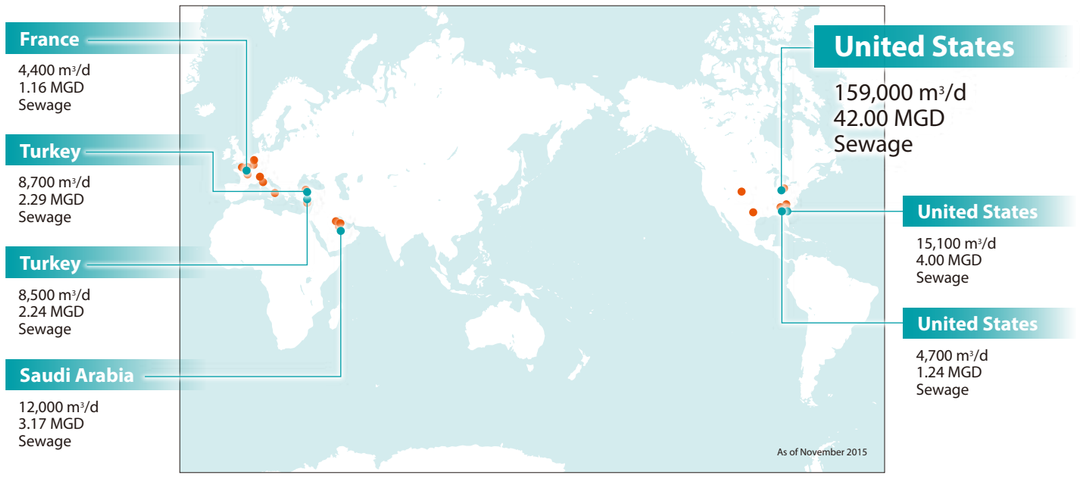
Unit Specification

The SP series has several unit types with different unit heights which can meet a **wide range of water depth requirements for retrofit projects**.

Unit Type	Total Membrane Area	Dimensions			Weight (Dry)	Required Min. Water Depth*
		Height	Width	Length		
SP200	200 m^2 / 2,153 ft^2	1,877 mm / 6.2 ft	944 mm / 3.1 ft	2,186 mm / 7.2 ft	567 kg / 1,250 lbs	2.3 m / 7.55 ft
SP300	300 m^2 / 3,229 ft^2	2,401 mm / 7.9 ft	944 mm / 3.1 ft	2,186 mm / 7.2 ft	747 kg/ 1,646 lbs	2.8 m / 9.19 ft
SP400	400 m^2 / 4,306 ft^2	2,923 mm / 9.6 ft	944 mm / 3.1 ft	2,186 mm / 7.2 ft	927 kg / 2,043 lbs	3.3 m / 10.83 ft
SP600	600 m^2 / 6,458 ft^2	4,213 mm / 13.9 ft	944 mm / 3.1 ft	2,186 mm / 7.2 ft	1,421 kg / 3,132 lbs	4.6 m / 15.10 ft

* Extra water depth will be needed for gravity filtration.

KUBOTA SP Series References



KUBOTA SMU models shown in this brochure received image processing. KUBOTA SMU design and specifications are subject to change without notice.
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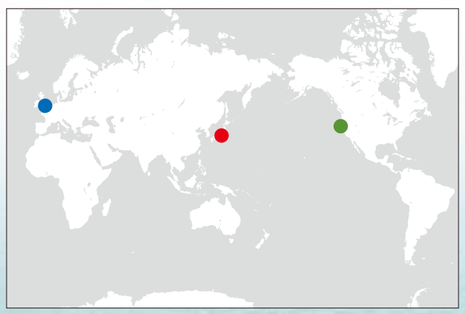

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For Earth, For Life
Kubota

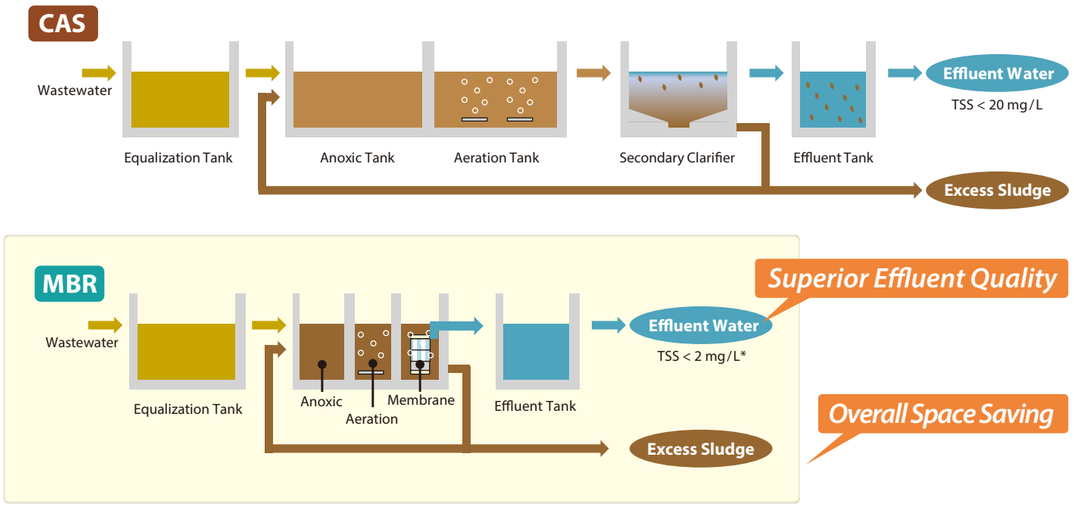
KUBOTA Submerged Membrane Unit®

SP Series

SP400 SP600

Membrane Bioreactor

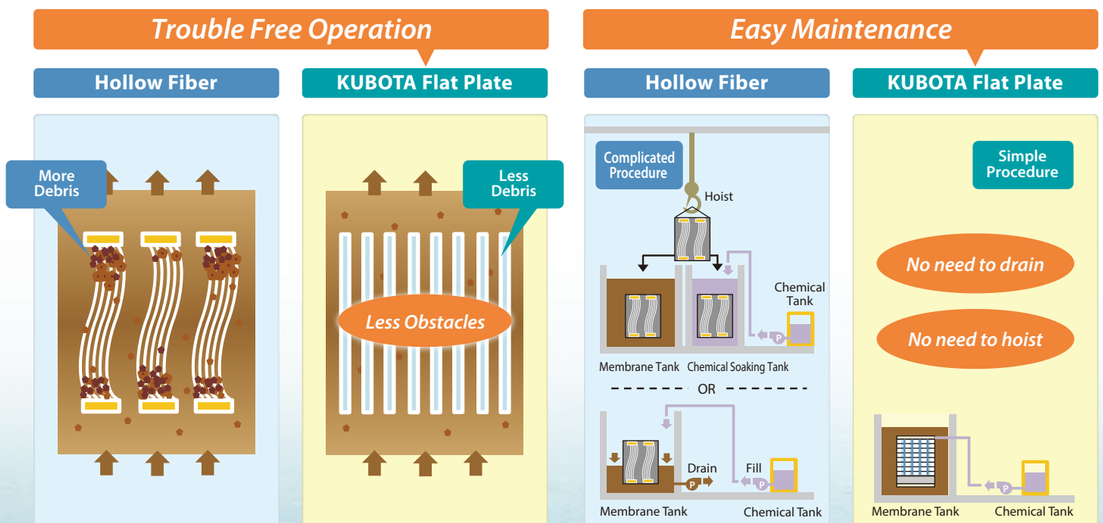
The Membrane Bioreactor (MBR) process is a proven wastewater treatment method which combines a biological treatment process and a membrane filtration process for final solid-liquid separation. The MBR perfectly eliminates the secondary clarifier and carry-over of the activated sludge. Therefore, the concentration of the activated sludge becomes higher and process tank volume becomes smaller compared to Conventional Activated Sludge (CAS) process.



* TSS < 2 mg/L is typical achievable values, not guaranteed values.

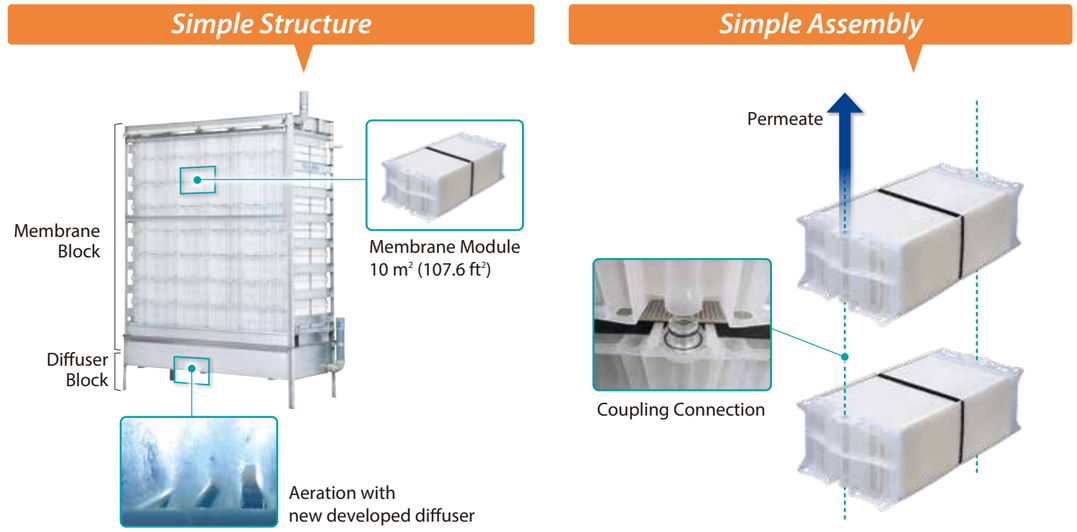
KUBOTA Submerged Membrane Unit®

The KUBOTA Submerged Membrane Unit® (SMU) is membrane equipment dedicated for the MBR process. The SMU can be directly submerged in activated sludge and allows only clean treated water to pass through its "**Flat Plate**" type membrane. The membrane sheet is made of chlorinated polyethylene with maximum (nominal) pore size of 0.4 µm (average: 0.2 µm) which blocks most microorganisms in the activated sludge.
The "Flat Plate" configuration keeps the space between membranes clear and minimizes debris accumulation. ***In-situ*** chemical cleaning is the only maintenance typically required.



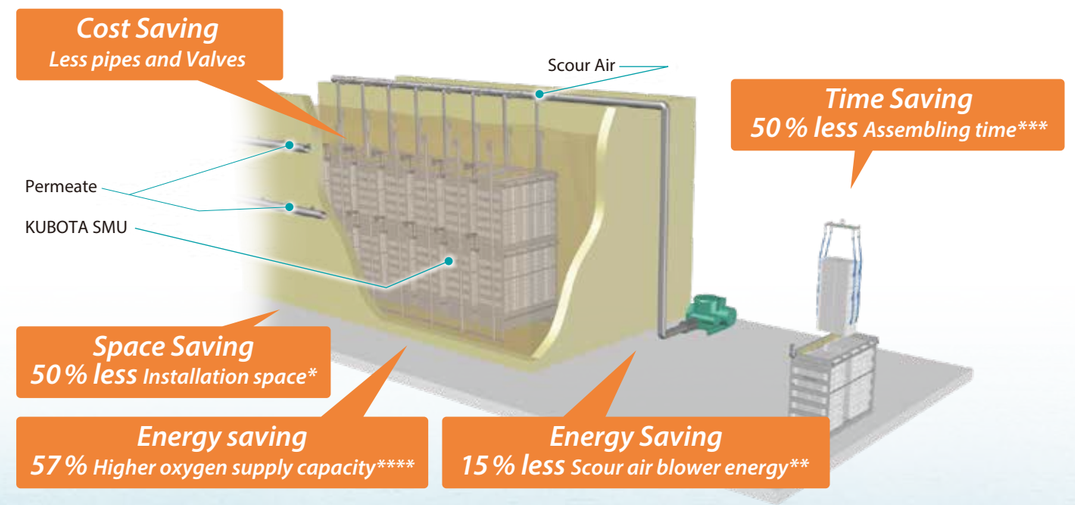
Structure of KUBOTA SP Series

The KUBOTA SP series is made up of SMU models optimized especially for **medium to large scale wastewater treatment applications**. Forty (40) flat membrane plates having 10 m^2 of membrane area and permeate collection chambers are integrated into a compact "**Membrane Module**". This design improves packing density and reduces scour air requirements. Multiple Membrane Modules are assembled into a Membrane Block using simple coupling connections. The coupling connection also serves as a conduit to the permeate header. This structure simplifies the assembling procedure of the SMU during field maintenance work. Moreover, a newly developed diffuser contributes not only to simplification of the air piping system but also to improvement of oxygen transfer efficiency.



Advantages of KUBOTA SP Series

Based on its unique structure, the SP series reduces **required space**, **required scour air**, and **required assembling time during maintenance work**; all of which are important considerations for medium to large scale projects.



* Comparing SP600 to RW400 in terms to membrane area per required tank space for installation [m^2/m^3].
** Comparing SP600 to RW400 in terms to required scour air blower energy consumption per membrane area [kWh/m^2].
*** Comparing SP600 to RW400 in terms to assembling time per membrane area [min/m^2].
**** Comparing SP600 to RW400 in terms to oxygen transfer efficiency per membrane unit [%].