Continuous extrusion as a tailor-made process for the production of aquatic feed

Wide range of aquatic feed applications that can be produced on Coperion's high performance twin screw extruder ZSK MEGAvolume PLUS

With an extrusion test lab that meets the special requirements for the production of aquatic feed, Coperion, well known by their former name Werner & Pfleiderer, offers manufacturers of aquatic feed and aquatic feed adaptations optimum conditions for the development of recipes and the optimization of production processes. This extrusion test lab is at the Coperion site in Stuttgart. It is equipped with a ZSK MEGAvolume PLUS twin screw extruder and the appropriate plant periphery.

"The test lab serves above all for the development of the process design and screw configuration but also for the design of the turnkey plant for the production of new or modified products", Frank Lechner, Head of Process Technology explains. "In every single case we cooperate very closely with our customers so that the future owner gets a turnkey plant which meets his individual requirements and is optimally adapted to his products. Coperion's long years of process know-how which enables the scale-up to large-scale machines is particularly important for our customers."

In comparison with the aquatic feed production with single shaft extruders, the twin screw extruder is suitable for the production of a much wider range of recipes, for example, for the extrusion of aquatic feed with a higher fat content. The floating and sinking behavior of the aquatic feed can be influenced by flexible settings of different parameters of the extrusion systems.

Extrusion systems for aquatic feed usually achieve throughput rates of 15 to 20 t/h today; throughput rates of up to 25 t/h are achieved in individual cases. Coperion has already produced numerous large-scale extruders with screw diameters of up to 380 mm and throughput rates of up to 80 t/h for alternative areas of application. Coperion is therefore well prepared for the demand for increasing throughput rates in aquatic feed production which is to be expected in the future. The exact agreement with different cooperation partners such as Dinnissen, the Dutch manufacturer for plant peripheral equipment, ensures that the whole periphery equipment of the production system from the feeder and pelletizer to the drier, coater and cooler work together without any trouble. As a result the customer gets a turnkey plant from one provider.

ZSK MEGAvolume PLUS twin screw extruder – properties and user benefits

With the ZSK MEGAvolume PLUS which has been proven in numerous applications for many years, a high performance extruder is available for the production of a wide range of aquatic feed applications. As Edgar Strobel, process engineer for animal food technology, explained, the continuous process results in a high, constant product quality of the aquatic feed and also simplifies the further processing. The ZSK twin screw extruder achieves very high throughput rates and operates very economically. The large free volume of the process section in connection with high screw speeds is decisive for this.

The modular structure of the self-cleaning twin screw in the ZSK enables an optimized screw configuration for the respective process task. In addition to the conveying, mixing or kneading elements, numerous special elements such as shoulder or sieve discs with specific functions are available for special requirements. Furthermore, the ZS-B side feeder or the ZS-EG side devolatilization increase the throughput rate and process flexibility. By using a ZS-B side feeder, difficult bulk materials such as starch powder with very small particle sizes can be fed into the process section. The ZS-EG side devolatilization enables influencing of the bulk weight by steam extraction. Of course the pelletizers are also designed for the special requirements of aquatic feed production. Special material solutions with high corrosion and abrasion resistance are available. The screw barrels are equipped with through-hardened liners, in the screw elements a wear and corrosion resistant outer coating is applied to the tenacious core material by powder metallurgy technology. The structure of the whole processing system ensures that it is easy to clean and keep clean. The ZS-B side feeder and the ZS-EG side devolatilization are easy to remove and therefore well accessible.

The test lab in practice

Numerous customers use the possibility of simulating their future production process in advance in the Coperion test lab in Stuttgart on a smaller scale and acquiring reliable scale-up data. Evonik Degussa GmbH, Hanau (Wolfgang) is currently testing the influence of different process parameters on their amino acid products MetAMINO®, ThreAMINO®, TrypAMINO® and Biolys® with basic aquatic feed recipes. After extensive analyses, reliable data of the extrusion behavior of these limiting amino acids are available which allow the optimized balance of alternative and less expensive vegetable protein based diets.

■ ***Coperion GmbH***
www.coperion.com
info@coperion.com