

Co-Matrix™ Filters for Electrolyte Filtration

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SpinTek Filtration, LLC
Delkor South America Ltd.



Organic Recovery

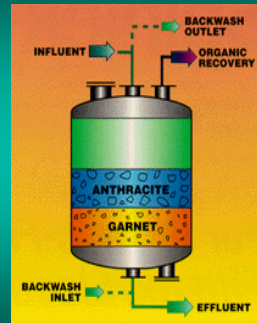


Organic Recovery

- 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.



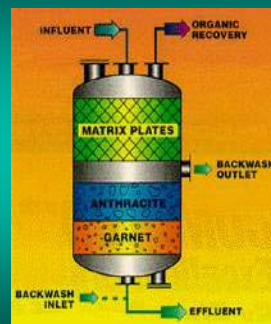
SX Dual-Media Filter



Dual-Media Filters



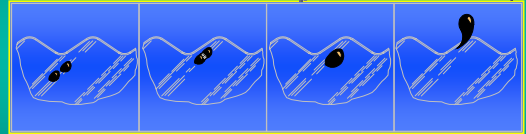
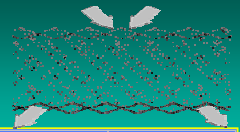
CoMatrix Filter



Gunpowder



Coalescing Droplets on Matrix Plate Surface

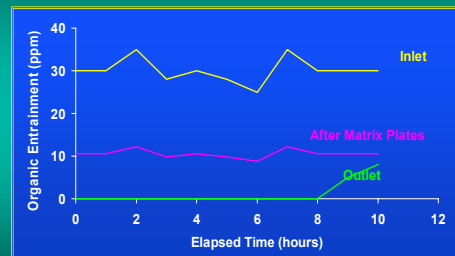


Design concept

- 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 – 60m³/hr.m²



Feed Flow of 1800m³/hr

Dual Media – Design Base - 12 m³/hr. m²

- 150m² of Filter Area.
- 10 x 4.6m (15') diameter DM Filters.

Co-Matrix – Design Base - 60 m³/hr. m²

- 30m² 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

Objetives:

- 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



Industrial Scale Pilot Plant Trials

Measurements

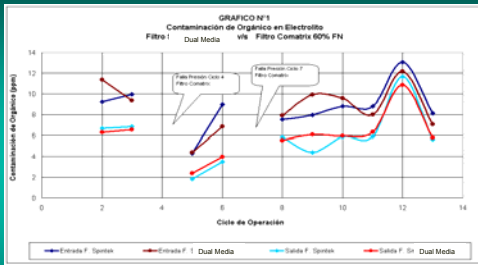
- Operating Time – in service
- Backwash Time – out of service.
- Flow Rates
- Pressure drops during in and out of service operations.

Pilot Equipment

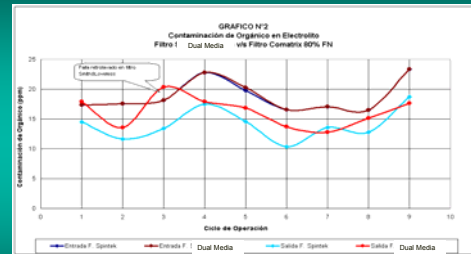
- 0,05m² Co Matrix Filter x 3mts high + filter media, Co-Matrix packs, valves, PLC etc.



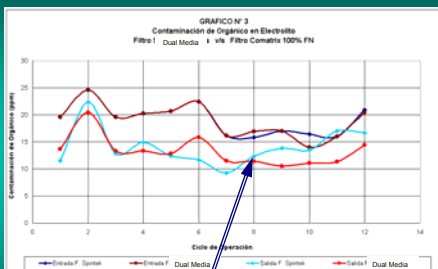
Results 3 x DM Filtration Rate.



Results 4 x DM Filtration Rate.



Results 5 x DM Filtration Rate.



Organic Break Through after 8 hours



Co-Matrix Installations Ango Base Metals - Skorpion



- 4 x 4.1 m 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

Escondida Low Grade Sulphide Project



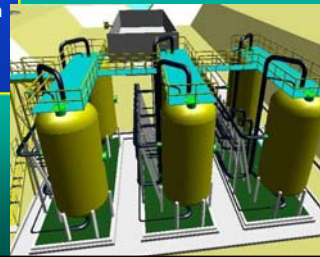
- Start up – June / July 2006
- Initial problems with services and automated sequence
- Initial Data sketchy, 2 to 3ppm organic and 1 to 3ppm inorganics at design flow @ 12 hour cycles

Escondida Low Grade Sulphide Project



- 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

BHPBilliton Spence



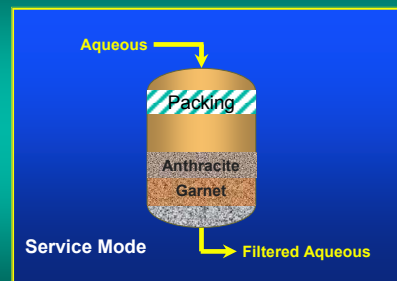
BHPBilliton Spence



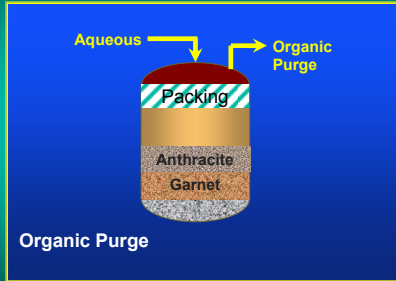
Operation



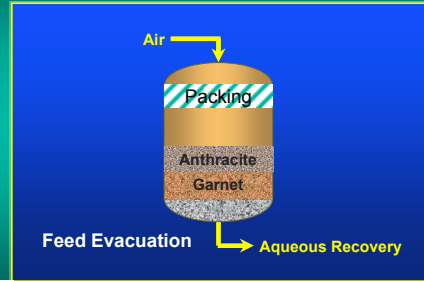
Filter Service Flow



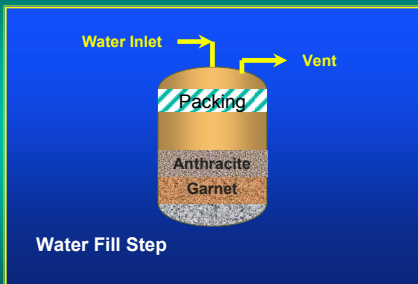
Filter Organic Purge



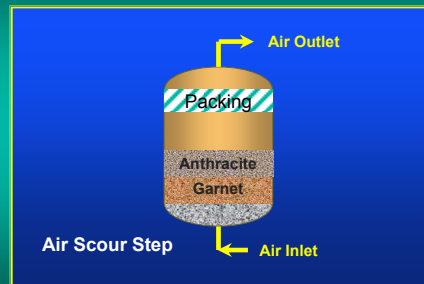
Filter Feed Evacuation



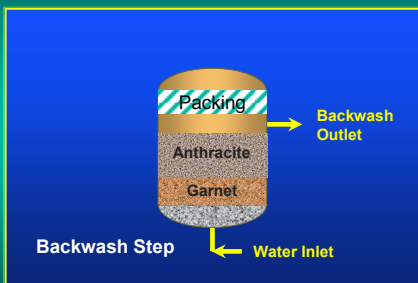
Filter Water Fill



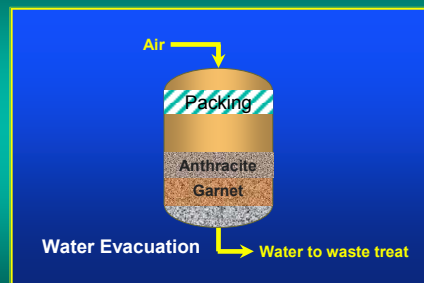
Filter Air Scour



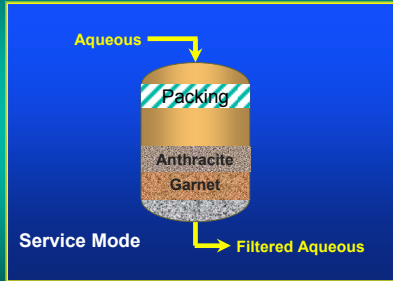
Filter Backwash



Filter Water Evacuation



Filter Service Flow



GRACIAS - THANK YOU

