for the mitigation of hazardous gas releases from pressurized 150-pound cylinders and one-ton containers of chlorine, sulfur dioxide and other toxic gases.

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.

**DES**

**Type DES**

**Dry Emergency Scrubber for One-Ton Containers**



The EST Dry Emergency Scrubber™, Type DES, 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 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 model sizes are offered corresponding with the required room exhaust rate and type of dry media utilized. The Type DES 3000 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 Scrub-House™ Type DSH described below.

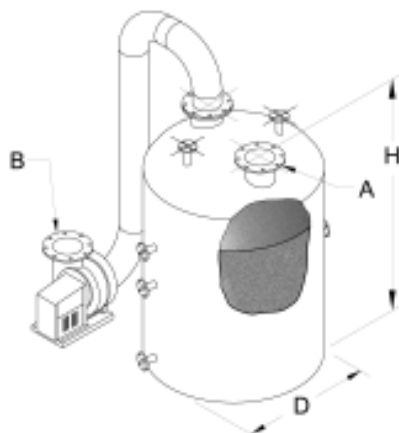
SIZE	DIMENSIONS				WT. LBS	HORSEPOWER
	D	H	A (INLET)	B (OUTLET)		
7000	12'	15'-6"	24"	18" x 28"	4500	20-25
5000	10'	14'-6"	20"	14" x 20"	3500	15-20
3000	8'	14'-0"	18"	14" x 20"	3000	10-15

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.

**Type DSH**

**Dry ScrubHouse for 150# Cylinders**

**DSH**



The EST Dry ScrubHouse™, Type DSH, is a 150-pound dry scrubber engineered to treat accidental gas releases of chlorine, sulfur dioxide, and other toxic gases. Dry pellet media is contained within the vertical FRP cylindrical vessel and separated by an internal gas-side partial baffle, thus creating two media sections. The contaminated air is drawn in the top inlet of the first section, down through the dry media, under the baffle, and then up through the second section of media and out the top connection to the fan.

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 an overfilled 150-pound cylinder of hazardous gas at a leak rate in accordance with code requirements while constantly maintaining a negative pressure on the cylinder storage room. For 150-pound cylinder applications, three compact model sizes are offered and correspond to the required room exhaust rate and type of dry media utilized. The Type DSH 250 is designed to treat a chlorine release at a room exhaust rate of 250 cubic feet per minute. A higher exhaust rate such as 400 or 650 cubic feet per minute is normally considered when the gas capacity needs to be split between two or more storage shelters or if a single storage room 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.

SIZE	DIMENSIONS				WT. LBS	HORSEPOWER
	D	H	A (INLET)	B (OUTLET)		
650	5'	6'-2"	10"	20"	1300	5-7.5
400	4'	6'-0"	8"	12"	900	3-5
250	3'	5'-10"	6"	8"	600	2-3

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.

Make a copy of this form and submit as much information as possible about your application. This will enable EST to provide the best evaluation and recommendation to fulfill your requirements. This is an inquiry only - not an order - and involves no obligation.

### CONTACT INFORMATION

Company \_\_\_\_\_ Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_  
Address \_\_\_\_\_ E-mail \_\_\_\_\_  
Customer Contact \_\_\_\_\_ Reference No. \_\_\_\_\_ Date \_\_\_\_\_

### GENERAL OPERATING CONDITIONS

#### Inlet Gas

- |                                                                  |                                                                                |                                                                            |
|------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <input type="checkbox"/> Chlorine (Cl <sub>2</sub> ) IDLH 10 ppm | <input type="checkbox"/> Sulfur Dioxide (SO <sub>2</sub> ) IDLH 100 ppm        | <input type="checkbox"/> Anhydrous Ammonia (NH <sub>3</sub> ) IDLH 300 ppm |
| <input type="checkbox"/> 150# Cylinders _____ qty. stored        | <input type="checkbox"/> 150# Cylinders _____ qty. stored                      | <input type="checkbox"/> 150# Cylinders _____ qty. stored                  |
| <input type="checkbox"/> Ton Portable _____ qty. stored          | <input type="checkbox"/> Ton Portable Tank _____ qty. stored                   | <input type="checkbox"/> 10,000# Stationary Tank                           |
| <input type="checkbox"/> Multi Ton Tank _____ Tons stored        | <input type="checkbox"/> Other Gas (specify) _____; pounds to neutralize _____ |                                                                            |
| <input type="checkbox"/> _____ 90-Ton Railcar                    |                                                                                |                                                                            |

#### 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    ☐ Other \_\_\_\_\_ 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)

#### Room Exhaust Rate

- |                                                                                                    |                                                                                                       |             |
|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------|
| 150# Cylinders                                                                                     | One-Ton Containers                                                                                    | Other _____ |
| <input type="checkbox"/> 250 CFM <input type="checkbox"/> 450 CFM <input type="checkbox"/> 650 CFM | <input type="checkbox"/> 3000 CFM <input type="checkbox"/> 5000 CFM <input type="checkbox"/> 7000 CFM | _____ CFM   |

#### Estimated Ducting Losses

Exhaust Rate CFM	Recommended Duct Size	Inches WC Drop per 100' EQ Duct	Specify Actual EQ FT of Ducting*	Exhaust Rate CFM	Recommended Size Duct	Inches WC Drop per 100' EQ Duct	Specify Actual EQ FT of Ducting*
250	6"	0.5		3000	18"	0.2	
400	8"	0.3		5000	20"	0.4	
650	10"	0.3		7000	24"	0.3	

\*Combine inlet and outlet ducting.

### SCRUBBER DESIGN FEATURES

- ☐ Indoor installation - room size restrictions \_\_\_\_\_ Height; \_\_\_\_\_ Width; \_\_\_\_\_ Length  
☐ Outdoor installation - size restrictions, if any \_\_\_\_\_ Height; \_\_\_\_\_ Width; \_\_\_\_\_ Length  
☐ Stand-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) \_\_\_\_\_

Design improvements may be made without notice.

Represented by:



# EST

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