



How polynode technology yields higher separation capacity

SEPARATION

A limiting factor for the capacity of a separator is the total surface of the discs that can be fitted into the separation bowl, and this is in turn limited by the required distance or space between the discs. A brand-new machine-embossing manufacturing design and method have made it possible to substantially increase the number of discs in the disc stack, and thereby the capacity, without increasing the water and energy consumption per litre of product. Here lies the secret behind the increased separation capacity and efficiency of a separator equipped with polynode discs.

Equidistance is essential

For a smooth and effective separation process, the discs must be kept equidistant, with exactly the same distance between discs over their entire surface. In traditional separators, this is achieved with welded spacers separating the discs.

This proven and effective design has, in principal, been the same since the more than 100 years ago. Over the years, materials and manufacturing methods have been continuously developed to improve the performance of the separator, including reducing the distance between

"A significant increase in capacity"

The Arla Foods facility in Vimmerby, Sweden handles 1,5 million kilos of milk daily. In 2014, the dairy had reached its capacity limit and launched a joint project with Tetra Pak, built on brand-new polynode technology, to increase separation capacity. The result is a significant increase in

discs to increase the separation surface in the separator bowl.

But up until now, the disc design with welded spacers has been a limitation. This is simply because of the challenge of increasing the number of discs in a stack and at the same time maintaining equidistance between them. The new polynode technology is an elegant solution to this problem, since it allows a reduced distance between the discs with consistent distance over the entire surface.

Increased surface = higher capacity

Polynode technology represents a major breakthrough in as it eliminates the need for traditional welded spacers and replaces them with micro-embossed polynodes. This has made it possible to reduce space between discs by as much as 35%*, thereby substantially increasing the separation surface through allowing more discs in the disc stack. In practice, this means that a separator equipped with polynode discs has a significantly higher capacity than its predecessors.

Increased surface = increased efficiency

Capacity is not everything. As an alternative for dairy producers, the use of polynodes enables an increased separation efficiency at a maintained capacity. This is interesting for customers who, for example, want to remove as much fat as possible to achieve their end product specifications.

One-piece design

The newly developed machine-embossing manufacturing process allows a one-piece design with extremely high precision. The exact shape, size and distribution of polynodes mean that the number of contact points between discs has increased by 38x, while the total contact area has been reduced by 94%** . Due to the many, evenly distributed contact points, polynode discs are more stable than traditional welded designs – equidistance between discs is kept perfectly over the entire surface, ensuring a consistent separation process. In summary, equidistance between polynode discs is key for reducing space between the discs, thereby enabling higher capacity compared with traditional designs.

efficiency that can be utilised to raise capacity or further improve the separation performance/reduce the fat content in skimmed milk. "We now have a stable process delivering a consistent level of accuracy and capacity. It's a fantastic result", says Allan Leandersson, Project Leader Product & Technology Development at Arla in Vimmerby.

Higher capacity with water and energy savings

Polynode discs can be introduced into machines that currently feature a welded disc design. The capacity of a separator equipped with polynode discs is 9%* higher compared to the previously largest hot-milk separator. Thus, the design of polynode discs enables significantly lower energy and water consumption per 1,000 litres of processed product, both saving money and resources.

**Tetra Pak® Separator H80*

*** All figures compared to traditional welded spacers in typical configuration for high capacity hot milk separators*

To learn more about how Tetra Pak's polynode technology can solve your separation challenges:

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