(2) The Schulze equation can be used to size rock filters with the following modifications to the k values

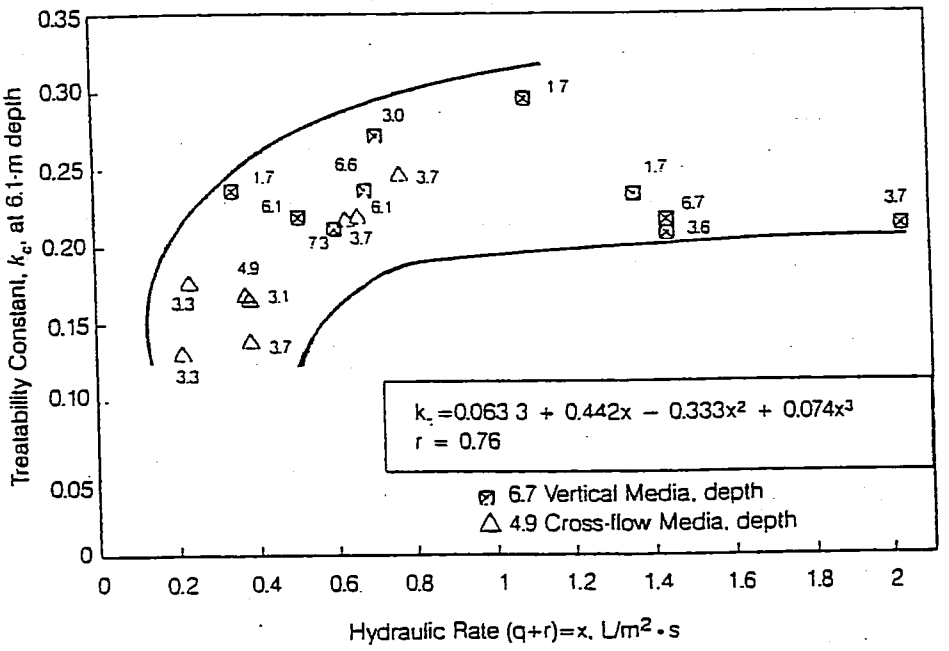
recycle = 2 × infl. Q

rock TFs

BOD5 loading, lb/d/1000 cu ft[a]	Hydraulic rate, gpm/sq ft[b]	NRC removals (E), %			Calculated k values,[c] (gpm)$^{0.5}$/sq ft		
		R = 0	R = 1	R = 2	R = 0	R = 1	R = 2
15.6	0.064 7	81.9	85.3	86.7	0.072	0.081	0.086
31.2	0.129	76.2	80.5	82.2	0.086	0.098	0.103
46.7	0.194	72.3	77.1	79.1	0.094	0.108	0.115
62.3	0.259	69.4	74.4	76.6	0.100	0.116	0.127
93.5	0.388	64.9	70.4	72.7	0.109	0.126	0.135
124.6	0.518	61.6	67.3	69.8	0.115	0.134	0.144

[a] lb/d/1000 cu ft × 1.602 = kg/100 m^3·d.
[b] gpm/sq ft × 2.44 = m^3/m^2·h.
[c] D = 1.83 m (6 ft), L_o = 120 mg BOD_5/L, n = 0.5.

plastic



Type of waste/location	Flow, gpm/sq ft[a] Feed	Recycle	Depth, ft[b]	BOD_5 load, lb/d/1000 cu ft[c]	BOD_5, mg/L	BOD_{5R}, %	Average temperature, °C	Actual k_{20}, $gpm^{0.5}$/sq ft^d	Normal k_{20}, $gpm^{0.5}$/sq $ft^{d,e}$
Kraft mill, Ala.	0.57	0.71	21.5	51	160	76.2	37	0.028	0.030
	1.50	0.71	21.5	134	160	72.4	38	0.039	0.042
	2.00	2.00	21.5	179	160	64.6	38	0.037	0.039
	3.70	1.29	21.5	331	160	59.5	41	0.039	0.042
Cereal (dry mill), Ill.	0.29	0.71	21.5	155	956	75.2	32	0.023	0.060
	0.43	0.71	21.5	230	956	69.9	32	0.024	0.063
Meat packing (anaerobic pond effluent), N.C.	0.43	2.00	21.5	27	114	61.0	30	0.020	0.018
	3.00	2.00	21.5	204	122	41.0	30	0.030	0.028
Meat packing, N.C.	2.00	2.00	21.5	2089	1870	63.0	38	0.035	0.129
	6.43	0.00	21.5	5291	1473	42.0	38	0.035	0.112
Domestic, high industry, N.Y.	1.00	1.00	21.5	274	490	57.0	18	0.042	0.079
	2.00	2.00	21.5	547	490	39.0	18	0.035	0.065
Wet corn milling, Ind.	1.00	0.57	21.5	232	415	40.0	20	0.024	0.041
Synthetic dairy, Mich.	0.15	1.37	21.5	16	191	95.0	20	0.054	0.063
Synthetic dairy, Calif.	0.11	0.22	7.2	39	215	72.0	20	0.059	0.042
Tannery (pigskin), Mich.	0.29	1.00	21.5	118	727	84.0	33	0.029	0.067
Domestic, Ohio	1.10	1.80	9.0	364	248	47.0	21	0.071	0.062
Meat packing, Iowa	0.46	0.74	31.5	289	1645	69.0	32	0.017	0.069
	1.00	1.50	31.5	448	1175	67.0	32	0.023	0.082
	1.31	1.00	31.5	1144	2290	49.0	32	0.016	0.079
Frozen foods, Va.	0.60	0.00	21.5	488	1456	52.0	20	0.026	0.085
	0.65	0.00	21.5	453	1248	50.0	20	0.026	0.078
Pharmaceutical, Pa.	1.41	1.88	16.2	398	381	48.0	15	0.057	0.820
Fruit canning, Calif.	1.00	1.50	21.5	398	712	49.0	20	0.031	0.071
	2.00	1.00	21.5	1103	987	30.0	20	0.023	0.062
Sugar processing, Calif.	1.00	0.00	21.5	274	491	50.0	20	0.032	0.060
	2.50	0.00	21.5	666	477	36.0	20	0.033	0.061
Domestic, Mich.	0.50	1.50	21.5	49	175	86.0	17	0.072	0.080
	1.00	2.00	21.5	93	167	77.0	17	0.076	0.083
	2.00	0.00	21.5	162	145	71.0	17	0.090	0.092
	0.50	0.00	5.5	115	105	67.0	17	0.158	0.069
Domestic, Fla.	1.00	0.00	21.5	41	73	73.0	24	0.053	0.038
	2.00	0.00	21.5	79	71	62.0	24	0.055	0.040
	3.00	0.00	21.5	116	69	65.0	24	0.074	0.052
	4.00	0.00	21.5	179	80	54.0	24	0.063	0.048
Domestic light industry, Ga.	2.00	1.00	21.5	258	231	75.0	24	0.079	0.102
	1.00	2.00	21.5	109	196	80.0	24	0.065	0.077
Refinery, Calif.	2.00	0.00	21.5	80	72	60.0	40	0.030	0.022
	1.50	0.50	21.5	78	93	54.0	36	0.026	0.021
Potato processing, Idaho	0.72	2.00	21.5	861	2140	59.0	20	0.035	0.138
Textile mill, Va.	0.86	0.47	21.5	94	196	78.0	42	0.031	0.036
	1.50	0.71	21.5	195	233	76.0	42	0.038	0.049

[a] gpm/sq ft × 2.44 = $m^3/m^2 \cdot d$.

[b] ft × 0.304 8 = m.

[c] lb/d/1000 cu ft × 1.602 = kg/100 $m^3 \cdot d$.

[d] Corrected for temperature: $k_{20} = \dfrac{\ln\left(\frac{L_n}{L_e}\right)(q)^{0.5}}{(D)(1.035^{t-20})}$.

[e] Normalized to D = 6m (20 ft) and L_o = 150 mg/L: $k_{20} = \dfrac{\ln\left(\frac{L_o}{L_e}\right)(q)^{0.5}}{(D)(1.035^{t-20})}\left(\dfrac{D}{20}\right)^{0.5}\left(\dfrac{L_o}{150}\right)^{0.5}$.

'k' values