

FOOD APPLICATIONS

Sophisticated extrusion solutions for food and feed production



WE EXTRUDE EVERYTHING FROM BREAKFAST TO DINNER.

Sophisticated extrusion technology for a full product range.

#we love food
#we love extrusion
#we love food extrusion

9:00 PM
Malt drinks,
flavored health
beverages



7:00 AM
Flavor and aroma encapsulation for
convenience products and flavor
enhanced teas



7:30 AM
Cereals and
snack products



12:00 PM
Starch-based products
for cooking



7:00 PM
Crispy snacks
to nibble on



6:00 PM
Textured Vegetable
Proteins



4:00 PM
Sweets, snacks,
bakery products



Your no-compromise policy on quality in food and feed production matches ours: hygienic design, compact set-up and gentle product treatment.



OUR EXPERTISE HELPS TO GET YOUR PRODUCT TO THE SHELF.

Leitzritz accompanies you through the entire product life cycle: from first development phase to line operation all the way to plant optimization. And helps you to find the right answer for your product needs.

Inspiration and advice

- Which dosing quantity is right for my product?
- What are the optimum process parameters?
- Which screw configuration is best for my application?
- What kind of up/downstream equipment is needed?
- How to monitor quality while process is running?

Machine technology and process expertise

- Sophisticated twin screw extruders and extrusion systems
- Fully-equipped laboratories including clean room facilities
- Extrusion line set-up for experimental recipes
- Support in development and process challenges by our experienced extrusion experts

EXTRUSION TECHNOLOGY FOR TOMORROW'S FOOD APPLICATIONS.

Plant-based proteins and alternative food and feed solutions.

- State-of-the-art extrusion technology and brilliant engineering add up to successful recipes, consistent quality and scalability.

We are committed to working closely with our clients to speed up development of new products. In our test labs in Somerville (US), Nuremberg (Germany) and Singapore the Leitzritz engineers develop tailor-made solutions and accept product challenges. Know-how is shared and expanded.

Example processes:

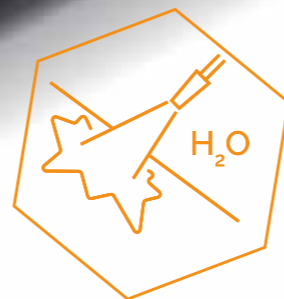
- Cooking extrusion
- Reactive extrusion
- Degassing of e.g. large quantities of water
- Encapsulation processes
- Wet/melt granulation
- Wet extrusion

ZSE MAXX-HD SERIES

NEXT-LEVEL CLEANABILITY. MAXIMUM HANDLING EASE.

Strong on cleanability and hygiene, easy on handling.

Just three major benefits that take your productivity and product quality to a new level. Thanks to a revolutionary 3-component machine design and striking machine features.



- Extruder and processing unit fully water-cleanable (equivalent to IP 65)
- All water-sensitive supply lines in a separate, mobile supply unit: Simply disconnect and push away
- Spacious and clean machine design, no narrow cracks or crevices
- Closed stainless steel cover prevents contamination
- Integrated 2-circuit temperature control unit for tidy machine setting
- No water collection due to sloped surfaces
- Washing in Place (WiP). Cleanability meets DIN EN hygiene requirements.
- Powerful, energy-efficient synchronous motor

■ Leistritz extrusion systems are flexible. The Leistritz ZSE MAXX extruders in hygienic design help manufacturers of plantbased meat substitutes to produce a wide range of high-quality alternative protein-based food, e. g. with soy, oilseeds, pea protein or microalgae. Adjust texture, shape, color and flavor of the products according to the needs of your target market and desired product.



THROUGHPUTS
from 50 g/h
to 1,000 kg/h



MACHINE TECHNOLOGY
Proven ZSE MAXX
extrusion concept



LARGE FREE VOLUME
OD/ID 1.66



YOUR PRODUCT: PREMIUM QUALITY

Our promise: Premium extrusion systems and equipment.

■ Depending on your formulation and end product, Leistritz provides state-of-the-art extrusion technology and systems for various plant options. As we are independent from affiliates we select upstream and downstream flexibly to meet your specific process requirements. From dosing unit to pelletizer. Perfectly designed for your perfect product.

Leistritz Twin Screw Extruders

- Available for a wide range of capacities
- Screw diameters from 12 to 60 mm
- Throughput ranges from 50 g/h to 1,000 kg/h

ZSE 12	Nano 12	Nano 16	Micro 18
ZSE 18	ZSE 27	Micro 27	ZSE 35
ZSE 40	ZSE 50	ZSE 60	

STATE-OF-THE-ART DOWNSTREAM.

Customized related equipment and machine technology.



Hot Face Pelletizer LHP

Pelletizer for a multitude of products and food applications: expanded starch-based products, LMMA, encapsulated flavors etc. Perfectly designed hot face cutting system for lab and small-scale production.

- Easy to clean thanks to special housing design: perfect for hygiene requirements
- Swivel-mounted design: easy handling, quick product changeover, reduced downtimes
- Continuous product discharge



Hot Face Pelletizer

Air pelletizer for a wide range of products and applications. Designed for production-scale use with various options.

- Quick exchange of cutting tools
- Movable system on rolls for easy access
- Short cleaning time
- Large-volume cutting chamber with optimized geometry for various air flow rates
- Extrusion die tempering for exact temperature control for sensitive products



Cooling Die LCD

On Leistritz ZSE extruders both TVP/LMMA and HMMA products can be produced. However, process conditions and extruder discharge vary significantly. For a quick adaption in HMMA process designs we have developed the Leistritz Cooling Die.

- Clam shell design for easy cleaning and rapid product changes
- 5 temperature zones for perfect product texture and meat-like structures
- Foldable base frame for easy handling and transportation



EXTRUDED FOR TASTE AND TEXTURE.

Designing the right screw geometry is the alpha and omega for a stable process. Our process engineers are experts in this field.

Sophisticated extrusion solutions for best texture results in plant-based meat substitutes.

The Leistritz ZSE twin screw extruders are the core of processing plants for food and feed – all designed to produce superior quality, consistent tasting as well as cost-effective and safe products. The modular screw and barrel system is the heart of the extruder. Thanks to our expertise and experience we create the optimum screw design for any application.

- Various products have been run successfully in our labs, e.g.:
 - Dog chews: specific die design to prevent melt fracture
 - Granulation processes for nutraceuticals with reduction of water
 - Reactive extrusion of e.g. binders, flavours and others
 - Pet treats: production of multi-layered, meat-like snacks by using a roll-stack after compounding
 - Enzyme production for chicken feedstock

PROCESS DESIGNS FOR TEXTURED VEGETABLE PROTEINS.

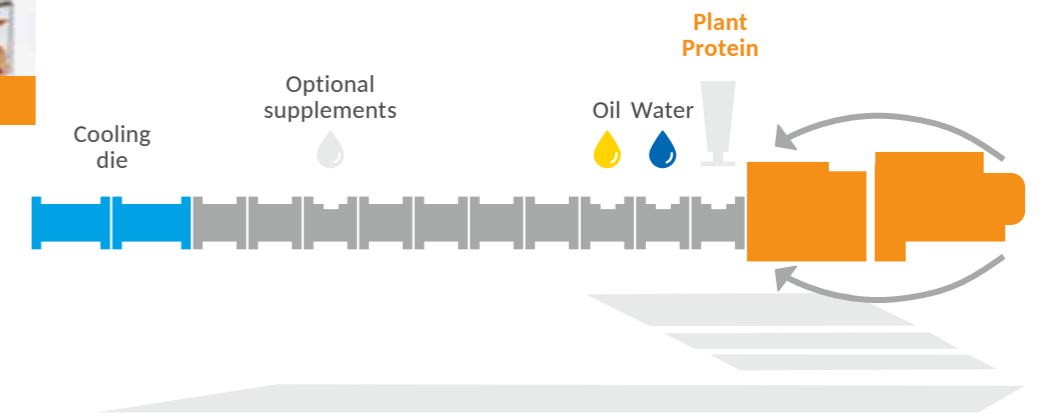
In the final product the right texture, fibre length, strength and firmness is decisive. A lot of influencing factors have to be taken into account: water addition, protein content and quality, non-protein components (e.g. fat, starch), process parameters (e.g. throughput, screw speed, temperature) as well as machine and equipment specifications.



HMMA (High Moisture Meat Analogues)

Examples: chilled or frozen meat or fish substitutes, marinated or breaded chunks, sliced, pulled meat analogues

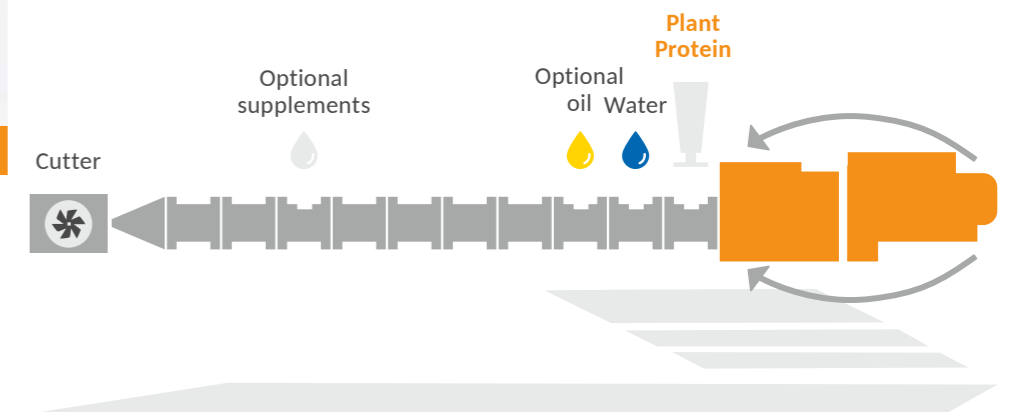
Applications: food, pet food



LMMA (Low Moisture Meat Analogues) | TVP

Examples: dry meat substitutes with long shelf life in various shapes, fillings, sauces etc.

Applications: food, pet food, feed, snacks



*All flow sheets depict example process design layouts

PROCESS DESIGNS FOR FURTHER FOOD APPLICATIONS.



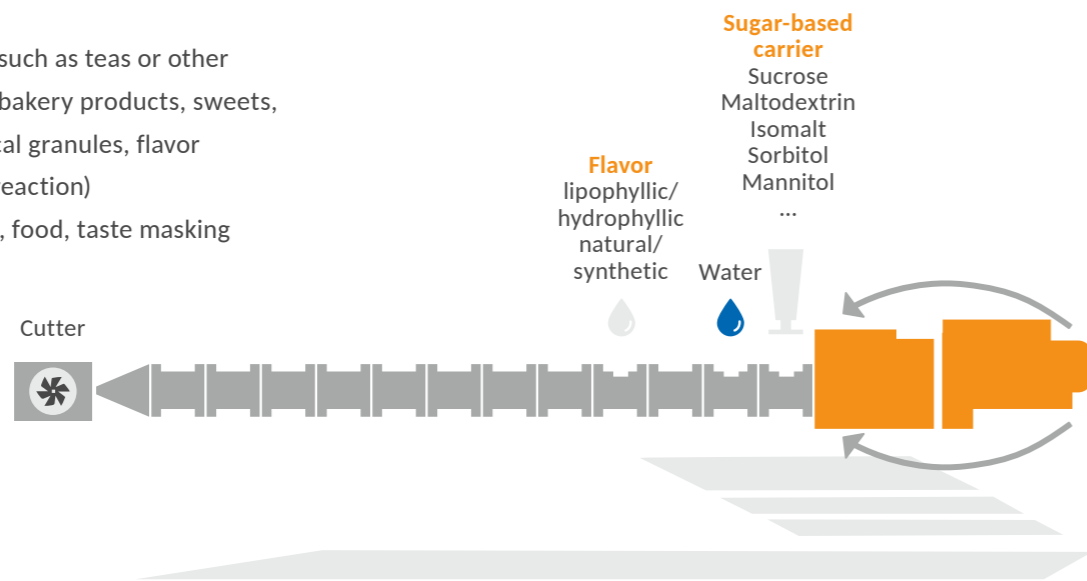
Leistritz provides innovative extrusion solutions for the food and feed industry such as:

- Encapsulation (enzymes/nutraceuticals/flavors): dispersion of one or more active ingredient in an inert carrier or matrix at solid state prepared by melting
- Wet granulation
- Physical, chemical and enzymatic modification of starches or flours for nutraceuticals or functional food

Flavor encapsulation

Examples: instant products such as teas or other powder beverage mixtures, bakery products, sweets, taste masking of nutraceutical granules, flavor development (e.g. Maillard reaction)

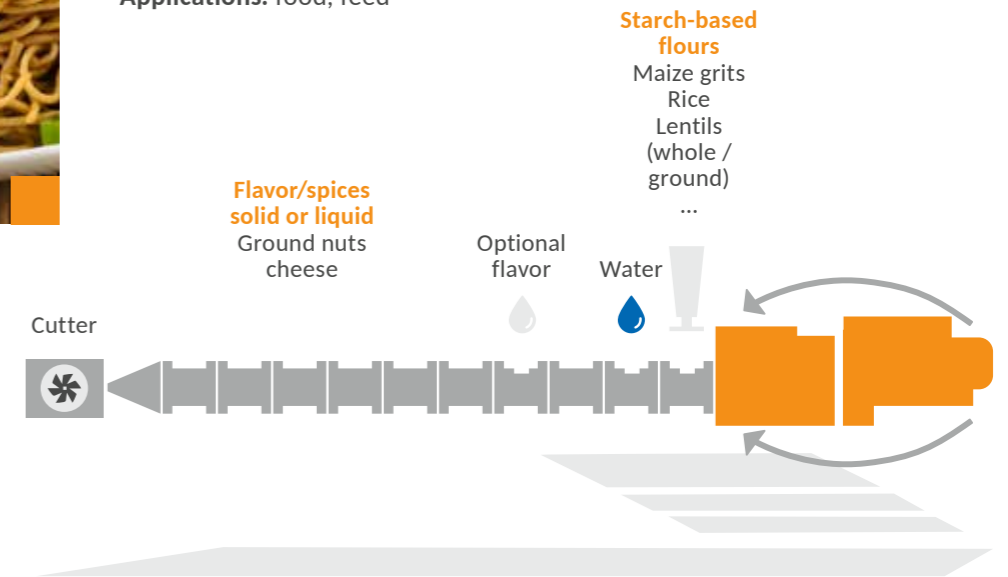
Applications: nutraceuticals, food, taste masking



Starch-based extrusion cooking

Examples: sweet or spicy expanded snacks, breakfast cereals, pasta

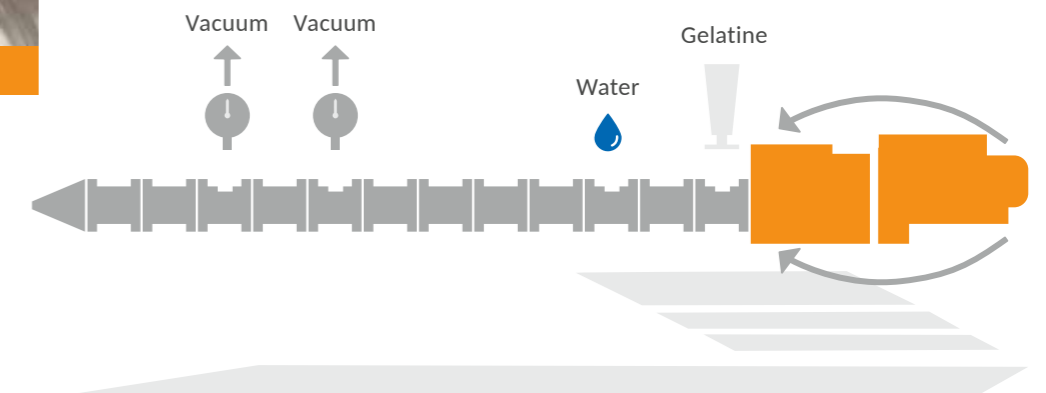
Applications: food, feed



Extrusion of gel masses

Examples: jellies, gelatine, cremes, pastes, chewing gum

Applications: food, health care products, cosmetics



*All flow sheets depict example process design layouts

We test, evaluate and optimize products and processes.
Discover the variety and contact us for your specific process requirement!

OUR GLOBAL SERVICE. YOUR PEACE OF MIND.

Customer focus is part of our DNA. Leistriz Extrusion Teams are committed to get your production lines running smoothly. And keep them running like clock-work.

Our service hubs are located in Nuremberg, Somerville, Taicang and Singapore. That's Germany, USA, China and South-East Asia - and your warranty for quick help.

We support you with test runs and trials in real-life environment. Explore your options in our fully-equipped process labs. We are at your side. And on your site. Globally.



Service and support

- Planning and design
- Plant commissioning
- Process optimization
- Modernisation / Upgrades
- Machine optimization
- Extended Warranty
- Support hotline
- Extended warranty
- Maintenance
- Digital + remote services
- Spare parts
- Smart services

Training and trials

- Operator training programs
- Customized hands-on and remote instruction
- Masterminded extrusion training units
- Trials in real-life environment
- Testing in the well-equipped Leistriz labs

ENGINEERING AND MACHINE KNOW-HOW. AND DEDICATED TO LISTENING.

Leistriz engineered solutions

Leistriz accompanies you through the entire product life cycle: From development phase to line operation all the way to plant optimization. From first product idea to small-scale feasibility trials all the way to large-scale production rates. From 50 g/h to 1,000 kg/h.

We support our clients both in theory and practically in our well-equipped labs in Somerville (US), Nuremberg (Germany) and Singapore.



Albrecht Huber
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Hungry for more?

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