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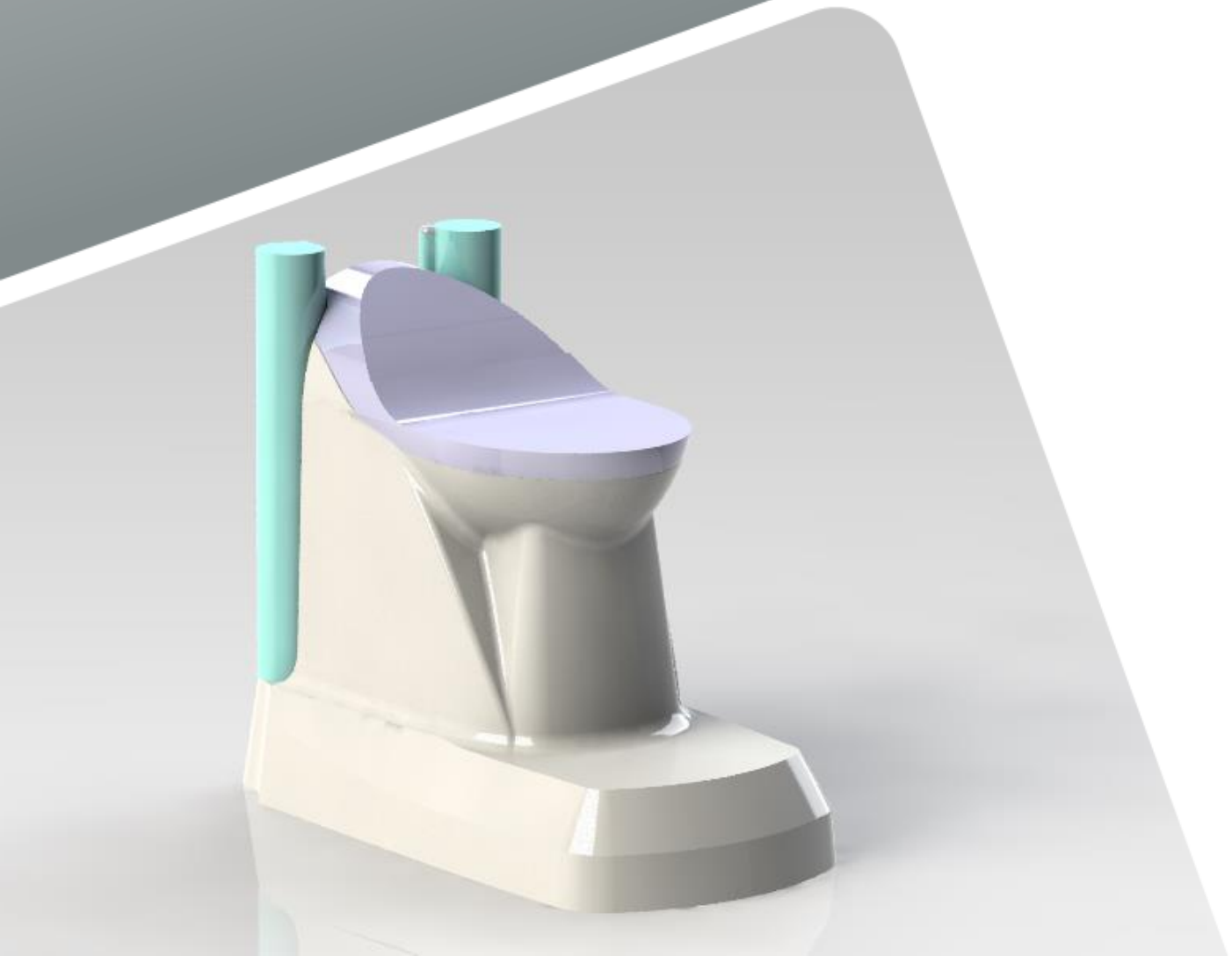
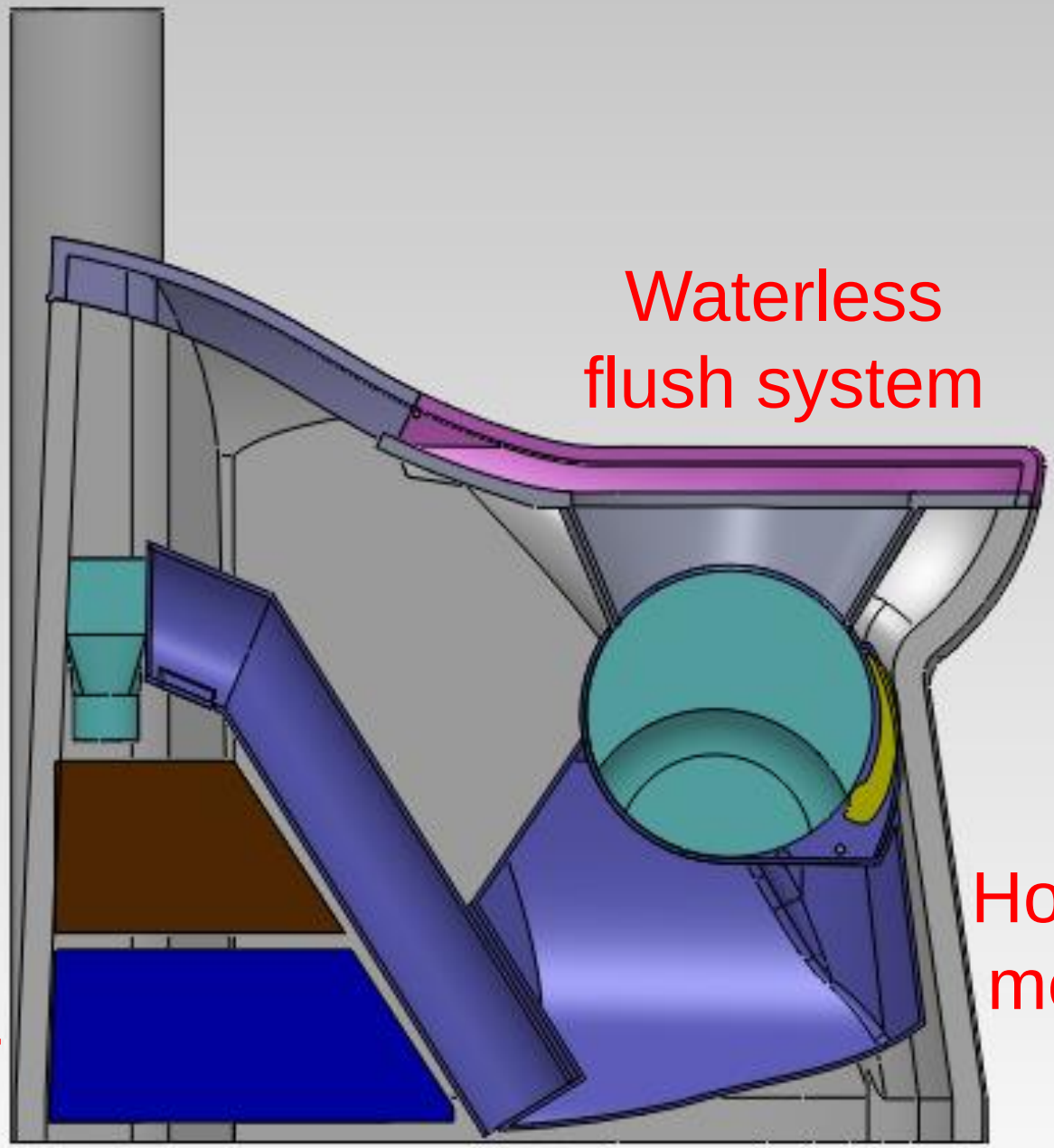
Reinventing the toilet



http://www.cranfield.ac.uk

Gates Foundation challenge

Condensing nanobeads



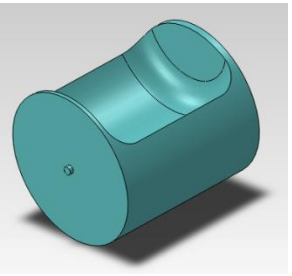
Waterless flush system

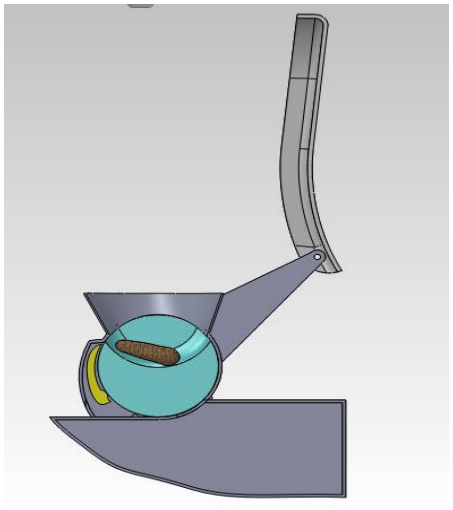
Nano-sprayer

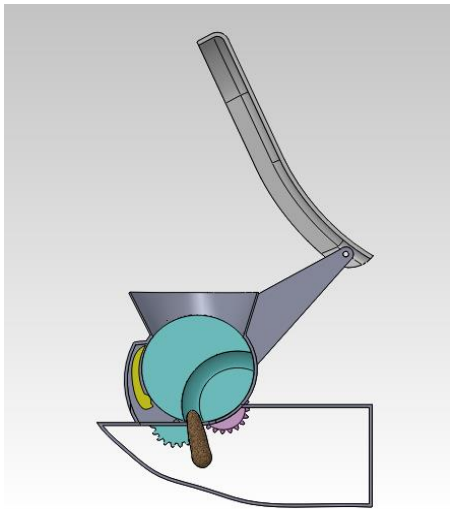
Pathogen free water

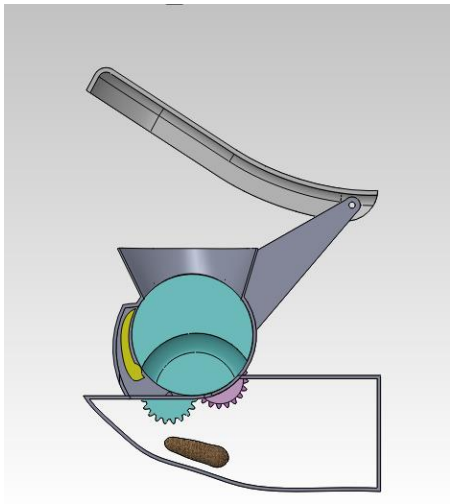
Hollow fibre membrane

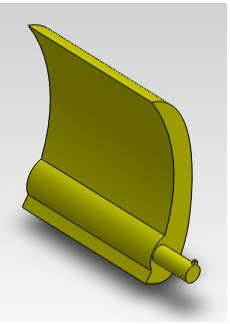
Action

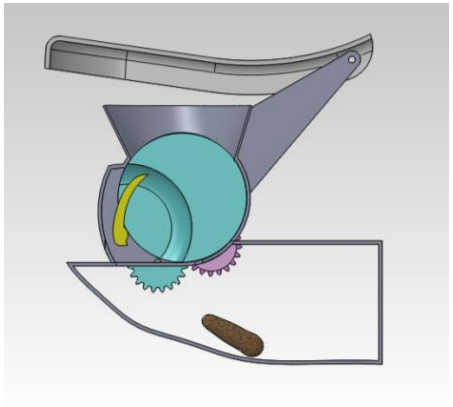


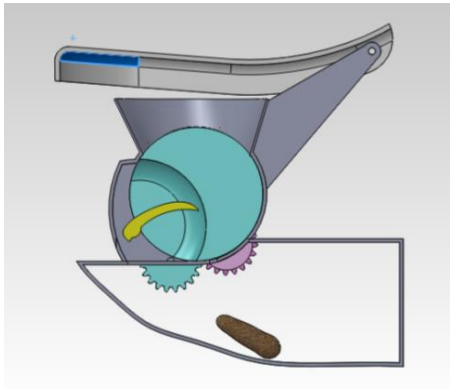


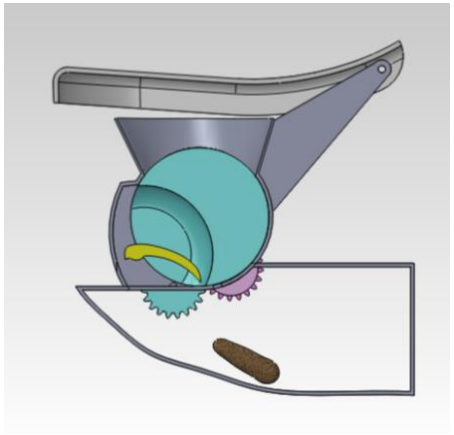


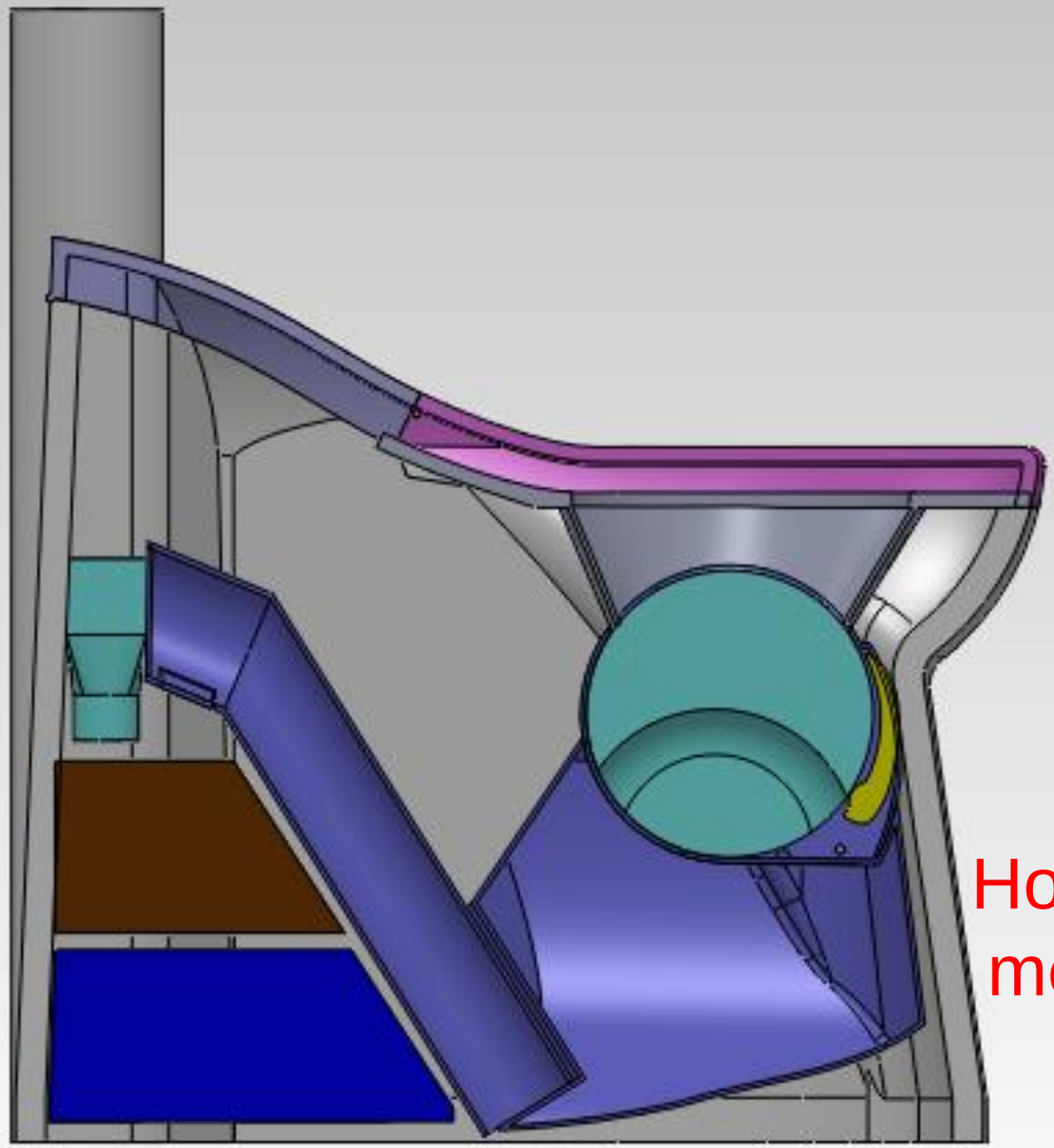












Hollow fibre membrane

The membrane

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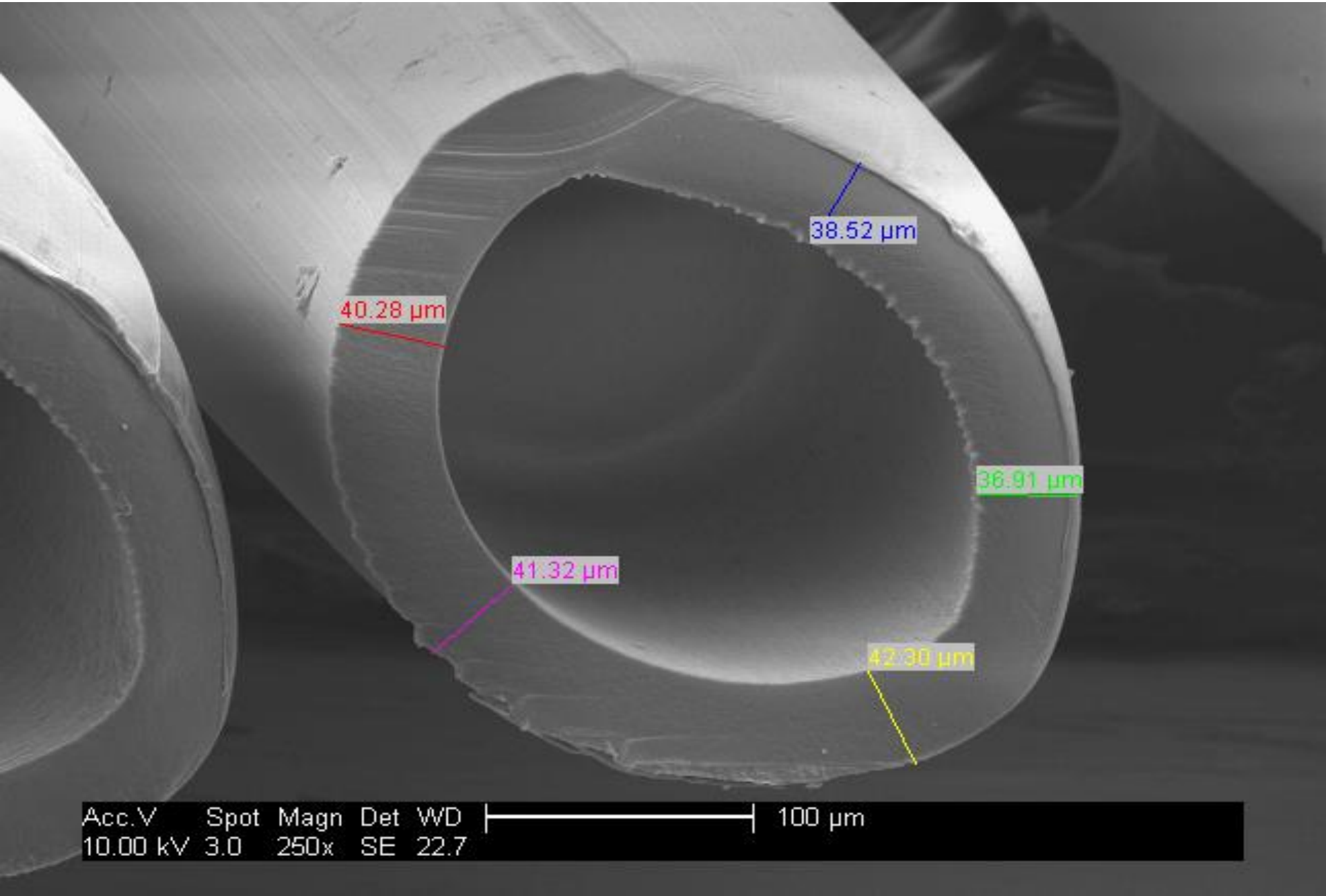
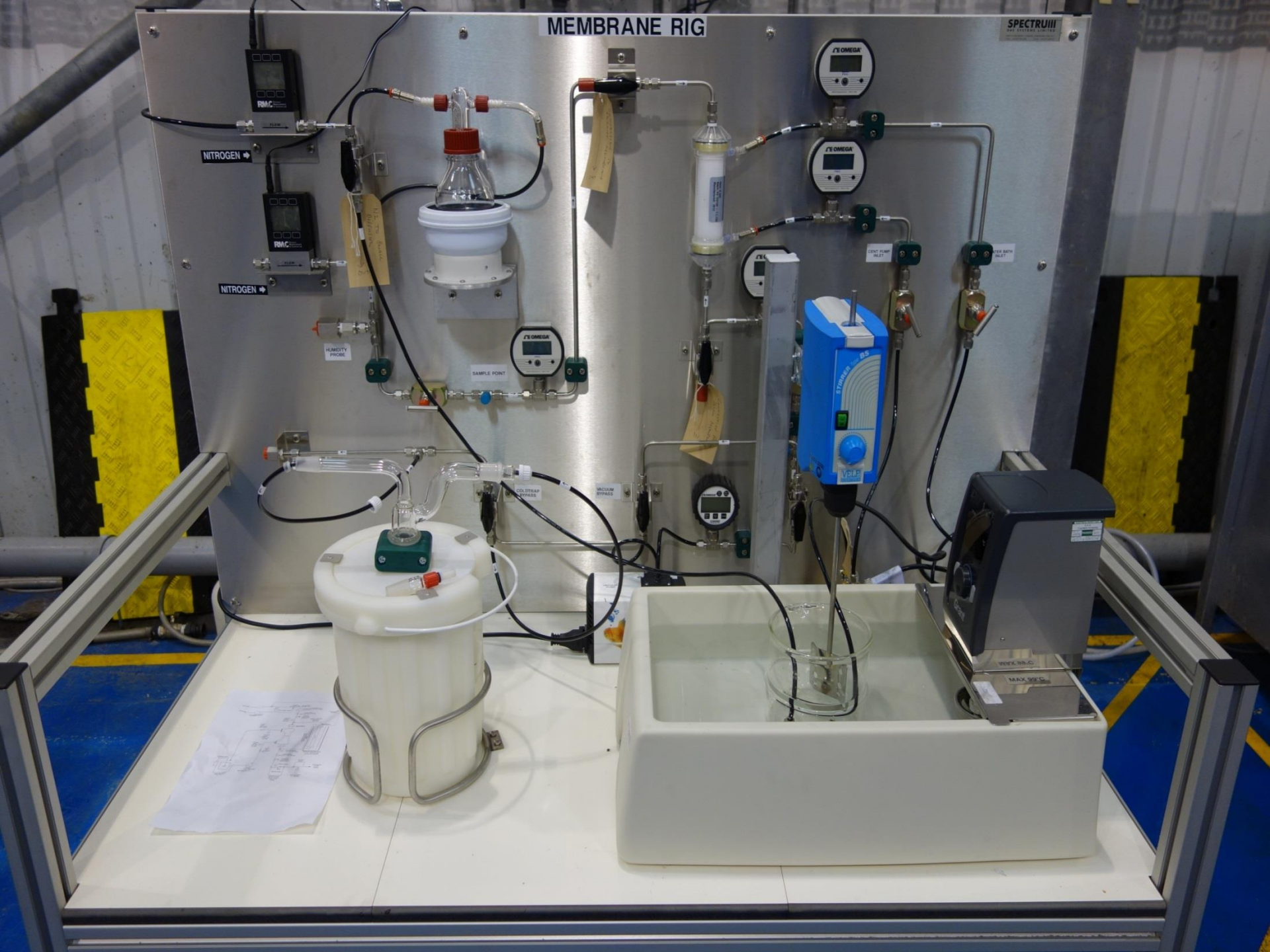
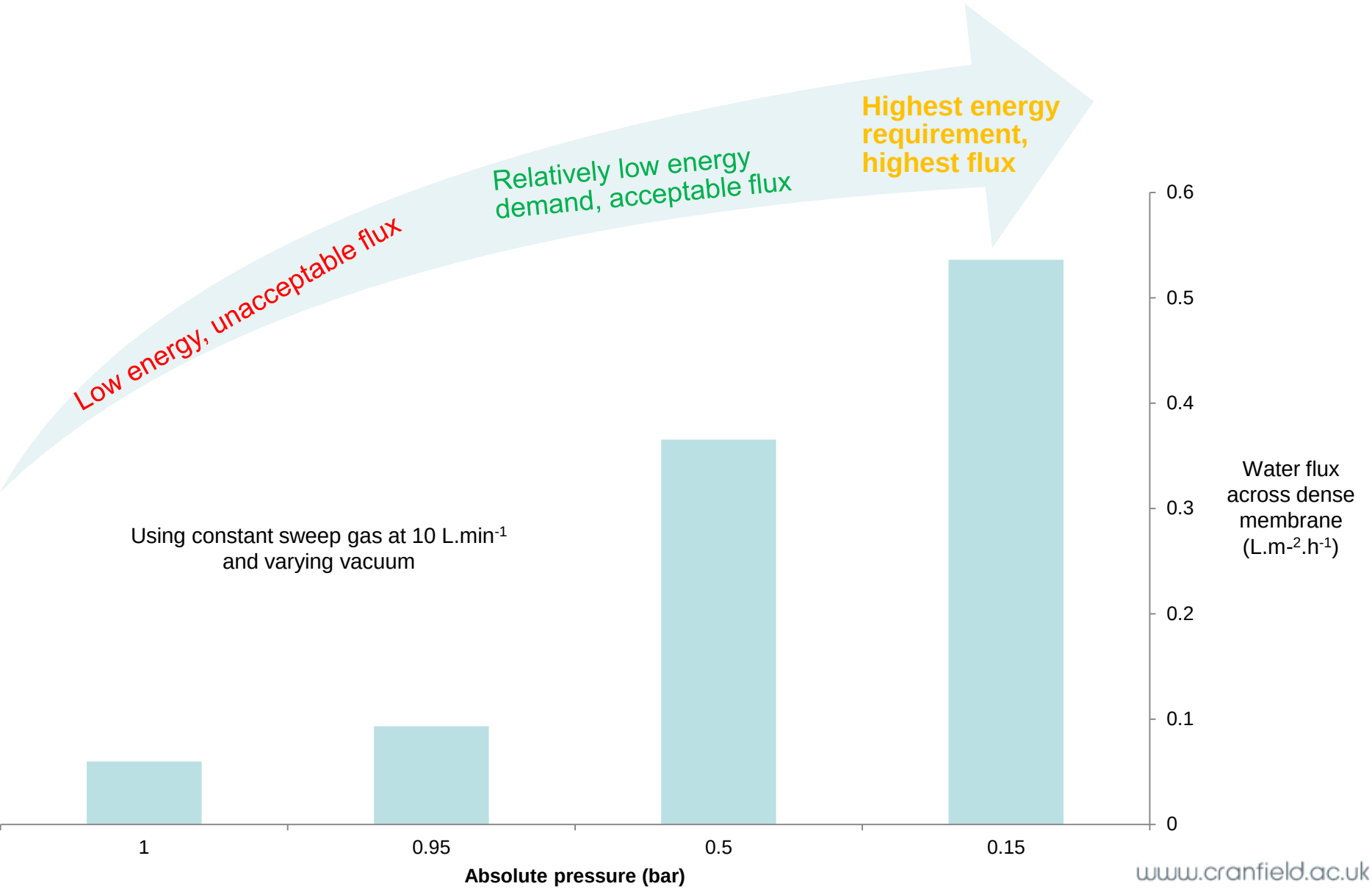
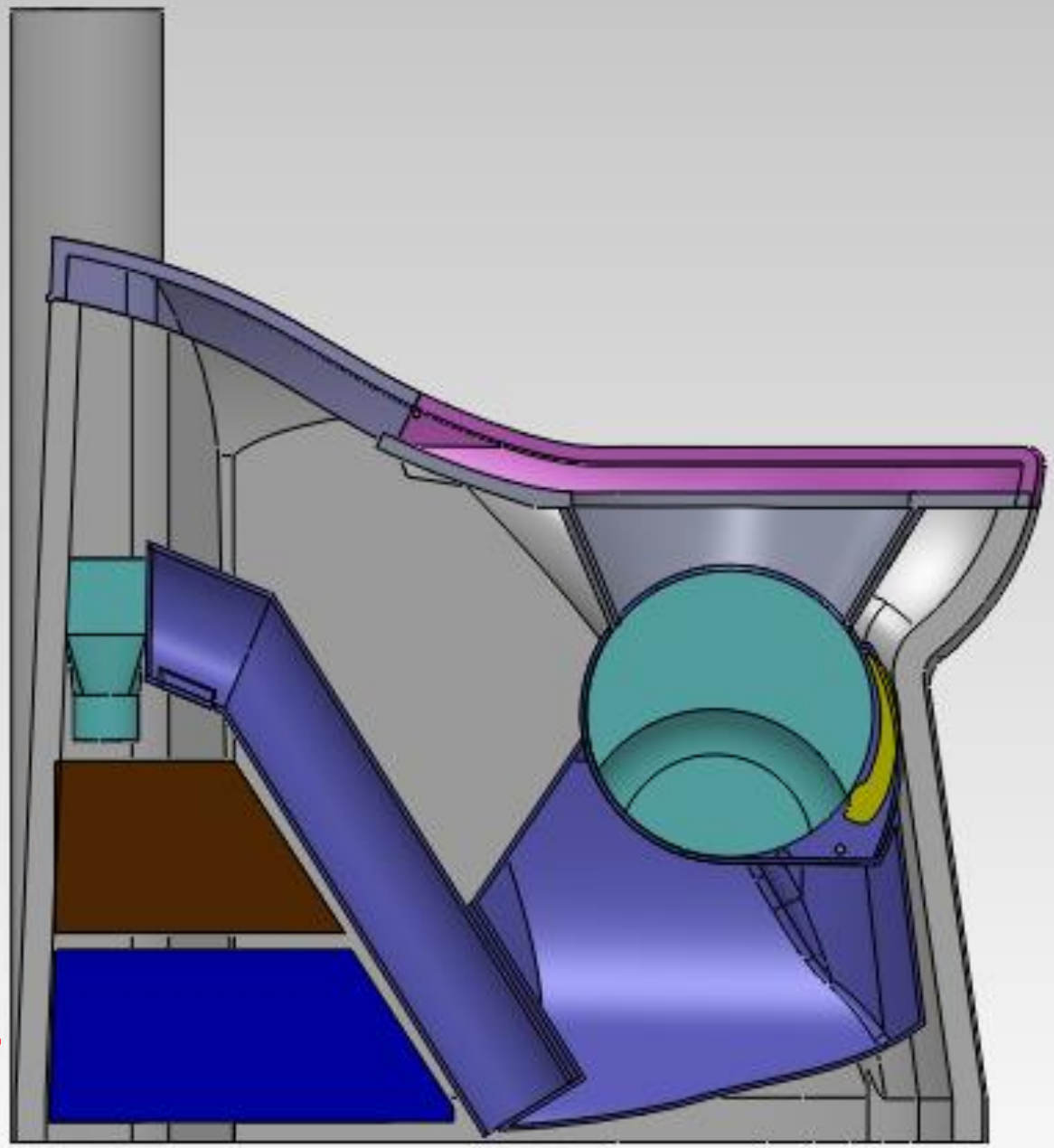



MEMBRANE RIG
SPECTRUM
NITROGEN
NITROGEN
OMEGA
OMEGA
OMEGA
HUMIDITY PROBE
SAMPLE POINT
VACUUM BYPASS

Membrane data highlight

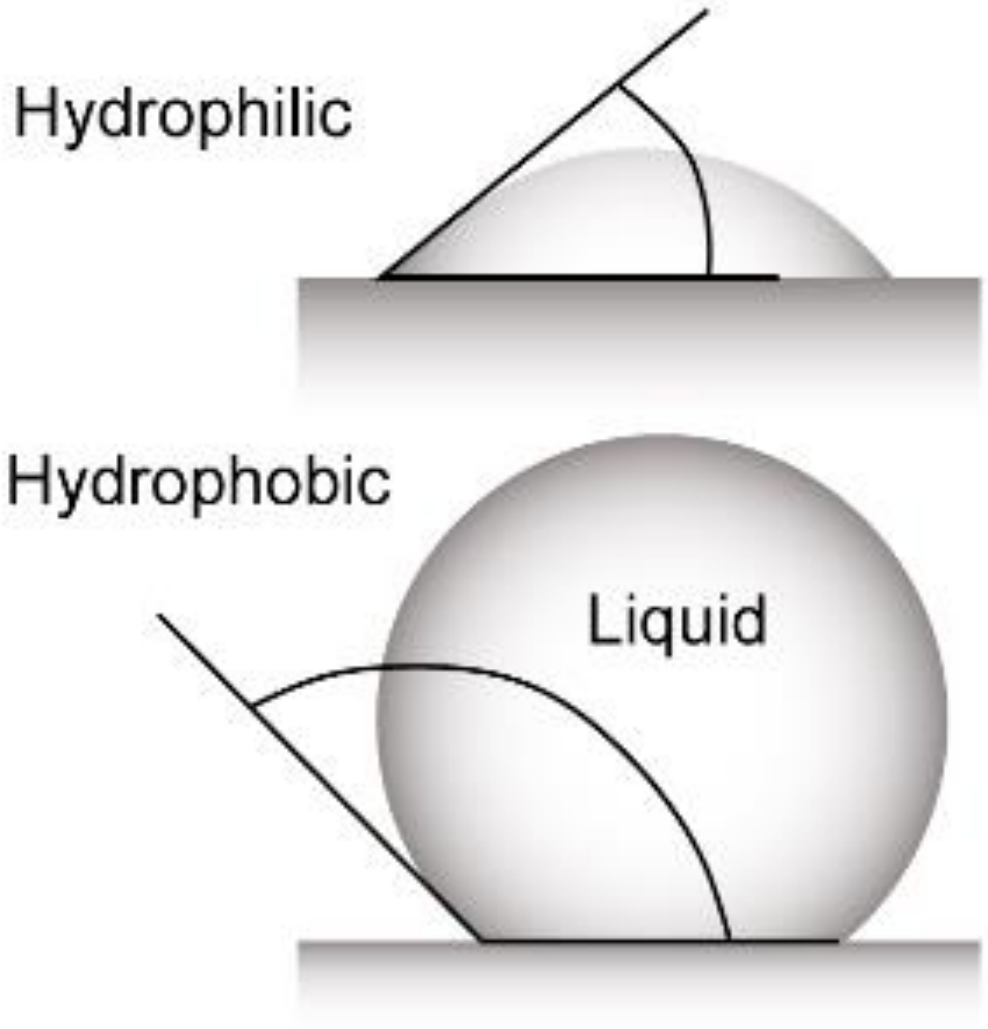


Condensing nanobeads



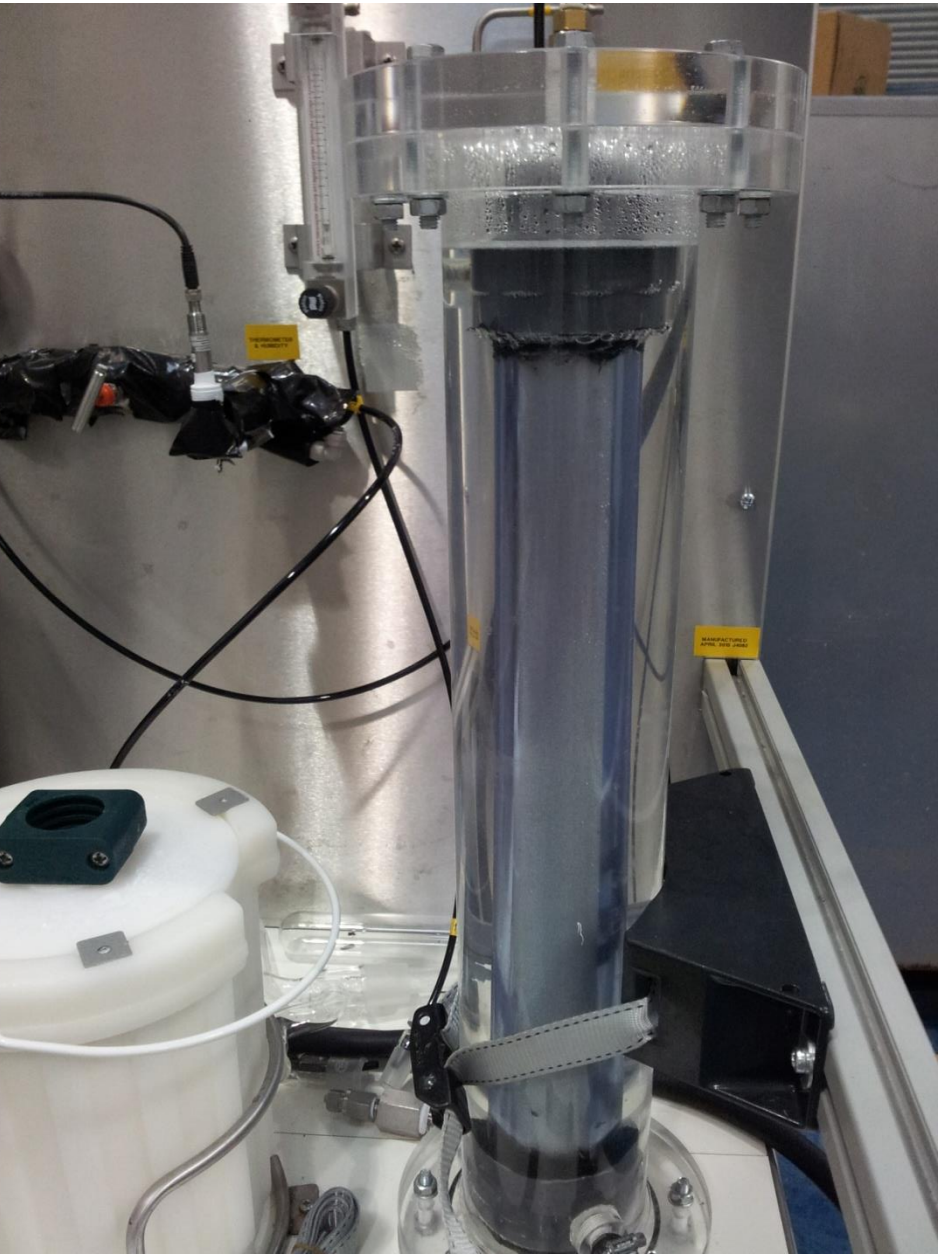
Pathogen free water

Condensing

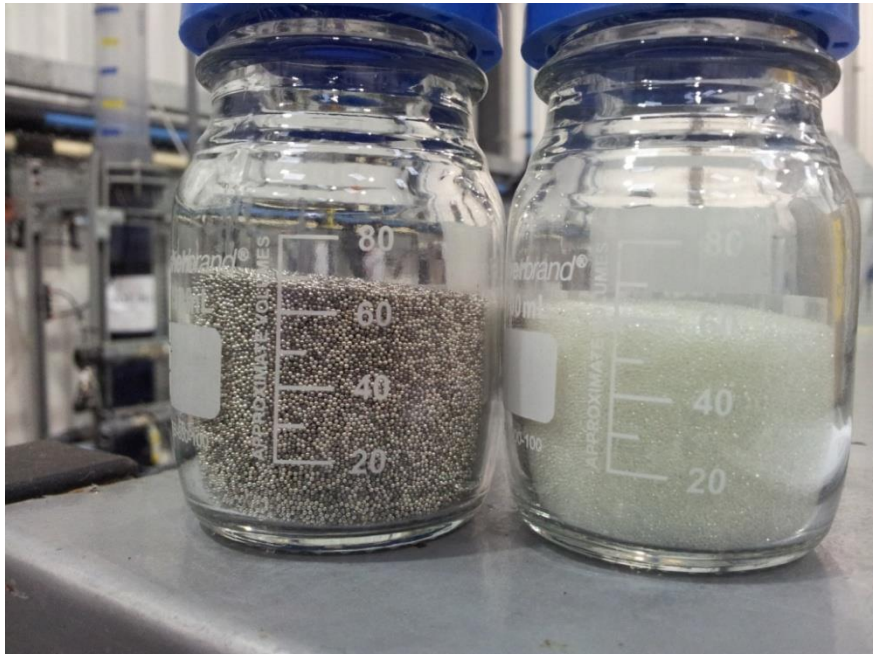



CONDENSING RIG
Grant

Condensing results



Initial data sets benchmarking standard glass media have shown ~ 40 % water capture from the vapour stream



Drainage rate (or passive collection)

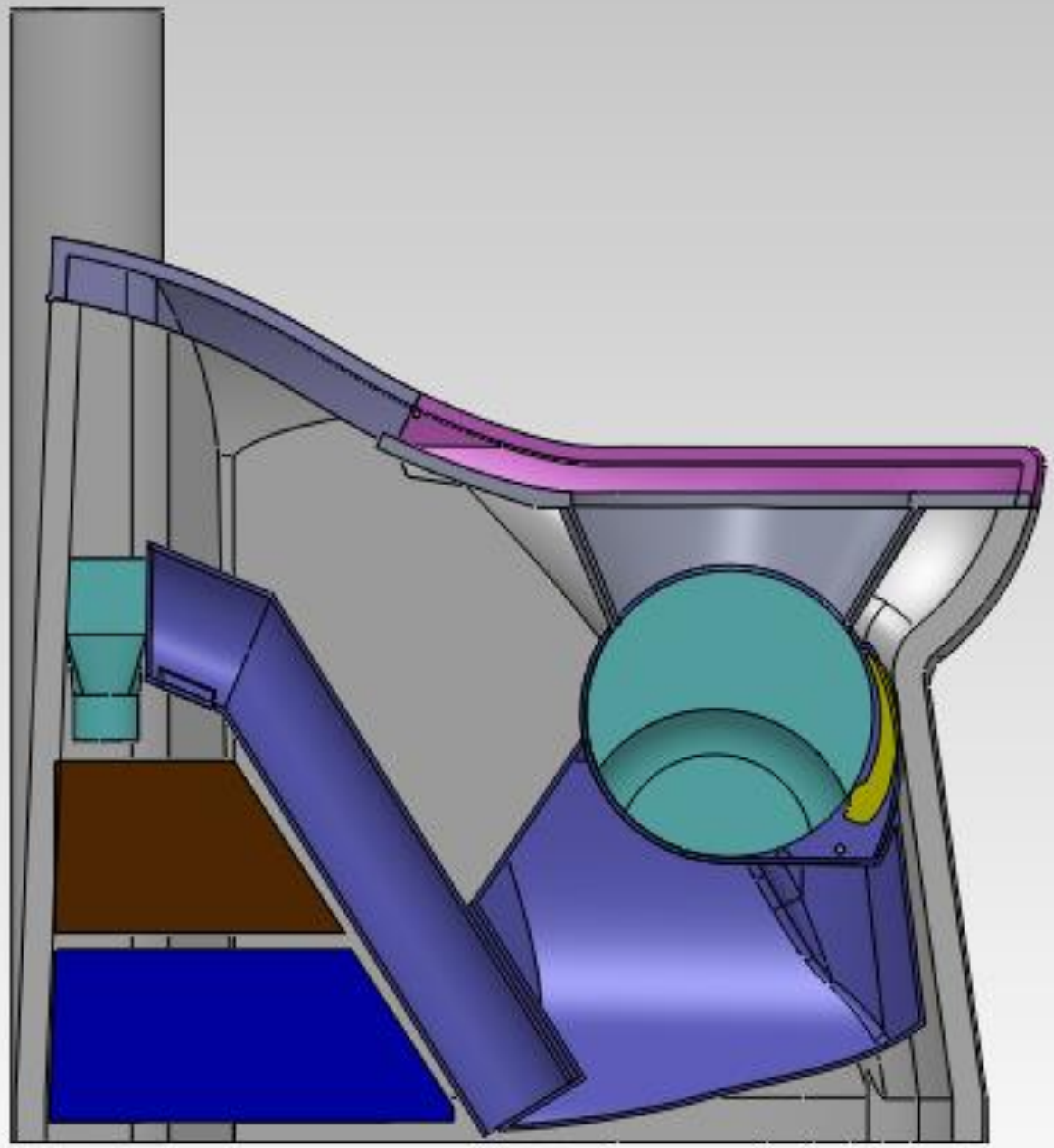
32˚ 67.7˚ 78.7˚

Increased hydrophilicity apparently enhances moisture retention

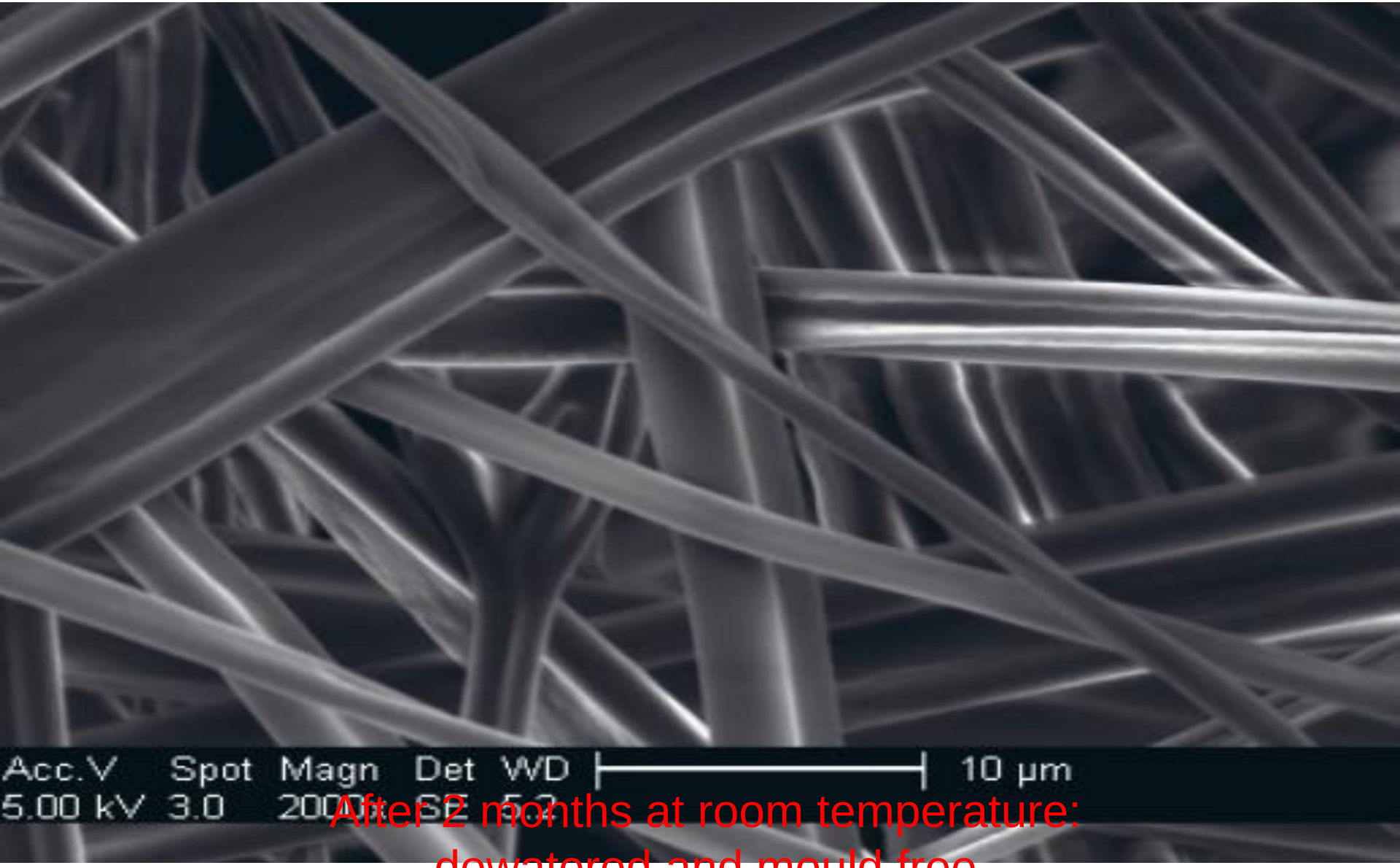
Does hydrophobicity govern drainage efficiency?

Synthetic urine vapour. Flow rate (4 LPM), BV (0.13 L), *v* (2.9 m/min), EBCT (1.95 s), temperature differential (< 2°C)

Nano-
sprayer



Weetabix challenge



After 2 months at room temperature:
dewatered and mould free

Next steps.

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