

The ECRP™ System

Recovery of Fertilizer from Ash Treatment Purge

Environmental Advantage of the ECRP

Veolia has developed an Enhanced Chloride Removal Process (ECRP) to allow mills with high potassium inputs to achieve high removal rates of chloride and potassium removal while minimizing sodium losses.

Application of the ECRP means:

- A quick operational payback
- Reduced sulfate levels in mill effluent
- Returning potassium to the forest through the production of SOP fertilizer
- Saving money on chemical make up such as for caustic and sodium sulfate.



Enhancement of the CRP

Veolia has developed an enhancement to the CRP technology:

- Increased efficiency
- Reduced discharge
- Recovery of high value potassium sulfate fertilizer

As most pulp mills are focused on chloride removal to minimize corrosion and boiler fouling, a conventional Chloride Removal Process is typically operated in a way to maximize chloride removal while minimizing soda losses. Potassium removal is not controlled and generally “floats” in the 70% to 90% range. Optimizing potassium and chloride removal together in a conventional CRP can only be achieved with a reduction in sodium recovery to 60-80%. The Enhanced Chloride Removal Process was developed to maximize chloride and potassium removal while maintaining a high sodium recovery.

Process Description

The ECRP system is a two stage crystallization process. The first stage consists of a conventional CRP system operating close to atmospheric pressure. Sodium salts are crystallized in the first stage and returned to the recovery cycle. The second stage crystallizer operates at lower temperature to take advantage of the reduced solubility of the remaining salt where potassium is aggregated.

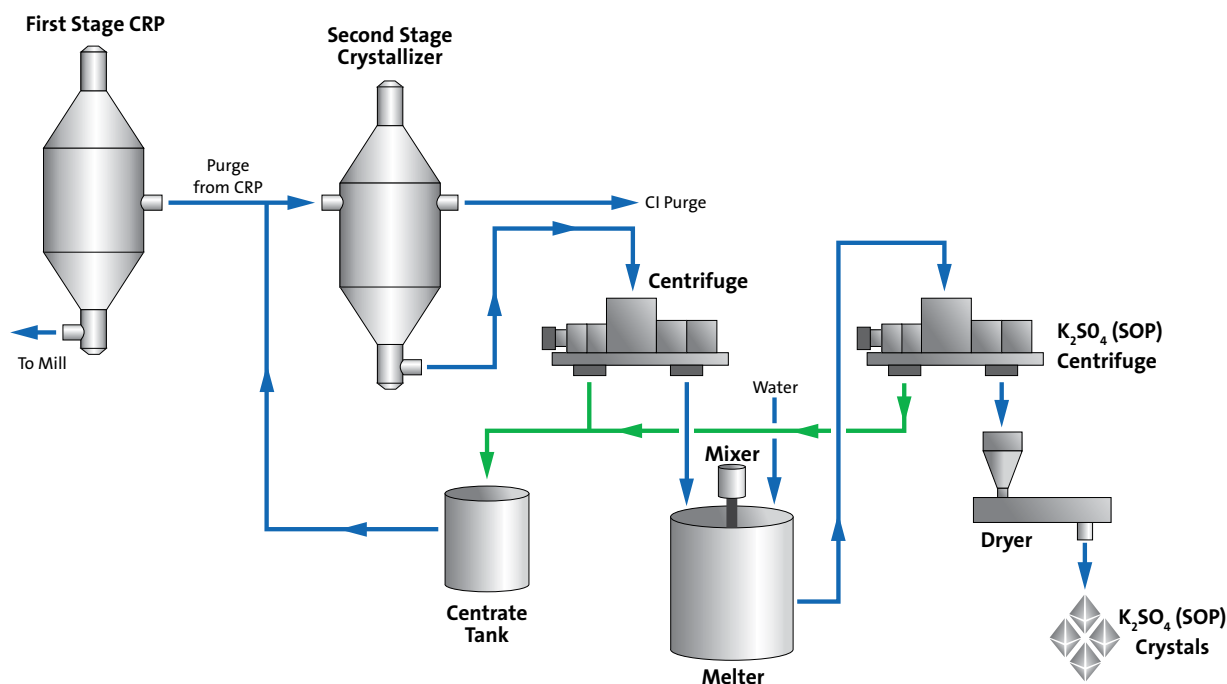
Crystallized solids from the second stage are dewatered in a centrifuge for subsequent disposal or otherwise further processed for production of SOP. The ECRP system takes advantage of the reduced solubility of the potassium salts salt at lower temperatures. The potassium salt can then be dewatered and removed from the mill cycle, representing an efficient potassium purge. The potassium salts may also be partially “melted” with water to produce purified potassium sulfate. Potassium sulfate, or Sulfate of Potash (SOP), is a valuable specialty fertilizer.

A portion of the second stage crystallizer mother liquor is purged from the mill to further enhance overall chloride removal efficiency, with the remainder of the mother liquor recycled to the first stage CRP crystallizer to recover sodium salts.



Removal Efficiency

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|-------------------|--------|
| Chloride Removal | 90-95% |
| Potassium Removal | 95-99% |
| Sodium Recovery | 90-95% |



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