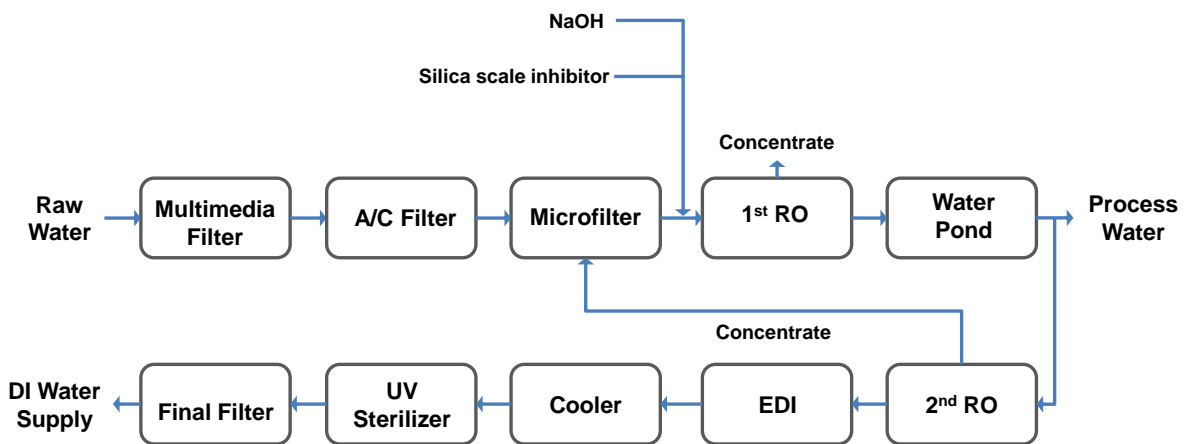


**Fig. S1.** Scheme of adsorbent media filtration for the silica removal prior to RO.



**Fig. S2.** Schematic drawing of DI water system in electronic fabrication plant located in Philippine. The 1<sup>st</sup> RO block supplies process water such as cooling tower. The 2<sup>nd</sup> RO produced DI water for manufacturing of electronic device.

**Table S1.** Ground Water Quality for DI Water System Design

Parameter	Minimum	Average	Maximum
pH as 25°C	6.8	7.1	7.8
Conductivity ( $\mu\text{S}/\text{cm}$ )	321.0	392.3	424.0
Total Dissolved Solids (mg/L)	186.0	201.5	214.0
Hardness (mg/L)	55.0	143.6	177.0
SiO <sub>2</sub> (mg/L)	55.9	88.4	110.0
Total Organic Carbon (mg/L)	0.8	1.9	3.0
Dissolved Oxygen (mg/L)	7.5	7.7	8.0
Turbidity (NTU)	0.2	1.1	2.0
Total Coliform Count (MPN/100mL)	<1.1	<1.1	<1.1

MPN : Most Probable Number

**Table S2.** Operation Data of Commercial HERO™ System Which Produced DI Water for the Use of Manufacturing Display Panel.

RO Stage	Recovery (%)	pH	Silica (mg/L)	
			Feed	Concentrate
1 <sup>st</sup>	59.5 - 61.1	10.8 - 11.1	1.6 - 2.0	3.8 - 5.3
2 <sup>nd</sup>	58.3- 59.6	11.1 - 11.5	3.8 - 5.3	12 - 14
3 <sup>rd</sup>	46.7- 48.1	11.4 - 11.8	12 - 14	23 - 24