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## **SYNECO SYSTEMS, INC. BID SPECIFICATIONS FOR PEACEMAKER<sup>®</sup> OXIDIZING DRY AIR SCRUBBER(S)**

### PART 1: GENERAL

The Contractor shall furnish and install, as shown on the drawings, a complete skid-mounted Dry Air Scrubbing System for the effective control of atmospheric hydrogen sulfide (H<sub>2</sub>S) and other sewage-based odors from an induced draft air stream. The draft-inducing fan shall have variable air flow control, and shall draw in air from the enclosed space being scrubbed through oxidizing and polishing sections to provide intimate contact with treatment media's.

#### 1.02 Related Work

- A. Mechanical piping is included in Part 3: 3.01 B.1.
- B. Concrete work is included in Part 3: 3.01 A.1.
- C. Electrical work is included in Part 3: 3.01 A.2.

#### 1.03 Submittals

- A. Manufacturer shall, upon request, provide the following submittals in order to establish compliance with this section:
  - 1.** Manufacturer's Technical Data, including drawings.
  - 2.** Individual Model Specification Sheet detailing exterior and interior dimensions, chamber sizes, material types and thickness, weight, packaging, storage and use conditions.
  - 3.** Fan specifications.
  - 4.** Installation and start-up instructions.
  - 5.** Return instructions

#### 1.04 System Description

- A.** The system shall remove H<sub>2</sub>S and other malodorous compounds from the air stream via dry air oxidation and polishing chemistry. H<sub>2</sub>S oxidation shall be accomplished via molecular contact with demand dependent media's H<sub>2</sub>S Chlorine dioxide releasing media; oxidizing H<sub>2</sub>S molecules to inorganic sulfate. Other malodorous gases shall be treated by Countervailant polishing chemistry. This chemistry shall include polymeric adsorption, esterification, and neutralization properties.
- B.** The unit shall draw contaminated air from the enclosed space being scrubbed into a mixing chamber and through an air diffuser which precedes the oxidizing media chamber, precedes the final polishing chamber; through the polishing and exhausting to atmosphere. Greater than **99%** of H<sub>2</sub>S shall be removed by the scrubber.

1.05 Quality Assurance

A. All of the equipment specified under this section shall be furnished by manufacturers who are fully experienced, reputable and qualified in the manufacture of the equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods.

B. The Oxidizing/Polishing Dry Air Scrubber specified herein shall be a PEACEMAKER® Model \_\_\_\_\_, manufactured by Syneco Systems, Inc. and shall have a model \_\_\_\_\_ Blower.

PART 2: PRODUCTS

2.01 General

**A.** This section calls attention to certain features, but does not purport to cover all details of construction of the equipment. Furnish and install the equipment complete in all details and ready for operation.

**B.** All system appurtenances, which include the plumbing connection from the vessel's foul-air intake to the malodor source, discharge ducting from exhaust to atmosphere (if required), the electrical connection from the power source to the fan switch box and a stable base on which to place mounting skid, shall be provided by installer as shown on the drawings. The dry air scrubber shall be designed to operate for a period of one to three years without chemical additions or need to exchange or service the media. The design parameters shall meet the following field conditions:

FIELD CONDITIONS

- |  |       |                 |    |
|--|-------|-----------------|----|
| 1) Area to be Scrubbed                             | _____ | FT <sup>3</sup> |    |
| 2) CFM required                                    | _____ | CFM             |    |
| 3) Air turnovers required                          | _____ | Times           |    |
| 4) Average daily flow                              | _____ | MGD             |    |
| 5) Peak hourly flow                                | _____ | MGD             |    |
| 6) Pump rate capacity of all pumps combined        | _____ | GPM             |    |
| 7) Variable speed drive pumps (at the wet well)    | _____ | Yes             | No |
| 8) Fresh Air Intake                                | _____ | Yes             | No |
| 9) Gravity line enters wet well below liquid level | _____ | Yes             | No |

LOAD INFORMATION

- |   |       |     |
|---|-------|-----|
| 1) Average atmospheric H <sub>2</sub> S - Oda-Log | _____ | PPM |
| 2) Peak atmospheric H <sub>2</sub> S - Oda-Log    | _____ | PPM |
| 3) Average atmospheric H <sub>2</sub> S - Grab    | _____ | PPM |
| 4) Peak atmospheric H <sub>2</sub> S - Grab       | _____ | PPM |

**BLOWER/POWER INFORMATION** - CFM must exceed the cubic foot displacement of peak flow and/or pump rates to wet well or other enclosed space being scrubbed. Please check below all power that is available.

- 110/115V, 60 Hz, 1 Phase       220/230, 60 Hz, 3 Phase       440/460, 60 Hz, 3 Phase

2.02 Physical And Electrical

A. Vessel

1. Scrubber vessels shall be constructed of rotationally molded High-Density Polyethylene (HDPE). No other material shall be acceptable. The polyethylene shall be of virgin material, containing no fillers. Pigments and ultraviolet stabilizers shall be compounded at the time of resin manufacture. The rotational molding process shall be in accordance with ASTM D 1988-91, Type 1 only.

**Minimum mechanical properties of the HDPE shall be as follows:**

PROPERTY	Units	Value
Melt Index 190°/2160 g	g/10 min.	5.5
Density	g/cc	0.934
Tensile @ yield 2"/min.	p.s.i.	2.100
Ultimate Elongation	%	440
Environmental Stress Crack Resistance Hours	F50 (100% Igepal)	>1,000
	F50 (100# Igepal)	>400
Flexural Modulus	p.s.i.	72,000
Heat Distortion Temp. °C	66 p.s.i.	49
ARM Impact @ -40°C	ft/lbs	38

B. Mounting Skid

1. Scrubber mounting skid shall be constructed of plastic lumber.

C. Fan and Air Flow Control

1. Fan and air flow control shall be appropriate for conditions of use and sized to provide necessary CFM to maintain a negative pressure in the enclosed space from which contaminated air is being drawn. All fans shall be inspected for balance, welding dimensions, bearings, base connector points, overall workmanship. Fans shall conform to Underwriters Laboratories and appropriate ISO standards and applicable state and local electrical codes.

## PART 3: EXECUTION

### 3.01 Installation

#### A. Site and Utilities

1. There shall be provided a base of concrete, crushed rock or other suitable material to safely support the skid upon which the scrubber is mounted, as shown on the drawings. Proximity to the enclosed space being scrubbed shall be as near as is practicable, and the area shall be accessible by hand truck, forklift or boom truck.
2. There shall be provided an electrical service, as shown on the drawings.

#### B. Connection

1. There shall be provided a PVC plumbing connection from the vessel's foul-air intake to the head space of the enclosed space being scrubbed (and discharge ducting from exhaust to atmosphere, if scrubber is in an enclosed building) and the electrical connections from the electrical service to the fan switch box, as shown on the drawings.

### 3.02 Testing

- #### A. All components of the scrubber system shall be provided by a single manufacturer who shall have sole-source responsibility for the system. Manufacturer's facilities shall be open for inspection at any time during the construction and testing of the system. Testing shall include at a minimum:
1. Visual inspection for any defects that would impair the serviceability of the vessel.
  2. Converting and polishing capacities of media.
  3. Complete assembly start-up and trial run of equipment