

DO₂E

WASTEWATER TREATMENT LLC

Grease Oil Aeration Tank
The G.O.A.T.



“ SOLVING THE WORLD’S WATER
PROBLEMS WITH INNOVATIVE
GREEN TECHNOLOGIES ”

Treating Greywater In Industrial & Commercial Applications.

VISIT US ON THE WEB AT WWW.DO2E.COM



DO₂E Waste Water Treatment LLC has designed and patented some of the most technologically advanced wastewater treatment equipment on the market today. DO₂E is proud to offer products that are environmentally friendly, air driven, and most importantly have no moving parts. This is a new paradigm in wastewater treatment equipment for both municipal and industrial applications. DO₂E continues to be on the cutting edge in the design, development, and production of environmentally friendly and energy efficient technology. Our approach to **Green Technology** continues to set new industry standards when it comes to "Solving the World's Wastewater Problems."



Green Technology refers to technology whose use is intended to mitigate or reverse the effects of human activity on the environment.

DO₂E: The Solution To Pollution!

APPLICATIONS
of
DO₂E'S G.O.A.T.



**No More
Grease Trap
Overflow**

**Prevents Odor
& Clogging of
Grease Traps**



**Eliminates the
Need for
Costly Pumping**

THE DO₂E G.O.A.T. EXPLAINED

Prepared By:

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**Analytic Chemist, Microbiologist,
Physicist, & Environmental Engineer**

Over 51 Years' Experience

Retired US Special Forces

Essentially, the DO₂E "G.O.A.T." is a small, dedicated digester that has been designed to process kitchen wastewater (dish washing discharge) in *situ*, and, as such, to allow the users to avail themselves of a Heavy-Duty, Light-Volume means for removal of fats, oils, and greases in a manner that will "prevent" them from being re-deposited and reforming in the effluent waste lines.

The term GOAT is an acronym for GREASE AND OIL AERATION TANK. This particular Digester allows one to use a smaller, portable unit that is only 21" long, 18" wide, and 18" high with a tank capacity of 13.75 U.S. gallons, a flow rate of 17 gallons/minute, operating on either a 115V or 230 V A.C. power input. The included Digester uses a 0.33 HP blower to operate the "collision" Venturi of the unit.

This unit results in the formation, that is, the reduction of fats, oils, and greases into much smaller particulates and emulsoids that are quickly acted upon by either the inherent microorganisms in the waste system, or by generated advanced oxygen processing (AOP) [ozone (O₃) + free-radical -OH ions], or by both. Such "treated" microparticulates are quickly oxidized into particles that do not reform in the effluent to clog any downstream sites or equipment.

In emergency situations it could even be employed to disinfect and sterilize drinking water, i.e., potable water feeds for farm animals and pets.

The essence of this technology is using a "collision" to change the properties of various microparticulate species so that their surface areas and thereby their chemical reaction rates are markedly increased. Then by using dissolved oxygen and its more highly energetic offshoots (AOP and Ozone), these particulates are then degraded (oxidized) where they normally would not be.

As an analogy, consider the metal aluminum. One may take a match and frustrate themselves trying to light an aluminum bar; but, using a file or abrasive, remove the aluminum into fine particles and then try to light the deposit. Surprise! Flash powder. This is a readily available method of illustrating this principle, and the result is dramatic.

The picture below depicts the collision effect of larger particles against the patent digester cutter head. This patent cutter head immediately reduces the larger F.O.G. particles into smaller micro particulates, accelerating the oxidation process. The AOP / Advanced Oxidation Processing used in this digestion process, reacts over 3,000 times faster than chlorine and produces NO harmful off gassing or residue. The result is a bio-soluble food source which can easily and quickly be consumed by the microorganisms present in the system.

Anyone who desires more detailed information regarding the physics and chemistry associated with this Advanced F.O.G. treatment technology can contact me directly by email or phone.

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DO2E Little John Dlgester
Advanced F.O.G. & Odor Control
Patent

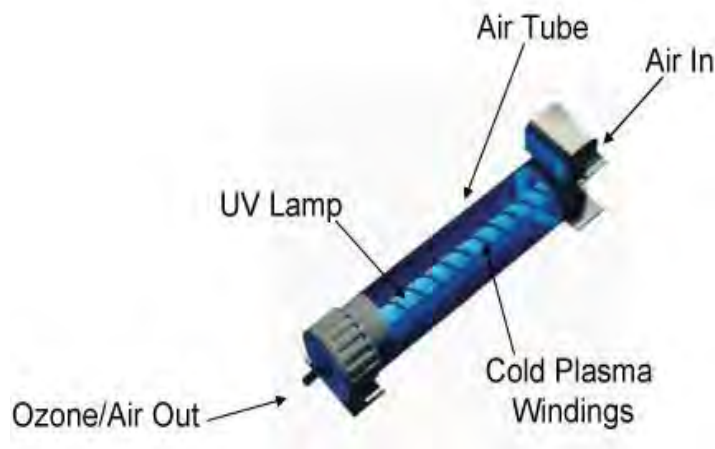
Advanced Oxidation Processing Technical Information

A.O.P. is the conversion of ozone, by ultraviolet radiation on the UVC wavelength, in the presence of water, to form high-energy hydroxyl radicals. Hydroxyls function in a manner similar to Hydrogen Peroxide, which is increasingly used as an additional oxidation shock.

Ozone is the most powerful oxidant and disinfectant readily available. Ozone is a form of oxygen that contains three atoms (O_3) rather than the normal two (O_2). Ozone acts as an oxidizer and disinfectant (sanitizer). Our equipment is designed primarily to provide oxidation and disinfection of the water, this water is known as **aqueous ozone** or ozone-enriched water. Ozone kills bacteria by rupturing the cell wall (similar to popping a balloon) and by destroying the virus' protective layer. Unlike most chemical disinfectants, microorganisms cannot develop a resistance to Ozone.

A.O.P. is an ideal solution for wastewater problems that must deal with high contaminant concerns, particularly in the areas where state or municipal laws require quick and effective treatment of these major issues.

A.O.P. Processing Tube



Ozone is Approved
For Use By:



PROS:

- **Rapid reaction rates**

The OH molecule has some of the fastest reaction rates of all of the oxidants used to treat water and wastewater due to its high oxidation potentials and their non-selective nature. These quick reactions result in much lower retention times than other conventional treatment processes.

- **Small footprint**

Because of the oxidation power of the $\cdot\text{OH}$ radical, advanced oxidation process units do not require much land area to process the needed flow rate for the system.

- **Theoretically, do not introduce new hazardous substances into water**

One of the issues with chlorine disinfection is the highly toxic byproducts (DPB's) that can result after treatment. To prevent these byproducts, an extra de-chlorination step is often required before anything else can be accomplished with the treated water. The $\cdot\text{OH}$ molecule can combine to create water. The biggest issues would be with bromate

formation and excess peroxide, but these can be dealt with in a well-designed advanced oxidation process system.

- **Mineralization of organics**

AOP can convert the organic materials within the water into stable inorganic compounds like water, carbon dioxide, and salts.

- **Can treat nearly all organic materials and can remove some heavy metals**

The highly reactive nature of $\cdot\text{OH}$ means these molecules will attack almost any organic materials without discriminating, and therefore, can remove many different contaminants in one reactor vessel, including reducing a few heavy metals.

- **Can work for disinfection & Sterilization**

Especially when used with UV disinfection, the oxidation power of AOP systems make them capable of acting as a disinfection step for any pathogens that may be present in the water.

- **No sludge production as with chemical or biological processes**

An advanced oxidation process does not treat water and wastewater by transferring pollutants into another phase. Other treatment processes create solids like sludge that need to be filtered out and dealt with separately.

- **Does not concentrate waste for further treatment**

Treatment solutions such as membranes result in increased concentrations of the waste contaminants, since they merely separate clean water from the pollutant compounds. AOP meanwhile directly reacts with the pollutants and reduces them to harmless compounds. This process, therefore, decreases their concentrations in the effluent.

CONS:

· Complex chemistry tailored to specific contaminants

Advanced oxidation processes have several different variants. These variants need to be carefully selected to efficiently treat the water/wastewater in question. This process is also a dosage dependent process, so the appropriate amounts of $\cdot\text{OH}$ molecules are formed to achieve the desired level of treatment. Such complex chemistry, will likely need highly skilled engineers to design the system correctly.

· Removal of residual peroxide may need to be considered

Advanced oxidation process systems utilizing hydrogen peroxide should be carefully controlled for residual H_2O_2 as it can have potential negative effects on later treatment steps. This residual hydrogen peroxide may be harmful to humans. However, careful design of the system can prevent excess residual H_2O_2 and any associated consequences.

Recommended Technology:

While there are many AOP systems on the market today, one stands out above all others for several reasons:

The DO2E Advanced Oxidation Processing Technology.

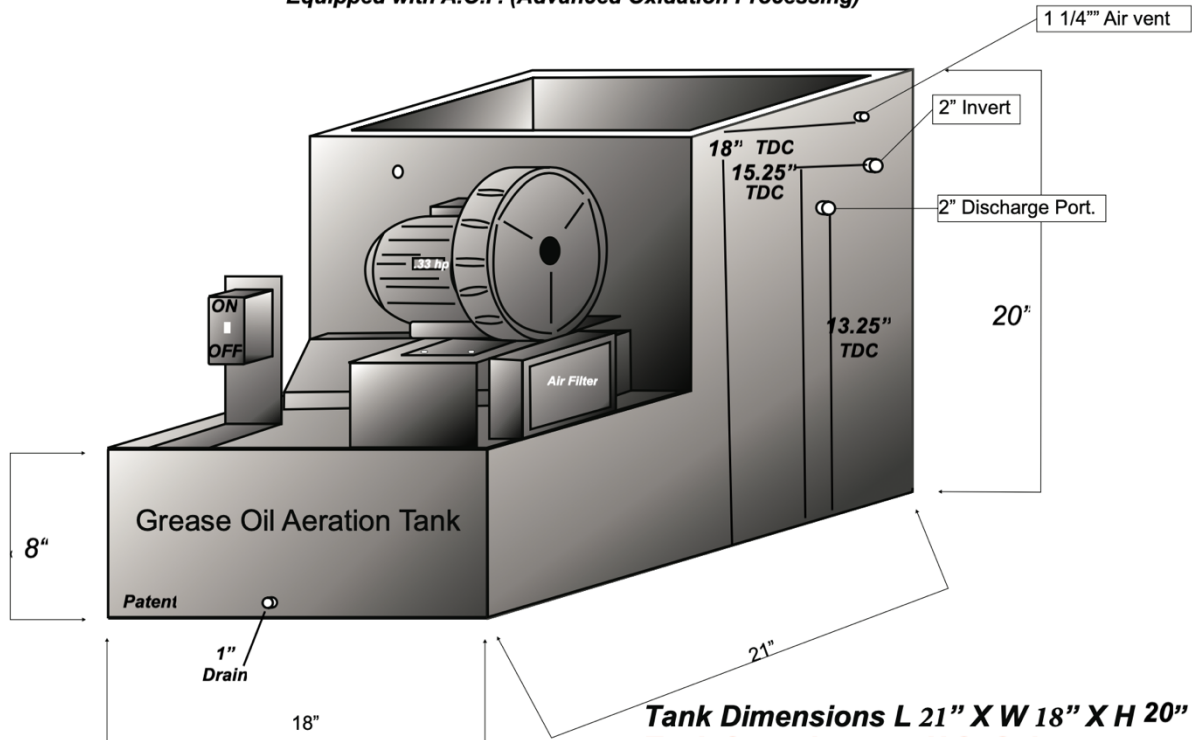
DO2E

Grease & Oil Aeration Tank

“G.O.A.T.”

**Converts F.O.G. to Non-Reforming
Micro Particulates
Commercial Use**

Equipped with A.O.P. (Advanced Oxidation Processing)



Tank Dimensions L 21" X W 18" X H 20"

Tank Capacity: 13.75 US Gallons

Flow Rate: 17.80 GPM

Power Supply: 115 / 230 Volt

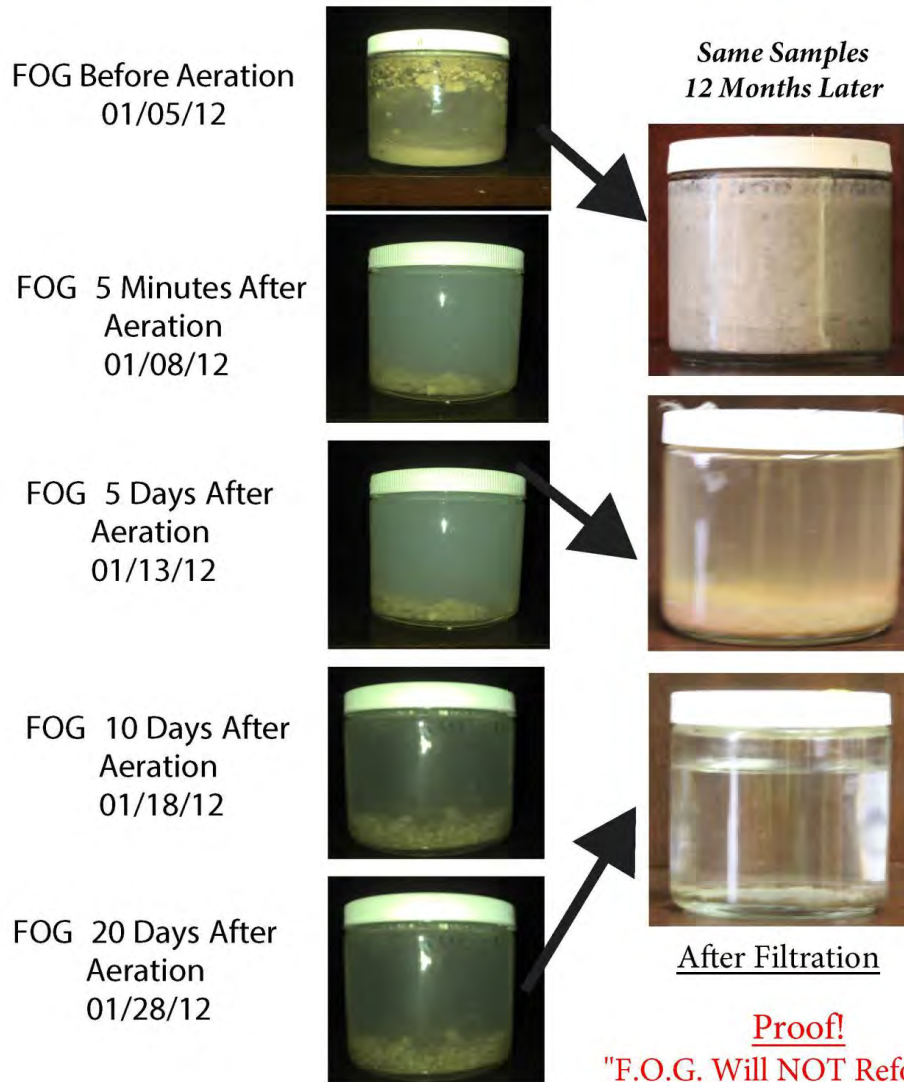
Air Supply: .33 Hp Blower

Macerator: DO2E Patent Digester

Advanced Oxidizer: A.O.P. Lamp

Patent

DO2E F.O.G. TEST with AERATION
F.O.G. (Fats, Oil, & Grease)
With Advanced Oxidation Processing



Proof!
"F.O.G. Will NOT Reform!!!"
(Confirmed by: Registered
Independent Laboratory testing.)

G.O.A.T.

Grease & Oil Aeration Tank

Removes Fats, Oil & Grease on Contact with A.O.P.
(Advanced Oxidation Processing)



- Removes Fats, Oils & Grease (F.O.G.s) In Greywater On Contact
- Reduces Costly Pumping of Grease Traps & Lift Stations
- No Moving Parts
- No Chemicals
- Fits Under Sink / Small & Compact
- Quick & Easy Installation / No Retrofit Required
- Environmentally Safe
- Disinfects & Sanitizes
- No Messy Tanks To Drain
- Kills E-Coli Bacteria & Hepatitis Viruses
- Eliminates Odor

100% Green Technology