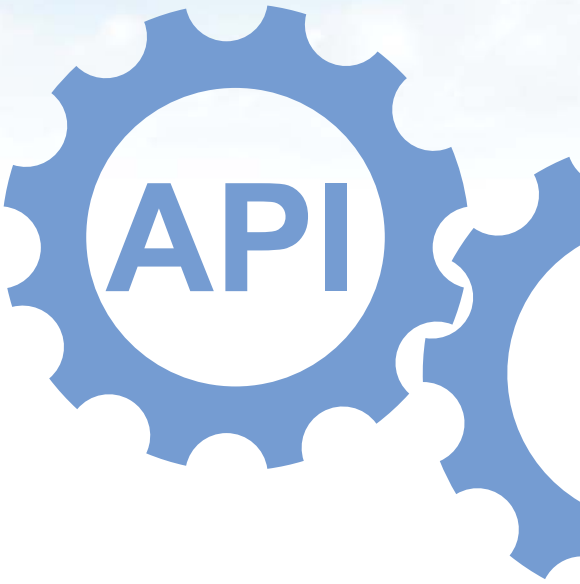
# Introducing ...

# CapdetWorks™ 4.0

## Open API
### Make Your Own Unit Processes*



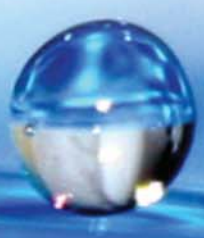

A new add-on Application Programming Interface (API) module has been created which allows for the development and integration of user defined unit processes in CapdetWorks™.

The new Open API can be used to develop design and costing procedures for any number of existing or new wastewater treatment technologies. The algorithms are written using the Java programming language and extensive examples are provided to get you started on your journey.

Within your new algorithms, you can either use the items and costs from our existing equipment cost database or if more versatility is required, you can create your own equipment cost database and tie them to cost indices and use those values.


This new functionality extends the capabilities of CapdetWorks™ and makes it an even more powerful and flexible tool for design and costing of wastewater treatment plants.

* the Open API is an optional add-on that must be purchased at an additional cost. Contact us for details.



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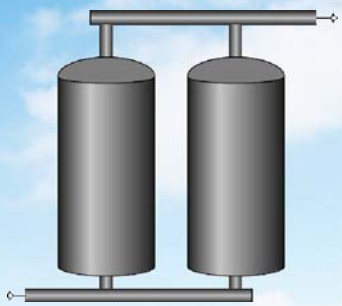
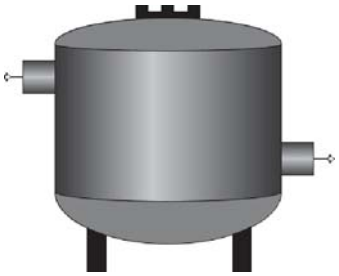
# New Unit Processes

**Pressure Swing Adsorption (PSA)** - PSA is a well-established gas separation and purification technique that is utilized in air separation, gas drying, hydrogen purification and methane purification. A design and costing algorithm has been developed for the PSA process to clean biogas produced from anaerobic sludge digester.



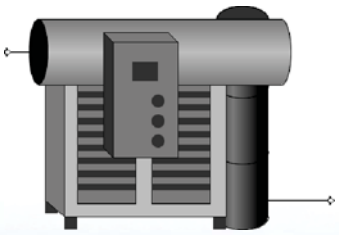
For given biogas cleaning and upgrade targets, the PSA design algorithm determines the equipment size, zeolite quantity, system pressure, power requirement, reactor temperature, cycle run times required to meet specific and compressor power. The equipment specification is then used to calculate the operating and capital costs. The system allows for the customization of media properties (e.g., bulk density, diameter and adsorption isotherms), bed characteristics, and unit costs (e.g., $/lb adsorbent, $/ft2 vessel).

**Iron Sponge Treatment** - Iron sponge treatment is another biogas treatment process that removes hydrogen sulfide from biogas. The process design and costing uses input parameters such as the bed height, superficial gas velocity, reactor contact time, media properties (e.g., bulk density, iron sponge grade, number of cycles, regeneration time, regeneration efficiency) and cost metrics ($/lb of Iron sponge, $/ft2 of vessel).



Design output includes reactor size (volume, diameter), mass of media required, media replacement period, number of reactors needed, and compressor / blower power.

**Moisture Removal** - Biogas is usually saturated with moisture which needs to be removed for its usage in energy recovery system. The process uses cooling and dehumidification of biogas to remove moisture. Based on a biogas target moisture content or temperature and Coefficient of Performance (COP) of the system, design information like dew point, heat flux, chiller power (HP), water loss rate as well as chiller and construction costs are estimated.



+ much more.

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