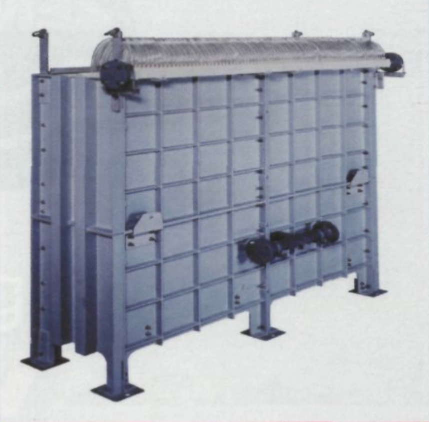
KUBOTA/SOLIS

Japanese Contribution to the Dutch wastewater treatment scene



Membrane unit of Kubota.

In 1989 the Japanese Government charged many of their large corporations, including Kubota, with investing time and money in new treatment technologies that had a low footprint and produced a high quality final effluent with re-use capabilities. This initiative resulted in the Kubota flat sheet submerged membrane bioreactor process. A number of membrane systems have been developed for effluent treatment, however, few of these can treat the biological and solids loading of the effluent in one treatment stage. By combining the biological and physical separation stages, membrane bioreactors have proven to be more compact and offer a number of economic advantages when compared to conventional systems. Since 1990 the number of operational Kubota MBR plants have increased enormously to 636 world wide, with 21 being situated within Europe. Capacities of these references are in the range of 125 to 13.000 m^3/d.

Features of the system include clean effluent, offering the possibility of reuse, low amount of excess sludge, adequate response at varying organic and hydraulic loads, low of operations and maintenance requirements, small footprint, minimum smell and noise emissions, reduced susceptibility to fouling because of the high cross-flow velocity and low energy consumption.

The Kubota membrane bioreactor is essentially a high MLSS activated sludge process where the membrane treatment units are submerged within the activated sludge tank. Typically the activated sludge is maintained in the range 15.000 - 20.000 mg/l MLSS. The unit comprises two sections. The top contains 50 to 200 flat membranes slotted into a GRP housing allowing a gap of approximately seven mm between panels. The lower section of the unit contains a coarse bubble diffuser mounted within a simple matching housing. This housing supports the top section and channels the bubbles and activated sludge flow between the membrane plates in the upper section. The bubbles released by the lower diffuser section generate an 'airlift' or upward sludge cross flow over the membrane surface and as

Operational plants with Kubota submerged membrane in Europe

	place	customer	capacity kL/d	no of cartridges	year operation	remarks
1	England	N-company	80	200	1995	Pilot
2	England	Porlock Sewage plant	1.900	3.600	2/1997	Sewage treatment 4000PE
3	Germany	Malt plant	100	300	1998	Industrial
4	Germany	Erlangen Sewage plant		300	1998	Sewage treatment
5	Germany	Buechel Sewage plant	960	1.800	6/1999	Sewage treatment (Pilot)
6	Ireland	Avonmore company	7.100	11.100	8/1999	Industrial
7	England	Swanage sewage plant	13.000	19.800	1999	Sewage treatment (23000 PE)
8	Netherlands	Beverwijk sewage plant	240	300	5/2000	Sewage treatment (Pilot)
9	Ireland	Mallinckrodt plant	77	450	11/2000	Industrial
10	Holland	Nijhuls,Voss Logistios company		600	2000	Industrial
11	Germany	Biochemie company		900	2000	Industrial (Pilot)
12	England	South Wraxall Sewage plant	145	200	4/2001	Sewage treatment (Partial)
13	England	Daldowie supernatant plant	10.800	25.600	8/2001	Supernatant
14	Ireland	Minchmalt plant	1.720	2.700	6/2001	Industrial
15	Belgium	Diary plant		450	7/2001	Industrial
16	Netherlands	Tank cleaning waste plant		300	2001	Industrial
17	Netherlands	Fish processing plant		150	2001	Industrial
18	Netherlands	Various		900	2001	
19	England	South Wraxall Sewage plant	290	Total 400	4/2001	Sewage treatment (Final 300PE)
20	England	Minehead supernatant plant		600	2001	Supernatant
21	Northern Ireland	Moneyleagh sewage plant		1.200	2001	Sewage treatment