

# The Gentle Vacuum Coater

## Robust Pellets All the Way to the Fish

By Dr. Stephan Sternowsky, Head of R&D, Amandus Kahl GmbH & Co. KG



Vacuum coating, or vacuum infusion processes, are widely known in the fish feed industry since they enable the feed manufacturer to produce high-fat feed of an outstanding quality.

With these processes liquids can be introduced in a feed crumble (extrudate, pellet, etc.) or petfood kibble in a way that they are protect-

ed against degradation by the surrounding environment if more than one liquid is sprayed after another.

Together with the person behind the idea, Ismet Nikqi, and the rest of the team at the Centre for Feed Technology (Norwegian University of Life Sciences in Ås), Amandus Kahl (Reinbek, Germany) has now designed a complete new type of vacuum coater to overcome the known obstacles of the

already existing vacuum coaters in the market. Assisted by two Bachelor-Theses from Students from the Hamburg University of Applied Science, a 1,000-litre (through-put rate app. 8t/h) version of this new "Gentle Vacuum Coater" was designed and finally built. This Coater was presented for the first time to the public at the Victam Exhibition in Cologne in June 2015.

Abrasion of the product inside the traditional coaters and mechanical impact due to the fast rotating mixing elements of twin-shaft vacuum coaters result in an increased amount of fines. Additionally, the mechanical impact promotes micro cracks, which act as weak spots. In consequence, these weak spots promote breakage of the feed while the product undergoes handling procedures after the coating process. In case of aqua-feed, where breakage can also occur in the long feeding hoses before spreading the extrudate into the cages, the micro cracks can result in an observable amount of additional fines. Moreover oil-leaking after coating is sometimes said to be related also to the mechanical load and to micro cracks.

The new “*Gentle Vacuum Coater*” is designed as a rotary drum mixer with no moving parts inside the mixing chamber. Tests showed a significantly decreased



The “*Gentle Vacuum Coater*” was nominated for Aquafeed.com’s Aquafeed Innovation Award 2015.

### Amandus Kahl

The KAHL group of companies, founded in 1876 is medium-sized and family-owned. Complete feed mills, extrusion lines, rice mills, grain processing and food freezing plants, fluidized bed processes, green coffee center, as well as coffee roasting facilities are sold all over the world.

More than 700 employees, a worldwide network of agencies, service technicians, subsidiaries and sales offices enable the direct contact to our customers and extensive services. The machines and plant components are produced near Hamburg and Bremen. They are "made in Germany". AMANDUS KAHL is the largest company of the KAHL group. AMANDUS KAHL is a medium-sized family-owned company managed by its proprietors.

The Amandus Kahl test departments are responsible for the development of new processes and machines. They have extensive pilot plants with laboratory, production machines, and measuring equipment for the most important process stages of the conditioning technology.

### Centre for Feed Technology, NMBU (“Fôrtek”)

The Centre for Feed Technology is co-located with Department of Animal and Aquacultural Sciences as a research/production unit within Animal Production Experimental Centre (SHF) in Ås (close to Oslo, Norway) The interaction between those two divisions enables researchers to monitor the complete feed chain, from feed ingredients processing and its technical characteristics to the effects on nutrition, health and welfare of different animal species. Thus, the main strategy of the Centre for Feed Technology is to serve as base for research and know-how, in order to combine knowledge in the area of feed technology and animal nutrition.

In total, this makes The Centre for Feed Technology a universal host that can offer a complete research package for feed research and product development. See page 23 for more about the centre.

amount of fines in comparison with twin shaft mixers. Also the amount of micro cracks inside the feed was significantly lower, measured by the DORIS-Test. Hence the overall product quality was improved significantly. The double positive effect of the “*Gentle Vacuum Coater*” by reducing fines on site and preventing the possibility of breakage after the pellets have left the feed plant also has an

environmentally positive impact, in addition to the obvious economical one for the feed company. Less fines means less feed reprocessing and reduced energy consumption. Less breakage after the feed has left the plant ensures that the loss of feed is minimized.

Furthermore, a disadvantage of the existing twin shaft vacuum coaters is the

fairly poor cleanability due to the limited accessibility inside these types of mixers. The new "Gentle Vacuum Coater" allows complete accessibility to all parts for reliable and fast cleaning when required, which is a big step ahead, compared with the conventional twin shaft vacuum coaters.

The cycle times of the batch operation and the size of the individual batches are comparable to the coaters on the market. Furthermore, the footprint and the height are similar to the known coaters, therefore a subsequent replacement of older machines by the new KAHL "Gentle Vacuum Coater" is easily possible.

The new "Gentle Vacuum Coaters" design allows reduced feed waste, both in the feed plant, and during handling later in the process, which in general will increase customer satisfaction for the feed.

Reduced feed loss, also equals reduced environmental impact. In addition the improved ease of maintenance and cleaning reduces operational costs for the feed producers.



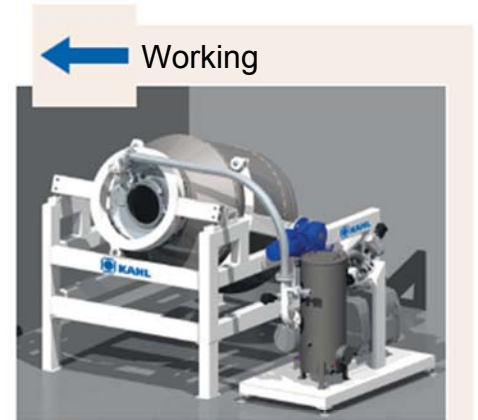
#### More information

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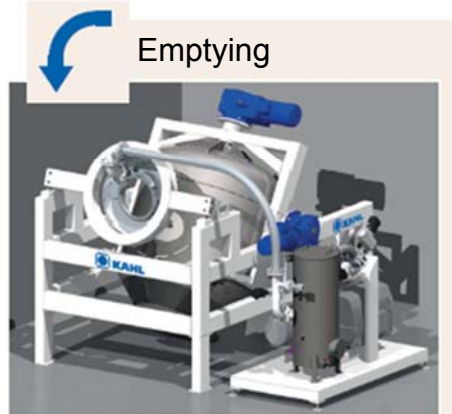
Filling

The drum is filled with the product to be processed. Weighing and proportioning are carried out by high-precision load cells integrated in the vacuum coater. The drum swings into working position and rotates.



Working

In the working position, the vacuum is generated and then one or more liquids are sprayed, one after the other, onto the product. (Nozzles and liquid addition are not shown). The vacuum is broken in a defined way.



Emptying

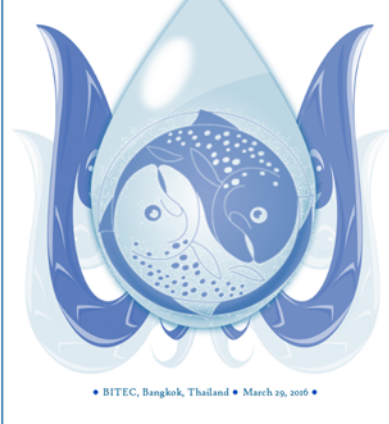
The drum is emptied by a pivoting movement downwards. Meanwhile, the drum continues to rotate. Complete emptying is ensured.



Cleaning

For cleaning and inspection, the drum can be completely pivoted towards the rear side, so that the best possible access is given.

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