

## Evaporation and crystallization

### Industrial minerals

Evaporation and crystallization are the heart of many chemical and mineral processing plants. Evaporators can be used to concentrate mineral rich process streams by removing water or solvents and can provide a means of heat removal through vacuum flash evaporative cooling.

Crystallizers are typically used for the recovery of precipitated solid reagents products. Crystallization can be achieved by lowering solubility of solution constituents in cooling of the liquor or concentrating the solution to saturation through evaporation.

We have extensive experience in the design, construction, commissioning and management of evaporator and crystallization processes from a variety of different industries. And offer a wide range of expertise with specialized process design 'know how' and multi-disciplinary engineering teams to provide innovative cost-effective solutions for our clients.

We have recently designed four, 9 stage multiple effect evaporators with a total capacity of 530 tonne/hour for the Ma'aden Alumina Refinery in Saudi Arabia (in construction 2014).

Hatch designed the multiple effect evaporators for the Yarwun Alumina Refinery – Stages 1 and 2, in Gladstone, Australia.

We have worked with the Phosphate industry to improve existing processes through new innovative designs that serve our client's needs. We recently designed and installed a phosphoric acid evaporator and cyclonic entrainment separators for Simplot in Rock Springs, Wyoming, USA.

Hatch has experience with the design and operation of the isothermal phosphoric acid plant reactor which is a single tank vacuum crystallizer utilized for the reaction of phosphate rock and sulfuric acid to produce phosphoric acid and bi-product gypsum. We recently provided the detail design, EPCM and commissioning services for the installation of a new isothermal reactor at Simplot's Phosphate Chemical Complex in Rock Springs, Wyoming, USA.

We have well-established relationships with major evaporator and crystallizer vendors through all stages of engineering.

For example, we worked closely with Swenson in 2010 in the design and construction of a 500 000 tonne KCl/year cold crystallization potash plant expansion for the Arab Potash Company (Safi, Jordan). Our scope included full EPCM services and start-up assistance.



Evaporation Circuit at the Yarwun Alumina Refinery, in Gladstone, QLD Australia

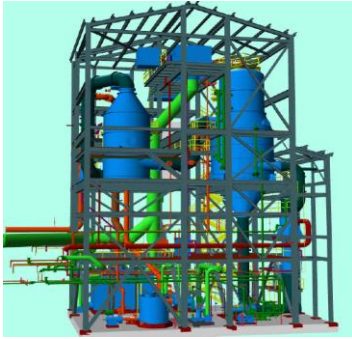
#### Contacts

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We can provide the following engineering services:

- Test work coordination and piloting
- Execution models from EPCM to D&S
- Design review of the technology package
- Coordination and interfacing of the design of the technology package
- Ongoing operational site support and monitoring



Phosphoric Acid Evaporator Design (above) and Installation (below) for Simplot in Rock Springs, Wyoming, USA