

# How a biorefinery increased capacity by 40%. Faster, cheaper and conveniently

*“We need to produce more, ASAP!”*

This was the problem statement of one of the leading biotech companies in the world (Company A) when they decided to increase their production capacity to meet the growing demand of the market ahead of their competitors.

Their Ceramic Tangential Flow Filtration (CTFF) unit was the key production bottleneck, and the talented group of engineers at Company A was posed with one question: *“How to increase the production capacity of the CTFF unit?”*

This CTFF unit was part of a large biorefinery and was one of the main downstream processes following bacterial fermentation. The ceramic membranes were the best technological solution to separate the bacterial cells in low pH and high temperature, while also allowing a reliable CIP procedure compatible to food industry standards and the long lifetime of the membranes.

## Is the current solution always the best alternative?

Company A had debated different options and had made a preliminary decision to expand their CTFF capacity by installing a new standalone unit. As expected, this alternative was facing a strong opposition internally due to the high level of investment required, the long time needed to build a completely new unit and the operational burden to manage two independent CTFF units.

This is when Company A contacted TAMI Industries to jointly assess the possibility

of increasing CTFF capacity faster, cheaper and more conveniently.

## The solution proposed by TAMI Industries: non-circular channel membranes



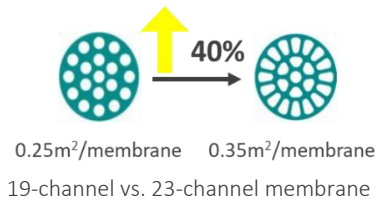
CTFF unit of Company A

The CTFF unit of Company A was equipped with 19-channel membranes (OD25mm). These circular channel membranes were part of the first generation of ceramic membranes with no technological improvements in the last three decades.

Therefore, TAMI Industries confidently proposed the non-circular channel 23-channel membrane (same OD25mm), with the same pore size, as the best alternative for this project, based on:

- Hydraulic diameter: the 23-channel membrane has the same hydraulic diameter of the 19-channel membrane (3.5mm) at OD25mm. This meant that the risk of channel blockages would not change;
- Filtration area: it has 40% more filtration surface than the 19-channel membrane.
- Pore size: it has the exact same pore size of the 19-channel membranes.

What was done, what was achieved



Company A replaced all 19-channel membranes in their CTFF unit by 23-channel membranes supplied by TAMI Industries. To cope with the increased filtration area and productivity (+40%), a study to verify the suitability of the existing piping, instruments and pumps was conducted, after which only the impellers of the feeding, recirculation and cleanings pumps were replaced. All the rest, including the housings, remained unchanged, allowing the project to be completed in less than 3 months (compared to +8 months expected to install a new CTFF unit).

And the cost? It actually cost the price of replacing the impellers of the pumps, because the 19-channel membranes were near the end of their lifetimes.

From the operations point of view, despite of increasing the production capacity of the CTFF unit by 40%, no extra operational training was needed and no new procedures were created.

## Related articles:

- Non-circular channel ceramic membranes: Why are they worth it?

*Do you have a question? Want to learn more about Ceramic Tangential Flow Filtration? Contact us!!*

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