



Aquafacts

Louisiana Sea Grant • Louisiana State University • Baton Rouge, LA 70803-7507

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THE BEAD FILTER FOR AQUACULTURE SYSTEMS

The bead filter, a type of expandable granular-media biofilter, was designed by Dr. Ronald Malone and fellow researchers of the Civil Engineering Aquatic Systems Laboratory (CEASL) at Louisiana State University. It is an innovative and highly efficient biofilter and solids-capture device for use in the culture of finfish and crustaceans in recirculating aquaculture systems. Supported by the Louisiana Sea Grant College Program, Dr. Malone originally developed the filter for soft-shelled crawfish production systems, but it also has application in the culture of fingerlings, tropical fish, food fish, soft-shelled crabs, clams, oysters, and alligators. Its ability to support dense populations of nitrifying bacteria and its reliable operation, easy maintenance, and automation capability make the filter especially suitable for high-density recirculating aquaculture systems. The filter is available in several configurations and sizes from Armant Aquaculture, Inc., of Vacherie, Louisiana.

Bead filters provide:	Reliable nitrification Suspended solids capture BOD reduction Low water loss
Bead filters are:	Easily automated Self-cleaning, with removable retaining screens Easy to install, using standard schedule 40 PVC fittings Weather-, saltwater-, and corrosion-proof
Bead filters require:	No backwash pump No media replacement

BUBBLE-WASHED BIOFILTERS (Patents Pending)

MODEL BBF-1

Bead Volume: 1 cu. ft.
Biofilm Surface Area: 350 sq. ft.
Nitrification Capacity: 8.75 g-TAN/day
Suspended Solids Capture: .5-1 kg/day
Backwash Water Loss: 12 gal.
Flow Rate: 5-15 gpm
Loading capacity: 50-100 lbs. fish (.75-1 lb. feed/day)

MODEL BBF-3

Bead Volume: 3 cu. ft.
Biofilm Surface Area: 1050 sq. ft.
Nitrification Capacity: 26.25 g-TAN/day
Suspended Solids Capture: 1.5-3 kg/day
Backwash Water Loss: 40 gal.
Flow Rate: 30-40 gpm
Loading Capacity: 150-300 lbs. fish (2.25-3 lbs. feed/day)

PROPELLER-WASHED BIOFILTERS (Patents Pending)

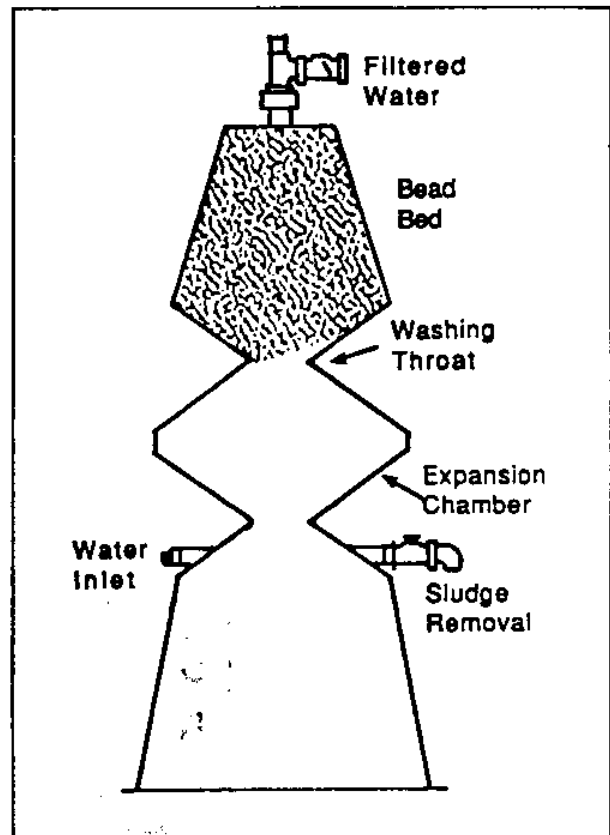
MODEL PBF-6

Bead Volume: 6 cu. ft.
Biofilm Surface Area: 2100 sq. ft.
Nitrification Capacity: 52.5 g-TAN/day
Suspended Solids Capture: 3-6 kg/day
Backwash Water Loss: 3-5 gal.
Flow Rate: 10-30 gpm
Loading Capacity: 300-600 lbs. fish (4.5-6 lbs. feed/day)

MODEL PBF-20

Bead Volume: 20 cu. ft.
Biofilm Surface Area: 7000 sq. ft.

Bubble-Washed Filters



Nitrification Capacity: 175 g-TAN/day
 Suspended Solids Capture: 10-20 kg/day
 Backwash Water Loss: 15-30 gal.
 Flow Rate: 50-120 gpm
 Loading Capacity: 1,000-2,000 lbs. fish (15-20 lbs. feed/day)

MODEL PBF-100

(Under development—available in six to eight months)
 Bead Volume: 100 cu. ft.
 Biofilm Surface Area: 35,000 sq. ft.
 Nitrification Capacity: 875 g-TAN/day
 Suspended Solids Capture: 50-100 kg/day
 Backwash Water Loss: 45-75 gal.
 Flow Rate: 175-250 gpm
 Loading Capacity: 5,000-10,000 lbs. fish (75-100 lbs. feed/day)

COMBINATION BEAD AND FLUIDIZED BED BIOFILTERS
 (Patents Pending)

MODEL CBF 1.25

Bead Filter:

Bead Volume: 1 cu. ft.
 Biofilm Surface Area: 350 sq. ft.
 Nitrification Capacity: 8.75 g-TAN/day
 Suspended Solids Capture: .5-1 kg/day
 Backwash Water Loss: 12 gal.

Fluidized Bed:

Sand Volume: .25 cu. ft.
 Biofilm Surface Area: 187.5 sq. ft.
 Nitrification Capacity: 4.69 g-TAN/day
 Suspended Solids Capture: None
 Flow Rate: 10-15 gpm

Total Biofilm Surface Area: 537.50 sq. ft.
 Total Nitrification Capacity: 13.44 g-TAN/day
 Total Suspended Solids Capture: .5-1 kg/day
 Loading Capacity: 75-150 lbs. fish (1.15-1.5 lbs. feed/day)

MODEL CBF-4

Bead Filter:

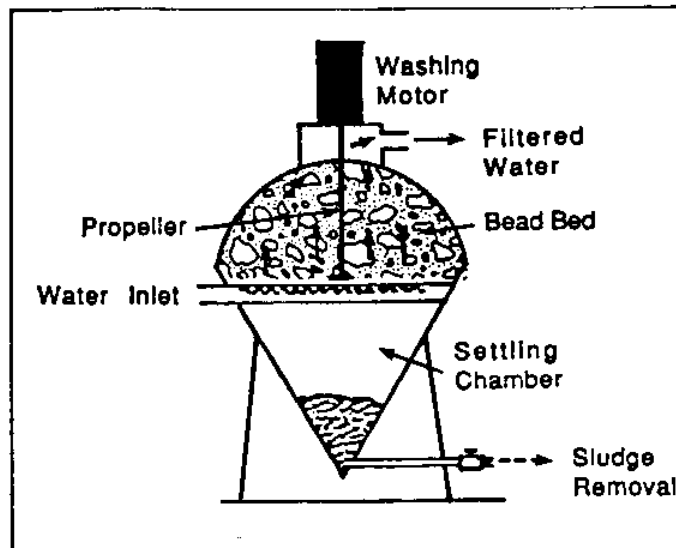
Bead Volume: 3 cu. ft.
 Biofilm Surface Area: 1050 sq. ft.
 Nitrification Capacity: 26.25 g-TAN/day
 Suspended Solids Capture: 1.5-3 kg/day
 Backwash Water Loss: 40 gal.

Fluidized Bed:

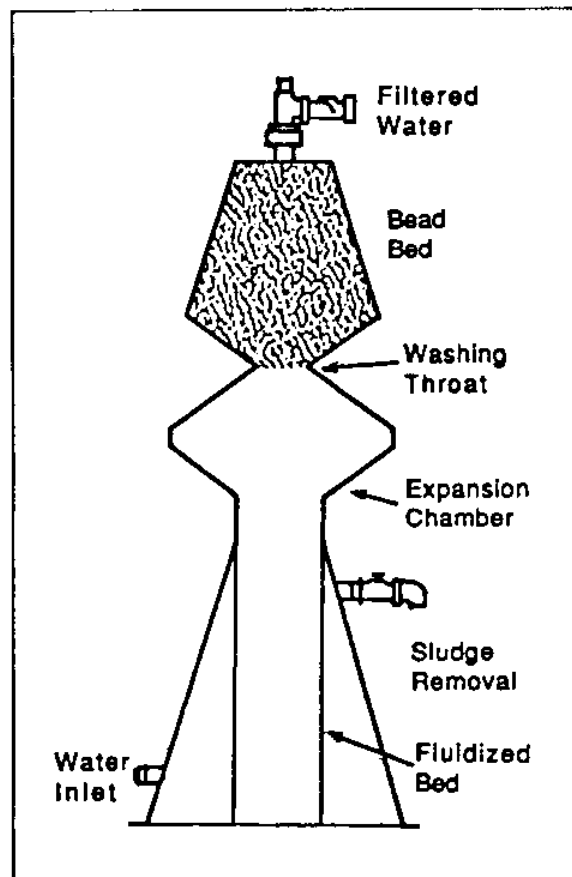
Sand Volume: 1 cu. ft.
 Biofilm Surface Area: 750 sq. ft.
 Nitrification Capacity: 18.75 g-TAN/day
 Suspended Solids Capture: None
 Flow Rate: 20-30 gpm

Total Biofilm Surface Area: 1800 sq. ft.
 Total Nitrification Capacity: 45 g-TAN/day
 Total Suspended Solids Capture: 1.5-3 kg/day
 Loading Capacity: 250-500 lbs. fish (3.5-5 lbs. feed/day)

Propeller-Washed Filters



Combination Filters



ORDER INFORMATION

For current prices, terms, and delivery information for these filters, call or write to:

Armstrong Aquaculture, Inc.
 P.O. Box 2
 Vacherie, Louisiana 70090
 Telephone: (504) 265-9215 or 265-2049
 Fax: (504) 265-7212

To order manuals describing the design and construction of the recirculating aquaculture systems developed by Dr. Ronald Malone, call or write to:

Communications Office,
 Louisiana Sea Grant College Program,
 Louisiana State University,
 Baton Rouge, Louisiana 70803-7507
 Telephone: (504) 388-6449 or 388-6448
 Fax: (504) 388-6331

