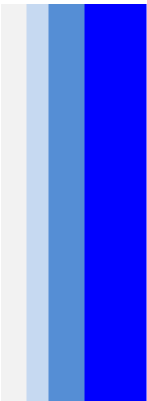
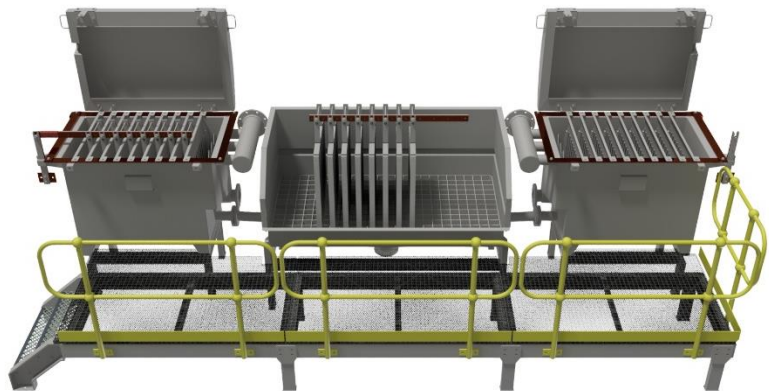




ELECTROWINNING CELLS



ELECTROWINNING

Electrowinning is a process used to recover precious metals from a concentrated solution by applying a voltage across electrodes immersed in this solution. The voltage applied across these electrodes induces a cathodic reaction which in turn results in the deposition of the metal from the solution onto the cathode.

Kemix design and supply electrowinning cells used to recover gold and silver from eluate solutions generated from either carbon elution circuits, AARL or Zadra, or from the intense leaching of gravity concentrates. The Kemix electrowinning cell is engineered as a non-complex, robust and easy to operate unit having minimal maintenance requirements.

The Kemix electrowinning cell comprises of a series of anodes arranged in a “sandwich” configuration either side of the cathode compartments. The anodes and the cathode compartments are all insulated and contained within a stainless steel rectangular tank. This cathode compartment contains either stainless steel or mild steel cathode mesh. The cathode size, quantity and weight of cathode mesh is calculated to ensure that there is sufficient cathode area available to effectively electro-win the metal from the eluate solution. The anode plates are fabricated from stainless steel.

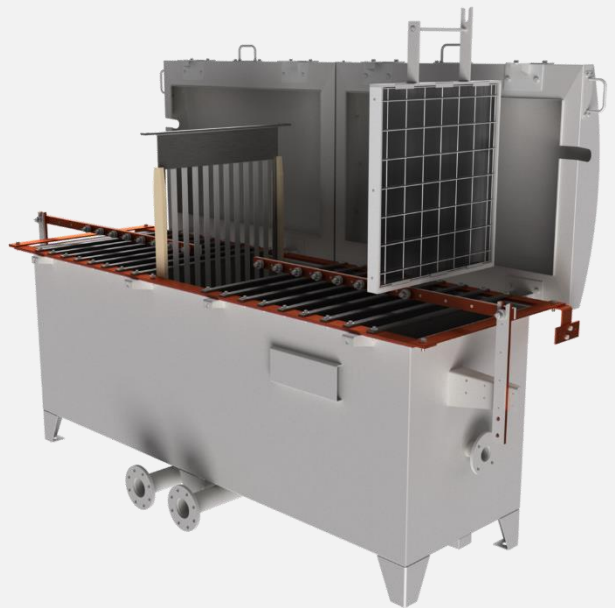
The anodes are connected to an insulated bus bar and the cathodes are connected to a pin bar arrangement.

The Kemix electrowinning cell is energized via a custom sized Kemix rectifier. The Kemix rectifier’s positive terminal is connected to the anode. The anode is the electrode at which oxidation occurs and where electrons are generated. These electrons get consumed at the cathode, which is connected to the Kemix rectifier’s negative terminal. The reduction reaction that occurs at the cathode results in the deposition of metal onto the cathode mesh.

Kemix can supply either an oil- or air-cooled rectifier.

The robust design of the oil cooled unit allows it to work in high ambient temperature applications under harsh operating conditions.

Air cooled units are more cost effective and energy efficient. They are smaller, lighter and easier to install. They also do not require annual oil dielectric testing maintenance.



Electrowinning cell



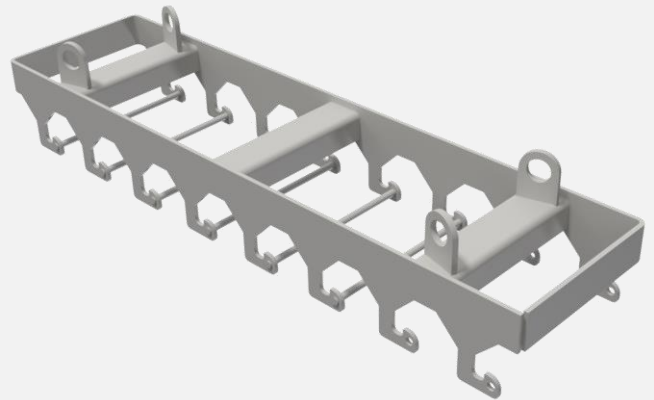
Air cooled rectifier

The Kemix electrowinning cell incorporates a ventilation manifold, connected to a ventilation system which extracts gasses generated during the electrowinning process. The gasses generated during the electrowinning process are hydrogen, ammonia and oxygen.

The Kemix electrowinning cell also has a hinged stainless steel hood that can be locked, thus securing and limiting access to the cathodes containing the valuable deposited metal sludge. On completion of the electrowinning cycle, the hinged hood is unlocked, the cathode pin bar disconnected and the cathodes are removed from the cell to harvest the electro-won metal sludge.

The cathodes are removed from the cell using an overhead hoist and cathode lifting rack. The cathodes get transported to a cathode wash bay where the cathodes are washed using a high pressure washer.

Post the removal of the cathodes, sludge that accumulates in the cell is washed via the sloping channel at the bottom of the cell and collected. The cathode sludge is filtered through a filter press, dried and smelted.



Cathode lifting rack



Cathode wash bay



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