

Caltech, Kohler & the Gates Foundation

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Reinvent the Toilet Challenge



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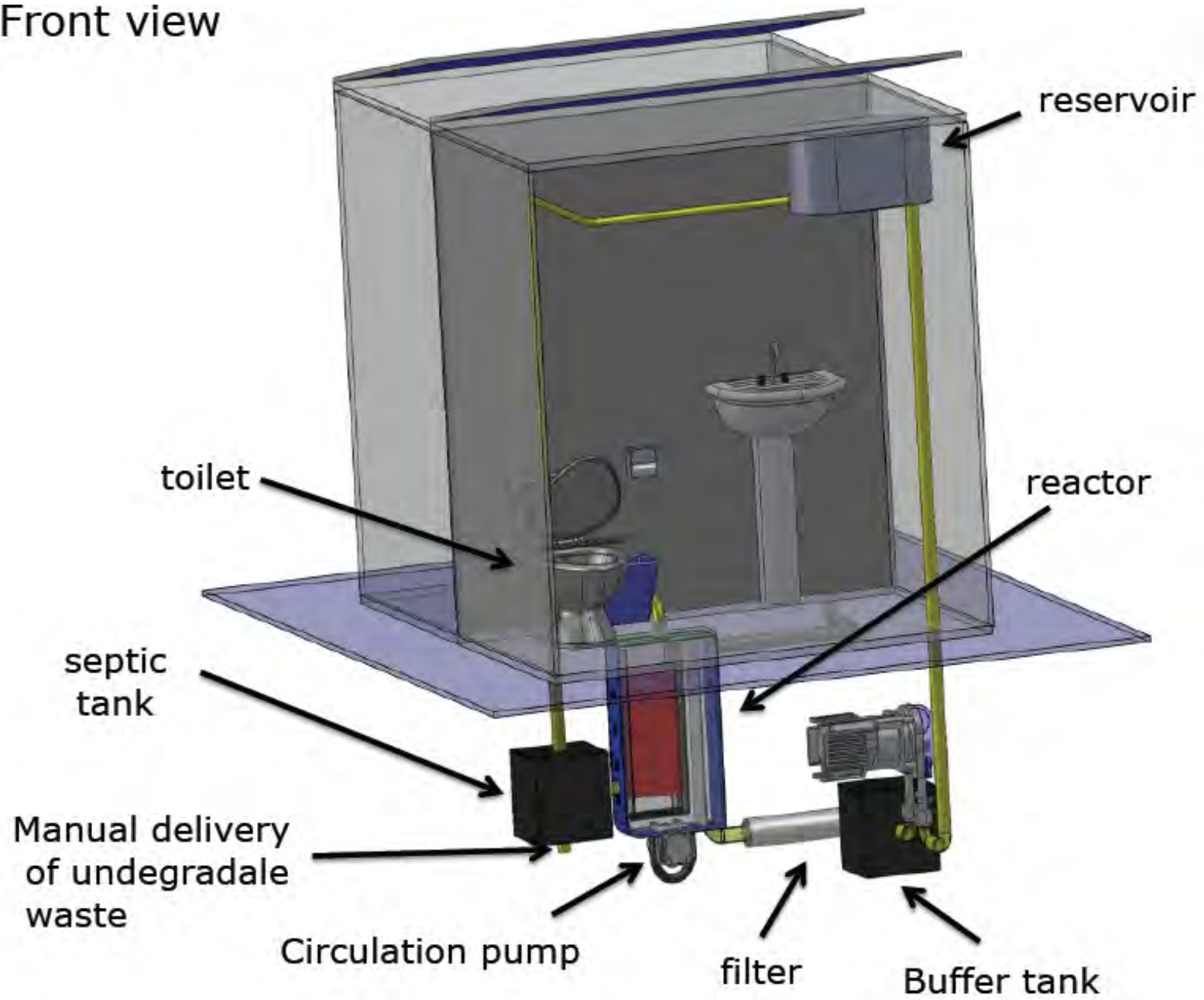








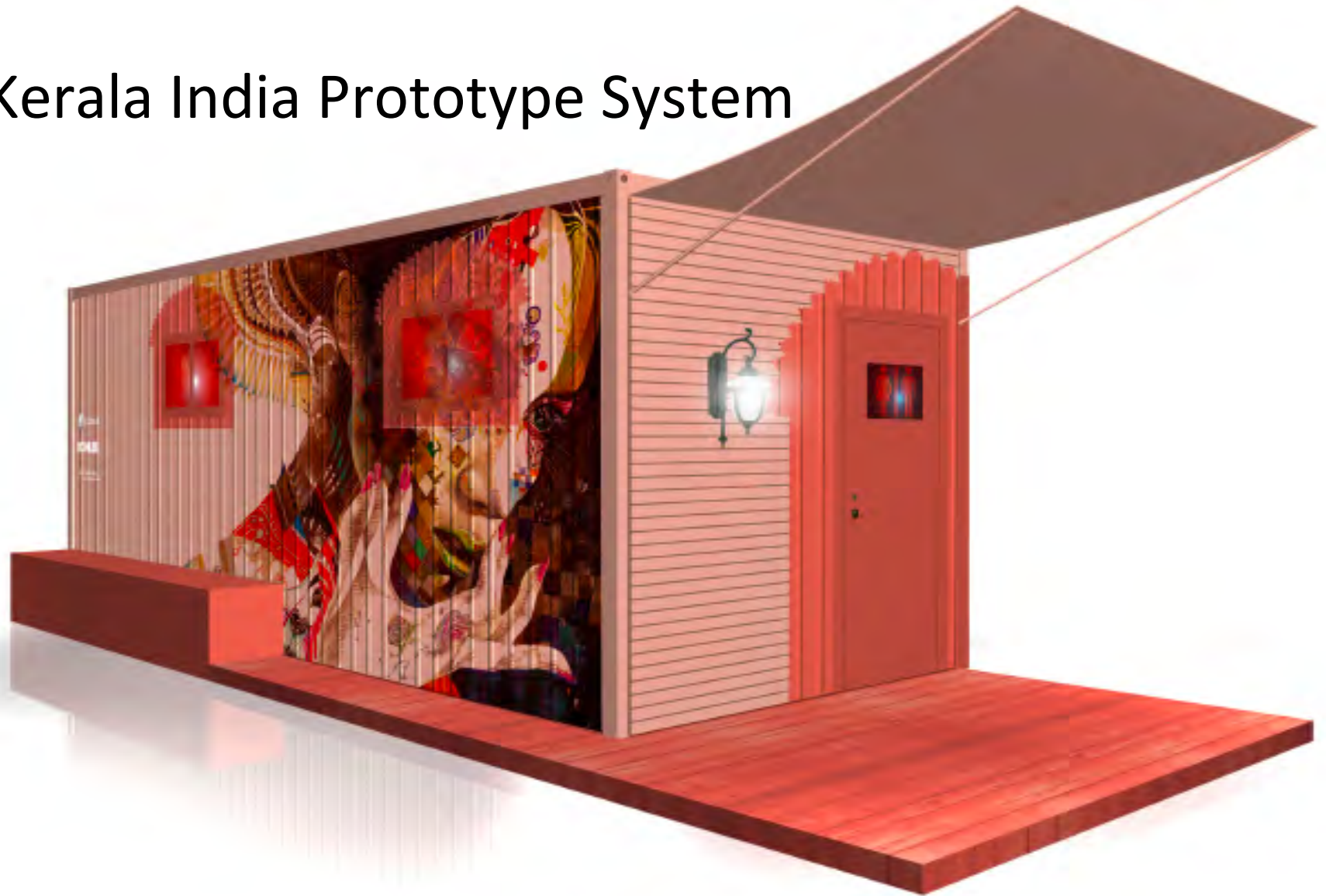
Front view







Kerala India Prototype System



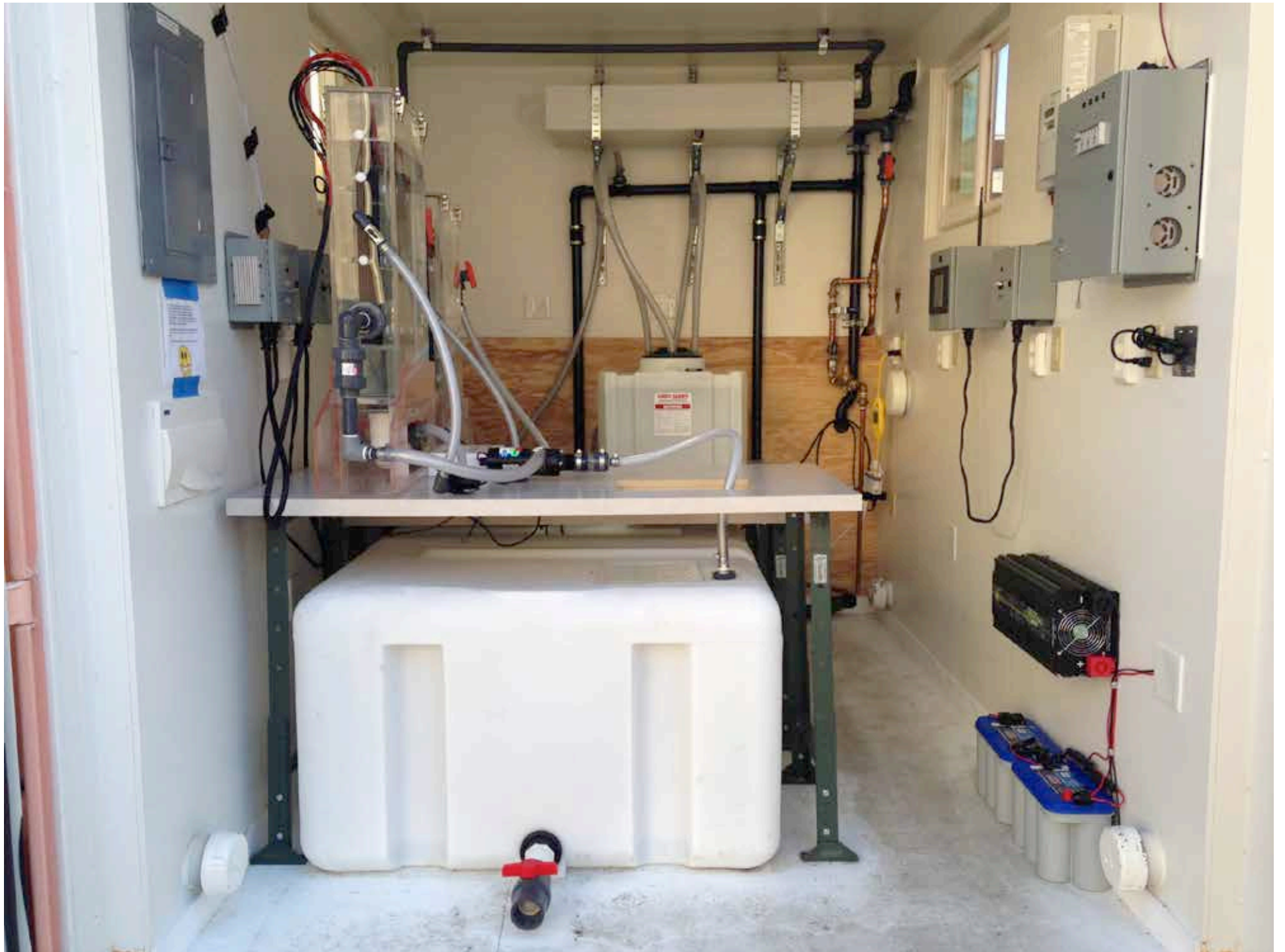
A Working Solar Toilet Facility
with Water Purification and Recycle











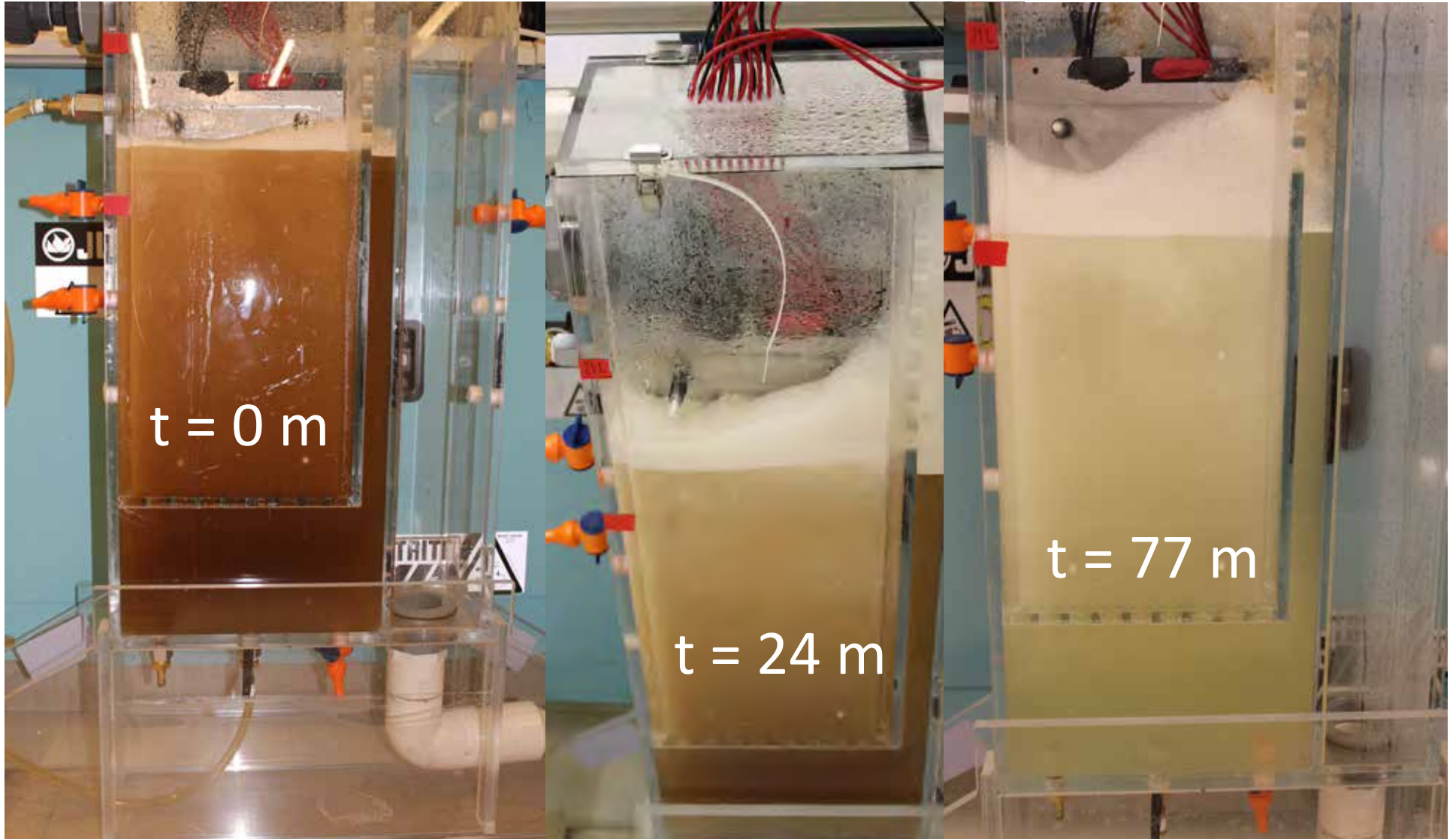


↑
L-tryptophan
on bottom

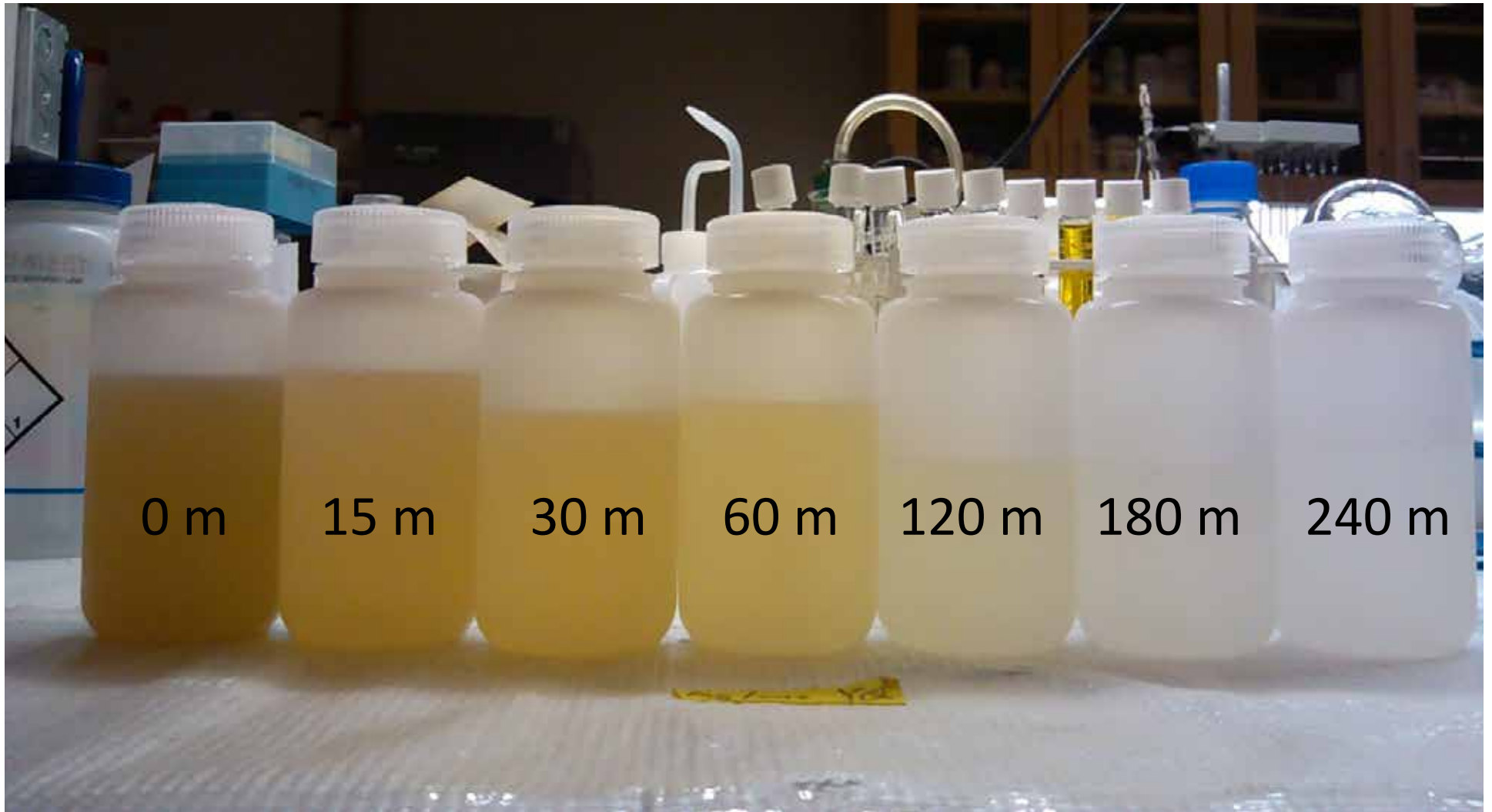
Processing Collected Wastewater after Sedimentation and Preliminary Digestion



Electrochemical Wastewater Treatment



Color Changes & Bacterial Disinfection



Electrochemical Disinfection: Total Coliforms vs. Time

0.01 mL, t = 0 min

0.1 mL, t = 30 min

0.1 mL, t = 60 min

0.1 mL, t = 100 min



0.1 mL, t = 120 min

1 mL, t = 180 min

1 mL, t = 240 min

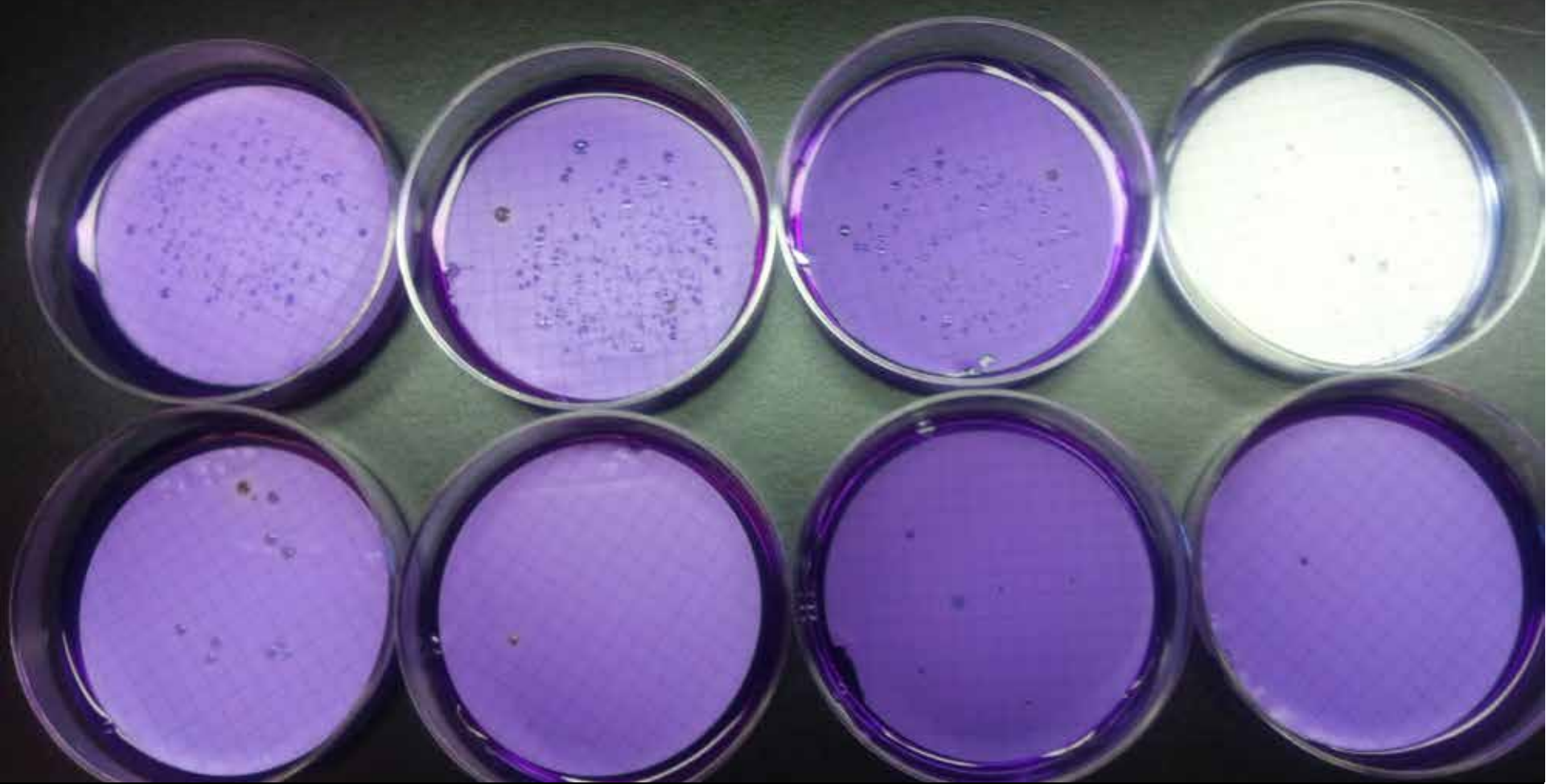
E. coli

0.01 mL, t = 0 min

0.1 mL, t = 15 min

0.1 mL, t = 30 min

0.1 mL, t = 60 min



0.1 mL, t = 100 min

0.1 mL, t = 120 min

1 mL, t = 180 min

1 mL, t = 240 min

Fecal Coliform Counts vs. Time

0.01 mL, t = 0 min 0.1 mL, t = 15 min 0.1 mL, t = 30 min 0.1 mL, t = 60 min

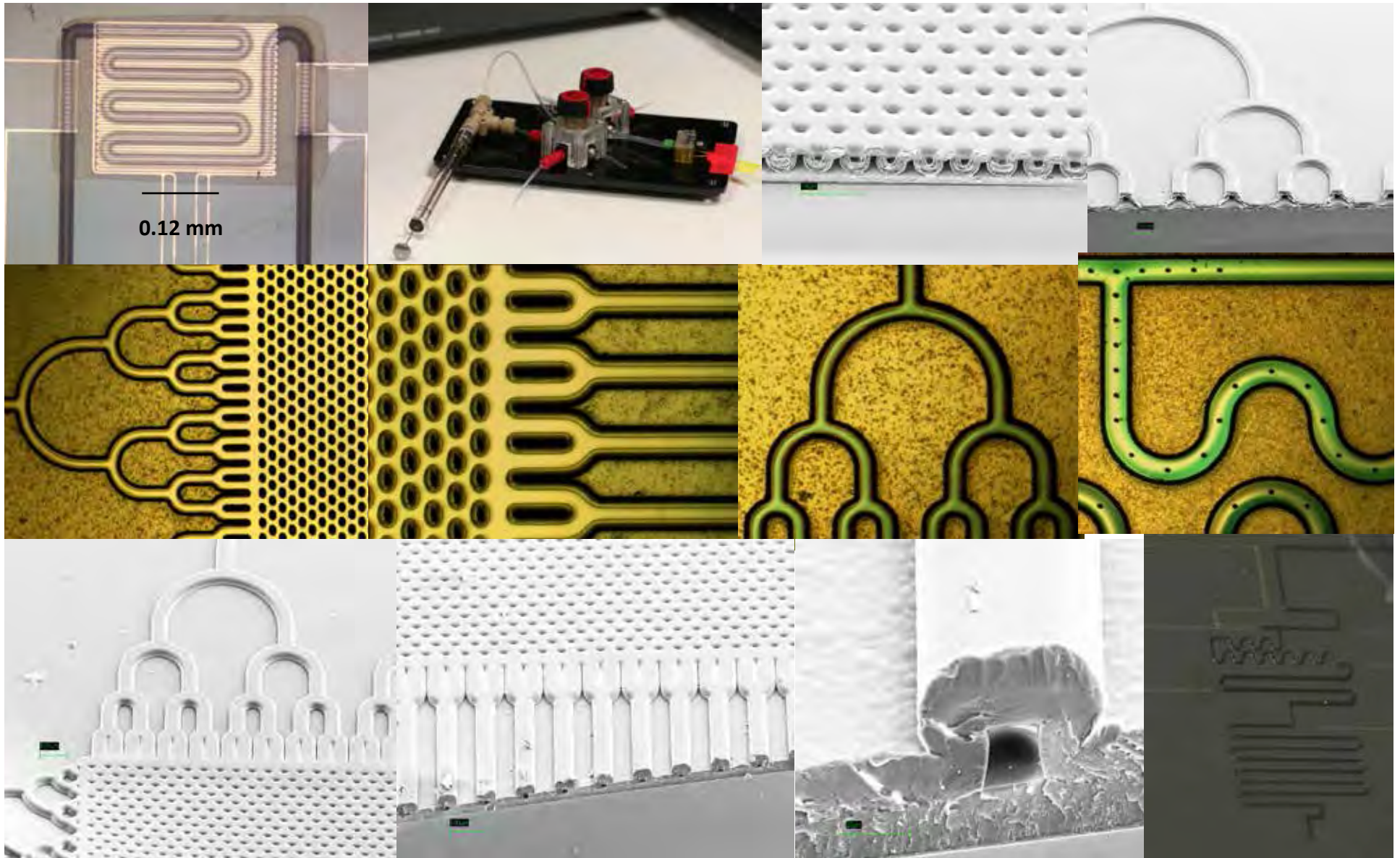


0.1 mL, t = 120
min

1 mL, t = 180 min

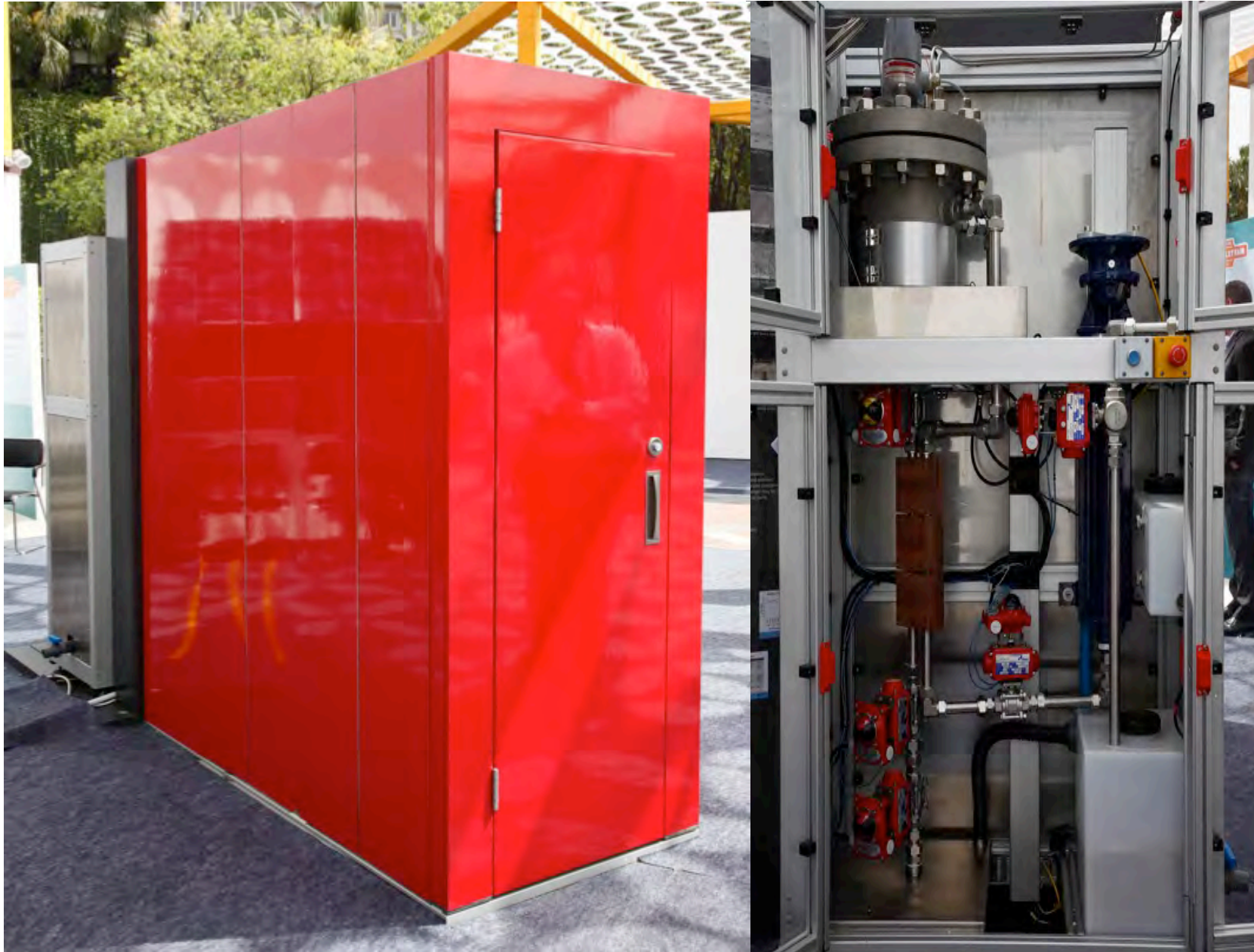
1 mL, t = 240 min

Microbe Detection and Quantification - Q-PCR Lab-on-a-Chip



P. Y. Satsanarukkit and M. R. Hoffmann , “Novel Parylene Fabrication Technologies For Microfluidics Systems With Reduced Mass, Volume, And Power Consumption”, *Transducers*, 2013.

Loughborough University – Toilet & Treatment System





 Blue
Diversion





SJU 100261 2261

SJU 100261 2261

SJU 100268 2261

SJU 100262 9 2261

SJU 100265 2261

MAX GROSS 9 000 KGS 19 840 LBS

MAX GROSS 9 000 KGS 19 840 LBS

TARE 2 640 KGS 5 820 LBS

MAX GROSS 9 000 KGS 19 840 LBS

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