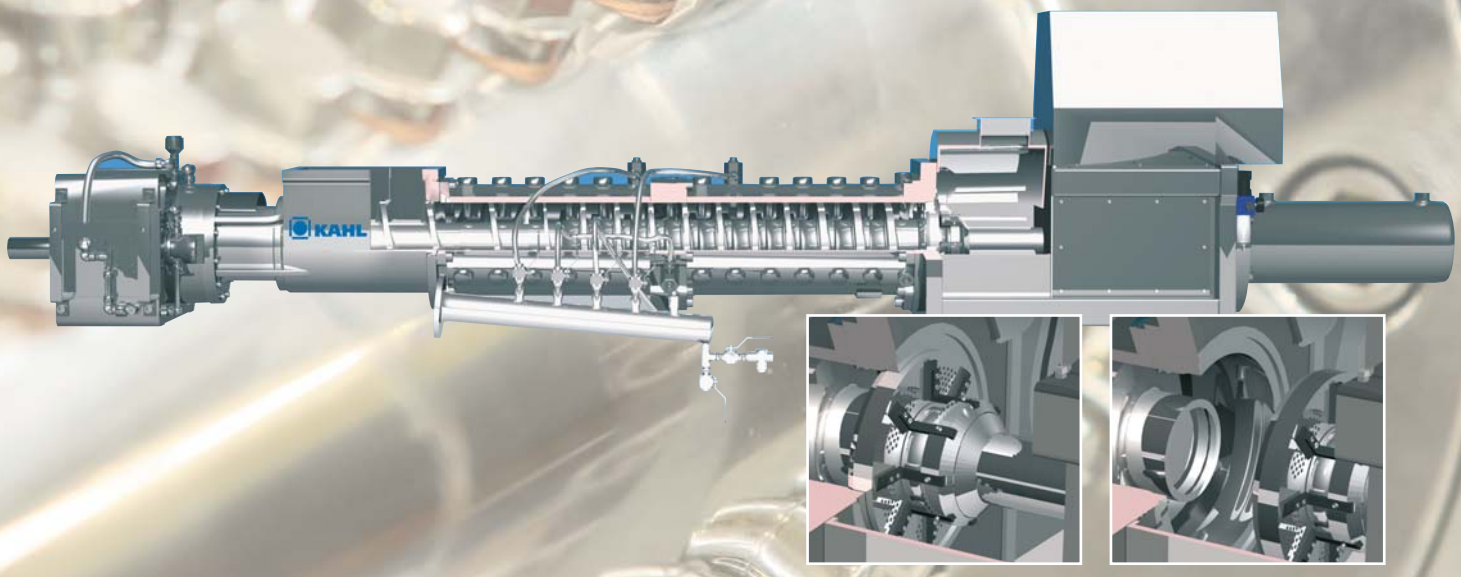
Production of Fish and Shrimp Feed with the Extruder OEE



Latest Process Technology for High-Quality Fish Feed

Training on the extruder OEE

Screening machine

Coater

Extruder, type OEE 8

KAHL fish feed plants are equipped with the latest process technology, the core of which is the extrusion system with the extruder OEE and the process control system ESEP.

In the production process, the raw materials undergo the process steps of weighing, fine grinding, mixing, extrusion, drying, vacuum coating, cooling and packaging.

Wide Range of Products
Sinking, slowly sinking and floating products in various shapes and sizes can be produced. Particularly in the area of conditioning and extrusion, the Kahl process technology allows it to respond to the demands of local raw materials.

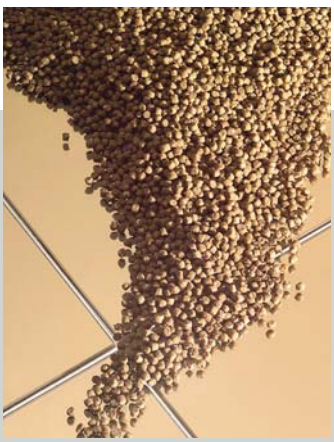
Advice and Training
In addition to the process and plant design for the complete line, Kahl provides comprehensive advice and support regarding the basic formulae and the raw materials to be used as well as intensive training of the operating personnel.

Theoretical and practical training is performed in the Kahl pilot plant in Reinbek/Germany as well as locally during commissioning of the plant.

Two-Stage Conditioning
In preparation for the extrusion, the feed mixtures are pre-cooked with a special two-stage conditioning system according to the different starch qualities.

The principal machine is the retention conditioner of type VK. In this machine, the retention time of the feed is continuously adjustable between 60 and 180 seconds, using a pile-up

3D plant design



Extruder, type OEE 23


Drier


Packing

geometry at the outlet. Depending on the feed properties, the desired retention time is determined in the formula or directly at the user interface. A correction during operation as well as automatic emptying of the retention conditioner at automatic stop of the plant is possible.

Extruder, Type OEE

Shaping and adjustment of the extrudate density are realised in the extruder type OEE. This machine is equipped with the hydraulically movable die which is typical for the Kahl extruder. It allows an extruder start with open die which makes the critical process start and stop very easy and waste saving.

Due to the hydraulic extension of the die, a die change can be completed within 10 minutes. This provides additional convenience, in particular since fish feed production typically requires a variety of different extrudate diameters. At the same time a high level of plant availability with a low downtime results from the rapid die change.

Vacuum Coater

A comprehensive modernisation package was implemented in the field of the vacuum coater. The complete revision of the measuring devices and the proportioning systems is the basis for the control. The sequence of the individual process steps in vacuum coating can be tracked and retraced by the operator. As a result, the parameters can be adjusted exactly in dependence on the extrudate properties or formula.

This refers in particular to the important steps of liquid proportioning, vacuum breaking, sequence and speeds of the coater. Thus, the saturation level of the liquids in the product, the fines production and the throughput can be optimised.

Total Quality Management

The continuous quality control of the finished product is ensured by a new software system for batch traceability. It forms the basis for a total quality management.

It allows the storage of more than 1,000 formulae and retracing of the production data. With the help of continuous batch marking in the process database, it can be traced which production adjustment was chosen at which time. When storing the time when samples are taken, the results of the laboratory analysis can be assigned to the exact production data.



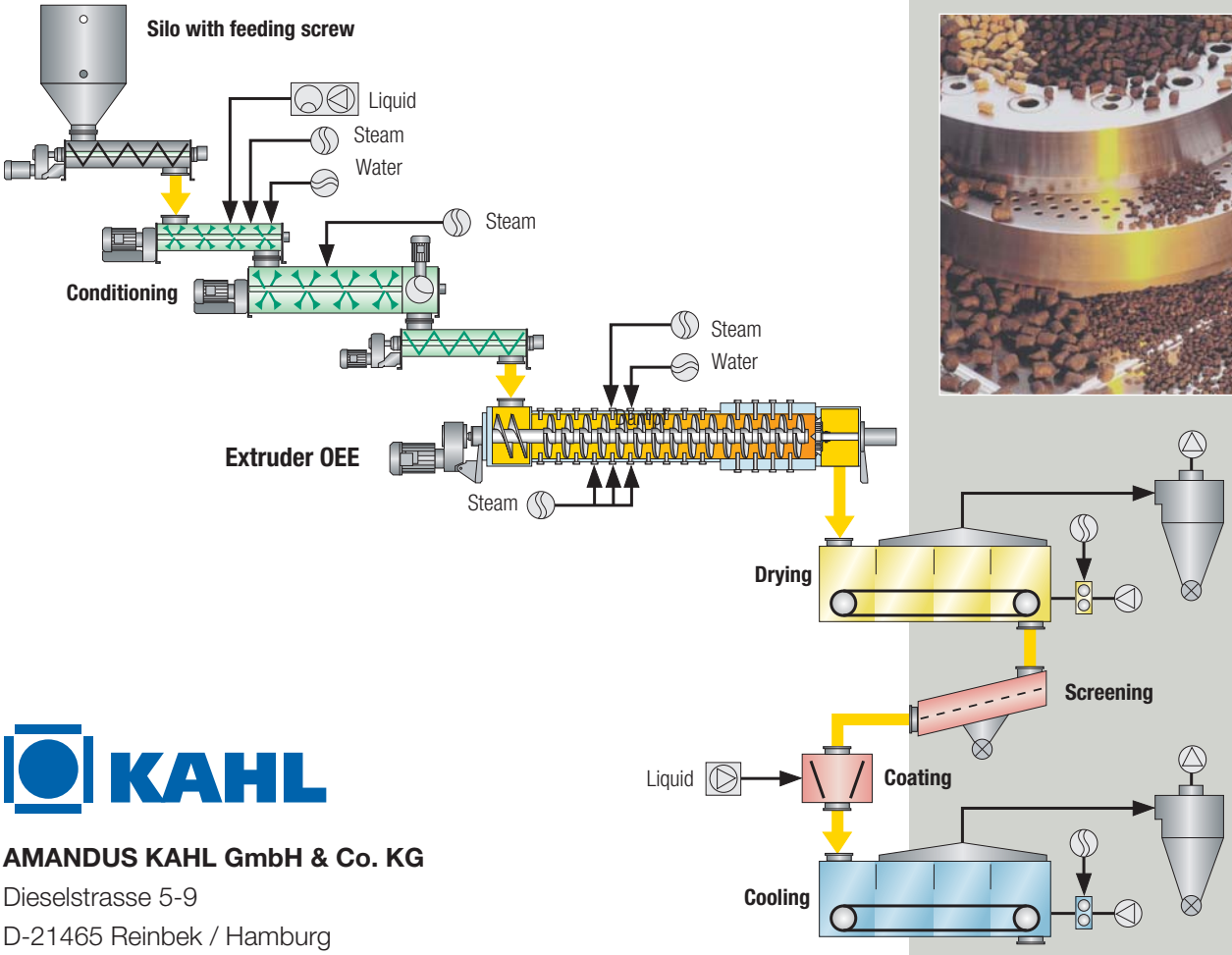

Extruder OEE - Flexible Production by Means of the Hydraulically Adjustable Die

Plant Properties:

- Precise proportioning of solid matter, liquids, steam, and water.
- Optimum product conditioning by means of a combination of continuous mixer and continuously adjustable retention conditioner.
- Extruder design with hydraulically adjustable die. This prevents blockages. Together with the retention conditioner starting and stopping are possible almost without residues.
- Rapid die change.
- Belt drier in stainless steel design with variable layer level and retention time. Gentle drying with adaptation of the drying parameters to different pellet sizes.
- Coating system for spraying of oils, fats, micro-components at atmospheric pressure or in a vacuum.
- Belt cooler with variable layer level and retention time.
- Crumbling device for rearing feed of 0.1 mm to 2 mm.

Product Characteristics:

- Starch modification of 80 to 90 % acc. to the amyloglucosidose method (AMG).
- Production of floating or slowly sinking pellets for tilapia, carp, catfish.
- Production of slowly sinking pellets for trout, salmon, perch, fat content up to 30 %.
- Production of water-stable pellets for shrimp and other crustacea.
- Pellet diameters of 2 to 12 mm.
- Pellets without fines.
- Production of rearing feed in form of crumbles, granular size 0.1 to 2 mm.



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