



STI BioSAFE

A Division of BioSAFE Engineering



Protects Operators, the Environment and the Community.

Commercial Medical Waste Treatment Products

Chemical-free Medical Waste Treatment with proven steam technology, providing the lowest operating costs in the industry.

STI BioSAFE offers products designed to mitigate the time and expense of healthcare waste disposal through efficacious waste treatment, logistics, transportation and disposal.

Our technology is utilized on a global basis to effectively treat a range of waste streams including: regulated medical, pharmaceutical, infectious, anatomical, crop science, animal research and path lab. Our equipment's unique ability to run continuous cycles, combined with a wide range of capacities, options and configurations, results in an engineered solution that meets our customer's requirements.

Saves Money and Solves Environmental Issues

STI BioSAFE Commercial Medical Waste Treatment Systems have been time tested and proven to have the lowest industry operating cost, obtained through sustainable continuous treatment operation (no batch processing). Our technology provides a low risk and OSHA safety compliant operator interface, in addition to effectively treating Medical Waste and cutting operational costs when compared to other waste treatment technologies.

Cost Benefits

Lower Processing Costs – STI BioSAFE lowers the cost of operation by nearly eliminating labor requirements and continuous feed operation. Utility costs are minimized by using low pressure steam (not high pressure like an autoclave) and via “hibernation mode” when not in use, halting utility usage.

Landfill Avoidance – Recyclable Processed Materials aimed at waste to oil, synthetic gas and liquid petroleum products reduce US requirements to import foreign petroleum and create energy independence.

Disposal Costs – Dry, 90% bulk reduced waste is tailored to minimize the landfill impact and hauling costs of treated materials, lowering tipping fees and hauling charges 10-fold.

Environmental Benefits

Cleaner Air, Water and Soil – Continuous feed non-incineration process has no environmental impact on air, water and soil.

Less Energy Consumption – With STI BioSAFE you have the ability to turn the unit on and off to meet demand (no heat up time required). No longer is there a need to continually consume utilities while not processing waste.

Increase Effectiveness of Treatment

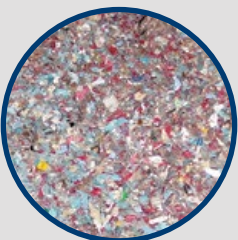
STI BioSAFE technology has been independently tested by numerous laboratories and exceeds domestic and foreign regulations pertaining to efficacious Medical Waste treatment. STI BioSAFE systems achieve higher efficacy than regulatory requirements by a factor of 100 due to superior temperature penetration pathways.



Hospital Loading Dock Installation. STI BioSAFE equipment can be installed indoors or outdoors.



The STI BioSAFE system does not create any air, water or soil pollution.



90% bulk reduced steam-treated waste.



STI BioSAFE System Features

Standard Components

- Integral automatic loading of wheelie bins and reusable tubs
- Automatic high-temperature wheelie bin / reusable tubs wash system (600PPH through 3 metric ton models)
- Single push button operation
- HEPA filtered air system in the enclosed lift
- Application-specific commercial shredder
- Patented continuous feed steam treatment auger
- Fully automated controls
- Integrated system weighing scale
- Remote diagnostics and monitoring capabilities via Ethernet connection (STI SmarTec™)

Options

- Twin wheelie bin lift
- Conveyor feed
- Quick removal roll in / roll out shredders for ease of maintenance
- Bifurcated discharge for two compactors ensuring uninterrupted operation
- Additional options can be configured to meet any high-volume need
- Low pressure steam boiler
- Radiation detector

Additional Product Offerings

STI BioSAFE provides a wide array of Medical Waste Treatment System capacities to choose from. Products range from 300 pounds per hour to 3 metric tons per hour.

Units

- | | |
|-------------------------|--------------------------|
| • 300 lb/hr (136kg/hr) | • 3000 lb/hr (1350kg/hr) |
| • 600 lb/hr (272kg/hr) | • 4000 lb/hr (1800kg/hr) |
| • 1000 lb/hr (450kg/hr) | • 2 Metric ton/hr |
| • 2000 lb/hr (900kg/hr) | • 3 Metric ton/hr |



Integral shredding assures efficacy under all circumstances.



Shredded waste in the steam auger chamber.



Large commercial waste treatment facility.



Roll-up door for integral automated loading system.

The STI BioSAFE System Addresses

Airborne Pathogens – The inclusion of a negative air pressure and HEPA filter system combats the potential release of airborne pathogens during the automated loading process.

Odor Control – The automated, patented use of a cleanser acts as a deodorant for the waste stream.

Steam Treatment – Integral shredding (not pre-shredding) destroys the waste containers, bags, boxes and sharps. Shredding maximizes the waste surface area, exposing all material to direct steam impingement. Efficacy is assured under all circumstances by maintaining boiling temperatures of waste and dwell times ≥ 60 minutes, two times longer than a conventional autoclave temperature cycle.

Validation – Accurate validation testing is achieved by introducing a “carrier” holding self-contained Biological Indicators (challenge spores) after the shredding process. The bacterial spores actually travel with the waste during the treatment process, further validating parametric monitoring of the system.

Emissions – Operating temperatures are deliberately set below the threshold temperature of the volatilization of plastics, eliminating problems associated with V.O.C. emissions.

No Cold Spots or Blockages – The STI BioSAFE system’s integration of shredding and direct steam impingement ensures maximum exposure of all contaminated waste surfaces to the proper treatment conditions. This eliminates cold spots or blockages that can be associated with conventional autoclaves. The STI BioSAFE steam treatment system even treats un-shredded test tubes or syringes unlike ozone/gaseous treatment systems.

Proven Implementations

The first STI BioSAFE unit replaced incineration in 1995 and STI BioSAFE products have processed in excess of two billion pounds of biological waste since. Commercial units have been placed in the United States, Ireland, Northern Ireland, Australia, England and Canada, with many new sites pending.

We have installations in a wide range of facilities, including hospitals, commercial waste treatment plants, crop science facilities and laboratories. Our product line includes indoor and outdoor systems ranging in size from 300 pounds (136 kgs) per hour up to 3 metric tons per hour.

Some of Our Clients

Pharmaceutical / Laboratory Facilities

- Laboratory Corporation of America
- Lexicon Genetics

Hospitals and Healthcare Facilities

- IU Health Group
- Geisinger Health
- Virginia Hospital Center
- Milton S. Hershey Medical Center
- St. Joseph's Hospital of Atlanta
- University of Louisiana Lafayette

Blood Plasma Manufacturing

- CSL Behring

Bio-Agricultural Firms

- Syngenta Crop Protection

Commercial Waste Processing Facilities

- Stericycle, Inc. (USA)
- Sterile Technologies Group (Ireland)
- Sterile Technologies Group (Northern Ireland)
- White Rose Environmental (England)
- Medical Waste Services (USA)
- Healthcare Medical Waste Services (USA)

End of Life Solutions

Landfill Avoidance Through Gasification of Final Product

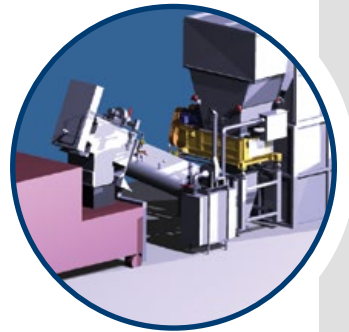
STI BioSAFE is laying the groundwork to redirect the treated waste from historical landfill disposal to recycling alternatives.

- With one-third the cost of medical waste treatment associated with disposal, we are developing a long term, low operating cost alternative to landfill via recycling of treated medical waste.
- STI BioSAFE machine output has been tested and approved for the Vadxx process.
- Gain a public image benefit from landfill avoidance.
- For more information, visit www.STIBioSAFE.com.

Partnership With Operators (PWO)

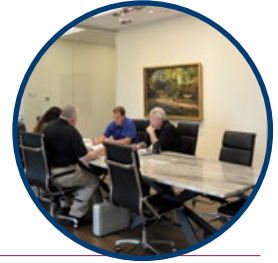
A low up-front capital program makes cost of ownership competitive with any other technology available.

- Healthcare environmental service organizations can focus on their own strengths – providing healthcare to the general public.
- Asset service life, efficiency, and uptime reside in the hands of STI BioSAFE.
- Long term, stable disposal pricing becomes a real possibility.
- For more information, visit www.STIBioSAFE.com.



How STI BioSAFE Stacks up to the Competition

STI BioSAFE technology outperforms all other Medical Waste processing options on the market today. The chart on the right compares the benefits and features of popular waste processing methods against STI BioSAFE's proven technology.



Why Choose STI BioSAFE?

- Cut disposal costs. Total ownership and operating costs average \$0.10-\$0.12 per pound as opposed to three times this amount for third-party hauling and treatment.
- Annual savings in many cases pays for the system in one year.
- Control your future costs without worry about waste processing price increases.
- Best warranty in the industry (2-Years with PM Agreement included).
- Proven technology with over two billion pounds processed in STI BioSAFE systems world-wide.
- Using STI SmarTec™ remote access support, equipment will notify user and BioSAFE Engineering if needs arise.

Hospitals, Agricultural, Research and Production Facilities

- STI BioSAFE Medical Waste Treatment systems may be installed outdoors at a loading dock or indoors, if you prefer.
- Eliminate labor associated with off-site transportation of waste (no boxing, labeling, manifesting, and double handling of infectious waste), lowering risk of exposure.
- Operate STI BioSAFE equipment under Permit by Rule in your state. Reference www.stibiosafe.com/state-by-state-outlook for more information.

Commercial Treatment Facilities

- Stop transporting and brokering waste to other treatment facilities.
- Remove the “middle man” approach and pocket the profits for your company.
- BioSAFE Engineering support is unsurpassed during the permitting and implementation process.



Medical Waste Treatment Technology Limitations Comparison

	STI	Autoclave	Microwave	Rotary Autoclave	Incinerator / Pyrolysis	Rotating Paddles	Ozone
Wet / Heavy Waste Product to Landfill (costly)		•	•	•			•
Manual Loading and Unloading Standard		•		•	•	•	•
Manual Unloading Standard		•		•		•	
Batch Process (slow lower throughput)		•		•		•	
Requirement To Manually Sort White Bag / Red Bag Waste		•	•	•	•	•	•
Full Time Operator Required (direct labor expense)		•	•	•	•	•	•
Problems With Metallic Objects		•	•	•		•	•
Compressed Air Required (additional expense)							
Chilled / Cooling Water Required (additional expense)		•		•		•	

Medical Waste Treatment Technology Features Comparison

	STI	Autoclave	Microwave	Rotary Autoclave	Incinerator / Pyrolysis	Rotating Paddles	Ozone
Steam Treatment	•	•		•			
Moist Heat Treatment	•	•		•			
High Temperature Treatment					•	•	
Chemical Treatment							•
6 Log Reduction of Bacterial Spores	•	•	•	•	•	•	•
Dry Waste Product to Landfill (inexpensive)	•				•	•	
Automated Loading Standard (limits handling)	•	•	•	•			•
Shredded Waste Standard (bulk reduction=cost reduction)	•		•	•			•
STAATT III Compatible (Integral Shredding/Treatment)	•		•	•	•		
Continuous Process (most efficient throughput)	•		•		•		
Bulk Reduction Achieved	90%	30%	85%	85%	95%	20%	80%
High or Low Pressure System (low pressure=low cost)	Low	High	Low	High	N/A	High	
Odor-Vector Control	•						
Maintenance Interval of Shredder in Pounds Processed	2-3M	800K	800K	800K	N/A	1M	1M
Closed System Without Exposed Waste	•		•				
Cost Per Pound To Process (large capacity unit)	\$0.015	\$0.060	\$0.040	\$0.060	\$0.140	\$0.10	\$0.15
Average Capital Cost	\$600K-\$2M	\$150-\$500K	\$750-\$900K	\$750K	\$3M	\$600-\$900K	\$900K-\$1.7M

Simple, Low-Risk Waste Processing Solutions

STI BioSAFE technology eliminates environmental issues associated with Medical Waste disposal and provides a sustainable and economical method of Medical Waste processing. Our mission is to help our clients take steps today to create a cleaner and safer tomorrow.

Contact us to learn more about an STI BioSAFE solution that will meet your budget and processing needs. We offer in-depth consultation to meet the specific needs of each of our customers' unique situations.

Locate Reps Worldwide, visit: www.stibiosafe.com/international-sales-reps



BioSAFE Engineering

A Clean Technology Company

BioSAFE Engineering is a global leader in the design, manufacture, and installation of equipment used in healthcare, industry, and science to eliminate the threat of hazardous or infectious agents. We engineer and deploy our technology so that customers can count on a healthier, cleaner and safer work environment.



STI BioSAFE Commercial Medical Waste Treatment Systems

BioSAFE Engineering's commercial medical waste treatment technology is utilized on a global basis to inactivate a range of waste streams including regulated medical, pharmaceutical, infectious, anatomical, crop science, animal research, and path lab. Our equipment's unique ability to run continuous cycles, combined with a wide range of capacity, options and configurations, results in an engineered solution to meet our customer requirements.



Tissue Digesters

BioSAFE Engineering's patented alkaline hydrolysis technology meets and exceeds some of the world's most hazardous, infectious and critical disposal challenges. BioSAFE Engineering's equipment has been validated at and is in service throughout the world, working under several standards and guidelines ranging from noncritical to highly infectious BSL4 and BSL4-Ag laboratories.



Effluent Decontamination Systems (EDS)

From healthcare to Bio-Safety Laboratories (BSL) ranging from level 1 through 4 research facilities, the world is placing higher scrutiny on potentially dangerous liquid wastes. BioSAFE Engineering has an extensive track record in the design, installation, and maintenance of EDS systems. You can depend on us to engineer systems for the most stringent physical and biological validation requirements, regardless of whether organisms and agents are known or unknown.



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