

## Large scale capture and purification of industrial enzymes

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### **ABSTRACT**

One of the trends in food industry is the application of high quality and pure enzyme products. The main driver for purification is the selective removal of non-desired side activities. Side activities are endogenously produced by the microorganism and need to be removed to avoid application issues caused by these enzymatic activities.

In common unit operations in enzyme recovery, such as centrifugation, (dead) end filtration, ultra filtration the unit operation shows moderate selectivity and yield losses can exceed 10%. DSM introduced chromatography as purification technology for the capture, purification and concentration of food enzymes. Chromatography is due to its high yield and selectivity cost competitive with conventional process routes.

A large scale purification plant has been built in the DSM enzyme manufacturing facility in Seclin, France. Chromatography resins were selected based on binding capacity and selectivity. The final result is a fully automatically controlled production scale chromatography system, which is used to purify enzymes.

The major challenge was to introduce chromatography for large volumes of fermentation liquids, preferably replacing one or more other unit operations, maintaining the same process throughput and competitive high yields.

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### **Biosketch**

Ruud van Beckhoven has a bachelor degree in Biochemistry/Biotechnology. He works now for approximately 20 years for DSM currently in the department Down Stream Processing of the DSM Biotechnology Center. The last 10 years he was responsible for the workgroup chromatography. This workgroup is developing purification processes of industrial enzymes for DSM Food Specialties. Next to that Ruud is responsible, in DSM, for several external projects, collaborations in between industry and academic, sponsored by the Dutch government.