

BIOFORCETECH: COMPANY OVERVIEW

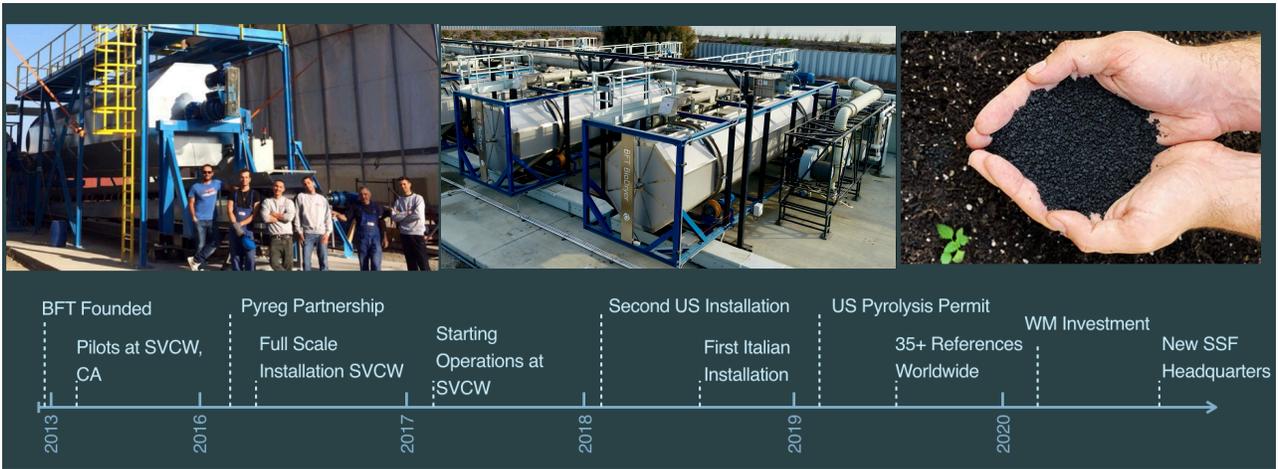
Bioforcetech (BFT) is a US C Corporation with its operational headquarters in the state of California. Founded in 2012, Bioforcetech has built upon the foundational knowledge base of the Presezzi Group, which has developed technologies for industrial sectors since 1954 and has hundreds of industrial installations all over the world.

With the support of the Presezzi Group, our team spent 7 years refining our technology. These efforts have culminated in equipment now installed and in use all around the globe. We are tirelessly dedicated to designing processes and machines that are automated, sustainable, environmentally friendly, and address the needs of our clients in every detail.



Bioforcetech is committed to protecting nature and human health by providing technologies that deliver a zero waste future, transforming organic waste into sustainable products.





IN 2020, WASTE MANAGEMENT JOINED OUR FAMILY OF INVESTORS

We are pleased to announce that WM Organic Growth, Inc., a corporate affiliate of **Waste Management, Inc.**, the leading provider of comprehensive waste management environmental services in North America, **has joined with Bioforcetech Corporation as a minority investor to help further advance our biosolids and organic waste processing technology.**

Since 2013, Bioforcetech has been committed to protecting nature and human health by providing technologies that deliver a zero waste future, transforming organic waste into sustainable products. This new investment will help our team deliver innovative solutions to more municipalities and help fulfill our goals on a bigger scale.

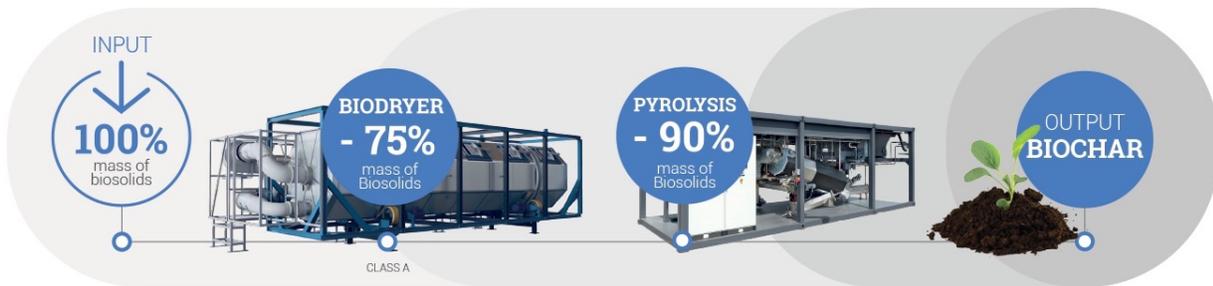
A special "Thank You" to the Waste Management team for their continued support and for believing in our vision!



THE UNIQUE BIOFORCETECH PROCESS

BIODRYER AND PYROLYSIS

As a system, the BioDryer, P-Series Pyrolysis, and PLEXUS make up the highest performing biomass treatment solution in the World. Individually, they can be used to both dry wet material and make Biochar from biomass.



The BioDryer: In order to gather value from organic waste with a high moisture content, it is necessary to remove the water contained inside the biomass first.

Traditional drying methods utilize a prohibitive amount of fossil fuels as a source of energy to achieve the necessary dryness. Our patented BioDryer leverages the living energy within a biomass to achieve the same results with a fraction of the energy requirement of traditional dryers.

Heat from thermophilic bacteria cultivated within the BioDryer allows our machine to dry biosolids from 80% moisture content to 25-10% moisture. The BFT BioDryer uses 50% less heat than any traditional drying machines like paddle or belt dryers, while achieving Class A compliance.



50% less energy



Nearly Maintenance Free



Fully Automated With IIOT 4.0

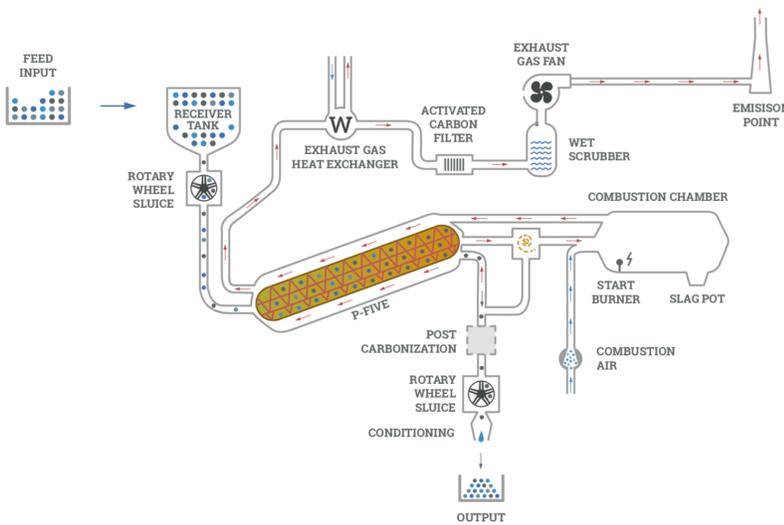


Produces Class A Biosolids



THE P-SERIES PYROLYSIS SYSTEM

The goal of our pyrolysis machine is to transform biosolids (or any other organic waste streams) into Biochar and renewable energy. Our proprietary system is the result of more than ten years of engineering and studies in order to achieve the highest efficiency and byproduct quality. **The self-sustained and automated process ensures a high quality Biochar output without the need for fossil fuels.** The schematic below shows how our system achieves positive energy production without the use of any external fuel sources.



1: The organic feedstock enters the oxygen-free reactor chamber.

2: The material is transported through the heated reactor in 20 minutes. During this phase, the material produces syngas and Biochar.

3: The produced syngas is forced to the flameless combustion chamber where is completely oxidized.

4: The energy produced by the oxidizer is now covered around the pyrolysis reactor chamber with the exhaust gas that is generated. This process ensures that the reactor stays at the desired temperature, without the use of any external energy source (The process is self sustained!).

5: The additional energy generated is collected through a heat exchanger to heat up water. The hot water is then beneficially used to provide additional drying capabilities or for other processes.

THE BFT PYROLYSIS UNIQUE AND PROPRIETARY ADVANTAGES



Self-Sustained
No external energy is used to perform pyrolysis



Flameless Oxidizer
No flame is formed in the oxidizer = clean emissions!



Permitted in the Bay Area
The first and ONLY full scale biosolids pyrolysis process and non-incineration process permitted in USA



HQ Biochar Production
Production of PFAS free, Hydrocarbon free, CDFA certified Biochar



THE OUTPUT: HIGH QUALITY BIOCHAR

Biochar is a valuable byproduct of pyrolysis and can be used in many different ways. Biochar is mostly know as a great soil amendment, but it can be used also as absorber in functional clothing, insulation in the building industry, as carbon electrodes in super-capacitors for energy storage, food packaging, wastewater treatment, air cleaning, silage agent or feed supplement, for drinking water filtration, sanitation of human and kitchen wastes, and as a composting agent. The Bioforcetech system has been designed with one goal in mind: make high quality biochar.

In order to achieve a valuable and marketable product, the P-Series pyrolysis machines do:

- Process biosolids at constant temperature;
- Process biosolids at a consistent residence time;
- Ensure no condensation of TARs and bio-oil, thanks to the patented flameless vacuum oxidizer design;
- Ensure an oxygen-free pyrolysis environment
- Process biosolids with a proprietary high temperature conveying system that can withstand temperatures as high as 1,900°C without deforming.



CDFA Approved

Our Biochar has been approved by CDFA as a soil amendment



Value Back Program

BFT handles the Biochar sales and give back a share of the profit to the city



Research and Development

BFT is committed on maximizing the value of Biochar thru intense R&D programs

A CIRCULAR-ECONOMY STORY:

REDWOOD CITY UTILIZES THE BIOFORCETECH BIOCHAR TO PROMOTE TREES GROWTH



In 2018 Bioforcetech started the production of high-quality Biochar at the Silicon Valley Clean Water plant. Since then, many farmers have used the product for regenerative agriculture practices and to improve soil fertility. In 2020, thanks to the collaboration with the City of Redwood City, the BFT Biochar is now utilized by the Parks and Recreation department as a media to promote faster trees growth in the new “Magical Bridge Playground.” Redwood City is now the first city in the World that utilizes the up-cycled sludge into parks and flower beds. Nothing is wasted, everything is sustainably recycled.

THE BFT BIOCHAR IS THE FIRST AND ONLY BIOSOLIDS BIOCHAR SOLD IN THE USA!



PFAS REMOVAL AND DESTRUCTION

Per- and polyfluoroalkyl substances (PFAS's) are in our water and our biosolids (treated domestic Sewage Sludge), and they are a big problem if left untreated. Because these compounds are toxic in very low concentrations, in 2016 the EPA issued a Health Advisory Level (HAL) of 70 parts per trillion (ppt) for PFOA and PFOS for drinking water. Risk assessments are currently being conducted to define remediation levels and effluent limits further.



On September 12th, 2019 Bioforcetech Corporation provided anaerobically digested biosolids (at 91% solid content) to Vista Analytical Laboratory in El Dorado Hills, CA for analysis. The input biosolids were processed through BFT's P-FIVE pyrolysis reactor utilizing a patented flameless technology that results in the transformation of the treated sewage sludge into Biochar. Bioforcetech has conducted an internal study to evaluate the fate of 38 PFAS and PFOAS compounds using this method. The results are published in an article for the first time showing **the P-FIVE Reactor as an effective method for removing PFAS and PFOA from municipal biosolids at an industrial scale (Results Attached in Appendix A).**

After internal tests, Bioforcetech conducted similar **tests in collaboration with the EPA.** The samples were sent to two different laboratories and results were confirmed: No PFAS are found in our biochar.

The tests with the EPA were conducted at the end of August 2020. The EPA conducted these tests only with Bioforcetech **because the facility in Redwood City is the only operational pyrolysis of sewage sludge in the USA at full-scale.**

EPA test Program Manager:

Eben Thoma, Ph.D.
Physical Scientist
U.S. Environmental Protection Agency
Phone: 919 491-8684





Biosolids Derived Biochar - PFAS,PFOA

Analysis of 38 PFAS and PFOA compounds, before and after Pyrolysis

Intro

Biochar is defined as “a form of charcoal that is produced by exposing organic waste matter (such as wood chips, crop residue, manure or biosolids) to heat in a low-oxygen environment...”.

Thanks to its revolutionizing P-FIVE pyrolysis machine, Bioforcetech is the first company in the USA that is generating high-quality biochar from biosolids at an industrial scale. The tables below show the amount of PFAS and PFOA present into Bioslids before and after Pyrolysis.

Analysis Results

Operating data:

Input Material: Anaerobically digested Biosolids at 91% solid content

Location: Silicon Valley Clean Water, Redwood City, California

Pyrolysis Conditions: Temperature 600°C +/- 20°C (1,112°F +/- 68°F), Residence time ~20 Minutes

Lab Info: Vista Analytical Laboratory, 1104 Windfield Way , El Dorado Hills, CA

	Dry Biosolids (ng/g)	Biochar (ng/g)
PFBA	7.03	ND
3:3 FTCA	ND	ND
PFPeA	5.94	ND
PFBS	2.3	ND
4:2 FTS	ND	ND
PFHxA	33.7	ND
PFPeS	ND	ND
HFPO-DA	ND	ND
5:3 FTCA	64.5	ND
PFHpA	7.45	ND
ADONA	ND	ND



APPENDIX A



PFHxS	ND	ND
6:2 FTS	ND	ND
PFOA	89.1	ND
PFHpS	ND	ND
7:3 FTCA	40	ND
PFNA	5.3	ND
PFOSA	ND	ND
PFOS	26.3	ND
9CI-PF3ONS	ND	ND
PFDA	11.3	ND
8:2 FTS	5.68	ND
PFNS	ND	ND
MeFOSAA	23.5	ND
EtFOSAA	19.6	ND
PFUnA	3.39	ND
PFDS	ND	ND
11CI-PF3OUdS	ND	ND
10:2 FTS	ND	ND
PFDoA	5.85	ND
MeFOSA	ND	ND
PFTTrDA	ND	ND
PFTeDA	2.44	ND
EtFOSA	ND	ND
PFHxDA	ND	ND
PFODA	ND	ND
MeFOSE	17.1	ND
EtFOSE	ND	ND



EPA + BFT: TESTS RESULTS

Tests date: AUGUST 2020

1) PFAS LEVELS IN BIOSOLIDS (Feedstock) and BIOCHAR (Output):

Test date: 08/25/2020 -> 08/29/2020

Input Material: Anaerobically digested Biosolids at 85% solid content

Location : Silicon Valley Clean Water, Redwood City, California

Pyrolysis Conditions: Temperature 600°C +/- 20°C (1,112°F +/- 68°F), Residence time ~20 Minutes

BIOSOLIDS, Vista Analytical Laboratory:

Analyte	CAS Number	Conc. (ng/g)	RL
PFBA	375-22-4	9.66	0.485
PFPtS	423-41-6	ND	1.46
3:3 FTCA	356-02-5	ND	3.88
PFPeA	2706-90-3	8.03	0.485
PFBS	375-73-5	3.24	0.485
4:2 FTS	757124-72-4	ND	0.485
PFHxA	307-24-4	44.3	0.485
PFPeS	2706-91-4	ND	0.970
HFPO-DA	13252-13-6	ND	1.46
5:3 FTCA	914637-49-3	53.1	3.88
PFHpA	375-85-9	9.95	0.485
ADONA	919005-14-4	ND	0.485
PFHxS	355-46-4	ND	0.485
6:2 FTS	27619-97-2	1.72	0.970
PFOA	335-67-1	98.2	0.485
PFecHS	646-83-3	ND	0.970
PFHpS	375-92-8	ND	0.970
7:3 FTCA	812-70-4	12.6	3.88
PFNA	375-95-1	5.62	0.485
PFOSA	754-91-6	ND	1.46
PFOS	1763-23-1	27.9	0.485
9Cl-PF3ONS	756426-58-1	ND	0.485
PFDA	335-76-2	13.1	0.485
8:2 FTS	39108-34-4	4.12	0.970
PFNS	68259-12-1	ND	1.46
MeFOSAA	2355-31-9	26.6	0.970
EtFOSAA	2991-50-6	19.2	0.970
PFUnA	2058-94-8	3.87	0.485
PFDS	335-77-3	ND	0.970
11Cl-PF3OUdS	763051-92-9	ND	0.970
10:2 FTS	120226-60-0	3.92	1.46
PFDoA	307-55-1	6.73	0.485
MeFOSA	31506-32-8	ND	9.70
PFTtDA	72629-94-8	ND	0.485
PFDoS	79780-39-5	ND	0.970
PFTeDA	376-06-7	2.10	0.485
EtFOSA	4151-50-2	ND	9.70
PFHxDA	67905-19-5	ND	0.485



PFODA	16517-11-6	ND	0.970
MeFOSE	24448-09-7	16.5	9.70
EtFOSE	1691-99-2	ND	9.70

BIOCHAR, Vista Analytical Laboratory:

Analyte	CAS Number	Conc. (ng/g)	RL
PFBA	375-22-4	ND	0.495
PFPrS	423-41-6	ND	1.49
3:3 FTCA	356-02-5	ND	3.96
PFPeA	2706-90-3	ND	0.495
PFBS	375-73-5	ND	0.495
4:2 FTS	757124-72-4	ND	0.495
PFHxA	307-24-4	ND	0.495
PFPeS	2706-91-4	ND	0.990
HFPO-DA	13252-13-6	ND	1.49
5:3 FTCA	914637-49-3	ND	3.96
PFHpA	375-85-9	ND	0.495
ADONA	919005-14-4	ND	0.495
PFHxS	355-46-4	ND	0.495
6:2 FTS	27619-97-2	ND	0.990
PFOA	335-67-1	ND	0.495
PFecHS	646-83-3	ND	0.990
PFHpS	375-92-8	ND	0.990
7:3 FTCA	812-70-4	ND	3.96
PFNA	375-95-1	ND	0.495
PFOSA	754-91-6	ND	1.49
PFOS	1763-23-1	ND	0.495
9Cl-PF3ONS	756426-58-1	ND	0.495
PFDA	335-76-2	ND	0.495
8:2 FTS	39108-34-4	ND	0.990
PFNS	68259-12-1	ND	1.49
MeFOSAA	2355-31-9	ND	0.990
EtFOSAA	2991-50-6	ND	0.990
PFUnA	2058-94-8	ND	0.495
PFDS	335-77-3	ND	0.990
11Cl-PF3OUdS	763051-92-9	ND	0.990
10:2 FTS	120226-60-0	ND	1.49
PFDoA	307-55-1	ND	0.495
MeFOSA	31506-32-8	ND	9.90
PFTTrDA	72629-94-8	ND	0.495
PFDoS	79780-39-5	ND	0.990
PFTeDA	376-06-7	ND	0.495
EtFOSA	4151-50-2	ND	9.90
PFHxDA	67905-19-5	ND	0.495
PFODA	16517-11-6	ND	0.990
MeFOSE	24448-09-7	ND	9.90
EtFOSE	1691-99-2	ND	9.90



BIOSOLIDS, Eurofins - Test America*:

*Please note that Eurofins - Test America does not show values if considered ND (Non Detected). For a full list of compounds analyzed during this test, please refer to the Vista Analytical Laboratory table.

Analyte	Result	Qualifier	RL	MDL	Unit
NMeFOSA	0.77	J	2.1	0.44	ug/Kg
NMeFOSE	17		2.1	0.76	ug/Kg
NEtFOSE	5.0		2.1	0.38	ug/Kg
Perfluorobutanoic acid (PFBA)	4.6	B	2.1	0.30	ug/Kg
Perfluoropentanoic acid (PFPeA)	5.5		2.1	0.82	ug/Kg
Perfluorohexanoic acid (PFHxA)	30		2.1	0.45	ug/Kg
Perfluoroheptanoic acid (PFHpA)	7.2		2.1	0.31	ug/Kg
Perfluorooctanoic acid (PFOA)	75		2.1	0.92	ug/Kg
Perfluorononanoic acid (PFNA)	4.6		2.1	0.38	ug/Kg
Perfluorodecanoic acid (PFDA)	12		2.1	0.23	ug/Kg
Perfluoroundecanoic acid (PFUnA)	4.4		2.1	0.38	ug/Kg
Perfluorododecanoic acid (PFDoA)	7.6		2.1	0.71	ug/Kg
Perfluorotridecanoic acid (PFTriA)	0.95	J	2.1	0.54	ug/Kg
Perfluorotetradecanoic acid (PFTeA)	2.1		2.1	0.58	ug/Kg
Perfluorooctanesulfonic acid (PFOS)	21	B	5.3	2.1	ug/Kg
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	24		21	3.9	ug/Kg
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	30		21	4.2	ug/Kg
6:2 FTS	1.6	J	21	1.6	ug/Kg
8:2 FTS	5.1	J	21	2.7	ug/Kg
10:2 FTS	1.1	J	2.1	0.53	ug/Kg
Perfluorododecanoic acid (PFDoA) - RE	7.6	J	10	3.4	ug/Kg

BIOCHAR, Eurofins - Test America:

Analyte	Result	Qualifier	RL	MDL	Unit
Perfluorobutanoic acid (PFBA)	0.15	J B	0.18	0.025	ug/Kg



2) PFAS LEVELS IN THE CITY TAP WATER (Inlet) and PYROLYSIS SCRUBBER WATER (Outlet):
CITY WATER, Eurofins - Test America:

Analyte	Result	Qualifier	RL	MDL	Unit
Perfluorobutanoic acid (PFBA)	0.62	J	1.7	0.29	ng/L
Perfluoroheptanoic acid (PFHpA)	0.22	J	1.7	0.21	ng/L
Perfluorooctanoic acid (PFOA)	1.0	J	1.7	0.71	ng/L
Perfluorohexanesulfonic acid (PFHxS)	0.33	J B	1.7	0.14	ng/L
Perfluorooctanesulfonamide (FOSA)	4.2	B	1.7	0.29	ng/L

SCRUBBER WATER, Eurofins - Test America:

Analyte	Result	Qualifier	RL	MDL	Unit
Perfluorobutanoic acid (PFBA)	0.71	J	1.9	0.34	ng/L
Perfluoroheptanoic acid (PFHpA)	0.26	J	1.9	0.24	ng/L
Perfluorohexanesulfonic acid (PFHxS)	0.36	J B	1.9	0.16	ng/L
Perfluorooctanesulfonamide (FOSA)	4.6	B	1.9	0.34	ng/L

