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Press Release

Coperion and Coperion K-Tron at IFFA 2022

Solutions for Manufacturing Plant-Based Meat Substitutes

Stuttgart, April 2022 – At the IFFA 2022 (14-19 May 2022, Frankfurt am Main, Germany), Coperion and Coperion K-Tron are presenting their technologies and process expertise for manufacturing plant protein-based meat substitute products. Coperion has already realized numerous installations for manufacturing TVP (Texturized Vegetable Protein) and HMMA (High-Moisture Meat Analogues). Key components for bulk material handling, feeding and the ZSK Food Extruder with discharge are all manufactured in house.

At Coperion's booth A61 in Hall 12.0, the K-ML-D5-KT20 twin screw loss-in-weight feeder, the K3-HD-CL-SFS-V100 vibratory feeder, and the P10 sanitary vacuum sequencing central receiver will be available to view.

Plant Protein-Based Meat Substitute Products

Consumer demand for plant-based meat substitutes is growing very rapidly. With their technologies for bulk material handling, feeding, and extrusion, Coperion and Coperion K-Tron offer TVP and HMMA manufacturers solutions to expand their production, and they support new businesses entering the market.

TVP is used both as a meat substitute as well as a supplement to meat products. This dry, porous intermediate product has a long shelf life under normal ambient conditions. TVP requires rehydration in liquid prior to use. HMMA is primarily used as a high-quality meat-analogue product in ready-to-eat meals. In its structure, it is strikingly similar to various types of meat.

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Both TVP and HMMA are extrusion-manufactured. Various protein-rich, powdered raw materials and water are the main ingredients of both product groups. Parameters in the extruder, such as temperature profile, screw speed, and moisture content, as well as the type of extruder discharge, differentiate TVP and HMMA production processes.

ZSK Food Extruder for TVP and HMMA Manufacturing

Extrusion is a continuous, thermomechanical process which transfers raw materials purely physically into the desired products with the aid of moisture, pressure, temperature, and mechanical energy. The raw materials are fed continuously into the ZSK Food Extruder's process section precisely in accordance with the recipe via high-accuracy feeders. There, they undergo the necessary process steps, passing through various process zones along the twin screws, to generate the desired end product structure.

The extrusion system's discharge in particular is clearly different for TVP manufacturing and that of HMMA. When manufacturing TVP Coperion's ZGF centric food pelletizer is attached to the ZSK Food Extruder's process section to cut the product directly at the nozzle plate. HMMA is discharged using a specialized cooling die which produces a product strand that exhibits a texture closely resembling that of genuine meat.

Coperion has developed a hybrid design of its ZSK Food Extruder especially for smaller companies, research units, and startups, that makes it possible to manufacture both TVP and HMMA on a single machine. Using a newly developed adapter solution, the discharge section can be switched in no time from the ZGF to the cooling die. Switching back to the ZGF is just as quick; no electrician is needed.

Along with the adapter solution, the ZSK Food Extruder's cleanability is decisive for rapid recipe change. The Food Extruder is constructed for very good accessibility. In the hygienic design model, it possesses many smooth surfaces and fulfills all of the food industry's hygiene and safety requirements. The extruder's process section features the self-cleaning profile of the twin screws. The screws are closely intermeshing, reaching into each other such that no product can stagnate in any of the process zones, and product changeover can be executed fully in just a few minutes.

Reliable Bulk Material Handling and High-Accuracy Feeding

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Handling plant-based protein powders presents a number of challenges. Coperion K-Tron offers numerous technologies, proven over many years, to ensure that raw materials are continuously supplied to the extrusion process, providing continuously high product quality.

Representing its range of gravimetric feeders, Coperion K-Tron will present the K-ML-D5-KT20 gravimetric twin screw feeder at the IFFA. This feeder ensures high-accuracy feeding of individual ingredients into the process by measuring the weight of the material to be fed and continually modifying its feeding to the desired set point. The experts at Coperion K-Tron configure the modular screw feeder with its wide range of possible components and screws so that it precisely matches the properties of the protein powder in use. The feeder is equipped with the KCM-III controller, offering a variety of user-friendly functions and improved feeding accuracy, thus increasing efficiency in production processes.

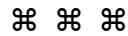
Coperion K-Tron will also present its K3-HD-CL-SFS-V100 vibratory feeder at the booth. This gravimetric feeder is suited for the gentle feeding of a variety of free-flowing bulk materials such as powder, pellets, and flake, as well as for sensitive bulk materials. With advanced electronics, its fast-acting controller maintains a clean sinusoidal displacement, achieving an extremely precise material flow. Compared to other feeders, this unique drive, combined with Coperion K-Tron's SmartConnex control unit, leads to markedly reduced energy consumption. The vibratory feeder is available in three different sizes, in both standard and easy-to-clean hygienic design.

Coperion K-Tron's P10 Sanitary Vacuum Sequencing Receiver, also available to view at IFFA, is suited for conveying flaked products, free-flowing powders, powder with poor flow properties, and materials requiring gentle conveying. All of the P Series models are constructed of stainless steel and feature steep cone angles for safe product discharge as well as tri-clover quick release fittings to ensure quick disassembly.

About Coperion

Coperion is the international market and technology leader in compounding and extrusion systems, feeding and weighing technology, bulk materials handling systems and services. Coperion designs, develops, manufactures and maintains systems, machines and components for the plastics, chemicals, pharmaceutical, food and minerals industries. Within its two divisions – Polymer and Strategic Markets / Aftermarket Sales and Service – Coperion has 2,500 employees and nearly 30 sales and service companies worldwide. Coperion K-Tron is a brand of Coperion. For more information visit www.coperion.com or email info@coperion.com.

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ZSK Food Extruder in Hybrid Design gives meat substitute product manufacturers maximum flexibility in TVP and HMMA manufacturing.

Photo: Coperion, Stuttgart Germany



The K-ML-D5-KT20 twin screw loss-in-weight feeder ensures high-accuracy feeding of protein powder in the TVP and HMMA manufacturing process.

Photo: Coperion K-Tron, Niederlenz, Switzerland