

CASE STUDY: SEMI BATCH POLYMERISATION

THE CHALLENGE

Our client's tank's purpose was to **achieve blending uniformity**. Excessive mixing time was currently required to ensure a consistent product quality. This meant the organisation was subject to **delayed scheduling**, **increased energy and operation costs** and reduced production outputs.

- The 35m³ tank was mixing batches of hot polymer dispersion from two reactors.
- Contents were cooled prior to in-tank dilution with two aqueous additives.
- pH and GC was used to test quality prior to partial discharge as well as the process including surface additions and surface sampling

OUR APPROACH & FINDINGS

We reviewed the current operation, assessing all available client data, taking time to completely understand their drivers and all factors influencing the situation. Our analysis found that:

- The coils and impeller being used were of non-standard design, making it difficult to predict performance
- The **low heat transfer** rate in the client's larger reactor was limiting cooling
- The surface addition of the product's catalyst solution was limiting blending

THE OUTCOMES

We provided comprehensive analysis of the options available to our client, working together to clarify the pros and cons of the options available. For example the option to increase impeller speed (requiring a new motor/gearbox would have required significant investment that meant savings benefits would actually be limited). Another option that was discounted was the introduction of a sub-surface feed, which our client felt was too substantial a change.

Instead, on our advice, our client switched to larger diameter impellers. This simpler, faster solution which affected only the impeller and the shaft, rather than the entire system, was **easier to implement and made best use of the existing drive and gear box**. Operational downtime when the changes were being made was also reduced. Further benefits achieved were an improvement in consistency in product production.

