

**SECTION 1000  
ENGINEERING SPECIFICATION: AIR STRIPPER (REMOVABLE TRAY)**

**PART 1— GENERAL**

1.1 SCOPE

1.1.1 The manufacturer shall furnish a low profile, multi-tray Air Stripper for removal of volatile organic compounds from water. System shall be manufactured by QED Environmental Systems, Inc. and represented by \_\_\_\_\_ or pre-approved equivalent.

1.2 PROCESS DESCRIPTION

1.2.1 The air stripper process must allow influent water to be piped to the air stripper inlet distribution port. The water is then allowed to flow over a weir and through a series of sieve/aeration trays as it descends to a sump at the bottom of the unit. Air forced up through the sieve holes in each tray forms a froth of bubbles, generating a large gas/liquid contact surface area. Depth of froth and unit air-to-water ratio are carefully controlled to optimize the contaminant removal process. This allows mass transfer of contaminants from the water into the rising air, which is exhausted at the top of the unit. A demister pad prevents release of water droplets in the exhaust.

1.3 SUBMITTALS

1.3.1 Manufacturer shall submit the following with the bid:

1.3.1.1 Product data for selected model, including rated flow capacity, dimensions, weights (dry and operating), accessories, and warranty coverage.

1.3.1.2 Drawings and/or data sheets containing all information necessary to relate the equipment to the specifications.

1.3.1.3 List of all instrumentation to be provided, with descriptive information for each component. See attached Air Stripper Data Sheet for list of required instrumentation.

## PART 2 — PRODUCTS

### 2.1 GENERAL

2.1.1 The air stripper shall be an E-Z Tray™ Removable-Tray Air Stripper or pre-approved equivalent (low profile, multiple sieve tray design using pressure rather than vacuum to generate airflow). See Data Sheet for model number.

2.1.2 All components and options shall meet requirements specified on the Data Sheet attached to this specification.

### 2.2 EQUIPMENT DESIGN REQUIREMENTS

2.2.1 Standard product design shall include one low-profile aeration unit shell with the following specifications:

2.2.1.1 The shell shall accommodate slide-out removable, interchangeable sieve trays for easy cleaning.

2.2.1.2 Access to the individual trays shall be provided via a removable hatch, without requiring removal of influent, effluent, or air discharge piping. The hatch shall be constructed of transparent material to allow visual observation of stripper operation. Optional hinged door(s) allows tray access without the need to fully remove hatch(s).

2.2.1.3 The air stripper shell dimension shall be no smaller than the size specified on the attached Data Sheet.

2.2.1.4 The shell shall be of one piece welded construction; to minimize seal and gasket requirements, 5 sides shall be imperforate except for welded or flanged fittings used for air, liquid, or sensor connections.

2.2.1.5 The air stripper shall be equipped with integral sump, tray support tracks, and a high efficiency demister, plus an external sump gauge to allow visual observation of water level, plus a high efficiency demister. Demister shall effectively remove water droplets at air flow velocity greater than stripper blower maximum capacity. See Data Sheet for demister specifications.

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- 2.2.1.6 Shell construction shall be of uncoated stainless steel; see Data Sheet for specific requirements. Construction must be suitable for all loads placed on shell, including but not limited to: loads resulting from internally supported parts, weight of operating liquid, piping, structural supports, internal or external pressure.
- 2.2.1.7 Shell design shall include mounting brackets suitable for hold-down on a skid or floor, plus forklift cutouts and/or lifting lugs to allow the unit to be moved easily without damage.
- 2.2.2 Standard product design shall include removable sieve trays with the following specifications:
  - 2.2.2.1 Trays shall be constructed of stainless steel with a slide-out design. See Data Sheet for full specifications.
  - 2.2.2.2 Trays shall have latches designed to hold them in position on the shell slide tracks.
  - 2.2.2.3 Trays shall include a mechanical flow control device which will regulate water volume in each tray, preventing air short circuiting.
  - 2.2.2.4 Trays shall be supplied with engineered perforations, sized and located to maintain not less than the specified active area of optimum mass transfer (not including seal pot or downcomer area). See Data Sheet for full specification.
  - 2.2.2.5 Design shall allow the option of purchasing a set of spare trays. (This option reduces system downtime by allowing operation to resume without a delay for tray cleaning. It may also permit easier tray cleaning -- i.e. by setting trays aside, calcium or iron fouling can dry on them so it can simply be cracked off.)
  - 2.2.2.6 Design shall allow the option of purchasing two part trays. (This option reduces tray weight to allow easier removal during tray cleaning.)
- 2.2.3 Standard product design shall include piping connections.
- 2.3 OPERATION AND PERFORMANCE PARAMETERS
  - 2.3.1 Stripper must be fully accessible for cleaning from front hatch only. Models 72.X and 96.X shall be fully accessible for cleaning from front and back hatches only.

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- 2.3.2 Dry weight of individual trays or other removable components must not exceed 75 pounds (to allow one-person cleaning). Optional split tray design reduces maximum weight to 28 pounds.
- 2.3.3 Design shall require a maximum clearance not to exceed 4" at the rear and at least one side to allow placement in a corner without interfering with operation or cleaning. (For models 72.X and 96.X, this requirement is for one side only.)
- 2.3.4 Air to water ratio shall be kept in accordance with generally accepted chemical engineering practice as defined in Perry's Handbook; see Data Sheet for exact specifications.
- 2.3.5 Design flow shall be as specified on attached Data Sheet or on Performance Model Run printout.
- 2.3.6 Design temperature (water and air) and site altitude shall be as specified on attached Data Sheet or on Performance Model Run printout.
- 2.3.7 Design influent and effluent concentrations shall be as specified on attached Data Sheet or on Performance Model Run printout.
- 2.3.8 Air stripper shall be installed in accordance with manufacturer's recommendations, including but not limited to the following:
  - 2.3.8.1 If an exhaust stack is installed to provide venting of the stripped air, the size of the exhaust shall be in accordance with manufacturer's recommendations (see Data Sheet for specification).
  - 2.3.8.2 If air stripper exhaust is to be passed through a subsequent treatment device (such as vapor phase activated carbon), back pressure shall not exceed manufacturer's recommendations (see Data Sheet for specification). If design post-treatment back pressure exceeds this level, a suitable auxiliary blower consistent with manufacturer's recommendations must be installed.

**ENGINEERING DATA SHEET 1  
AIR STRIPPER (REMOVABLE TRAY)**

GENERAL PRODUCT DATA

Model No.	Max. Flow (GPM)	Dry Weight (lbs)	Oper. Weight (lbs)	Area required Dimension ("DxWxH)	Trays per tier (no x lbs)	Active Area (sq ft)	Nom. air flow (cfm)	*Oper. Clearance (inches)
4.4	1-50	630	985	29 x 27 x 82	4 x 29	2.8	210	27
4.6	1-50	780	1,219	29 x 27 x 102	6 x 29	2.8	210	27
6.4	1-65	790	1,285	37 x 27 x 82	4 x 40	3.8	320	35
6.6	1-65	978	1,591	37 x 27 x 102	6 x 40	3.8	320	35
8.4	1-75	955	1,580	49 x 27 x 82	4 x 50	5.6	420	47
8.6	1-75	1,182	1,956	49 x 27 x 102	6 x 50	5.6	420	47
12.4	1-120	1,165	2,105	73 x 27 x 82	4 x 60	8.8	600	71
12.6	1-120	1,442	2,606	73 x 27 x 102	6 x 60	8.8	600	71
16.4	1-150	1,625	2,870	49 x 52 x 84	8 x 50	11.1	850	47
16.6	1-150	2,011	3,553	49 x 52 x 104	12 x 50	11.1	850	47
24.4	1-250	2,100	3,980	73 x 52 x 84	8 x 60	17.5	1300	72
24.6	1-250	2,599	4,926	73 x 52 x 104	12 x 60	17.5	1300	72
36.4	1-375	3,200	6,085	73 x 100 x 104	12 x 60	26.25	1900	72
36.6	1-375	3,900	7,532	73 x 100 x 124	18 x 60	26.25	1900	72
48.4	1-500	5,000	12,500	73 x 120 x 104	16 x 60	35	2600	72
48.6	1-500	5,500	13,000	73 x 120 x 124	24 x 60	35	2600	72
72.4	1-750	6,400	14,600	146 x 100 x 104	24 x 60	52.5	3800	2x72
72.6	1-750	7,800	15,100	146 x 120 x 124	36 x 60	52.5	3800	2x72
96.4	1-1000	11,000	25,000	146 x 124 x 104	32 x 60	70	5200	2x72
96.6	1-1000	11,500	30,000	146 x 124 x 124	48 x 60	70	5200	2x72

\* Additional clearance required for tray removal. Models 96 and 72 need tray removal clearance at front and back. One side requires space for piping, blower, appurtenances, etc. (depends on design layout).

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## INSTALLATION DATA

Model	+Water Inlet ("FNPT)	+Water Outlet ("FNPT)	Air Inlet ("OD pipe)	*Exhaust Stack Size (inches)	Water drain ("FNPT)	#Max. back pressure ("H <sub>2</sub> O)
4.4	2	3	4.63	6.63	1	10
4.6	2	3	4.63	6.63	1	5
6.4	3	3	4.63	6.63	1	10
6.6	3	3	4.63	6.63	1	5
8.4	3	4	4.63	6.63	1	10
8.6	3	4	4.63	6.63	1	5
12.4	4	4	6.63	6.63	1	10
12.6	4	4	6.63	6.63	1	5
16.4	4	4	6.63	8.63	1	10
16.6	4	4	6.63	8.63	1	5
24.4	4	6	8 flange	8.63	1	10
24.6	4	6	8 flange	8.63	1	5
36.4	8	6	10 flange	12 flange	1	5
36.6	8	6	10 flange	12 flange	1	5
48.4	8	8	10 flange	12 flange	1	5
48.6	8	8	10 flange	12 flange	1	5
72.4	8	10	12 flange	16 flange	1	5
72.6	8	10	12 flange	16 flange	1	5
96.4	8	10	12 flange	16 flange	1	5
96.6	8	10	12 flange	16 flange	1	5

+ Models 36.X and larger use flange inlet and outlet connections

\* Minimum recommended nominal diameter of exhaust stack, if added

# Maximum clean-tray exhaust back-pressure allowed without auxiliary blower

**ENGINEERING DATA SHEET 2  
AIR STRIPPER (REMOVABLE TRAY)**

<u>REF</u>	<u>ITEM</u>	<u>SPECIFICATION (S)</u>												
1.3.1.3	<u>Standard</u> Sump pressure gauge:  Sump sight gauge:	Differential pressure gauge, diaphragm-actuated dial type, 0-50" H <sub>2</sub> O range  Clear tube connected to sump water drain for visual sump water level monitoring												
	<u>Recommended options</u> Sump high level switch: Sump low pressure switch:	PVC jacketed SPST, 20VA SPST, 15VA, EXP												
	<u>Options</u> High pressure switch: Air flow sensor: Air flow gauge:	SPST, 15VA, EXP Pitot tube Differential pressure gauge, diaphragm-actuated dial type: 0-0.25" H <sub>2</sub> O range (6.X models) 0-0.5" H <sub>2</sub> O range (4.X, 8.X) 0-1" H <sub>2</sub> O range (12.X, 24.X) 0-2" H <sub>2</sub> O range (16.X)												
	Liquid flow meter:	(check if included) Digital in-line ___ or mechanical brass nutating disk ___												
	Pump on/off switch:	PVC jacketed SPST, 20VA												
2.2.1.5	Demister:	High efficiency polypropylene (98% removal of droplets @ 10 microns)												
2.2.1.6	Shell material (check one): Wall thicknesses:	304 stainless steel (uncoated) 10 GA (0.14")												
2.2.2.1	Tray material:	304 stainless steel												
2.3.4	Minimum air/water ratio:	50:1												
2.3.5	Design flow for this spec:	_____ GPM                      Or see attached												
2.3.6	Design temperature for this spec:	_____ °F (water)                      Or see attached _____ °F (air)                      Or see attached												
	Site altitude:	_____ feet above sea level                      Or see attached												
2.3.7	Design concentrations for this spec:	<table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 30%;">Contaminant</th> <th style="text-align: left; width: 30%;">Influent ppb</th> <th style="text-align: left; width: 30%;">Effluent ppb</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Contaminant	Influent ppb	Effluent ppb	_____	_____	_____	_____	_____	_____	_____	_____	_____
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