Co-Matrix™ Filters for Electrolyte Filtration

HYDROPROCESS 2006
October 2006
Iquique – Chile

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Organic Recovery

- To Recover - Entrained Organic solution from the electrolyte prior to Electro-winning.
- Entrained Organic defined as droplets of organic solution not miscible in the aqueous portion.
- Current technology considers the use of
  - Column Flotation
  - Coalescers
  - SX Dual Media Filters
- This presentation reviews the electrolyte filtration step in the organic recovery process.

SX Dual-Media Filter

CoMatrix Filter
**Design concept**
- Anthracite bed holding capacity defined in kg organic per m² anthracite bed surface.
- Anthracite load bearing capacity defines filter capacity.
- Coalescing plates take out part of the organic load.
- Less organic load on anthracite bed means:
  - Longer cycles without backwash.
  - Higher feed rates for the same cycle.
  - Higher organic content in feed.

**CoMatrix™ Electrolyte Filter**
- Design Operation – 60 m³/hr.m²

**Feed Flow of 1800 m³/hr**
- **Dual Media – Design Base** - 12 m³/hr. m²
  - 150 m² of Filter Area.
  - 10 x 4.6m (15') diameter DM Filters.
- **Co-Matrix – Design Base** - 60 m³/hr. m²
  - 30 m² of Filter Area.
  - 3 x 3.6m (12') diameter Filters.

**Co Matrix Benefits**
- Smaller Foot Print, less instruments, less valves, piping, controls etc
- Lower Capital Cost
- Lower Operating Cost
- Less Filter Media
- Backwash Water Consumption 6lt per m³ electrolyte.
- Dual Media backwash consumption +/- 19lt per m³ Electrolyte.
- Can accept higher Organic in Feed Stream – if lower design rates used.
Industrial Scale Pilot Plant Trials

Objectives:
- Compare Operation of Co Matrix design to standard Dual Media Design.

Test Runs – Oxide Cu Leach Plant in Chile
- Dual Media ran at design Rate – 12 m³/hr.m²
- Co Matrix Ran at:
  - 3 x DM Filtration Rate - 36 m³/hr.m²
  - 4 x DM Filtration Rate - 48 m³/hr.m²
  - 5 x DM Filtration Rate - 60 m³/hr.m²

Measurements
- Operating Time – in service
- Backwash Time – out of service.
- Flow Rates
- Pressure drops during in and out of service operations.

Pilot Equipment
- 0.05 m² Co Matrix Filter x 3mts high + filter media, Co-Matrix packs, valves, PLC etc.

Results 3 x DM Filtration Rate.

Results 4 x DM Filtration Rate.

Results 5 x DM Filtration Rate.

Organic Break Through after 8 hours

Co-Matrix Installations
Anglo Base Metals - Skorpion
**Escondida Low Grade Sulphide Project**

- **4 x 4.11m dia Co Matrix**
- **480-625 m³/hr flow to each filter – 1880 m³/hr total**
- **Original project contemplated 8 x 4.72m Dual Media Filters**
- **60 ppm inlet organic, 2 ppm outlet**

- **Start up – June / July 2006**
- **Initial problems with services and automated sequence**
- **Initial Data sketchy. 2 to 3ppm organic and 1 to 3ppm inorganics at design flow @ 12 hour cycles**

**BHPBilliton Spence**

- **6 x 3.81m dia Co Matrix**
- **420-470 m³/hr flow to each filter – 2500 m³/hr total**
- **Original project contemplated 12 x 4.57m Dual Media Filters**
- **100 ppm inlet organic, 2 ppm outlet**

**Operation**

**Filter Service Flow**

- **Aqueous**
- **Anthracite Garnet**
- **Service Mode**
- **Filtered Aqueous**
Filter Service Flow

Aqueous

Service Mode

Anthracite

Garnet

Filtered Aqueous

GRACIAS – THANK YOU