



Donnan Dialysis Metal Recovery

Donnan Dialysis uses ion-exchange membrane technology to effectively recover metals from aqueous streams. The membranes used are Cation-exchange membranes which are placed into a membrane stack. The metals are recovered in a mildly acidic solution yielding the metal salt of the acid used.

The membranes are placed into membrane stacks of varying size. Because of this, a membrane stack can be constructed with as many membrane cells as an application requires. These Flow distributors channel the flow of the metal-bearing water stream and a mild acid solution on opposite sides of the ion-exchange membrane.

The mild acid solution is used to 'capture' the metal cations. These metals will then form the metal salt of that acid. Any Acid can be used in this acidic solution. The acid is chosen based on the preferred recovered metal salt.

The driving force for metals recovery is the concentration gradient of hydrogen ions across the membrane, between the acid solution and the metal-bearing water stream. Ions flow from an area of high concentration, the acid solution, to an area of low concentration, the metal-bearing water stream. These hydrogen ions act like a pump to force the metal cations to flow in the opposite direction.

Donnan Dialysis effectively removes the metals from the water stream and concentrates them in the mild acid solution. By maintaining an acid concentration of 0.20 Normal Acid the metals can be concentrated as much as 1,000 times in the acid stream. At the same time, the metal concentration can be lowered to below 1 ppm in the water stream.