Metal Processing Solutions

Esmil and our Partners have conducted much research and constructed many plants gaining vast experience in the metal industry. From bench scale studies right the way through to full scale plant operations we strive to offer BAT (Best Available Technology) using state of the art membrane separation and dewatering processes.

Metal processing effluents that have been treated by Esmil technology include:

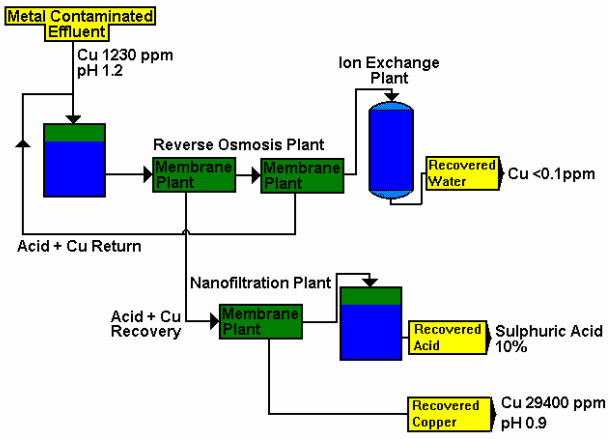
- Acid Rinse Waters
- Acid Recovery
- Copper Sulphate/ Rinse Water Recovery
- Heavy Metals Removal/ Recovery
- Shipyard Effluents

Depending on the process requirements, Esmil will explore a range of technological solutions to achieve the treatment, recovery and economical requirements

Examples

Esmil are well positioned to upgrade existing neutralisation and precipitation systems by integrating membrane technology to improve recovery of water and metals, reduce off-site disposal costs and improve plant effluent quality to match ever increasing environmental constraints.

Two very different plants, including a copper rod plant and printed circuit board (PCB) manufacturer have both been able to achieve similar water recovery from spent acid rinse waters (95%) and valuable copper recovery (99%) from their effluent streams.



Heavy metal removal/ recovery is particularly important in the metals industry across a range of sectors from mining tailing ponds to processing applications. Esmil membrane technology is well suited to solving the problem of heavy metals due to the high rejection efficiency by the membrane materials. This can reduce the load on current conventional treatment systems such as ion exchange or act as a standalone plug and play system to achieve the desired effluent qualities.

Metals	Feed (mg/l)	Permeate (mg/l)	Concentrate (mg/l)	Rejection (%)
Zinc - Zn	193	0.8	550	99.6
Iron - Fe	210	0.7	710	99.8
Cadmium - Cd	1.98	0.09	7	99.6

Nickel - Ni	21.5	0.05	66.2	99.7
Manganese - Mn	625	2.50	2050	99.8
Copper - Cu	775	3.55	2060	99.5
Chromium - Cr	2.2	0.008	3.6	99.5

Other Technologies

- Dewatering – Filter press, Screw Press, Multidisc Screw Dehydrator.
- DAF – Dissolved Air Flotation
- MBR – Membrane Bio Reactors
- Polishing Units – Activated Carbon, Ion Exchange, Advanced Oxidation Processes
- And More!!!

Metal Applications Design Philosophy

We strive to use the most appropriate solution to suit your treatment and/or recovery requirements. We are not limited to a single technology as we have a vast range of experience in the majority of treatment technologies. This includes membrane bio reactors, aerobic treatment, media filtration, ion exchange and other membrane technologies across a range of effluents and industries.

As no two processes are equal it is essential to follow a number of steps to ensure that your tailored metal application treatment/recovery process performs as well and economically as possible to achieve your treatment goals.

- Lab scale dewatering and membrane trial and selection to ensure process feasibility
- Long term site pilot trial to allow for feed variation and data gathering
- Extensive plant design and OPEX calculations
- Build, Installation and Commissioning
- Comprehensive service support including maintenance and system upgrades.

Food and Beverage Reference Plants

- Phelps Dodge Copper Rod Mill, USA (RO, NF, IEX)
- A & P Appledore, Shipyard Docks, UK
- Asarco Globe Plant, Heavy Metals Refinery, USA
- Toppan, PCB Manufacturer, San Diego
- Ekoton Refs

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