

Mercury Separation of the Raw Brine Solution (HgS filtration)

Challenge

Vinnolit GmbH & Co. KG is the leading manufacturer of PVC in Germany and, with worldwide sales and licensing activities, one of the key players in the European PVC business. In the field of PVC products for special applications Vinnolit is the global market leader. In 2001, the reconstruction and upgrade of chlorine production capacities began at the Vinnolit plant in Chemical Park, Knapsack, Germany.

To increase the chlorine production to 280.000 t/a a membrane electrolysis plant was added. A membrane electrolysis unit requires the brine solution to be free from mercury (Hg), since the mercury would damage the cell membranes.



Solution

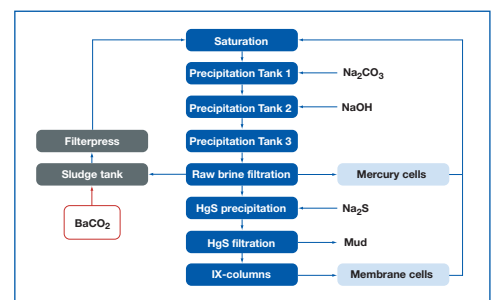
After carefully investigating different filter suppliers and systems (one-step versus two-step), it became clear that ZYLON™ surface filtration technology (formerly GORE backpulse filtration) offered decisive technologic and economic advantages. The Vinnolit plant installed a pre-coat-free, completely automatic ZYLON filter system with GORE™ high durability liquid filters made of PTFE/PP.

Reduction of the mercury is accomplished by HgS precipitation, followed by filtration using the ZYLON system. Na₂S is used for the precipitation, and the filter is operated in an alkaline setting. The concentration of HgS in the feed is almost 500 ppb, and is reduced to less than 20 ppb.

Since start-up of the installation, in the fall of 2001, there are two vessels, each containing 499 filter elements. In the summer of 2006, a vessel will be added. Total throughput currently is 250 m³/h (to be upgraded to 300 m³/h).

Benefits

There are no costs for the purchase and disposal of pre-coating media, nor for the disposal of mercury-containing sludge. The sludge from the HgS-filter is feed to the mud tank. In contrast to a precoat unit, it is possible to reduce the mercury-contaminated sludge to zero.



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