

Manufacturing

Designing a solution for pumping latex

At the production site of a major elastomers producer, the pumping of latex was proving to be an expensive and complicated process. Looking to improve operations, the company called on pump manufacturer Amarinth to design equipment that could continually pump latex coagulate with little maintenance required from production staff.

The pumping of latex presents a particular difficulty because of its adhesion and coagulation properties. Polimeri Europa, a producer of elastomers, was operating with a high cost maintenance regime at one of its production sites. This regime required numerous built up spare pumps, stand-by pumps, regular labour intensive overhauls and cleaning to keep process lines running. Pumps were changed as often as every shift during certain product batches.

With no standard products available in the market that could resolve the issues, Polimeri Europa turned to Amarinth, pump manufacturer and designer for the industrial, chemical and petrochemical markets, to engineer an advanced impeller and pump design which would allow latex coagulate to be pumped reliably meanwhile reducing equipment maintenance costs. Polimeri needed a design which would include special features outside of Amarinth's standard catalogue.

Designing the solution

Starting with its proven and reliable N-series pump, Amarinth began to design a scalloped impeller that would minimize clogging of the latex. An electro-polish was then applied to both the impeller and the backplate to create low friction surfaces. A removable front suction cover was designed to enable quick access for cleaning and finally a specially adapted mechanical seal was added to contain the latex coagulate.

The new pumps were delivered on time and prepared to fulfil all design expectations for this

demanding application. Labour costs were reduced by 85% and overall costs were brought down by 83%. These labour savings have meant that the pumps have paid for themselves in under a year.

Continual improvement

Despite the success of the original specification, Polimeri Europa was keen to further develop the design and achieve even better performance. Ideas were jointly developed between engineers from Amarinth and Polimeri Europa and following Finite Element Analysis (FEA) by Amarinth it was found that further small modifications to the impeller and backplate could dramatically increase performance.

Andrew Maxwell, plant engineer materials at Polimeri Europa, worked closely with Amarinth on this new design and commented: "I have been impressed by Amarinth's repeated willingness to further develop and improve this product. Working with them and developing innovative ideas has been a very productive and rewarding experience. The cost savings generated for Polimeri Europa have been considerable and have turned one of our most problematic maintenance issues into one of our most reliable." Polimeri Europa now has a pump that has run for six months without the need for any maintenance or cleaning – much longer than the original three week design brief. As an additional bonus the most recent design changes are also delivering significant energy savings.

A scalloped and electro-polished impeller from Amarinth.



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