Heavy metals removal using ultrafiltration

Metals are chemically precipitated simply using hydroxide or sulfide precipitation, or in cases where the metals are complexed, other chemistries are available to cause precipitation to occur, typically in a simple one-step operation. There is no need to enlarge or flocculate the precipitated crystals, as is typical in conventional chemical systems since the pore structure of the membrane will retain the small precipitated crystals.

When oils are or may be present in the waste stream, the positive filtration provided by ultrafiltration prevents upsets that can occur with settlement or flotation devices. The membrane prevents passage of both oils and solids, including the precipitated heavy metals from passing, creating a concentrate of the metals.

If the waste stream consists principally of oils, a concentrate of the oils that will also contain the heavy metals is created that can be disposed of to oil recyclers. When the same type of waste is treated using DAF or clarifier technology, a sludge is created that can only be disposed to a landfill, and the benefit of reuse is lost and disposal is more expensive.

When the waste stream consists mostly of metals and suspended solids, the addition of a precipitant allows the waste to be simply ultrafiltered. The amount of sludge created is much less than the amount created using other technologies.

Dynatec’s design of ultrafiltration systems for heavy metals separation utilizes tubular membranes operated at high flow velocities. This design allows for high concentrations of metals and/or oils, and/or suspended solids in solution while minimizing cleaning maintenance of the membrane system.

Dynatec has metals separation systems in use since 1979.