

R2 CASE STUDY: REMEMBRANING AND RECOATING OPTIMIZATION AT VESTOLIT, MARL CHLOR-ALKALI PLANT

WHO IS VESTOLIT?

With an expertise spanning more than 70 years, Vestolit produces caustic soda, alkyl chlorides, and chlorine derivatives in addition to their general and specialty vinyl resins. As part of Orbia, Vestolit delivers globally through twelve production sites in the Americas (North, Central, and South) as well as in Europe.

In Marl (Germany), Vestolit operates the biggest fully integrated vinyl production site in Europe with a total capacity of 400,000 tons. The chlor-alkali plant on this site comprises 8 electrolyzers with 180 cells each and produces 294 kilotons of caustic soda per year.



Vestolit, Marl – Chlor-Alkali Cell Room
(Image Courtesy of Vestolit, Marl)

CHALLENGE: WHEN TO REMEMBRANE AND RECOAT EACH CELL

Peter Fischer, plant manager for chlorine & caustic at Marl, summarizes the issue: “Membranes and electrodes are expensive parts to replace and running degraded membranes or electrodes significantly increases our electricity costs. Furthermore, the replacement activities create downtime and production loss in a plant with high utilisation, because recoating takes weeks if you do not have a sufficient number of spare elements.

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Therefore, remembraning and recoating usually are rare but very costly activities. Over the years, we have seen that the industry rule of thumb of replacing all membranes every 4 years and all electrode coatings every 8 years is flawed, because some membranes and/or coatings age faster, and they should be replaced earlier to maximize our plant performance. Accordingly, finding the best timing to remembrane and recoat each cell is key to optimize our plant production and keep our costs under control.”

SOLUTION: EMOS® CELL PERFORMANCE ANALYZER FROM R2

Since 2010, Vestolit, Marl engineers have used R2’s Cell Performance Analyzer (CPA), a predictive maintenance service that precisely characterizes the performance of each cell component (anode, cathode and membrane) by determining cell specific power consumption, cell current efficiency and other parameters. CPA utilizes an economic simulation that takes into account electricity costs, membrane cost replacement, cell performance, etc. to recommend (together with some other data) which components should be replaced and when.

BENEFITS OF EMOS® CELL PERFORMANCE ANALYZER FOR VESTOLIT

Mr. Fischer says: “CPA is an important source of information for us to carefully plan our continuous maintenance shutdowns since we can decide ahead which elements get remembraned or recoated. Typically, we shut down 1 or 2 electrolyzers per month and we replace a certain number of elements. With the information provided by CPA, our shutdowns last only a single day, so that we can go back into production mode more quickly. This decrease in maintenance downtime directly increases our revenues.

CPA also decreases our energy costs by identifying early on the worst membranes and electrodes, so that we can replace them rapidly. We therefore always operate our plant at high performance with membranes and electrodes in very good conditions. Finally, predictive maintenance with CPA smoothens the budgets for cell renewal over the years and it allows us to maintain a skilled workforce for cell replacements, because this activity is carried out whenever necessary.”

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