February 23, 2023

Average Testing Performance Data for Components of Nitrogen-Reducing Performance-Based Treatment Systems (PBTS)
(see Performance-based treatment systems, including innovative for average performance testing data for components of all PBTS systems in Florida; below is a subset of that document).

Construction permits for PBTS must comply with Part IV of Rule 62-6, Florida Administrative Code (FAC) (for details, see Memo HSES-10-001). For all PBTS, the engineer will establish performance levels, and design the system as a whole to meet them. To find treatment receptacles approved for use for a particular PBTS component, refer to the septic tank design approval listings.

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 have been reviewed by the Bureau as indicated in the column "innovative status" for use as a component of an engineer-designed **nitrogen-reducing PBTS.**

Table 2 summarizes innovative system testing data or test center testing results either associated with an NSF or 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 a component of a **nitrogen-reducing PBTS** designed by engineers. Equipment series where "yes" is indicated in the "Innovative Status" column, are currently in innovative status, indicating that such approval has occurred in a limited fashion, providing for a limited number of permits and requiring additional testing**. Note that construction permits for systems currently in innovative status require forms DH 3144 and DH 3145 and must be reviewed by the Onsite Sewage Program office for compliance with the innovative system permit, in addition to the regular county health department review.** "Passed" indicates that components are not in innovative status (completed innovative testing in Florida); "n/a" indicates components are not in innovative status (use of previously approved ATUs in nutrient reducing systems accepted based on third party data). "Rule 62-6.025(7)(a), F.A.C." indicates components are approved without innovative system testing per rule 62-6.025(7)(a)(1) to (3) F.A.C.

Department of Environmental Protection (DEP) Basin Management Action Plan (BMAP) nitrogen-reducing requirements differentiate between systems with 24 inches of separation between the bottom of the drainfield and the wet season water table (WSWT) and those that do not. Existing systems (modifications/repairs) installed with less than 24 inches of water table separation between the bottom of the drainfield and the WSWT (as allowed per Rule 62-6, Florida Administrative Code) must use PBTS components that are capable of at least 65% nitrogen removal. New systems, modifications, and repairs installed with at least 24 inches between the bottom of the drainfield and the WSWT may use any PBTS component capable of at least 50% nitrogen removal to comply with future BMAP requirements. To assess the engineer-specified performance level, refer to the TN removal (%) column.

Table 1. Results of Innovative System Testing in Florida

Component/ Configuration	Type of Testing	Summary Statistic	Average CBOD5 (mg/L) (In/Out)	Average TSS (mg/L) (In/Out)	Average TN (mg/L) (In/Out)	Average TN (%)	Vendor	Innovative Status
Fuji Clean CE	Innovative in Florida (13 systems, 50-52 data points total); average of system averages)	Average of system averages	[2]/4.4	[2]/4.3	45(assumed)/10.9	75.7%	Fuji Clean USA, LLC	Passed

TN = Total Nitrogen
[1]Yes = components are currently in innovative status (approval has occurred in a limited fashion, providing for a limited number of permits and additional testing; construction permits must be reviewed by the Onsite Sewage Program office for compliance with the innovative system permit and include forms DH 3143 and DH 3144).
[2]No Data Available

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

Equipment Series	Equipment Tested	Type of Test	in TN (mg/L)	out TN (mg/L)	TN removal (%)	Vendor	Innovative Status
Advantex	Advantex 20x Mode 1	N-testing concurrently with NSF-40, Squamish, B.C.	33	12	64%	Orenco Systems	Yes[1]
Advantex	Advantex 20x Mode 3	N-testing after NSF-40, Squamish, B.C.	35	12	66%	Orenco Systems	Yes[1]
Advantex	AX20, AX20RT	NSF 245, Bourne, M.A.	52	24	53.84%	Orenco Systems	62-6.025(7)(a) F.A.C.
Aerocell	Aerocell ATS SCAT-8-AC-C500	NSF+Nitrogen, Waco	40	9.3	77%	Quanics (Anua)	Yes[1]
Aqua Klear 245	AK6S245	NSF 245, Ascension Parish, LA November 2019-May 2020	47.5	19.6	59.4%	Aqua Klear	62-6.025(7)(a) F.A.C.
Aqua Safe	Aqua Safe 500	~31 N-tests during NSF-40 test	30.78	14.9	52%	Ecological Tanks	Yes[1]
BioBarrier	BioBarrier MBR 0.5	NSF 245, MASSTC Dec. 2010 – Aug. 2011	43	9	79%	Bio-Microbics	62-6.025(7)(a) F.A.C.
Clearstream Model D	Clearstream 500 D	NSF 245 Prairieville, LA (June-November 2012)	42	19	54%	Clearstream Wastewater Systems, Inc.	62-6.025(7)(a) F.A.C.
Clearstream Model DA	Clearstream 500 DA	NSF245 (June-November 2012)	42	19	54%	Clearstream Wastewater Systems, Inc.	62-6.025(7)(a) F.A.C.
CE	Fuji Clean CE 5	NSF-40+Nitrogen, Waco	47.6	15.7	67%	Fuji Clean USA, LLC	Passed (see Table 1)
CEN	Fuji Clean CEN 5	NSF 245, Waco TX (June – December 2014)	40	10.4	74%	Fuji Clean USA, LLC	62-6.025(7)(a) F.A.C.
ECOPOD-N	ECOPOD E50-N	NSF 245 Baton Rouge, LA	43	20	53.48%	Delta Treatment Systems, LLC (Infiltrator)	62-6.025(7)(a) F.A.C.
Enviro-Guard	Enviro-Guard 0.75	NSF+Nitrogen with reduced sampling	46	20	57%	Consolidated Treatment Systems	n/a
Jet CF	J-500CF	NSF 40/ NSF 245, Ascension Parish, LA (February 2008 – August 2008)	39.1	12.9	67.1%	Jet, Inc.	62-6.025(7)(a) F.A.C.
MicroFAST	MicroFAST 0.5	Keys Study, Phase I (12 samples)	38.45	10.97	71%	Bio-Microbics	n/a
MicroFAST	MicroFAST 0.5	Keys Study, Phase II (13- 14 samples)	47.98	11.51	76%	Bio-Microbics	n/a
MicroFAST	MicroFAST 0.5	NSF 245 testing, Waco TX (September 2006 – April 2007)	38	17	55%	Bio-Microbics	62-6.025(7)(a) F.A.C.
MicroFAST	FAST	NSF40+Nitrogen	34.5	9.4	73%	Bio-Microbics	n/a
HOOT	HOOT H-500 AND	N-testing (25 samples) concurrent with NSF-40	26.3	9.63	63%	Hoot Aerobic Systems	n/a
HOOT	HOOT ANR-450	NSF 245, Waco TX (May 2006-October 2006)	37	5.6	85%	Hoot Aerobic Systems	62-6.025(7)(a) F.A.C.
Hydro-Kinetic	Hydro-Kinetic 600 FEU	NSF245, Norwalk OH (June 2011-December 2011)	36	8.7	76%	Norweco, Inc.	Yes[1]
Nitrex	Nitrex (after LAI-specified pretreatment)	NSF-load, MASSTC 10/2001-03/2004	19.3	5.4	Additional 72%	Lombardo Associates, Inc.	Yes[1]

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[2]No Data Available

Equipment Series	Equipment Tested	Type of Test	in TN (mg/L)	out TN (mg/L)	TN removal (%)	Vendor	Innovative Status
Nitrex	Nitrex (after LAI-specified pretreatment)	NSF-load, MASSTC 12/2004-10/2005	22.6	7.1	Additional 69%	Lombardo Associates, Inc.	Yes[1]
Purasys Sequencing Batch Reactor (SBR)	(Pekasys) CRB1 / PS1	NSF40 / NSF245 Waco, TX	44	18	59%	Anua International	62-6.025(7)(a) F.A.C.
Singulair	Singulair 960 w/ Biokinetics phase 1 w/ recirc	16 N-tests at NSF-testing facility (Chelsea, MI)	25	6.8	73%	Norweco, Inc.	n/a
Singulair	Singulair 960 w/ Biokinetics phase 2 no recirc	8 N-tests at NSF-testing facility (Chelsea, MI)	25	11.8	53%	Norweco, Inc.	n/a
Singulair	Singulair R3-500	NSF 245/350, Norwalk OH (February 2017 – August 2017)	42.1	14.4	65.7%	Norweco, Inc.	62-6.025(7)(a) F.A.C.
Singulair	Singulair TNT-500	NSF 245, Waco TX June 2005 – January 2006	38	12	68%	Norweco, Inc	62-6.025(7)(a) F.A.C.
Septitech	Septitech Model 400	ETV (MA)	39	14	64%	Bio-Microbics	Yes[1]

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