

## SPECIFICATIONS

### Infectious Waste Treatment System STI Series 2000 (1000 lb./hr. capacity)(stainless steel model)

#### 1.0.00 Scope

Furnish labor, materials, tools and equipment required, complete fabrication, arrange delivery, assemble, test, and provide In-service training for the required number of units.

#### 2.0.00 Contractor

Equipment furnished shall be BioSAFE Engineering, LLC STI Series 2000, 1000 lb./hr. Commercial Medical Waste Treatment System as described in the following specification. The equipment furnished shall meet all requirements as applicable under the National Electrical Code regarding electrical design, construction and installation.

#### 3.0.00 Infectious Waste Treatment System General Specification

The Infectious Waste Treatment System shall be capable of inactivation of disinfection of Bacillus Atrophaeus spores. Inactivation meaning 6 log reduction of the above test indicator or better. The entire system shall not incorporate combustion of any materials to accomplish the required levels of Log Reduction. The entire system shall operate on electricity as the primary source of power, treating on the average, one imperial ton per hour of infectious waste. The entire system shall not incorporate combustion of any materials to accomplish the required levels of Log Reduction. The entire system shall incorporate automatic loading and is capable of handling infectious waste including sharps, sharps containers, red bag waste, animal bedding, HDPE buckets and glassware.

4.0.00 The Equipment: The basic configuration of these units shall be as outlined below. Specific site drawings may vary from the initial configuration.

4.1.01 An automatic cart-dumping device shall be included to lift the specified roll-around carts (maximum size 220 gallon) and dump their contents into the top of the unit. This device shall apply low-pressure steam directly into the inside of the cart upon completion of the dumping cycle. The lift shall include a locking entry door preventing operation of the unit until the door is shut and interlocked. This assembly shall be manufactured primarily with stainless steel or it shall be mild steel coated with stainless steel coatings on all non-stainless surfaces. The Cart Dumping unit shall be electric/hydraulic in operation and shall include the drive package required for operation. The entire device shall be computer interlocked to control feed rates for consistent operation of the entire system.

4.1.02 An access door shall be incorporated above the shredder unit. The access door shall be constructed of steel and shall be located at the side of stainless steel lift exterior to permit access to the shredding chamber. An interlock switch will be mounted in close proximity to the access door sensing closure of the door at all times. Should the switch sense the opening of the access door, the system cycle will pause until it senses that a door closure condition is satisfied.

4.1.03 A shredder shall be located above the auger assembly. The Shredder shall be capable of an average minimum throughput of 1000 Lbs. per hour. The shredder shall incorporate counter rotating cutting teeth and spacers. The shredder shall operate at low speeds (under 30 RPM) and shall be driven via integral gear reduction unit and electric motors. The electric drive motors driving the shredding package shall be 480VAC, 3 phase, 60HZ, TEFC design unless specified otherwise. Protection for the shredder is provided via sensors for rotation, and electrical amperage sensing devices. Should the cutting teeth fail to rotate during the duty cycle, the electrical pressure sensing mechanism will disengage the drive motor from the shredder gearbox and simultaneously stop the rotation of the cutter shafts. A reversing sequence will follow prior to second or third attempts to destroy the waste. A screen shall be installed below the counter rotating cutters with holes that generate a finer particle size. In general, waste materials exiting the shredder shall be bulk reduced and unusable. A transition below the shredder shall contain spray nozzles, which will mix and

deliver a solution of chemical and water at a specified rate.

4.1.04 A steam conveyor shall be supplied with the equipment. The steam conveyor and integral screw shall be constructed of a heavy gage stainless steel. The steam conveyor shall be capable of holding enough contents to permit a minimum residence time of between thirty and sixty minutes at the rated capacity prior to exiting the end of the conveyor. It shall have an integral access panel permitting access to the interior of the auger called a spore test insertion door. The access panel shall be fastened in place via quick fasteners to ease in removal and replacement. The steam conveyor shall contain thermocouples that sense the operational temperature of the steam conveyor. The rotational speed of the conveyor shall be variable and set to ensure equipment retention time and efficacy. The thermocouples are attached to microprocessors that permit the rotation of the steam conveyor screw only when desired operational temperatures have been reached. The steam conveyor shall be fitted with a steam jacket section to heat and de-hydrate the waste. The unit shall provide for direct steam injection to the interior of the conveyor permitting the direct introduction of steam to the contents of the steam conveyor. Steam injection is controlled via the equipment process controller. The bearing assembly at the introduction end of the conveyor is internal with no rotating components that protrude through the bottom of the conveyor. A removable end plate on the bottom end of the conveyor eases maintenance of the bearing assembly. The steam conveyor is driven at the top end of the conveyor via an electric motor/gear reducer combination and/or via final chain drive. The electric motor shall be 3 Phase, 480VAC, 60HZ, TEFC design unless otherwise specified.

The gear reducer power is transmitted via a direct drive connection to the rotating screw or via a heavy duty chain drive. A mounting plate on the top end of the steam conveyor shall permit mounting of the gear reduce and motor combination. A steam vent connection is supplied on the top side of the steam conveyor at the exit end. This connection will permit negative pressure inside of the steam conveyor to remove excess moisture vapor. The steam conveyor shall have leg assemblies that are constructed from steel. Leg assemblies shall be removable for shipping and installation purposes. Leg assemblies shall be coated with a corrosion resistant stainless steel paint.

4.1.06 Structural framework for the shredder, chute work and hopper shall be mild steel. The entire frame structure shall be in sections that bolt together on site for final assembly purposes. The framework assemblies shall be coated with corrosion resistant stainless steel paint.

4.1.07 One electrical panel shall be furnished with the equipment. The electrical panel shall be constructed of stainless steel. The panel shall have an integral equipment disconnect that isolates the internal electrical components and controls from the power source upon the opening of the enclosure doors. The panel shall be of NEMA 12 or better construction to resist the migration of moisture from outside the panel to the panel interior. The panel shall contain a touch screen for operation and maintenance of the system. It shall incorporate the ability to record all "real-time" operating parameters of the unit. The equipment electrical panel and all associated interconnecting wiring shall comply with the codes set forth by the National Electrical Code of North America unless otherwise stipulated. The electrical panel shall be connected to one (1) supply service, rated at 480VAC, 3 phase, 60HZ, 150 AMP service unless otherwise specified. A standard CAT-5 Ethernet connection is required utilizing one static I.P. address.

4.1.08 The equipment shall have the required pumps and accessories to automatically supply the chemical solution for odor control to comply with the operational specifications of the system. The chemical flows shall range from 0-0.5 gallons per minute, and the water flow rates shall range from 0-2 gallons per minute.

4.1.09 The system shall contain a negative pressure system that consists of a radial pressure blower, HEPA filter housing with pre-filters and HEPA filters, and interconnecting ductwork to the equipment. The negative pressure blower motor shall be rated to operate at 480VAC, 3 phase, 60HZ and be of TEFC design. Interconnecting ductwork shall be PVC or equal. The HEPA filter housing shall be constructed to allow for slide-in/slide-out pre-filters. The HEPA filters shall have a minimum operational efficiency of 99.97 @ 0.3 microns. The system negative pressure blower shall be capable of a minimum of 500 CFM at 3.5" W.C. The system shall include all necessary dampers to allow for system balance and test upon installation.

4.1.10 The system shall contain an additional separate radial blower to provide negative pressure at the exit end of the steam conveyor. This blower shall be connected to a vent pipe provided and installed by others.

4.1.11 The purchaser is to supply low-pressure steam (12-14psig) with relief and safety valves set at 15psig to operate the system. The steam shall be delivered at a minimum of 500 lbs./hr steam at a maximum of 15 psig. The manufacturer recommends the use of 1" valves. The steam shall be owner supplied and tied into the STI Chem-Clav system after installation of the system.

#### 5.0.00 Shipping and Delivery

Shipments shall be made on a Freight "F.O.B. Point Of Manufacture" basis. All freight charges, taxes, and fees, including required insurance are to be paid for by the purchaser.

#### 6.0.00 Installation

The contractor shall be responsible to provide the installation labor and to supervise the rigging, assembly, test, Workman's Compensation Insurance for its employees, and In-service training of the equipment unless otherwise specified during order placement. All associated site preparation including construction/renovation of the building necessary to complete the installation of these products is by the Purchaser. The processed waste container (compactor or roll-off) shall be supplied and maintained by the purchaser.

#### 7.0.00 Technical and In-Service Training Program

In as much as the effective operation of the Infectious Waste Treatment System is dependent upon staff familiarization and training, a detailed In-Service training program shall be provided to the user. The program will be conducted after installation of the equipment at a mutually agreed upon date. A detailed outline of this In-Service and training program shall be submitted with content and scope clearly defined. The content shall include but not be limited to the following items in detail satisfactory to insure optimum operation by the user staff:

Maintenance and Engineering training including mechanical assembly, mechanical and electrical components, filtration systems and air flow, troubleshooting, operational process description, functional design and performance, operational protocols, suggested emergency contingency plan, microbial monitoring and quality assurance techniques, certificate of completion for operator/maintenance In-Service Training Program.

(End of 1000 Lb./Hr. stainless steel Specifications)