

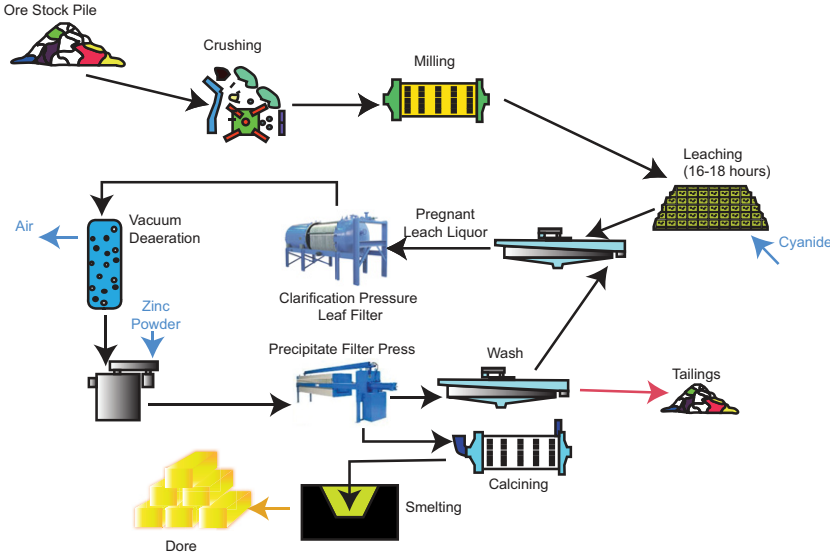
DURCO FILTERS

by Ascension Industries



MINING FILTRATION

Heap Leaching and Merrill-Crowe Process for Gold Recovery



Background

- Use of cyanide to dissolve gold since the 1800's
- Since the early 20th century, zinc was used to precipitate gold and silver
- Merrill-Crowe Company improves process by adding zinc powder to precipitate more gold

Factors Affecting Merrill-Crowe

- Silver to gold ratio should be 4 to 1 or more
- Gold in ore from 0.01 grams/ton up to 10 grams/ton, best when < 2 grams/ton
- Merrill-Crowe can remove over 97% of mercury whereas competitive processes can at best remove only 55%

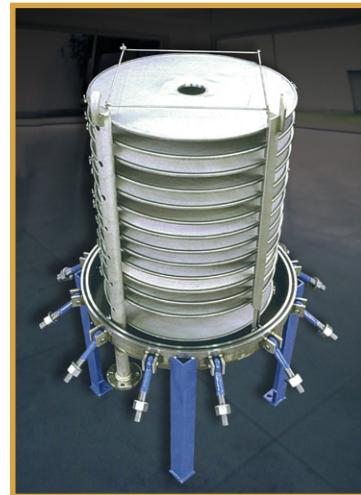
The "pregnant" solution containing dissolved metals is first clarified through Durco Filters designed **Pressure Leaf Filters**. By using a Durco Filters precoat and filter system (with diatomaceous earth) an extremely clear solution can be produced.

HC Horizontal Pressure Leaf Filter



- Removes undissolved waste solids from the cyanide solution while precious metal is kept in solution
- Flow rates up to 12,000 GPM or more

Vertical Pressure Leaf Filter



(Horizontal Leaf Style Shown, Vertical Leaf Also Available)

- Smaller footprint for space restricted applications
- Minimum labor and downtime requirements
- Positive O-ring seal minimizes cake by-passing the leaves during filtration

Once the pregnant cyanide leach solution is clarified by the Pressure Leaf Filters, the process continues with the addition of zinc (Zn) powder to precipitate the gold from the solution.

FOR YOUR MINING APPLICATION PARTS & EQUIPMENT - BUILT TO LAST

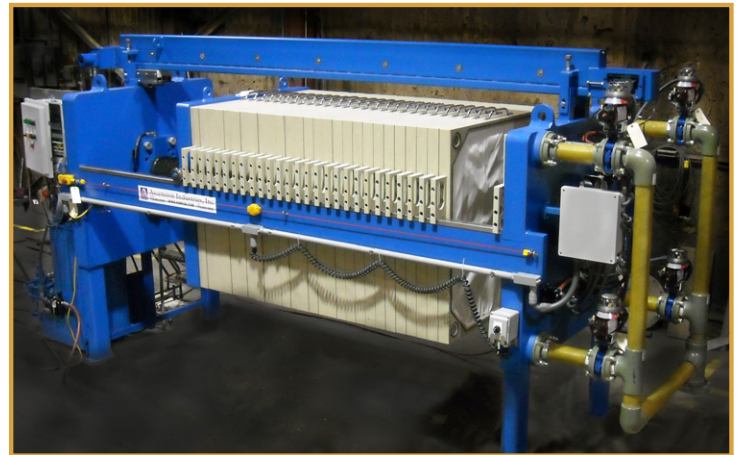
This process flow is then sent to a **Filter Press** where the liquid is removed and the solids are recovered containing the gold with the zinc.

QP Overhead Filter Press



4-bar design offers ultra-reliable process stream dewatering for high-density mining sludges, in the most demanding conditions.

EP Sidebar Filter Press



Provides economical dewatering of a wide variety of slurries and sludges for Merrill-Crowe, Solvent Extraction-Electrowinning (SX/EW), and other mining and processing operations.

An alternative method of filtering mining solids is to use a **Tubular Filter**. It can also be used in carbon fines filtration, solids removal in water treatment, filtration of chemicals in the gold/carbon plant and as a micro-filter in feed clarification.

Automatic TE3 Tubular Filter



with External Backwash



Features:

- Compact design used for demanding mining applications
- Automatic operation for continuous, uninterrupted flow
- Easy element access and changing
- Positive “O-ring” seals
- All electronic valve actuation

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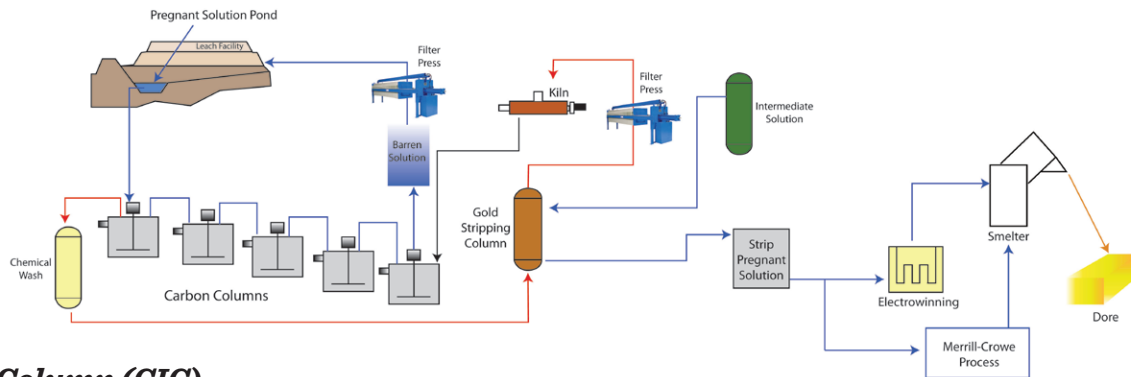
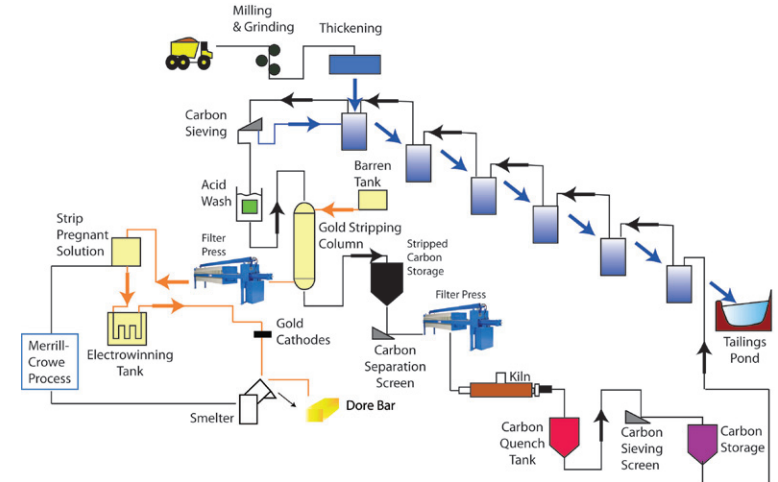
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Variations of the Heap Leaching Process

Carbon in Pulp (CIP) & Carbon in Leach (CIL)

Instead of separating ore solids from the pregnant solution, granular activated carbon is added to the leach slurry (pulp) to adsorb the gold.

The carbon adsorbs the gold from the slurry solution and is removed from the slurry by coarse screening and elution. The gold-free leach solution is then recycled, while the carbon is processed to remove the concentrated gold. It is sent either to electrowinning or to the Merrill-Crowe process for recovery of the gold and other precious metals.



Carbon in Column (CIC)

CIC starts with the standard heap leaching extraction process. The pregnant leach solution is then pumped upwards through a series of fluidized bed towers (columns) containing activated carbon.

As with CIL & CIP, the carbon adsorbs and concentrates the gold from the slurry solution and is then removed from the slurry by elution with both NaOH and NaCN solutions. The gold-free leach solution and the carbon are then recycled, and the concentrated gold solution is sent either to electrowinning or to the Merrill-Crowe process for recovery of the gold and other precious metals.

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Durco Filters will design and supply a total filtration system. Contact your local Durco Filters Sales Office for more detailed information.

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