

Supporting Information

Full-scale assessment of ultrasonic sewage sludge pre-treatment using a novel double-tube reactor

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Table S1: Selected characteristics of the 17 wastewater treatment plants examined.

	Design capacity [PE]	Daily PS production [m ³ /d]	Daily WAS production [m ³ /d]	TS of PS [% of FM]	VS of PS [% of TS]	TS of WAS [% of FM]	VS of WAS [% of TS]	Digester volume [m ³]	Digester temperature [°C]	HRT [d]	Share of WAS relative to RS [% of VS _{sed}]
Average	154,800	164	91	4.1	81	6.4	73	8,100	38	33	43
Median	100,000	108	59	3.9	80	6.7	73	5,000	38	32	43
WWTP #1 (Starnberg)	100,000	89	31	3.8	86	6.3	74	5,000 (2·2,500)	37	42	33
WWTP #2	600,000	800	380	3.5	83	4.2	81	27,000 (3·9,000)	39	22	36
WWTP #3	75,000	100	n.a.	4.5	75	n.a.	n.a.	4,680 (2·2,340)	38	25	n.a.
WWTP #4	65,000	40	24	4.0	n.a.	6.7	n.a.	1,400 (2·700)	36	22	n.a.
WWTP #5	175,000	115	75	4.9	82	7.7	78	8,250 (2·4,125)	38	40	49
WWTP #6	110,000	85	40	5.0	80	4.7	70	3,600 (3·1,200)	38	30	28
WWTP #7	100,000	90	38	4.5	n.a.	7.7	n.a.	3,600 (2·1,800)	37	30	n.a.
WWTP #8	220,000	286	197	3.5	80	4.3	70	14,250 (3·4,750)	37	32	43
WWTP #9	51,000	78	34	3.0	87	6.1	67	3,100 (2,350 + 750)	40	24	41
WWTP #10	110,000	n.a.	100	n.a.	n.a.	7.0	75	4,950	38	35	n.a.
WWTP #11	230,000	142	40	4.5	69	6.9	71	8,500 (2·4,250)	40	40	31
WWTP #12	400,000	205	160	6.3	79	8.1	69	18,000 (3·6,000)	38	30	47
WWTP #13	192,000	154	96	3.8	79	5.0	76	11,200 (3·1,800 + 2·2,900)	40	48	44
WWTP #14	68,000	30	43	2.6	81	7.1	73	5,000 (2·2,500)	38	30	78
WWTP #15	75,000	180	100	5.5	90	6.8	72	8,000 (2·2,000 + 4,000)	39	38	35
WWTP #16	41,747	57	20	3.1	78	7.5	76	2,800 (2·1,400)	37	36	45
WWTP #17	18,490	180	80	2.5	81	6.0	70	8,000 (2·4,000)	39	32	48

WWTP = Wastewater treatment plant, PE = Population equivalents, PS = Primary sludge, WAS = Waste activated sludge, TS = Total solids, FM = Fresh matter, VS = Volatile solids, HRT = Hydraulic retention time, RS = Raw sludge.

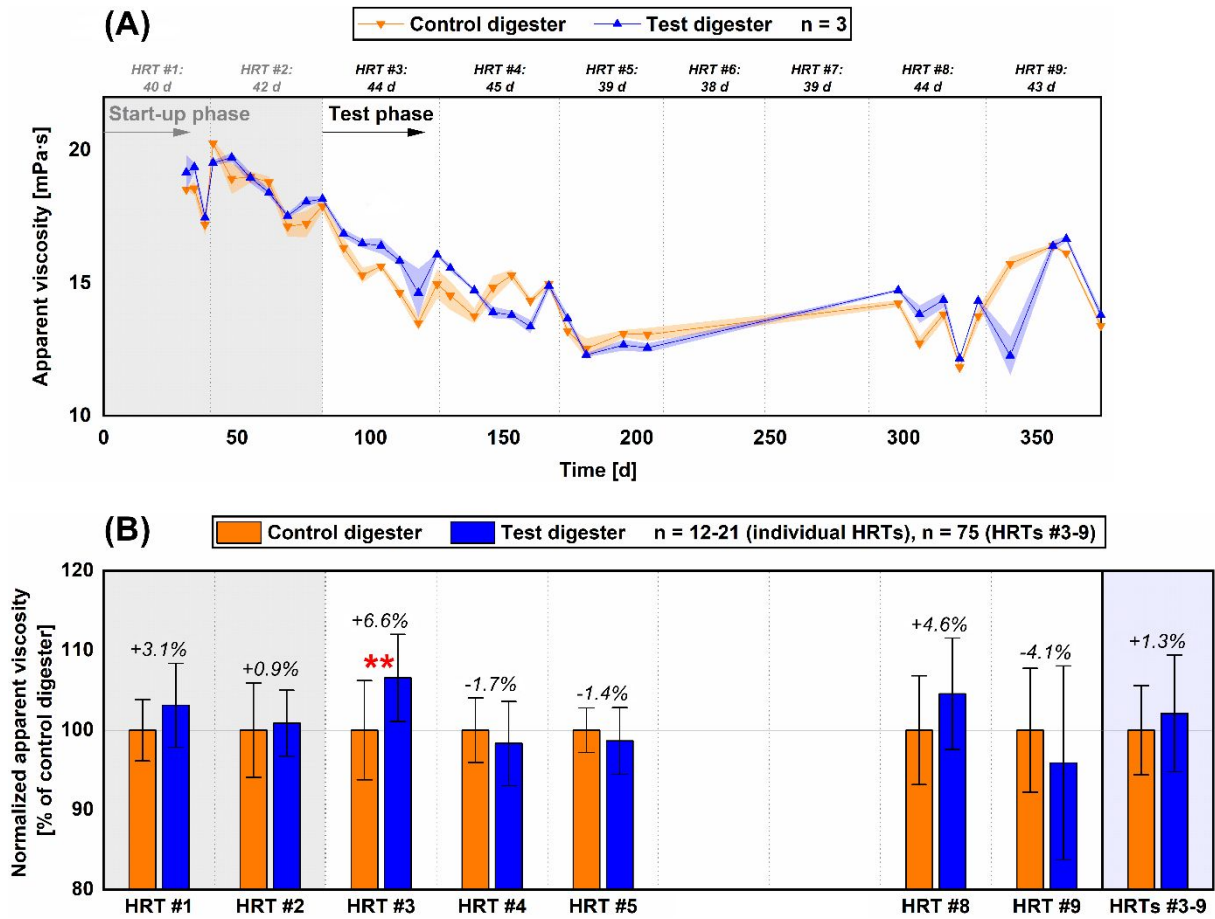


Figure S1: Development of apparent viscosity of digested sludge from the control and the test digester at a shear rate of 644 1/s (A) and normalized apparent viscosity relative to the control digester (B). Highly significant differences between two data sets are denoted with two asterisks. Error bands and error bars denote the standard deviation of the mean.