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Copper / Molybdenum Flotation Circuit

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The copper-molybdenum flotation circuit requires multiple thickeners. WesTech has a worldwide installation base with application experience across the spectrum for minerals and industrial high rate thickening applications. **HiFlo™ High Rate Thickeners** are designed to operate at a high solids throughput with a smaller surface area compared to conventional thickeners. Achieving consistent underflow and a clear supernatant is made possible in high rate thickeners with the efficient use of flocculant, proper feed dilution, and sufficient time for solids retention and clarification.

Copper / Molybdenum Flotation Circuit

Molybdenum (moly) is often produced as a byproduct of copper mining. Copper is used for electronics, construction, and metal alloys. Moly is mostly used to make metal alloys, and as a catalyst.

As markets need copper and moly, their ores are separated, concentrated, and sold separately. This separation and concentration of copper and moly is called the “copper-moly flotation circuit.”

Flotation – Sulfides

Copper and moly are often found together as sulfides*†. Sulfides in solution will float or sink with the right combination of chemicals and gas bubbles (froth flotation).

These sulfide ores are separated from gangue (waste) material, then from each other, by froth flotation.

Copper / Molybdenum Flotation Circuit Steps:

Grinding

Grinding mills liberate the ore from the gangue material (non-ores: silica, organics), and reduce it to an optimal size for flotation. Water mixes in to form slurry. This helps both in the transportation and separation of the solids.

Bulk (Copper-Moly) Flotation

Both the copper and moly sulfide ores together (bulk) float in rougher flotation cells, then cleaner column cells, and often scavenger cells. These groups of flotation cells work together to give a high total yield of the bulk ore, which is sent on to be thickened.

Tailings (Gangue) Thickening / Dewatering

The underflow gangue (waste) from the (rougher and scavenger) cells flows to a tailings thickener to recover water for the process. Filters dewater these tails further, or a tailings pond stores them.

Bulk (Copper-Moly) Thickener

A high-rate thickener dewateres the bulk of copper-moly concentrate before more separation.

Moly Flotation

The moly flotation circuit has similar groups of flotation cells with chemicals to float the molybdenite (moly concentrate), and settle out the copper sulfides (copper concentrate).

Copper Thickening / Dewatering

A high rate thickener thickens the copper concentrate. A vacuum drum (or other) filter dewateres the copper concentrate further before refining or storing until sale.

Moly Thickening / Dewatering

A high rate thickener thickens the moly concentrate. A vacuum drum (or other) filter dewateres the moly concentrate further before refining or storing until sale.

*Moly is found as Molybdenite (MoS_2), and copper is in various combinations with sulfur (eg. Chalcocite (Cu_2S)).

†If copper is found as an oxide, it is not as easy to float. It is typically heap leached with sulfuric acid (dissolved), then removed from solution and concentrated by solvent extraction (SX) and electrowinning (EW).