Average Testing Performance Data for Components of Performance-Based Treatment Systems 12/06/2007 by E. Roeder

- **from innovative system testing in Florida or**
- **from test centers for evaluation of use in nutrient-reducing performance-based treatment systems or**
- **from test centers for NSF-certification as aerobic treatment units (ATUs)**

For all performance-based treatment systems, the engineer will establish performance levels, and design the system as a whole to meet them. Approval of treatment receptacles is a separate matter and should be checked under the septic tank design approval listings http://www.doh.state.fl.us/environment/ostds/pdfiles/forms/tanks.pdf.

Table 1 summarizes **results of innovative systems testing under non-test-center** conditions in Florida. The components listed in table 1 have undergone innovative system testing and been reviewed by the Bureau as indicated in the column "innovative status" for use in conjunction with engineer-designed performance-based treatment systems.

Table 2 summarizes test center testing results either associated with an NSF/ETV protocol or during the Big Pine Key study in Florida. These data have been used to evaluate treatment components that might be used as part of a **nutrient-reducing performance-based treatment system** designed by engineers. These are systems that are designed to reduce nitrogen and/or phosphorus to specified levels. The components listed in table 2 below have previously been reviewed by the Bureau as indicated in the column "innovative status". "yes" indicates that the components are currently in innovative status. Innovative status indicates that such approval has occurred in a limited fashion, providing for a limited number of permits and requiring additional testing.; "passed" indicates that components have completed innovative testing in Florida; "n/a" indicates that the use of previously approved ATU's in nutrient-reducing systems was accepted based on third-party testing data.

Table 3 summarizes test center testing results where the objective was to achieve certification by NSF under standard NSF-40 (**waste strength reduction**). The components listed in table 3 below are treatment systems approved in Florida as ATUs under 64E6.012, Florida Administrative Code. Currently, the Department is accepting such data as a form of documentation of the "application of sound engineering principles" by engineers designing pressure dosed performance-based treatment systems with the only goal of **reducing waste strength** (CBOD5, TSS) in order to qualify **for drainfield size reductions** under 64E-6.028(3), Florida Administrative Code.

If you find errors, want to submit additional data or have questions, please contact Eberhard Roeder at Eberhard_roeder@doh.state.fl.us

Table 1. Results of Innovative System Testing in Florida

Component/ Configuration	Type of testing	CBOD5 (mg/L)		TSS (mg/L)		TN (mg/L)		TP (mg/L)		Vendor	Vendor Contact Phone	Vendor web-site	Innovative Status
		In	Out	In	Our	In	Out	In	Out				
EcoPure 300	Innovative in Florida (n=25/9 of 1 system)	327	7.7	421	6.2	58	31	11	5.1	Eco-Pure Wastewater Systems	1-888-999-0936	www.eco-purewastewatersystems.com	Passed
EnviroFilter C	Innovative in Florida (n=26/24 of 5 systems)		7.6		5.3		21.7		5.8	Earthtek Environmental Systems	904-381-0405		Passed
ZeroImpact	Innovative in Florida (n=33/29 of 5 systems)		10.49		16.63		23		1.4	Biotech Systems LLC	352-376-8016	www.biofilter.com	Yes

Table 2. Test Center Testing Results, which have been used in evaluating components proposed for nutrient-reducing performance-based treatment systems.

Component/ Configuration	Type of testing	CBOD5 (mg/L)		TSS (mg/L)		TN (mg/L)		TP (mg/L)		Vendor	Vendor Contact Phone	Vendor web-site	Innovative Status
		in	out	in	out	in	out	in	out				
Advantex 20x	NSF-40	162	5	291	4					Orenco Systems	1-800-348-9843	http://www.orenco.com/	Yes
Advantex 20x Mode 1	N-testing concurrently with NSF-40	166	5	292	4	33	12			Orenco Systems	1-800-348-9843	www.orenco.com/	Yes
Advantex 20x Mode 3	N-testing after NSF-40	112	7	170	9	35	12			Orenco Systems	1-800-348-9843	www.orenco.com/	Yes
Aerocell ATS SCAT-8-AC-C500	NSF-40+Nitrogen	240	2	290	2	40	9.3			Quanics	1-877-quanics	www.quanics.net/	Yes
Enviro-Guard 0.75 (Multi-Flo)	NSF+Nitrogen with reduced sampling	220	5	220	5	46	20			Consolidated Treatment Systems	937-746-2727	www.consolidatedtreatment.com	n/a
HOOT 500 AND (with recirculation for nitrogen reduction))	N-testing (25 samples) with NSF-40	196.1	2.2	194.3	1.5	26.3	9.6	8.8	3.1	Hoot Aerobic Systems	337-474-2804	www.hootsystems.com	n/a
MICRO-FAST	NSF-40+Nitrogen	144	9	197	7	34.5	9.3			Bio-Microbics	1-800-753-3278	www.biomicrobics.com	n/a
MICRO-FAST	Keys Study, Phase I (12 samples)	138	2.6	117	4.63	38	11	8.4	5.4	Bio-Microbics	1-800-753-3278	www.biomicrobics.com	n/a
MICRO-FAST	Keys Study, Phase II (n=13/ 14)	110	1.2	92.	3.9	48	11.5	8.7	6.6	Bio-Microbics	1-800-753-3278	www.biomicrobics.com	n/a
MICRO_FAST	NSF-40 April 2007	250	3	310	5					Bio-Microbics	1-800-753-3278	www.biomicrobics.com	n/a
RETROFAST 0.375	ETV	150	12	180	28	39	19			Bio-Microbics	1-800-753-3278	www.biomicrobics.com	Yes
Septitech Model 400	ETV	250	5.4	150	3	39	14			Septitech	207-333-6940	www.septitech.com	Yes
Singulair 960 w/ Biokinetics	NSF-40	184	6	238	10					Norweco	419-668-4471	www.norweco.com/html/main.htm	n/a
Singulair 960 w/ Biokinetics phase 1 with recirculation	16 N-tests at NSF-testing facility	167		226		25	6.8			Norweco	419-668-4471	www.norweco.com/html/main.htm	n/a
Singulair 960 w/ Biokinetics phase2 no recirculation	8 N-tests at NSF-testing facility	167		226		25	11.8			Norweco	419-668-4471	www.norweco.com/html/main.htm	n/a
24" unsaturated crushed brick ~1 gpd/sqft	Keys Study, Phase I (11 samples)							6.04	0.60				n/a
24" unsaturated crushed brick ~1.7 gpd/sqft	Keys Study, Phase II (n=13/ 4)							8.72	2.65				n/a
24" unsaturated LECA ~1 gpd/sqft	Keys Study, Phase I (11 samples)							6.04	1.31				n/a
24" unsaturated filterlite P ~1.7 gpd/sqft	Keys Study, Phase II (n=13/ 10)							8.72	0.53				n/a

Table 3. Test Center Testing Results, used for NSF-40 certification and evaluation of waste strength reduction

Equipment	Vendor	Data Source	test average CBOD5 (mg/L)		test average TSS (mg/L)		max 30-day average effluent (mg/L)	
			in	out	in	out	CBOD5	TSS
500N	Clearstream Wastewater Systems, Inc.	Final Report 00/3/2015/060 August 1991	148	14	193	48	8	13
AdvanTex AX20N	Orenco Systems	NSF 40 Final Report 01/11/20/15/060	162	5	291	4	8	6
AeroCell ATS-SCAT-8-AC-C500	Zabel Environmental Technology	NSF Final Report 05/01/060	240	2	290	2	4	4
AK500C	Aquaklear, Inc.	NSF Final Report 04/03/2015/060 November 2005	150	10	130	11	17	23
Alliance 500	H.E. McGrew Inc.	NSF Final Report 98/14/2015/060 May 2000	137	6	140	15	12	22
AP500	Hydro-Action Industries	Final Report 98/06/2015/060-2	177	9	201	15	22	18
Aqua Aire 500 Series 600,750,1000, and 1500	Ecological Tanks, Inc.	Baylor University ON SITE WASTE WATER TESTING AND CERTIFICATION Original Report May 2nd, 2002	108.0	108	124	1.6	3.26	2.76
B.E.S.T. 1	American Wastewater Systems, Inc.	Final Report 99/09/2015/060 May 2000	130	21	139	21	29	40
Bio-COIR ATS-SCAT-8-BC-C500	Zabel Environmental Technology	Final Report 04/04/2015/060 November 2005	160	9	190	12	14	20
BN-400	BIONEST Technologies, Inc.	Final Report 04/10/2051/060 March 2006	210	2	240	2	3	3
Cajun Aire Advanced 500	H.E. McGrew Inc.	Final Report 02/01/2015/060 April 2003 (Original print December 2002)	170	13	60	19	21	24
DF40-M	Delta Fiberglass & Environmental Products, Inc.	Final Report 92/04/2015/060 June 1993 (Reprint Nov. 1994)	173	6	189	7	8	8
Hoot 500	Murphy Cormier-General Contractor, Inc.	BAYLOR University Testing and Evaluation Certification Report Original 12/14/01	196	2.33	194	1.8	2.68	3.85
Hydro-Action AP500	Hydro-Action Industries	Final Report 98/06/2015/060-2 July 2003	177	9	201	15	9	16
J-500 - originally evaluated as the Jet J-353	Jet, Inc.	Reprint of Report for Model J-353 issued in May 1993	172	15	194	12	19	17
Micro FAST 0.5	Bio-Midrobics, Inc.	Final Report 01/09/2015/060 December 2002	155	11	177	16	18	18
Micro FAST 0.5	Bio-Midrobics, Inc.	Final Report 06/11/2015/060 December April 2007	250	3	310	5	4	11
Mighty Mack 500	H.E. McGrew, Inc.	Final Report 96/08/2015/060 December 1997	160	7	218	13	11	20
Multi-Flo FTB-0.5	Multi-Flo Wastewater Treatment Systems, Inc.	NSF Standard 40 Final Report March 1992	170	5	195	5	5	5

Table 3 cont'd

Equipment	Vendor	Data Source	test average CBOD5 (mg/L)		test average TSS (mg/L)		max 30-day average effluent (mg/L)	
Nayadic M-6A	Nayadic, Inc.	This June 1992 Report supersedes Wastewater Technology Report Number S40-13, dated December 1983	150	6	184	7	8	8
Norweco Inc. 900	Norweco, Inc.	Number S40-8-3 (see comments) October 1993	149	20	190	22	30	29
Premier Tech STB-500	Premier Tech Environment	Final Report 04/04/2015/060 November 2005	140	2	170	2	2	2
Puraflo P150N*3B	Bord na Mona	Final Report 05/09/2015/060 June 2006	240	2	260	2	3	2
Singulair TNT-500	Norweco, Inc.	Final Report 05/06/2015/060 June 2006	240	4	260	9	7	17
Singulair 960 w/ Biokinetics	Norweco	"Report on the Performance Evaluation of the Norweco Singulair Model 960 Wastewater Treatment System" April 1996. NSF International 95/12/2015/060; 55 pages	184	6	238	10	5-8	6-13
Singulair 820 and 900	Norweco, Inc.	Report No. S40-8-3	130	11	196	15		
UC50	Delta Environmental Products, Inc.	Final Report 00/3/2015/060 February 2001	181	6	159	8	8	15

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