SludgeHammer®

nature called. we answered.

Empowering Nature in Wastewater Treatment Systems

Presented at 2025 Mega-Conference, October 19-22. 2025

Any opinions or information provided in this presentation is the responsibility of SludgeHammer Group Ltd. and does not reflect the opinions of NOWRA

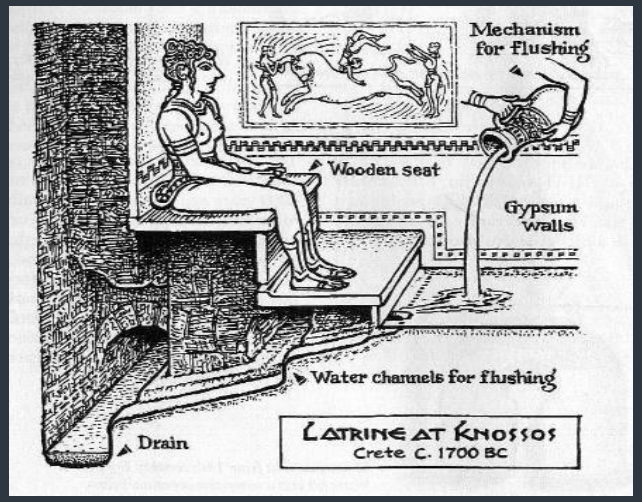
Bacterial Bioremediation

Dr. Wickham Develops the SludgeHammer Blend Bacteria and displays successful soil remediations at the Marine Corps Base Camp Pendleton, Oakland Naval Supply Depot, Chevron Oil and PEMEX.

Active Fermentation in Manure Lagoon

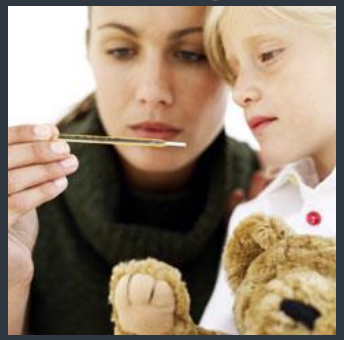
Sources of Wastewater Bacteria

ANAEROBIC SEPTIC TANKS



Low Appetite for Food

Narrow Temperature Range



Mucus

Sources of Wastewater Bacteria

SOIL BACTERIA

Huge appetite for organic carbon

Survive in anaerobic conditions

Ferment sugars such as muco-polysaccharides

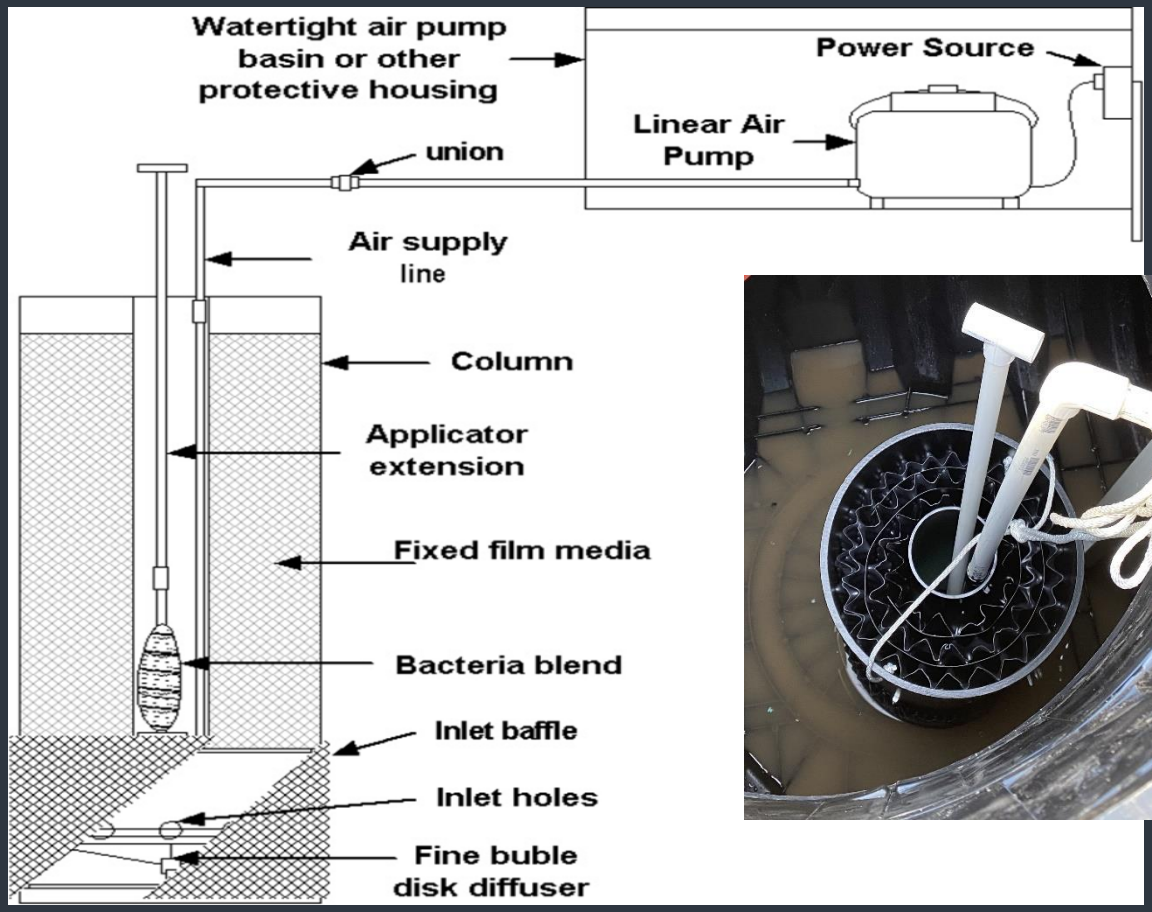
Denitrify nitrate and nitrite for oxygen

Operate at low temperatures

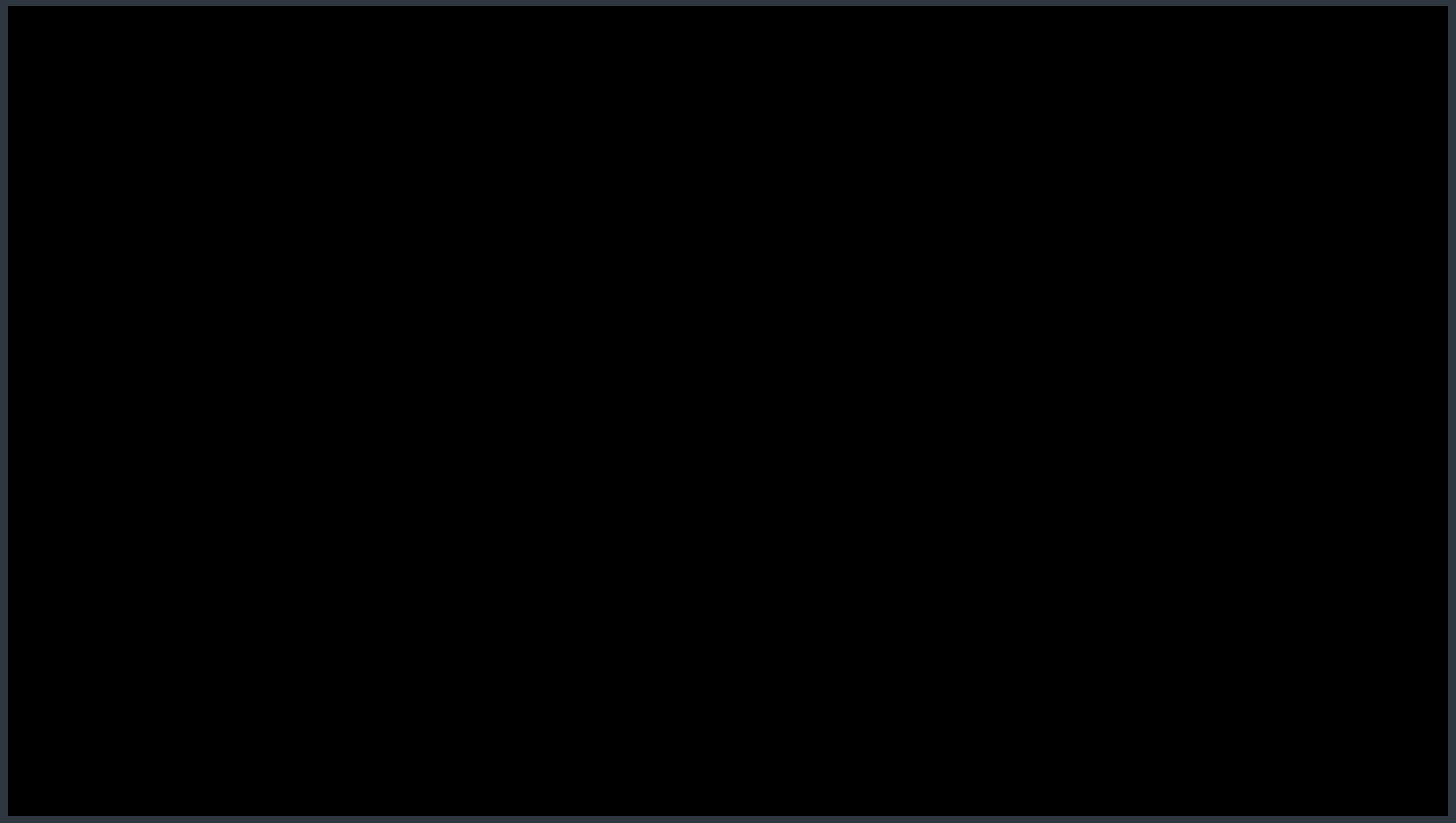
Form spores with low biomass

Very short generation times

The ABG is an aeration device that provides a specific refuge where facultative soil bacteria can be grown inside the tank.

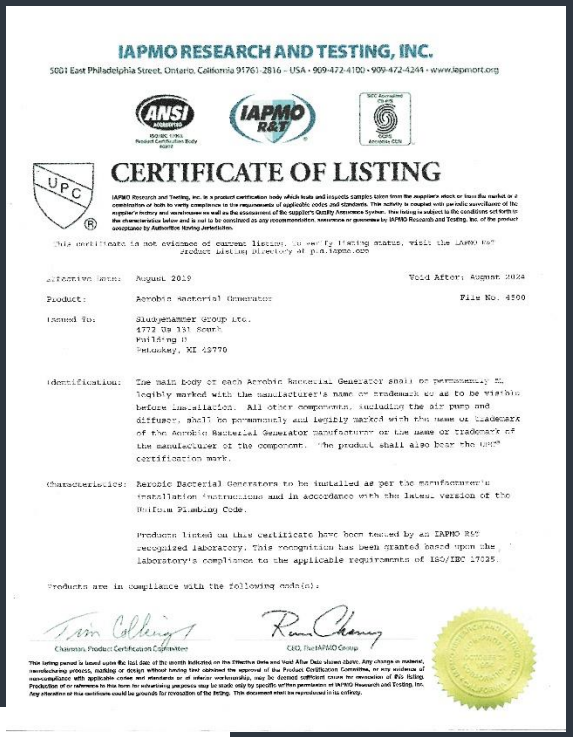


How the SludgeHammer System Works



IAPMO STANDARD
IGC 180-2003

Test facility at WWTP



IAPMO RESEARCH AND TESTING, INC.

5001 East Philadelphia Street, Ontario, California 91761-2816 - USA - 909-472-4100 - 909-472-4244 - www.iapmort.org

CERTIFICATE OF LISTING

IAPMO Research and Testing, Inc. is a product certification body which tests and inspects samples taken from the supplier's stock or from the market or a combination of both to verify compliance to the requirements of applicable codes and standards. This activity is coupled with periodic surveillance of the supplier's factory and warehouses as well as the assessment of the supplier's Quality Assurance System. The listing is subject to the conditions set forth in the characteristics below and is not to be construed as any recommendation, assurance or guarantee by IAPMO Research and Testing, Inc. of the product acceptance by Authorities Having Jurisdiction.

This certificate is not evidence of current listing. To verify listing status, visit the IAPMO R&T product listing directory at pcs.iapmo.org

Effective Date: August 2019 Void After: August 2024

Product: Aerobic Bacterial Generator File No. 4500

Issued To: SludgeHammer Group Ltd.
4772 Da 731 Scarb
Building D
Petawawa, KY 49770

Identification: The main body of each Aerobic Bacterial Generator shall be permanently and legibly marked with the manufacturer's name or trademark so as to be visible before installation. All other components, including the air pump and diffuser, shall be permanently and legibly marked with the name or trademark of the Aerobic Bacterial Generator manufacturer or the name or trademark of the manufacturer of the component. The product shall also bear the UPC® certification mark.

Characteristics: Aerobic Bacterial Generators to be installed as per the manufacturer's installation instructions and in accordance with the latest version of the Uniform Plumbing Code.

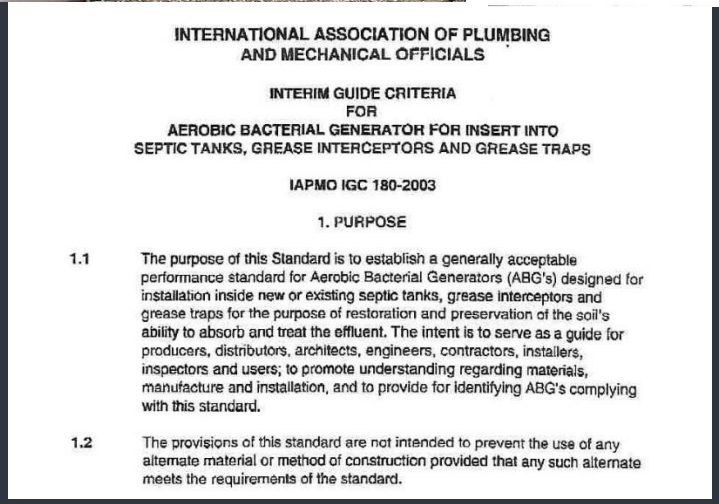
Products listed on this certificate have been tested by an IAPMO R&T recognized laboratory. This recognition has been granted based upon the laboratory's compliance to the applicable requirements of ISO/IEC 17025.

Products are in compliance with the following code(s):

Chairman, Product Certification Committee CEO, The IAPMO Group

This listing issued is based upon the last date of the month indicated on the Effective Date and Void After Date shown above. Any change in material, manufacturing process, marking or design without having first obtained the approval of the Product Certification Committee, or any evidence of non-compliance with applicable codes and standards or of inferior workmanship, may be deemed sufficient cause for revocation of this listing. Production of or reference to this form for advertising purposes may be made only by specific written permission of IAPMO Research and Testing Inc. Any alteration of this certificate could be grounds for revocation of the listing. This document shall be reproduced in its entirety.

SludgeHammer ABG systems passed rigorous testing by IAPMO to become certified and listed under the Uniform Plumbing Code.



INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

INTERIM GUIDE CRITERIA
FOR
AEROBIC BACTERIAL GENERATOR FOR INSERT INTO SEPTIC TANKS, GREASE INTERCEPTORS AND GREASE TRAPS

IAPMO IGC 180-2003

1. PURPOSE

1.1 The purpose of this Standard is to establish a generally acceptable performance standard for Aerobic Bacterial Generators (ABG's) designed for installation inside new or existing septic tanks, grease interceptors and grease traps for the purpose of restoration and preservation of the soil's ability to absorb and treat the effluent. The intent is to serve as a guide for producers, distributors, architects, engineers, contractors, installers, inspectors and users; to promote understanding regarding materials, manufacture and installation, and to provide for identifying ABG's complying with this standard.

1.2 The provisions of this standard are not intended to prevent the use of any alternate material or method of construction provided that any such alternate meets the requirements of the standard.

ABG Actively mixing contents of septic tank.

Solids digested in tank as organic material is converted to facultative bacteria.

These bacteria move to the leachfield where they consume the biomat slime.

Bulletproofing new systems and disposal methods for many more generations of use.

Protecting the lakes, water table and our environment with a clean sustainable/reusable effluent.

WASTEWATER TECHNOLOGY

NSF/ANSI Standard 40 - *Residential Wastewater Treatment Systems*

Final Report:

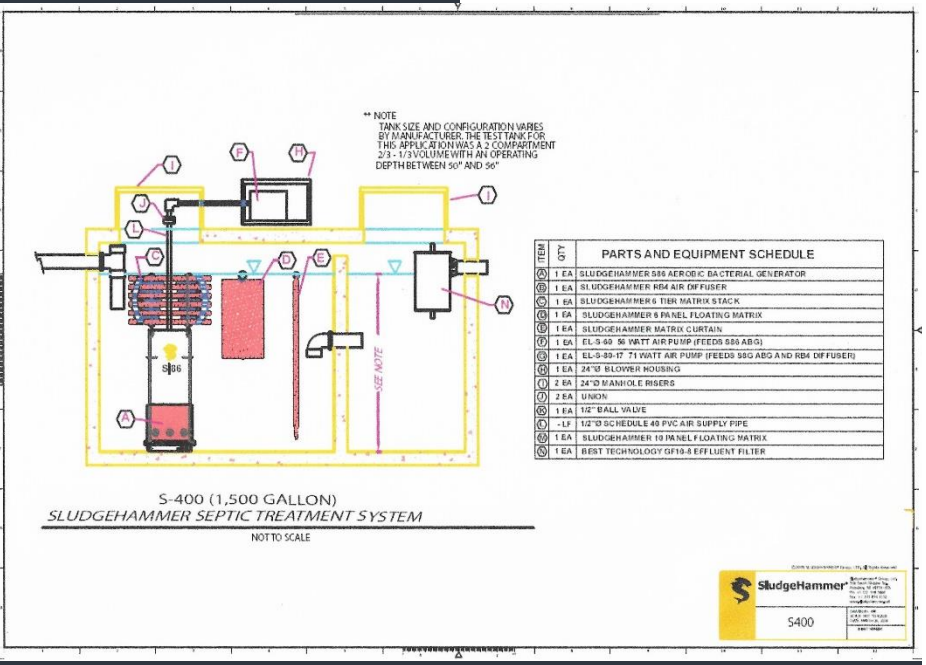
SludgeHammer

Model S-400 Wastewater Treatment System

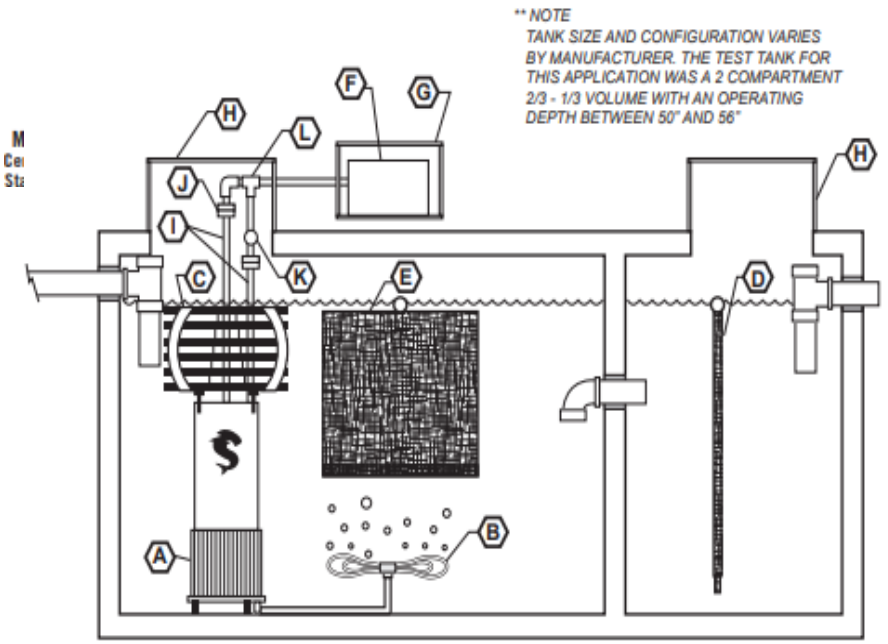
07/30/055/0030

NSF International
789 N. Dixboro Road
PO Box 130140
Ann Arbor,

NSF
Model S-400/600
Certified to NSF/ANSI
Standard #40 Class 1



Model S-400/600/800/1000
Certified to NSF/ANSI Standard #40, Class 1



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USAGE

The S-46, S-66, and S-86 are part of our residential wastewater treatment product line. They restore failing leach fields, bullet-proof existing septic systems, and can provide advanced treatment where NSF/ANSI Standard #40/Class 1 is not required.

The S-86 system is also the backbone of SludgeHammer commercial treatment systems. Typically used in conjunction with our Medusa diffusers and recirculation pumps. The S-86 allows us to engineer solutions for high-strength waste, such as restaurants, food processors, wineries, large communities, etc.

THE SCIENCE

The SludgeHammer Blend™ revolutionizes residential septic system function. Soil absorbs waste through microbes in the ground that consume organic material. The microbes thrive in oxygen-rich environments. Without oxygen, something called biomat is produced — a slime that clogs the soil. Clogged soil causes residential septic systems to fail, which means they can no longer treat the wastewater produced by your household.

THE STATS

It is estimated that 95% of all septic system failures are caused by biomat clogging. SludgeHammer technology is rigorously tested and certified to restore leach systems clogged by organic biomat through testing under IAPMO/UPC IGC180-2003. SludgeHammer is the ***ONLY*** technology listed on the market that holds the IAPMO/UPC standard.

THE SOLUTION

- Eliminate leach field clogging and optimize septic function with the SludgeHammer line of aerobic bacteria treatment systems.
- Extend the life of new leach fields
- Utilize alternative designs and take advantage of the nutrient-rich wastewater with drip irrigation or surface spray
- Drastically reduce the need for septic tank pumping
- Decrease or eliminate destructive property repairs

UPC C ®

IAPMO
International Association of Plumbing and Mechanical Officials

	residential S|66	residential S|46	commercial residential S|86
Usage:			
Home size	up to 3 bedroom	up to 3 bedroom	4 or more bedrooms
Platform	Residential	Residential	Residential/Commercial
Dimensions:			
Column diameter at top	8 3/8 in	12 in	12 in
Column diameter at base	9 in	15 in	15 in
Total height	36 in	36 in	36 in
Total weight	31 lbs	42 lbs	42 lbs
Electrical:			
Electrical service	120 VAC 60 hz - 15 amp	120 VAC 60 hz - 15 amp	120 VAC 60 hz - 15 amp
Power draw	51 watts ~ .425 amps	51 watts ~ .425 amps	71 watts ~ 1.5 amps
Air delivery rate	2.0 CFM at 2.5 psi	2.4 CFM at 2.0 ps	3.0 CFM at 2.0 psi
Liquid mixing rate at 4' depth	21,540 gpd	22,600 gpd	37,000 gpd
Organic digestion rate	1 lb/BOD/day	1.0 - 1.5 lb/BOD/day	2.5 - 3.0 lb/BOD/day
Tanks:			
Minimum depth of tank	40 in	40 in	40 in
Maximum depth of tank	60 in	60 in	60 in
DOUBLE or SINGLE chamber tanks	min 500 gal max 1,500 gal	min 500 gal max 1,500 gal	min 800 gal max size to load (residential applications)

General Trades Evaluation of Residential / Commercial Property Septic System and Disposal Field Infrastructure.

Qualification of Residential / Commercial Property for SludgeHammer Specific Solution

SludgeHammer™
nature called. we answered.

SEPTIC SYSTEM SITE SURVEY:
RESIDENTIAL – COMMERCIAL

Property address: _____
Directions to property: _____
_____
_____
Property Owner: _____
Contact information for Property Owner: _____
_____
Statement by Property Owner regarding the Owner's known history of the septic system:
_____
_____
_____
_____

The foregoing statement is true and correct to the best of my knowledge and is to be used to evaluate the septic system for the purpose of installing a _____ System. Owner understands that withholding information, making misleading statements, or misrepresenting facts concerning the history of the septic system may make any design solution inaccurate or inappropriate to solve the problem.

Owner's Printed Name _____

Owner's Signature _____ Date _____

County_____ State _____

OWNER INTERVIEW & SURVEY

1) Year of system installation _____ Age in years ____
2) Is property: Owner-occupied ___ Rental ___ Commercial ___ Restaurant ___ MHP ___
   Other _____
3) Residence: Bedrooms _____ Adults _____ Teenagers (13-19) _____ Children (<13) _____
4) Restaurant: Seating capacity _____ Meals served per day _____ Grease trap **Yes / No**
5) Other commercial: Employees _____ Meals served? **Yes / No** (indicate details above)
6) **Reason for installation**: New construction ____ Healthy system retrofit ____ Failure ____
   Property irrigation _____ Health Dept. directed _____ Other _____
7) Any current pharmaceutical drug(s) being used? **Yes / No**
   Name of drug _____ For how long? ___ wks / mos / indefinite
8) Does a water softener backwash into the septic tank? **Yes / No**

9) Other type of water treatment? **Yes / No** Type _____
10) Is there a Gray Water System? **Yes / No** Where does it drain? _____
11) Has the septic tank been serviced on a regular basis? **Yes / No** Frequency: _____
12) When was tank last pumped? _____ Pumper name _____
13) **If septic system failure:**
   a) Symptoms: Field surfacing ___ Tank surfacing ___ Swampy field ___ Odors ___
      Field break-out ___ Backed-up plumbing ___ Aggressive plant growth on field ___
      Dead plants on field ___ Aggressive plant growth on outlet pipe path ___
   b) Have chemicals been used in disposal field? **Yes / No**
      Name of chemical _____ How often _____
      Last time used _____ Results _____
   c) Have septic tank bacteria/enzymes additives been used? **Yes / No**
      Name of product(s) _____
      How often _____ Last time used _____
   d) Any long term pharmaceutical drug therapy prior to failure? **Yes / No**
      Name of drug _____ Used for ___ wks / mos / indefinite
   e) Did occupancy change in the residence prior to failure? **Yes / No** # _____
   f) Additions/remodels completed since the installation of system? **Yes / No**
   g) What construction was done? _____
   h) Any modifications/repairs made to septic system at any time? **Yes / No**
   i) What were the modifications/repairs? _____
      _____
   j) Was construction, landscaping or soil work of any kind done near the disposal field? **Yes / No**
   k) When? _____ Describe _____
   l) Well? **Yes / No** Water meter? **Yes / No** Current reading _____
   m) Has septic system been inspected by other qualified individual? **Yes / No**
   n) Contact _____ Phone # _____
   o) Is local health inspector involved? **Yes / No** Name _____
   p) Any permits issued? **Yes / No** Permit number _____

INSPECTION

14) **SEPTIC TANK MUST BE LOCATED AND ALL CHAMBERS INSPECTED**
   Sizes/Chambers/Numbers/Pump tank/Condition: _____
   _____
   _____
   _____
15) System type: Conventional ___ ATU ___ Mound ___ Sand Filter ___ Cesspool ___
   Other _____
16) If Cesspool: Dimensions of Cesspool _____ Liquid Depth _____ Opening Size _____
17) Design of disposal (leach line, seepage pit, bed, chamber, etc) _____
18) Topography of site is: Flat ___ Sloping ___ Gentle ___ Medium ___ Steep ___
19) Are there trees, hedges, bushes or large plants growing on or near disposal field? **Yes / No**
   Number and distance away _____
20) Attach **pictures** & make **drawing of septic system layout** with dimensions, not to scale – use back of form as needed.

NSF/ANSI Standard #40, Class 1

SludgeHammer meets the NSF/ANSI Standard #40, Class 1 for advanced treatment units. Testing at the NSF facility in Comox, British Columbia, demonstrated that our S-400 model produced an effluent with an average BOD of 14 mg/l and TSS of 17 mg/l under their rigorous six-month protocol. Since most jurisdictions in the United States and Canada accept the NSF Standard #40, we expect to see much wider applicability for our technology.

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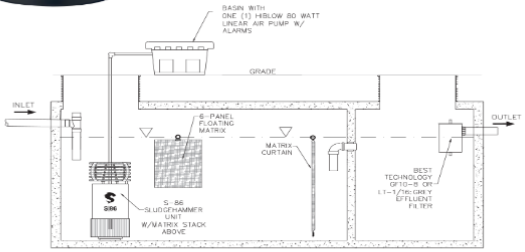
nature called. we answered.

The SludgeHammer® S-400, S-600, S-800, and S-1000 residential series are certified through NSF 40, Class 1 as Advanced Treatment Units. All SludgeHammer® units are made in America. They provide the most economical and effective treatment on the market.

residential S|400

To be installed into a standard 1,500 gallon, double-compartment septic tank (concrete, poly, or fiberglass. Tank is not included with the SludgeHammer® system) or a combination of two separate tanks that meets or exceeds the two-third/one-third equivalent, making certain that the liquid level in the first tank/chamber is at a dept of at least 44".

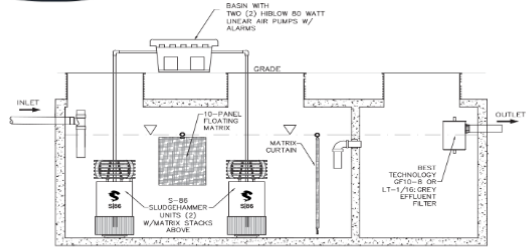
Air is pumped through a micro-fine bubble diffuser inside the SludgeHammer® ABG column. The continuous supply of aerated liquid circulates from entry points at the base of the unit and out of the top, while being introduced to SludgeHammer Blend™ bacteria inside the column.



residential S|600

To be installed into a standard 2,000 gallon, double-compartment septic tank (concrete, poly, or fiberglass. Tank is not included with the SludgeHammer® system) or a combination of two separate tanks that meets or exceeds the two-third/one-third equivalent, making certain that the liquid level in the first tank/chamber is at a dept of at least 44".

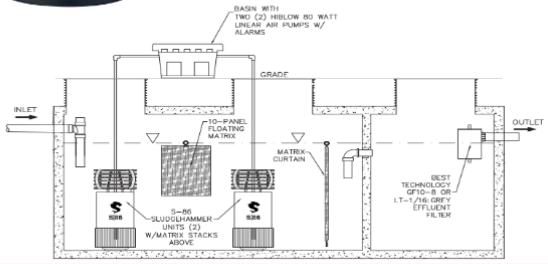
Air is pumped through a micro-fine bubble diffuser inside the SludgeHammer® ABG column. The continuous supply of aerated liquid circulates from entry points at the base of the unit and out of the top, while being introduced to SludgeHammer Blend™ bacteria inside the columns.



residential S|800

To be installed into a standard 2,500 gallon, double-compartment septic tank (concrete, poly, or fiberglass. Tank is not included with the SludgeHammer® system) or a combination of two separate tanks that meets or exceeds the two-third/one-third equivalent, making certain that the liquid level in the first tank/chamber is at a dept of at least 44".

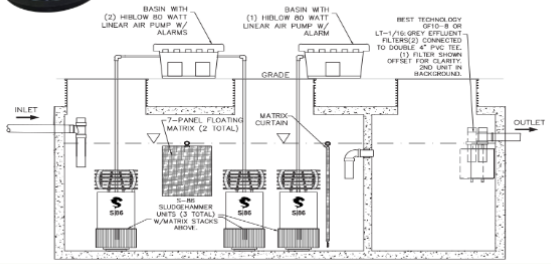
Air is pumped through a micro-fine bubble diffuser inside the SludgeHammer® ABG column. The continuous supply of aerated liquid circulates from entry points at the base of the unit and out of the top, while being introduced to SludgeHammer Blend™ bacteria inside the columns.



residential S|1000

To be installed into a standard 3,000 gallon, double-compartment septic tank (concrete, poly, or fiberglass. Tank is not included with the SludgeHammer® system) or a combination of two separate tanks that meets or exceeds the two-third/one-third equivalent, making certain that the liquid level in the first tank/chamber is at a dept of at least 44".

Air is pumped through a micro-fine bubble diffuser inside the SludgeHammer® ABG column. The continuous supply of aerated liquid circulates from entry points at the base of the unit and out of the top, while being introduced to SludgeHammer Blend™ bacteria inside the columns.



SludgeHammer®

nature called. we answered.

commercial & industrial

communities

marine

residential

military

The latest advance in wastewater treatment

IAPMO STANDARD IGC 180-2003

IMO - MARPOL MEPC-159 (55) International

Installation Instructions

What You'll Need to Install the SludgeHammer® Unit:

- ❒ Shovel & rake
- ❒ Hand saw and tape measure
- ❒ 7/8" hole saw/drill bit
- ❒ Phillips screwdriver and wrench
- ❒ Primer and glue
- ❒ 1/2" PVC schedule 40 pipe (amount based on location of tank)
- ❒ Multiple 1/2" PVC 90-degree elbows (dependent upon site layout)
- ❒ 1/2" PVC tee or elbow for bacterial catalyst assembly handle
- ❒ 1/2" quick connect union (optional)
- ❒ Mastic
- ❒ Riser (if none on septic tank)

Recommendations for Tank Pumping and Inspection—

The tank should be pumped prior to installing the unit unless the homeowner has had it pumped in the last 3-6 months. The tank should be visually inspected for cracks or leaks from house plumbing, baffles, concrete corrosion, or inlet and outlet tees. SludgeHammer® recommends a minimum liquid depth of 42" or greater for proper unit operation. After pumping, either refill the septic tank with the recommended 42" or greater liquid depth or allow for sufficient time for the tank to refill prior to turning on the unit.

Location of the Unit—

If the tank is a dual-compartment septic tank, install the unit in the inlet. For a single-compartment tank, the unit should be placed toward the inlet end of the tank. For an onsite system having more than one tank installed in series, install the unit in the first tank.

Step # 1.

Septic Tank Requirements

Riser—

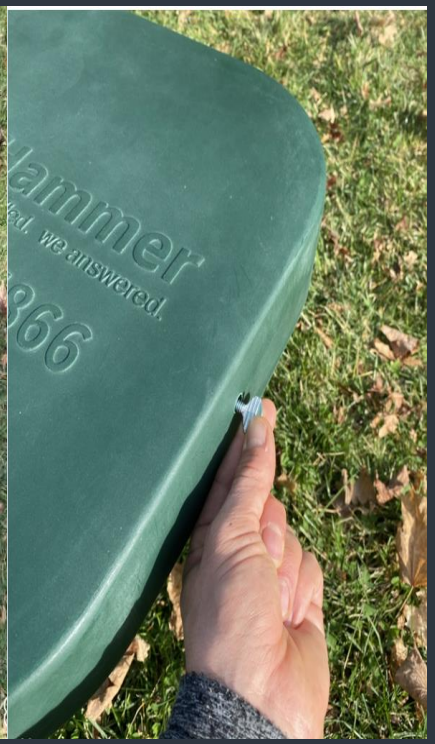
The riser will provide access to the unit for future inspections and maintenance. If there are no risers on the septic tank, expose the top of the septic tank so a riser (not provided) can be installed. Risers need to be approved by the local authority and installed per manufacturer's instructions. The lid should be secure to prevent unauthorized access and have provisions for safe access. Install the riser over the septic tank opening where the unit will be installed. To be effective, you will need just enough riser to allow for the 1/2" air line assembly, as well as enough height to reach grade.

Step # 2.
Location of Linear Air Pump Housing Basin

- Housing basin can be located next to existing 110V, 60hz. – 15 amp. outlet or placed at desired site location for hardwire of 110V, 60hz. – 15 amp. electrical line.
- *Housing basin should not be buried more than half it's height.

Housing Basin Specifications

Height- 13"
Length- 24"
Width- 18"



Step #3.
Install Air Line from the Air Pump to the Riser

- Drill 7/8” hole through the septic tank riser at or near bottom of the trench (Figure 1).

- Install ½” Sch-40 PVC pipe through hole so that it extends 12”. This PVC pipe is the air line that will connect the air pump to the SludgeHammer unit. The area where air line enters the riser must be sealed with mastic or similar waterproofing material (Figure 2).

- Run ½” Sch-40 PVC or ½” Flex pipe back to the air pump and attach the pipe to the air connection adapter on linear air pump (Figure 3).


Figure 1


Figure 2

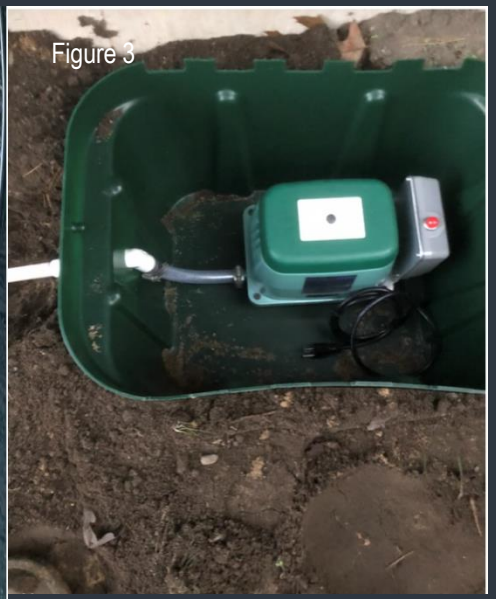


Figure 3

Step # 4.
Install SludgeHammer Unit in the Septic Tank

- Prime and glue a full-length piece of ½" Sch-40 PVC pipe into the ½" coupling within the the 4" center tube. (Figure 1) This is for the air line. There should be enough pipe to extend above the horizontal pipe protruding into the riser from the air pump housing basin when the SludgeHammer unit is on the bottom of the tank.

- Using the provided rope made of non-reactive material, lower the SludgeHammer unit into the tank (Figure 2). Rotate the the unit so the top is easily accessible for air line assembly (Figure 3). Secure rope so it does not fall into the tank.

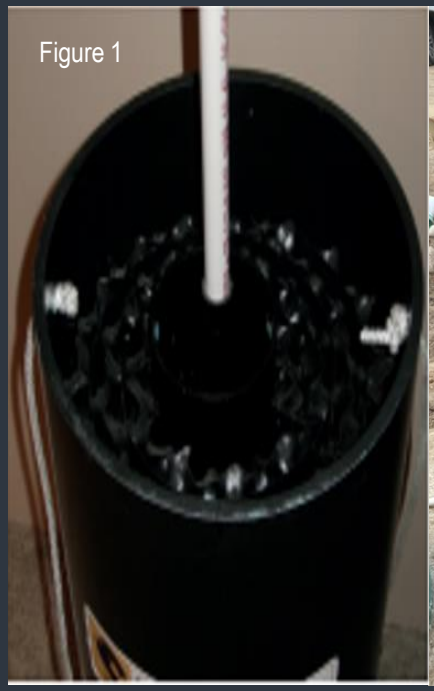


Figure 1

Figure 2


Figure 3

Step # 5.
Install SludgeHammer Unit into Septic Tank (Continued)

- To complete the air line assembly, cut the two PVC pipes to the appropriate length. Make a glued connection with a ½" PVC 90 (Figure 1). It recommended to install a ½" quick connect union to facilitate maintenance.

- Remove SludgeHammer blend bag and assembly from packaging. Glue a ½" Sch-40 PVC pipe into the coupling end of the SludgeHammer blend bag and assembly. The extension should be long enough to extend up into the access riser when the SludgeHammer blend bag is set down into the core of the unit (Figure 2).

- Insert the PVC extension with the SludgeHammer blend bag and assembly down into the center 4" PVC pipe of the unit (Figure 3).

Figure 1

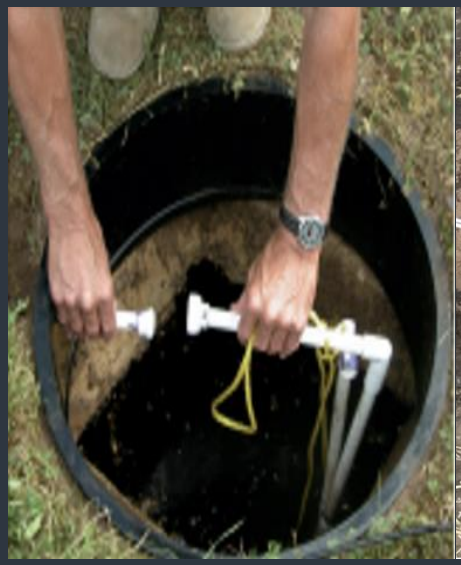
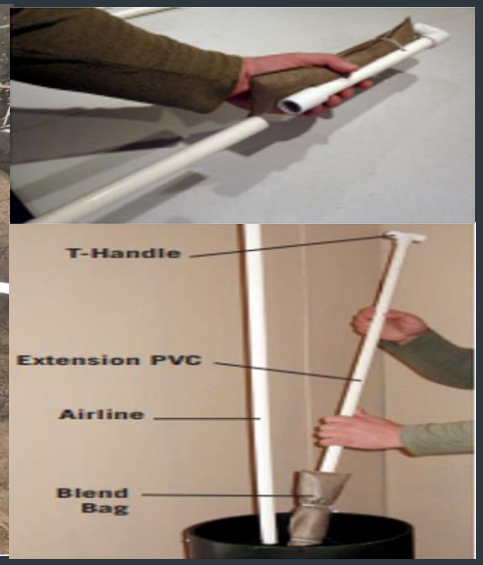


Figure 2

Figure 3



Step # 6.
Start Up of the SludgeHammer System

- Plug in air pump electrical cord (attached to back of pump) into electrical outlet (Figure 1).

- Check all PVC pipe and fitting connections for evidence of air leaks

- Make sure liquid in the septic tank is over the top of the SludgeHammer unit and is actively agitated and aerated. SludgeHammer Blend Bag assembly should be submerged (figure 2).

- Some odors may be as system is first started, but typically subside within 24-hours.

- Install septic tank lids (make sure lids are sealed properly and tight).

- Backfill trenches or bring site to grade with cover to restore landscaping (Figure 3)

Your Install is complete!

Figure 1

Figure 2

Figure 3

SludgeHammer® Maintenance Contract—Commercial-Industrial, Residential

This Maintenance Contract, dated _____, between _____ ("Client/Owner") and _____ ("Service Provider") outlines the specific scope of inspection and maintenance services to be provided by Service Provider relating to the operation of the onsite wastewater treatment system based on SludgeHammer™ technology installed at _____, _____ County, _____("Facility" or "Facilities or Residence").

1) Description of Basic Services of Service Provider: The following provisions are intended to supplement and comply with the Articles from the Charlevoix County District Sanitary Code effective 3/25/07 in relation to Advanced Treatment Systems (ATS, 9-2 through 9-2.12)

The Service Provider will provide operational and maintenance services to the Facility in accordance with Manufacturers' recommendations and local regulations.

Monitoring Schedule

- FIRST YEAR: Initial site visit to be completed within 10 - 45 days after system start up to ensure performance, plus two additional site visits 60 days apart**

- SECOND & SUBSEQUENT YEARS: ** Due to seasonal occupancy we will inspect the system within 10 - 45 days of system start up each spring to ensure performance, plus two additional site visits 60 days apart.**

**Where appropriate, visit scheduling will be based on seasonal occupancy. Client/Owner is responsible for notifying Service Provider of seasonal occupancy pattern.

Seasonal Start Up Procedures - Each spring the following items will be inspected before start up of the system and again in 10 -45 days to ensure performance of the system.

MAINTENANCE INSPECTION REPORT

Customer: _____
Address: _____City: ___
State:_____
Date: _____ Inspector: _____
Billed Amount: _____
Invoice: _____

Customer Contact Details
Local Out-of-town
Name _____Phone _____

Actions Performed: □ Check septic tank condition
□ Check & replace bacteria bag
□ Clean out basin to make certain it is free of debris
□ Check aeration in septic tank
□ Clean septic tank exit filter (if applicable)
□ Clean aeration blower motor filter
□ Check leach field
□ Take sample of effluent for Health Department (where applicable)
□ Other _____
Comments & Recommendations:

SludgeHammer Limited Lifetime Warranty

WARRANTY

So long as the specifications, data and representations of Customer are true and accurate regarding Customer's requirements for septage/sewage treatment, SludgeHammer warrants that the design and performance of its SludgeHammer units/systems shall meet the specifications delivered in writing to Customer.

Provided SludgeHammer's units/systems are serviced and/or maintained by SludgeHammer (or an approved third party in writing) SludgeHammer warrants all SludgeHammer units purchased new by an original owner, to be free from defects in the material and workmanship for the lifetime of the unit; all accessories/pumps are warranted for a period of 24 months from the date of purchase (excluding components and options which carry their own third party manufacturer's warranty, wherein that warranty will apply). SludgeHammer warrants, as a SOLE AND EXCLUSIVE REMEDY, to repair or replace only defective parts returned to SludgeHammer (prepaid) and deemed defective by SludgeHammer. Warranty is void when misuse or neglect is the cause.

Sludgehammer assigns any and all third party component manufacturer warranties to Customer.

DISCLAIMER

THERE IS NO WARRANTY, EXPRESS OR IMPLIED AS TO MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE; nor as to anything else except as otherwise expressly set forth above.

SludgeHammer is not liable for any incidental or consequential damages or injuries of any kind related to the use or misuse of SludgeHammer products. BUYER ASSUMES ALL RISKS OF HANDLING AND USE.

The use of any design or model in any SludgeHammer brochure or publication serves merely to indicate the type of systems, accessories and/or services which are offered for sale. SUCH SAMPLES OR MODELS CREATE NO WARRANTY THAT THE GOODS SHALL CONFORM TO THE DESIGNS OR MODELS. Specifications are subject to change without notice.

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