



WesTech's **AirLift™ Dilution System** uses an airlift pump to draw clarified water evenly from the thickener surface into the feedwell. An even draw from multiple points prevents flow disturbances in the quiescent settling zone while ensuring proper dilution and feed mixing inside the feedwell. Dilution flow can be regulated with precision by operator adjustment of the airflow to the system.

Zinc Processing

Zinc (Zn) is the fourth-most widely used metal, following iron, aluminum and copper. It is mined mostly in Canada, the former USSR, Australia, Peru, Mexico and the US. The US is the world's largest consumer of zinc.

Zinc is a metallic element that has only moderate hardness and can be made ductile and easily worked at moderate temperatures. Its most important use, as a protective coating for iron known as galvanizing, derives from two of its outstanding characteristics: it is highly resistant to corrosion, and, in contact with iron, it provides sacrificial protection by corroding in place of the iron.

Most zinc is used in the galvanizing steel process. Other uses include the automotive, construction, electrical, and machinery industries. Zinc compounds include agricultural chemicals, paints, pharmaceuticals, and rubber.

Refining

Zinc concentration is usually done at the mine site, prior to reaching the zinc processing plant (refinery). The concentration includes crushing, flotation, and thickening. The most common process in the refining is electrowinning, which uses an electrolytic cell to reduce the zinc. An electric current is run from a lead-silver anode through a zinc solution. The zinc deposits on an aluminum cathode and is harvested. The zinc is then melted and cast into ingots.

In a typical refinery flowsheet, zinc concentrate is converted to zinc calcine (ZnO) by burning the concentrate in fluid bed roasters. Zinc calcine is the soluble zinc form which is the primary feed for the leaching plant. After leaching, the acid leach slurry is thickened and dewatered to recover residues which go to the lead smelter for further processing. After neutralization, clear zinc sulfate solution flows from thickeners to the zinc dust purification circuit.

Removing Impurities

Trace impurities are removed from the solution by adding slurried zinc dust through three purification stages. The solution is filtered in the first two stages with filter presses. In the third stage, the solution is cooled and then directed to a gypsum clarifier. The purified clarifier effluent is then pumped to the electrolytic plant.

Other by-products produced in this process can include fertilizers, lead, cadmium, indium, germanium, and elemental sulfides. Wastewater from the lead and zinc operations is treated by liming in the effluent treatment plant. Heavy metals are precipitated in reaction tanks and separated from the clean water by thickening and dewatering. The solids are recycled back to the plant and the clean water is discharged to the river.