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How clean is the wastewater treated in a BioKube? BioKube test results.

BioKube AWTS (Aerated Wastewater Treatment Systems) are all based on the basic technology of using submerged aerated filters.

BioKube has enhanced the basic well documented technology of treating wastewater with natural bacteria living on submerged aerated filters with several international patents.

The main scope of these patents are to ensure that BioKube systems will clean sewage water with outstanding regularity regardless of factors like variations in the daily amount of incoming sewage water (situations like a large number of guests) or long periods with no sewage water (i.e. situations like a long vacation and consequently no sewage water being produced) or very hot and cold temperatures.

BioKube systems work with the same stable cleaning results both in the desert in Kuwait and in the below freezing temperatures in Scandinavia.

BioKube AWTS are certified to fulfill the highest norms in EU regarding treatment of sewage water. This norm is CEN 12566-3. The norm is a harmonized EU standard and it is obligatory for all EU countries to approve and judge wastewater treatment systems according CEN 12566-3.

How clean is the treated wastewater?

BioKube has had the cleaning quality of a system monitored and laboratory analyzed every month over a 4 year period by a certified laboratory. The aim was to document the stability of the BioKube technology over a long period of time. The average outlet values over this 48 month period were:

COD outlet value = 38,7 mg/l)

BOD₅ outlet value = 2,82 mg/l

NH₄ outlet value = 0,89 mg/l)

The monthly measurements are found on page 2 and 3.

The process for approval after the European Norm CEN 12566-3 involves testing after precisely defined criteria requiring testing over 12 months. The CEN testing and requirements are based on a percentage reduction of material in the incoming sewage water. Here BioKube systems attained the following test results:

BOD₅ reduction 97 %.

COD reduction 89 %.

NH₄ reduction 96 %.

BioKube systems are standard delivered to fulfill the following two sets of requirements:

EU Elite requirements where the requirements are: BOD₅ = 10 mg/ltr., NH₄ = 5 mg/ltr., COD = 75 mg/ltr., P = 1,5 mg/ml, SS = 20 mg/ltr

EU Standard where the requirements are: BOD₅ 25 mg/ltr., COD 125 mg/ltr. P 1,5 mg/ml, SS 20 mg/ltr

BioKube systems can however be manufactured to fulfill any national requirements.

How clean is Water from a BioKube?

Monthly measurements by independent certified institute.

The monthly measurements cover a period of 4 years (2004-08-10 to 2008-09-18)

These measurements document the stability of the BioKube cleaning process.

Average results for all measurements 2004-08-10 to 2008-09-18

	NH₄	BOD₅	COD	SS		
	0,89 mg/l	2,82 mg/l	38,7 mg/l	9,9 mg/l		

	NH₄	BOD₅	COD	SS	pH	Water Temp
Requirements:	5 mg/l	10 mg/l	75 mg/l	mg/l		C°
Date:						
10-08-2004	0,05	4,4	32,6	8,6	7,3	19,2
31-08-2004	0,05	2,1	28,8	7,3	7,4	17,3
27-09-2004	0,05	4,6	32,3	9,5	7,2	16,2
27-10-2004	2,14	6,5	49,6	7,4	7,3	13,4
25-11-2004	0,05	1,8	23,4	9,5	7,0	9,8
27-12-2004	1,04	2,2	30,4	4,7	7,6	7,3
28-01-2005	0,04	1,5	33,0	1,5	7,8	5,9
25-02-2005	0,05	1,7	29,0	1,9	7,9	4,7
26-03-2005	0,17	4,3	34,6	7,6	7,2	6,4
13-04-2005	0,82	6,7	49,0	6,6	7,6	8,0
17-05-2005	0,21	4,5	38,0	18,0	7,8	11,1
16-06-2005	0,10	5,0	38,0	9,9	7,7	14,3
08-07-2005	5,20	2,6	42,0	4,3	6,4	16,2
10-08-2005	0,21	3,8	47,0	7,6	7,1	16,2
09-09-2005	12,0	4,6	42,0	15,0	6,3	17,0
04-10-2005	1,20	3,5	45,0	7,1	6,9	13,8
25-10-2005	0,82	4,4	35,0	16,0	7,4	12,9
25-11-2005	2,60	8,4	61,0	13,0	7,0	9,1
21-12-2005	0,11	4,1	51,0	5,1	7,5	7,8
23-02-2006	7,70	3,2	37,0	15,0	7,6	4,8
11-04-2006	1,10	5,8	44,0	19,0	7,7	7,1
25-05-2006	0,03	2,7	40,0	8,0	7,7	11,9
15-06-2006	0,61	2,2	30,0	8,7	7,1	16,0
06-07-2006	1,50	0,9	17,0	7,3	7,8	15,9
07-08-2006	0,34	4,6	31,0	10,0	7,9	17,7

	NH₄	BOD₅	COD	SS	pH	Water Temp
Requirements:	5 mg/l	10 mg/l	75 mg/l	mg/l		C°
Date						
06-09-2006	0,10	2,1	41,0	6,3	8,3	17,3
02-10-2006	0,65	3,1	40,0	13,0	7,9	16,1
24-10-2006	0,06	4,3	67,0	16,0	8,0	14,8
23-11-2006	0,07	2,2	29,0	5,4	7,7	11,1
19-12-2006	0,10	1,7	34,0	2,2	8,2	10,8
23-03-2007	1,04	4,6	61,0	10,0	7,70	8,0
08-05-2007	0,196	3,1	73,0	27,0	7,62	11,2
18-06-2007	0,20	1,6	45,0	2,0	6,8	15,9
17-07-2007	0,155	1,0	39,0	8,7	6,7	17,0
22-08-2007	0,131	1,0	29,0	10,0	6,4	17,5
20-09-2007	0,51	2,2	46,0	13,0	6,4	16,8
27-10-2007	0,193	1,0	33,0	17,0	7,4	14,9
18-11-2007	0,130	1,4	24,0	18,0	6,7	14,1
20-12-2007	0,40	1,0	38,0	15,0	7,0	8,4
15-01-2008	0,22	1,0	22,0	9,2	6,6	8,0
20-02-2008	0,012	1,0	39,0	9,1	6,8	7,3
17-03-2008	0,059	1,5	41,0	19,0	7,2	7,6
06-05-2008	0,182	1,7	48,0	11,0	7,3	11,9
23-05-2008	0,35	1,2	46,0	9,4	7,1	12,6
15-07-2008	0,003	1,0	30,0	7,2	7,7	16,3
20-08-2008	0,036	1,0	29,0	7,3	8,2	17,2
18-09-2008	0,023	1,0	33,0	12,0	8,2	15,6
Average results for all measurements 2004-08-10 to 2008-09-18						
	NH₄	BOD₅	COD	SS		
	0,89 mg/l	2,82 mg/l	38,7 mg/l	9,9 mg/l		

How does BioKube systems achieve these excellent results?

Use of Submerged Aerated Filters

The use of submerged aerated filters means that the bacteria are given optimum living conditions.

BioKubes patented technology.

BioKube has enhanced the basic technology of Submerged Aerated Filters by (among other things) a precise control of the dosing of the incoming water over the full 24 hour day cycle and not just as the sewage water is produced.

Very tolerant to fluctuations.

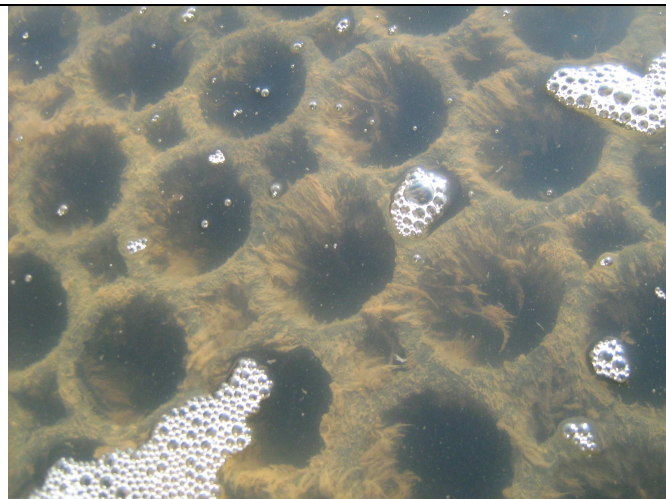
The BioKube designed systems are very tolerant to fluctuations in the incoming water. This gives a more stable system compared too as example an activated sludge system.

Designed precisely to the specific installation

BioKube system ore designed specifically to the individual system but it is done using stand components. Like building with Lego Blocks.

The bacteriological growth on the BioBlocks.

The technology of Submerged Aerated Filters gives a very stable cleaning process. Low maintenance cost make BioKube systems ideal for small cities and resorts where qualified wastewater personnel are not available.



Tank for BioReactor/150.

Each unit will for BOD 25 clean 150 m³ / day. Consists of aerated zone, settlement zone is part of the onsite built concrete tank. Equipped with all air blowers, diffusers and other mechanical parts. Delivered ready to install



On site built concrete tanks.

The BioReactors are mounted in on site built concrete tanks. Here for a 1.800 m³ / day system for a vegetable factory



Example of BioKube Jupiter system.

75 m³ / day system for Hotel Krotiri, Greece under installation in pre built concrete tanks

