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INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS

IAPMO 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.

2. SCOPE

- 2.1** This standard covers reference standards, definitions, general requirements, testing requirements, installation instructions, and marking and identification for Aerobic Bacteria Generators (ABGs). ABGs covered by this standard include an aerated chamber for introduction of a colony of aerobic bacteria, provide a flow of aerated effluent over this culture, and contain a matrix capable of providing an attachment surface for a fixed aerobic bacterial film. They shall be designed so that they are free standing and can be installed in an existing septic tank, grease interceptor or grease trap without structural change to the tank.

3. REFERENCE STANDARDS

- 3.1** The standards referenced herein shall be the current edition of the standards, as published in Table 14-1 of the Uniform Plumbing Code.
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| ASTM D1785 | Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 |
| ASTM D2665 | Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings |
| ASTM D3034 | Type PSM Poly (VinylChloride) (PVC) Sewer Pipe and |

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	Fittings
ASTM F810	Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields
IAPMO PS 1	Prefabricated Septic Tanks
UL 1450	Motor-Operated Air Compressors, Vacuum Pumps, and Painting Equipment
UL 1951	Standard for Electric Plumbing Accessories

4. DEFINITIONS

- 4.1** **ABG** - An ABG is a manufactured unit designed for installation inside a standard septic tank, grease interceptor or grease trap. ABGs aerate and cause a current to pass over a fixed colony of bacteria living on a fixed film matrix. The current passing over the fixed film provides a steady stream of suspended bacteria that digests the biodegradable material within the tank and is discharged to a receiving leach field.
- 4.2** **Aerated Fixed Film Matrix** - The fixed-film matrix in contact with the aerated effluent is part of the ABG that provides a surface for attachment of either introduced or indigenous aerobic bacteria.
- 4.5** **Pea Gravel** - double washed gravel that is 1/4 inch to 3/4 inch in dimension.

5. GENERAL REQUIREMENTS

- 5.1** **Materials** – An ABG shall be constructed of materials capable of resisting biological or physical deterioration within a septic tank, grease interceptor, or grease trap. Acceptable materials include PVC and PE.
- 5.1.1** PVC schedule 40 pipe shall comply with the requirements of ASTM D1785.
- 5.1.2** PVC DWV pipe shall comply with the requirements of ASTM D2665.
- 5.1.3** PVC sewer pipe shall comply with the requirements of ASTM D3034.
- 5.1.4** Polyethylene drainage pipe shall comply with the requirements of ASTM F810.
- 5.2** **Unit Size** – The diameter of an ABG shall be less than 20 inches so that it will be small enough to allow insertion into a septic tank, grease interceptor or grease trap through existing openings. The height of the ABG shall be less than the liquid depth in the septic tank, grease interceptor, or grease trap the ABG is designed for installation in.
- 5.3** **Aerobic Conditions** – Aeration shall be provided by the ABG so that the fluid contains a measurable amount of oxygen that is available to ensure aerobic conditions for the fixed bacterial colony.

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- 5.4 Electrical Components** - Electrical components, including air pumps, shall comply with UL 1450 or UL 1951.

6. TESTING REQUIREMENTS

- 6.1 Aerator Location** - An aerator shall be located within the ABG to create a flow of aerated effluent over the fixed film bacterial matrix.
- 6.2 Additional Components** - ABGs shall be tested while fitted with the exact components, including air diffuser and air pump, to be marketed with the unit. The test report shall identify all added components, including the air diffuser and air pump, used in the testing.
- 6.3 Effluent Processing Test.**
- 6.3.1** Install two 1,200 gallon septic tanks, manufactured in compliance with IAPMO PS 1, at a municipal wastewater facility (WWTP). Plumb the septic tanks to receive flow from the influent to the primary clarifier of the WWTP. Support the septic tanks as needed for filling with water. Install three replicate leach field test units downstream of each septic tank in accordance with the diagram shown in Figure 1. Install a dosing pump in the outlet chamber of each septic tank to provide effluent flow to the leach field test units.
- 6.3.2 Leach Field Test Unit Construction** - Construct each leach field test unit inside of a four foot diameter two foot tall round barrel or pipe in accordance with sections **6.3.2.1 - 6.3.2.7**.
- 6.3.2.1 Bottom Layer** - Install a slotted 1-1/2 inch PVC sub-flow drainage pipe at the bottom of each leach field test unit. Cover the sub-flow drainage pipe with a 3 ± 1 inch layer of pea gravel (1/4 inch - 3/4 inch dimension). This pipe will exit to a sump where capture of sub-flow can be made to monitor flow of effluent percolating through the sand layer above.
- 6.3.2.2 Sand Layer** - Place a 10-14 inch layer of sand into each leach field test unit on top of the bottom pea gravel layer.
- 6.3.2.3 Third Layer** - Place an 8 ± 1 inch layer of pea gravel (1/4 inch - 3/4 inch dimension) into each leach field test unit on top of the sand layer. Place the gravel around the base of the distribution pipe to support it.