

Supplementary material

Table S1. Characteristics, sampling points and general results from different studies

WWTP characteristics				Sampling points		General outcome			Ref
Location	Sites	Population Served	Average Inflow per day m3	Wastewater Samples	Sludge/Solid Samples	Polymers	Shape	Removal efficiency (%)	
Turkey	3	120,000 - 1 million	12,000-150,000	RWW, EFF-F	-	PE, PP	Fibres	20-87	Akarsu et al. 2019
Iran	1	105,800	-	EFF-Grit Chamber, EFF-PST, EFF-Clarifier unit (final)	-	PES, PE	Fibres	96.7	Alavian Petroody et al. 2020
China	1	1 million	109, 475	RWW, EFF-CSC, EFF- FSC, INF-SST, EFF-SST, EFF-UV disinfection, EFF-F	Return sludge, dry sludge	PET, PP, PVC, nylon, PE	Fibres	94.09	Bao et al. 2022
Scotland	1	184,000	-	RWW, EFF- CSC, EFF-PST (x2), EFF-SST (x2), EFF-SST mixed liquor, EFF-Nitrification tanks	-	PP	Fibres	96	Blair et al., 2019
U.S.A	3	32,000 - 180,000	11,400-83,300	RWW, EFF-F	-	-	Fibres	78 - 98	Conley et al. 2019
U.S.A	1	680,000	227,000	EFF-S (post disinfection)	-	Great specific variety of polymers*	Fragments	-	Dyachenko et al., 2017
Turkey	2	1.5 million	88,000-183,000	EFF-Grit chamber, EFF-SST (final)	-	PES	Fibres	73-79	Gündoğdu et al. 2018

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South Korea	3	-	20,840-469,249	RWW, EFF-PST, EFF-SST, EFF-coagulation, EFF-O3 (final), EFF-membrane disc filter (final), EFF-rapid sand filtration (final).	-	-	Microbeads	98.9-99.2	Hidayaturrahman & Lee, 2019
Thailand	3	580,000-520,000-51,000	200,000-160,000-24,000	RWW, EFF-Grit chamber, in aeration basin, EFF-Aeration basin (final), EFF-SST (final)	Secondary sedimentation	PES, Polyacrylate, PE	Fibres	84%	Hongprasith et al. 2020
China	48	-	500,000-2,000	RWW, EFF-F (A2O, MBR, CAS)	-	-	Fibres, flakes, beads	86.6	Hu et al. 2022
China	5	2.47 million	170,000-160,000-140,000-100,000-80,000	EFF-F	-	Rayon, PET, Chlorinated polyethylene	Fibres	-	Jiang et al. 2022
South Korea	3	67,700 - 245,200	35,000-130,000	RWW, in UV disinfection tank, EFF-UV disinfection (final)	Final sewage sludge	Tyre particles	Fibres, fragments	98	Lee & Kim, 2018
Wales	1	300,000	-	EFF-FSC, EFF-PST	Settled sludge, surface FOG	-	-	100	Lofty et al. 2022

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China	1		120,000	RWW, in air chamber, in rotary grit chambers, in oxidation ditch tanks, in SST, in A2O tanks, in MBR tank, EFF-UV disinfection	SS-S, membrane tank	PET, PS, PE, PP	Fragments	82	Lv et al. 2019
Spain	1	850,000	8,000	EFF- CSC/FSC, EFF-SST, EFF-rapid sand filtration and UV disinfection	Dehydrated sludge	PP, PET, PE, PS, PVC	Fibres	92.9	Menendez-Manjon et al. 2022
U.S.A	2	-	2,498,371-1,703	RWW, EFF-screen and grit removal, EFF-Primary clarifier, EFF-secondary clarifier (trickling filter), EFF-CAS, EFF-filter and chlorination tank (final)	-	-	Fibres	93.8-99.4	Michielssen et al., 2016
Sweden	1	790,000	369,000	EFF-CSC, EFF-disc filters (final)	Coarse and fine screens, digested sludge	PE, PP, PES	-	99.6	Rasmussen et al. 2021
Germany	2	820,000-340,000	270,000-260,000	EFF-Tertiary (not specified)	-	PE, PP, PET, PS, PUR/PMMA	Fragments, fibres	-	Roscher et al.

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Thailand	2	-	-	RWW, EFF- CSC, EFF-grit chamber/ FSC, EFF- grit channels, EFF-aeration tanks, EFF-post aeration, EFF-SST (final), EFF-UF (final)	Sewage sludge	PET, PE	Fibres	78.73-96.97	Tadsuwan & Babel 2022
Vietnam	3	-	720 - 2,000 - 5,000	RWW, EFF-F	-	PE, PET, Nylon, PVC	Fibres	21.8 - 25.5	Van do et al. 2022
Germany	1	98,500	10,000	EFF-SST	-	PET, PP, PE, PS	-	-	Wolff et al. 2018
China	1	2.4 million	1 million	EFF- CSC/FSC, EFF-PST, EFF-SST, EFF-denitrification/ UF/O3/ UV disinfection	-	PET, PES, phenol-Formaldehyde resin	Fibres	95.16	Yang et al., 2019
India	1	8, 600	-	EFF-CSC/FSC, EFF-aeration tank, EFF-F	-	PET, PVC, Polytetrafluoroethylene, PS	-	-	Yuvehda et al. 2019

Sampling points: A2O: Anaerobic-Anoxic-Aerobic treatment; CAS: Conventional Activated Sludge Process; CSC: coarse screen; EFF: effluent; EFF-F Final Effluent; FOG: Fats, Oil and Grease; FSC: fine screen; INF: influent; MBR: Membrane Biological Reactor; O3: ozone; PST: primary settlement tank; RWW: raw/crude/incoming wastewater; SST: secondary settlement tank; UF: ultrafiltration – Polymers: PE: Polyethylene; PES: Polyester; PET: Polyethylene Terephthalate; PMMA: Polymethyl Methacrylate; PP: Polypropylene; PS: Polystyrene; PUR: Polyurethane; PVC: Polyvinyl Chloride