**KUBOTA Submerged Membrane Unit®**

**SP Series**

**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.

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Total Membrane Area</th>
<th>Dimensions</th>
<th>Weight (Dry)</th>
<th>Required Min. Water Depth*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Height</td>
<td>Width</td>
<td></td>
</tr>
<tr>
<td>SP200</td>
<td>200 m² / 2,153 ft²</td>
<td>1,877 mm / 6.2 ft</td>
<td>944 mm / 3.1 ft</td>
<td>567 kg / 1,250 lbs</td>
</tr>
<tr>
<td>SP300</td>
<td>300 m² / 3,229 ft²</td>
<td>2,401 mm / 7.9 ft</td>
<td>944 mm / 3.1 ft</td>
<td>747 kg / 1,646 lbs</td>
</tr>
<tr>
<td>SP400</td>
<td>400 m² / 4,306 ft²</td>
<td>2,923 mm / 9.6 ft</td>
<td>944 mm / 3.1 ft</td>
<td>927 kg / 2,043 lbs</td>
</tr>
<tr>
<td>SP600</td>
<td>600 m² / 6,458 ft²</td>
<td>4,213 mm / 13.9 ft</td>
<td>944 mm / 3.1 ft</td>
<td>1,421 kg / 3,132 lbs</td>
</tr>
</tbody>
</table>

*Extra water depth will be needed for gravity filtration.*

**KUBOTA SP Series References**

- **France**: 4,400 m³/d 1.16 MGD Sewage
- **Turkey**: 8,700 m³/d 2.29 MGD Sewage
- **Turkey**: 6,500 m³/d 1.74 MGD Sewage
- **Saudi Arabia**: 12,000 m³/d 3.17 MGD Sewage

**United States**

- **159,000 m³/d 42.0 MGD Sewage
- **15,100 m³/d 4.00 MGD Sewage
- **4,700 m³/d 1.24 MGD Sewage**

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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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.

**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 m² 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.

- **Cost Saving**
  - Less pipes and Valves

- **Time Saving**
  - 50% less Assembling time***

- **Space Saving**
  - 50% less Installation space*

- **Energy Saving**
  - 57% Higher oxygen supply capacity****
  - 15% less Scour air blower energy**

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* 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.

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**Membrane Bioreactor**

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