



Pontic Technology

Germ-free, clean water from any source

**THERMAL DISINFECTION STERILIZATION SYSTEM
(TDSS)**

*WITHOUT REGARD TO WHETHER SOME
PLACE IS WEALTHY OR POOR,
EVERYBODY SHOULD HAVE THE CHANCE
AT CLEAN AIR AND CLEAN WATER.*

BARACK OBAMA

OUTLINE

Introduction

Implementation

Technology

Partnership & Investment

Pontic Technology Team



ABOUT US

Introducing Pontic Technology

Pontic Technology is a cutting edge technology corporation located in Los Angeles, California.

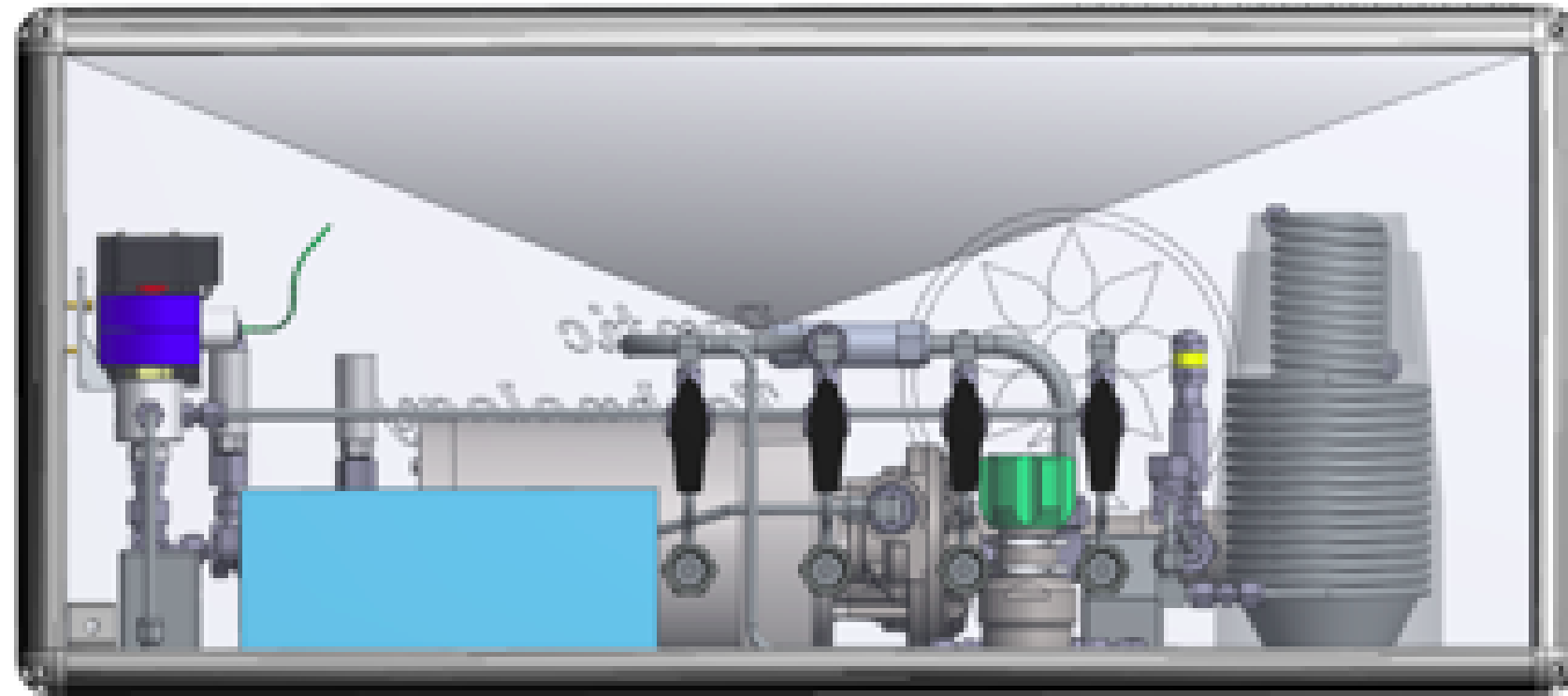
The company has a multidisciplinary group of scientists, engineers, and technologists from the Jet Propulsion Laboratory (JPL) in Pasadena, California. Together they have vast knowledge and experience bringing our innovations to a production model level, ready for market. The company currently provides two separate patented technologies: a water and fluid sterilization system (TDSS) and a chemical water and fluid decontamination system (3DOSS). Neither of these patented technological approaches use filters, membranes, or require chemical additives. Both technologies have the benefit of no by-product, providing a 100% usable product.

OUR MISSION

To be a global leader in clean water solutions by providing innovative, environmentally friendly and cost-effective water and fluid treatment technologies

As climate change and exponential population growth conspire to challenge human health, the importance of clean, affordable drinking water generated from reliable, low maintenance technology to communities drives at the heart of sustainable and healthy living. Almost 1 billion people rely on unprotected wells, lakes or rivers as water sources, which are susceptible to contamination by raw sewage, under treated wastewater discharges, and urban/agricultural runoff. These people are at high risk from waterborne, disease-causing microorganisms, which kill more than 2 million people annually.

Pontic Technology's TDSS was developed and patented to provide high-volume, continuous flow sterile water at a competitively low operating cost. By providing an economical and sustainable solution for global markets, our technologies differentiate us from all competitors in the water management and solutions industry.

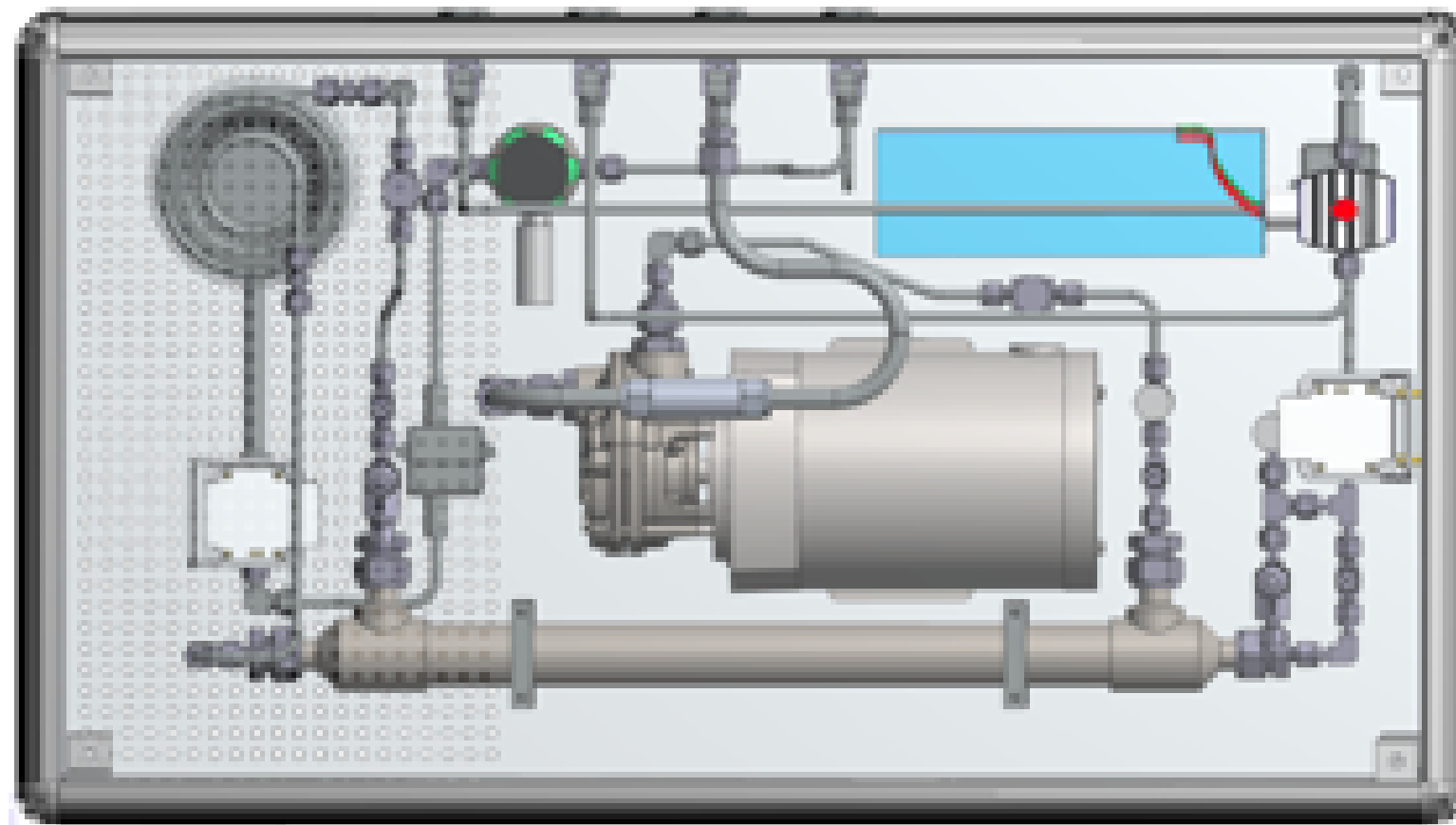


OUR TECHNOLOGY

Thermal Disinfection Sterilization Systems (TDSS)

Our first technology is an energy efficient waste free (no RO Brine), no filters, no chemicals, continuous flow water and fluid sterilization system for eliminating microorganism/biological contaminants. Thermal inactivation is the most optimal method for microbial destruction.

It is designed to provide clean, germ free water regardless of the contamination level of the source.



THE PROCESS

THERMAL DISINFECTION STERILIZATION SYSTEMS (TDSS)

Our TDSS technology achieves sterilization by superheating the water that remains in its liquid state to a high temperature as to eliminate any microorganism/biological contaminants such as fungi, bacteria, viruses (including COVID-19) and spore forms in an economical and environmentally responsible way, no matter the level of contamination of the source. Through a recuperative heat exchanger, much of the heat energy is retained making the process energy efficient. Sterilization is achieved through high heat, pressure and dwell time. Temperature and pressure can be changed while the process is operating - no other water sterilization technology is capable of accomplishing this. Many competitive advantages include minimal maintenance, no membrane/filters, no chemicals used, no moving parts and minerals remain in the water. Our patent describes the sterilization of all fluids, including water.

STERILIZATION MADE SIMPLE

HEAT IT UP

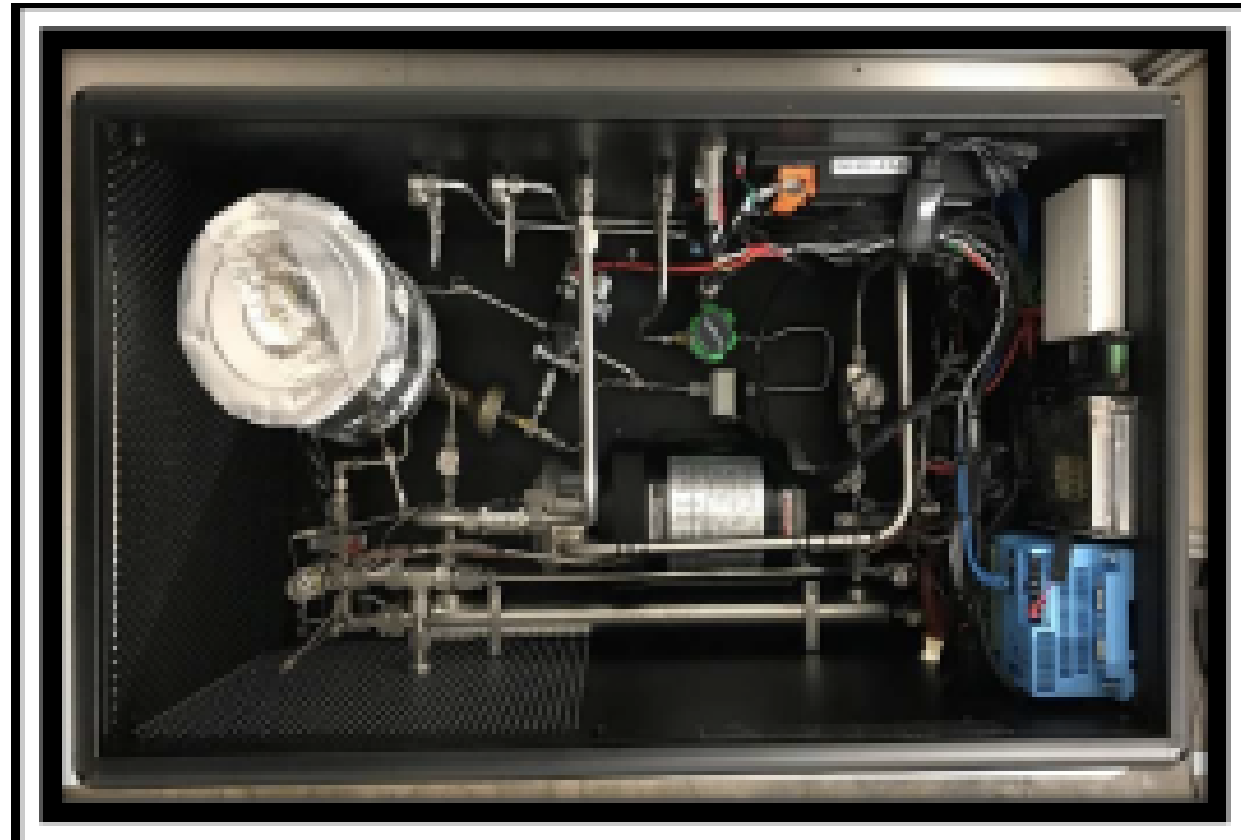
- Simple application to moderate heat
- Heating process takes place under pressure
- Multiple sources of heat can be used to achieve necessary combination of heat and pressure

COOL IT DOWN

- Reduce the heated water temperature through a simple heat recovery operation (recuperative heat exchanger)
- Complete process integrated into an uninterruptible operation - **'non potable water in, potable water out'**

SAFE TO DRINK

- All the water that goes into the system is recovered in the output and is 100% drinkable, leaving zero waste to contaminate the environment (no RO Brine)



TDSSg (fuel)

Sustainable

Pontic Technology's system has no filters, no moving parts, uses scalable, portable machinery and creates zero waste water.

Cost-Effective

The Pontic Technology TDSS uses less energy, requires less regular maintenance resulting in less cost, less down time and less man power, has zero consumables, and only requires a one-step "single pass" to purify the water to the highest level.



TDSSe (electric)

IMPLEMENTATION

<p>WHERE</p> <p>The units are customizable; size and placement are suit to condition. Emergency deployment units are available for remote areas and emergencies.</p>	<p>INSTALLATION</p> <p>TDSS may be used to service multiple homes/offices, residential entry valves, countryside/remote wells, and schools - water kiosks.</p>	<p>MAINTENANCE</p> <p>A non toxic biodegradable descaling solution is flushed to remove hard water debris from the heating section. Less down time, personal and man time.</p>
<p>POWER AND PRODUCTION</p> <p>The base units can be powered by a variety of sources including solar, natural gas, fuel, batteries (vehicle), waste heat and solar concentration. Each "base model" system produces 2,000 L per day. Other models can produce anywhere from 1 L or 3 million L or more per day.</p>	<p>CONTROL- REMOTE ACCESS</p> <p>The TDSS technology has a proprietary software and is fully autonomous with a host of pre-programmed safety features, and can be monitored and controlled remotely by smart phone apps.</p>	<p>ENVIORNMENTAL CONTROL</p> <p>The systems have been used in a strategic humanitarian aid capacity, and each system can be utilized in a rapid response/FEMA emergency. Benefits extend to drought stricken areas in Africa and dry, desert environments like much of the Middle East.</p>

ENVIRONMENTAL CASE STUDY- PUERTO RICO HURRICANE 2018

The TDSS system was brought in to aid the hurricane torn Puerto Rico. Due to power input flexibility the TDSS emergency deployment unit was rigged to car batteries, which provided the power for potable water in areas where power lines were down or damaged, and no available propane gas. The 100% zero water waste solution in its portable format was a viable solution for the emergency situation.

Other potential uses-

- In regions of severe drought and with power access issues
- Power outages at hospitals and remote health facilities





Our deployment unit is a lightweight and portable solution for emergencies and drought stricken areas.

"Can produce over 1,000 L per day, enough potable water for 600 people per day."



MARKET SIZE

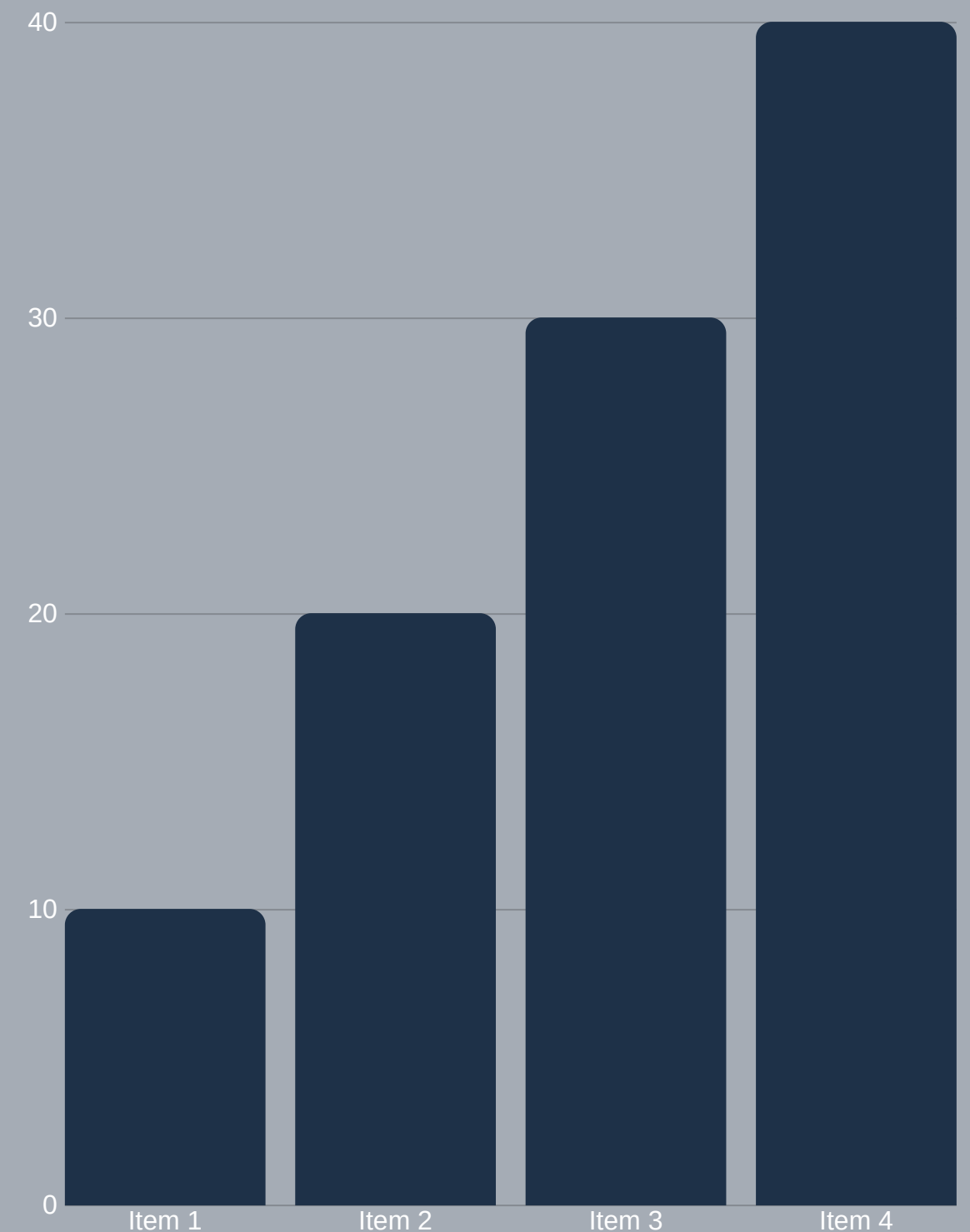
A significant increase

The earth's clean and safe water resources are inadequate due to increased contamination, population growth and inadequate waste water management. "More than half of the world's hospital beds are occupied with people suffering from illness linked to contaminated water" (thewaterproject.org).

The most common water disinfection approach uses membrane or filter reverse osmosis, both of which are expensive, material intensive and create the problem of dealing with a waste product.

The global waste water treatment market is expected to reach USD \$674.72 billion by 2025, driven by the rising demand for freshwater for drinking, industrialization and agriculture.

(Hexa Research- Sept. 12, 2017)



POTENTIAL MARKETS

POINT-OF-USE WATER TREATMENT

- customizable and scalable

RESIDENTIAL

- End of line use, Whole house, Counter top models, Under sink, Recycle water (Water Re-use)

INDUSTRIAL

- Clean waste water\fluids of organic contaminants, germs, grey\black water decontamination treatment and recycle water\fluids
- •Food and Beverage, Pharmaceutical, Semiconductor, Aerospace, Energy companies

MEDICAL

- Dialysis water, decontaminate surgery waste fluids, water autoclave. Decontaminate hospital laboratory waste water

POTENTIAL MARKETS

COMMERCIAL

- Bottled water, restaurants, hotels

GOVERNMENT

- Government Disaster sites, refugee camps, internally displaced peoples, military deployment units

GROUNDWATER RECHARGE

- Decontaminate water

AGRICULTURE

- Water reuse

DENTAL

- Germ free dental water use

SHIPS

- Ballast water treatment using waste, heat, energy from the engines

PETROLEUM

- Fracking-produced water disinfection & recycle

SPAS

- No chlorine and chemicals

MUNICIPALITIES

- Potable water, re-use projects

TECHNOLOGY

Thermal Disinfection Sterilization Systems (TDSS)

- Simple patented process with continuous flow
- Instantaneous turn on/off, rapid start up
- Simple operation, customized technology, no moving parts
- No Added Chemicals
- Eliminates all Microorganisms Contaminants- fungi, bacteria, viruses (including COVID-19), and spore forms
- All Natural Minerals remain in the treated water
- Autonomous
- Competitively Priced
- Limited footprint from machinery compared to other technologies (Osmosis, UV, Ozone)



Front panel of TDSSg (fuel)

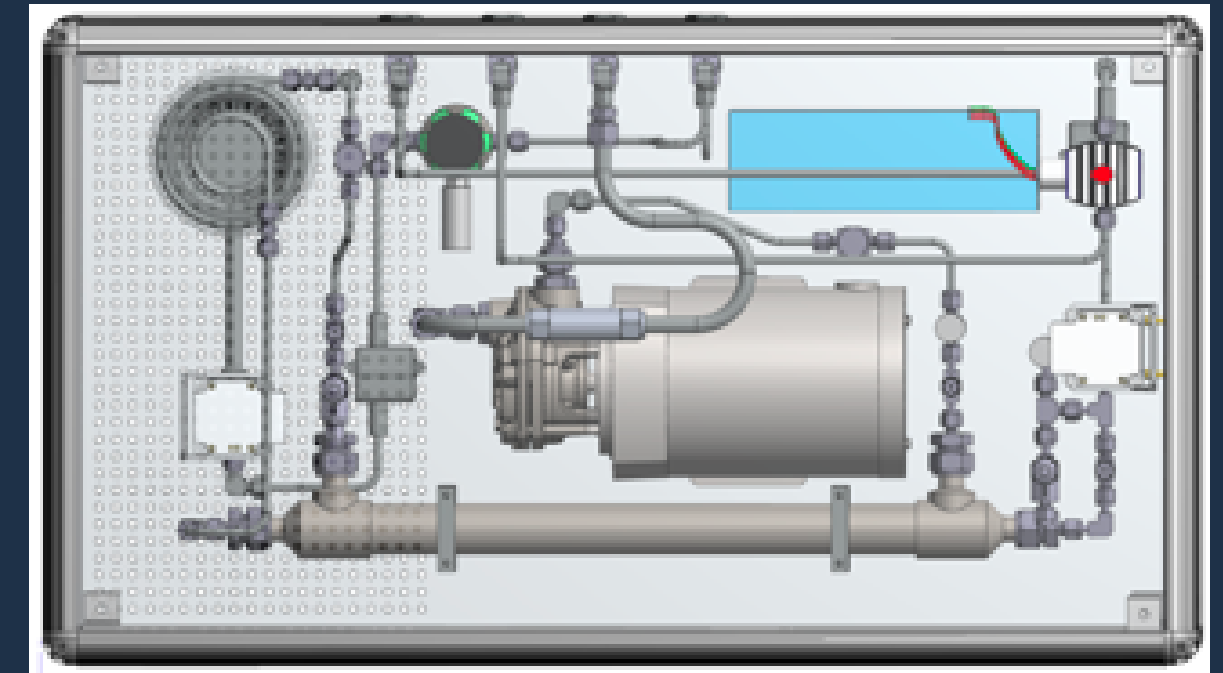
TDSS - BASE MODEL SPECIFICATIONS

Dimensions

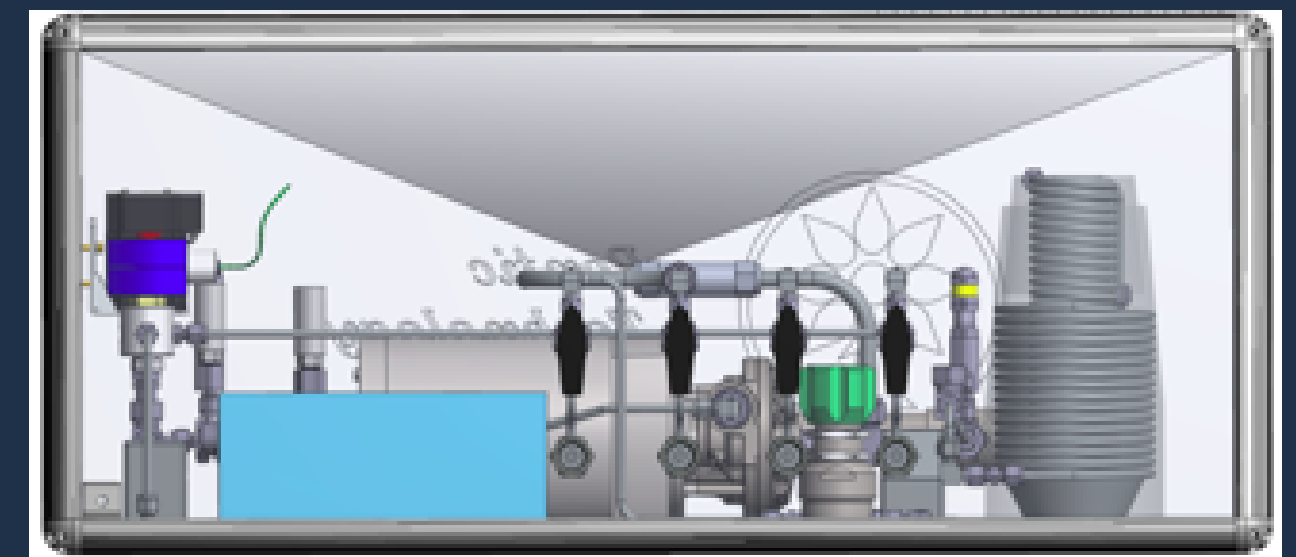
- 86cm x 45cm x 45cm
- Mass: 25kg
- Production: 2000 liters/day at a 6 log reduction SAL
- Energy Consumption:
 - Gas Model – 0.0017 Liters of fuel used per liter of water sterilized at a cost of ~\$0.0004/liter
 - Electric – 0.023 KWhr per liter of water sterilized at at cost of ~\$0.002/liter

Options include:

- Solar Panel & Rechargeable Batteries
- Solar Concentration (for areas with 80% sunlight)
- Remote System Control - Fixed, Vehicle or Airplane



TDSSe (electric)



TDSSg (fuel)

HOW IS TDSS DIFFERENT?

BETTER THAN CURRENT FORMS OF WATER CLEANUP

Significantly outperforms current water treatments including:

- Reverse Osmosis
- UV Lighting
- Ozone, chlorine & chloramine processes

as shown in sterility assurance level results achieved via bacterial spore inactivation.

- 6 log bacterial reduction or better

SIMPLE & EFFECTIVE METHODOLOGY

- Pressure, temperature & dwell time is the primary method for sterilization
- Rapid start up
- Thermal inactivation is the most optimal method of micro-destruction
- No added chemicals
- No filters
- No consumables
- Smaller footprint
- Operating performance by app or smart phones

MULTIPLE SOURCES OF POWER

- Models use natural gas/hydrocarbon fuel or electricity. Options include solar power and solar concentration heating methods
- Designs include using waste heat from existing sources (generators, engines etc.) to reduce operating costs

TDSS TECHNOLOGY TESTING

Our TDSSe, TDSSg systems performance have passed rigorous, multiple validation and assurance testing by independent laboratories. In all three cases, the findings and conclusions of the tests achieved all goals and validated technology objectives and performance.



Test #1 focused on eliminating Geobacillus Stearothermophilus spore suspensions, which are the most heat resistant organisms known.



Test #2 focused on eliminating E-Coli bacterial suspensions.

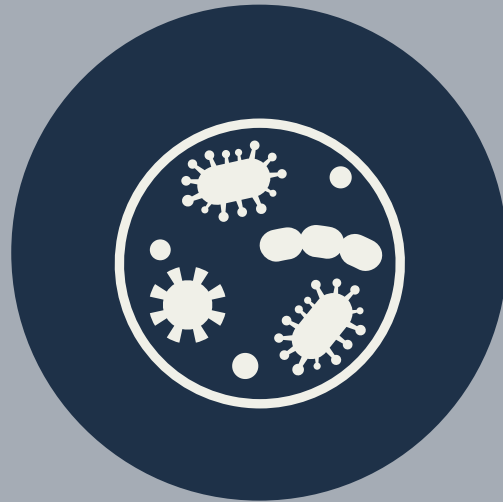


Test #3 focused on water bottling test. FDA issued comprehensive bottled water Standards of Identity- 21C.F.R. 165.110 (b)

TEST RESULTS

The water output of our thermal inactivation system was tested and validated by an independent 3rd party, VERRIX Technology, utilizing Geobacillus Stearothermophilus spore suspensions, which are the most heat resistant organisms.

TEST RESULTS



Test #1

Results showed "No other water purification and sterilization systems can claim the continuous flow capabilities that Pontic Technology's systems (electric, gas) achieve or the high level of sterilization assurance and validation of a 6 log bacterial reduction or better, which greatly exceeds established WHO, EPA and state standards."



Test #2

Results showed 1,553 MPN/100mL for total coliform, and 79 CFU/mL for the source water (input), and below detection limit results for all effluent (output) samples.



Test #3

Results showed that all treated water samples yielded non detected and less than detection limit for E-coli, total coliform and plate counts.

PARTNERSHIPS & INVESTMENT



- TECHNOLOGY ALLIANCE AGREEMENT (TLA)
- JOINT OPERATING AGREEMENT (JOA)
- TECHNOLOGY LICENSING AGREEMENT (TLA)
- STRATEGIC ALLIANCE AGREEMENT
- R&D INVESTMENT
- PARTNERSHIPS
- COLLABORATION

WHY PARTNER WITH PONTIC TECHNOLOGY?

Pontic Technology has created a water sterilization solution that:

- Destroys all the germs in water and fluids with no waste using thermal inactivation
- Is easy to install and maintain
- Can be implemented in a wide variety of situations both standard and emergency
- Is a versatile, scaleable and autonomous solution that can be installed in a wide array of places both developed and underdeveloped

DEVELOPING NEW TECHNOLOGIES

Our company creates new technologies to improve and solve scientific problems in our lives.

Pontic Technology offers several patented iterations of high temperature water purification and sterilization systems. Each system is able to produce safe, germ-free water no matter the level of microorganism/biological contaminants.

The company is developing several other new technologies at our Technology Development Center in Los Angeles. Among them is our patented organic chemical contaminate elimination system and a volatile organic compound (VOC) elimination system utilizing a new material never patented and exploited before. The company is developing a simple hand held chemical and bacterial elimination device.

Pontic Technology Team

DR. MICHAEL PAPADOPOULOS **FOUNDER & CEO**

The driving force behind Pontic Technology and the development of its first technology – an innovative, competitive cost, zero waste, patented thermal disinfection water sterilization system. He has self-funded all technology development and company operations to-date.

A practicing Dentist for more than 30 years, whose business acumen is highly respected, as is his knowledge and expertise in clinical training and advanced oral health care.

Education: DDS, University of Southern California (USC)
Herman Ostrow School of Dentistry.

DR. GERALD VOECKS
HEAD OF PR
CSO, CHIEF SCIENCE OFFICER

In charge of technology advancements and use of maximum science applications. Senior Scientist at NASA's Jet Propulsion Laboratory (JPL) and their lead for development of in situ sensors for NASA's life support systems and in advancing technologies of NASA's space program for In Situ Resource Utilization for future human missions. Past duties include development of heterogeneous catalysts, designed for hydrogen production/hydrocarbon combustion. His work has pioneered catalyst systems designs and reactor designs that have been incorporated into operations on aircraft, vehicles and stationary powerplants and been active in fuel cell systems development. Currently holds 20 patents, is co-author 20+publications, and is a Visiting Scientist at Caltech. Education: BSE, MA, PhD in chemistry, covering areas of inorganic synthesis, photo catalysis and reaction mechanisms. Postdoctoral work was in inorganic/organic surface chemistry.

JIM LEWIS
CTO, CHIEF TECHNOLOGY
OFFICER

In charge of overseeing the design, development and implementation of all company technology systems. Senior Test Engineer at NASA's Jet Propulsion Laboratory (JPL) and their lead for chemical propulsion and process automation. Lead integration engineer for Mars In-Situ Resource Utilization (Air & Water) Experiment (MOXIE). Past duties include Space Shuttle Systems Engineer and Test Director for Mechanical Truss systems on the International Space Station. Veteran: U.S. Special Forces officer (27 years active and reserves), including multiple Middle East combat tours as a Special Forces team, company and battalion commander. Recipient of 30+ military awards including Bronze Star and U.S. State Department Meritorious Honor award for work with Afghan District Governors in Afghanistan. Education: B.S. in Physics/Computer Applications, University of Alabama; Masters in Aerospace Engineering; Masters in Space Systems Engineering, both from Florida Institute of Technology.

**DR. JOHN SOLOMON
CONSULTANT AND SCIENTIST**

Dr. John Solomon is one of the consultants and scientists that advises on research and development of flow systems and water sterilization experiments. He is a tenured Associate Professor of Mechanical Engineering at Tuskegee University, Alabama. His research interest is experimental fluid mechanics and he holds two US patents for developing actuators for high-speed flow control.

**DR. ADRIAN PONCE
TSO, TEST AND STERILITY OFFICER**

In charge of ensuring the development and testing of company technology in meeting highest water sterilization assurance and validation standards. Senior Scientist at NASA's Jet Propulsion Laboratory (JPL) and chemistry faculty at Caltech. Research interest investigating microbial survival and growth have taken him to extreme environments, including the Atacama Desert, Chile, and the Kilimanjaro glaciers. A list of published articles is available online at <http://ponce.caltech.edu>. Education: Ph.D. Chemistry, Caltech for research on electron transfer in proteins and water.

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