



FEED AND BIOFUEL

**PET FOOD
TECHNOLOGIES**

HOW CAN WE HELP FEED YOUR BUSINESS?

ANDRITZ

ENGINEERED SUCCESS

Feeding and fueling the planet

Dedicated to feeding and fueling the planet

ANDRITZ is vital to ensuring a reliable global supply of aqua feed, animal feed, pet food, and biofuel. With full process lines accounting for half the world's production of aqua feed and biomass alone, we continuously support leading producers in achieving the highest levels in safety, quality, and control from feedstock to final product.

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LET’S FEED AND FUEL YOUR BUSINESS

The future of food and energy is full of ambitious ideas such as novel nutrient blends, unique feed properties that boost conversion rates, and high capacity process lines that virtually eliminate waste. To seize upon these opportunities, feed and biofuel producers demand a partner they can trust to deliver the right production capacity with the right service and expertise today – and for decades to come.

As a partner with more than 180 years of industry experience, no one knows more about these opportunities than ANDRITZ. From initial feedstock analysis to grinding, conditioning, and drying. From extrusion and pelleting all the way through to the largest parts and service supply chain on the planet. Together with leading producers in all major markets worldwide, our knowledge, services, and solutions continue to drive the evolution of tomorrow’s feed and biofuel production.

Flawless quality for the most demanding customers

The growing demands of today's pet food market require increasingly specialized knowledge, together with advanced processing technologies. As a longtime partner to hundreds of premium pet food producers worldwide, ANDRITZ provides comprehensive processing solutions and aftermarket services to keep your operations ahead of the curve. All to guarantee easy, safe, and efficient operations that can quickly adapt to the next market trend.

ADVANCED TECHNOLOGIES

We are strongly committed to excellent performance and the quality of our products, making us a strong partner for our customers. Our focus is on innovation and keeping up with technological developments in the industry. We strive to provide our customers with the newest technologies to ensure:

- Better and more efficient production
- Minimizing operation cost
- Maximizing energy efficiency
- Environmental protection considerations

We provide our customers with the technology that will give them a competitive advantage.

FEED PROCESSING TECHNOLOGIES

ANDRITZ is unique in their ability to manufacture and supply every machine for pet food production. With in-depth knowledge of each key process, we provide a compatible and advantageous solution, from raw material intake to finished feed bulk loading.

PET FOOD

The pet food business is undergoing constant development. Progressing considerations regarding the health and well-being of pets have set higher standards and increased demands on pet food processors. Pet owners, to a great extent, expect pet food to come in many different shapes, colors, and flavors and the demand for high-quality pet food, with an appealing visual appearance as well as the right nutritional benefits, require advanced, multifunctional equipment. ANDRITZ manufactures the advanced machines and technologies that enable our customers to meet the demands of discerning pet food customers.

COMPLETE PLANT SOLUTIONS

Our solutions are simple and effective. We strive to be a "one-stop-shop" supplying all your needs.

Our packages are tailor-made to suit the specific requirements of our customers, whether it is our extensive knowledge or expert engineering along with individual process machines, complete processing lines, or spare parts and service availability.

PROJECT MANAGEMENT

Our easy-to-operate plants, adaptable systems, short implementation times and proven performance make us the stand out partner for the pet food processes. Our core competencies, leading technologies, and international business units work together in perfect unison. The ANDRITZ staff commitment and dynamics truly distinguish us from other suppliers. Experienced project managers teamed with specialized, subject area experts ensures that we exceed your expectations every time. Through outstanding performance, mastery of key process technologies, and engineering capabilities, ANDRITZ has become a leading global supplier of pelleting equipment and systems.

Being the largest supplier worldwide of equipment for the feed industry with more than 180 years of experience, five manufacturing facilities, and a global network of sales and service companies, plus a supplementary worldwide distribution network, we are confident in our claim that ANDRITZ is able to supply the optimum technology solution for any possible need in animal feed plants.

WE OFFER

- Process line solutions
- Unit machines
- Technical consultancy
- Engineering services
- Aftermarket service and support



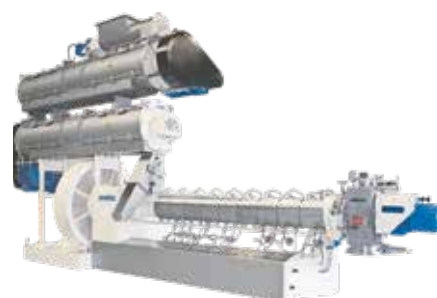
ANDRITZ manufactures the advanced machines and technologies that enable pet food processors to meet the changing nutritional needs of a wide variety of animal breeds while also realizing the demands of discerning pet food consumers and their owners.

MAIN MACHINES IN THE PET FOOD PROCESSING TECHNOLOGY

Multimill



Extruder EX1021



Optimix



Extruder EX1250



Conditioner CM



Combi-zone dryer



Extruder EX618-EX621



Batch coater



Supplier of key machinery and complete process plant solutions

BULK INTAKE SYSTEM WITH ASPIRATION FILTER

Bulk intake hopper and conveying system with filter.

INGREDIENT SILOS AND HOPPER SCALES

Hopper scales for weighing individual ingredients in formula mixtures.

LIVE BIN

For pre-mixing feed ingredients prior to grinding ensuring optimum hammer mill performance and homogeneous particle size distribution.

MULTIMILL HAMMER MILL

Fine grinding is often used in the aqua feed industry when producing starter feed or scrimp feed. 3000/3600 rpm hammer mill with small hammer-to-screen clearance. Screen perforations as small as 0.75 mm. Capacity: up to 25 t/h.

ASPIRATION FILTERS

Fully automatic, continuously operating bag filters cleaned by compressed air. A variety of filters support any need for process air filtration throughout the entire extrusion plant.

PREMIX AND MICRO-INGREDIENTS WEIGHING UNIT

For weighing/metering premix and micro-ingredients in formula mixtures.

OPTIMIX PADDLE MIXER

Optimix paddle mixer for dry mixing or for mixing with large amounts of added liquids. Capacity: up to 40 t/h. Batches: up to 6 t.

CONDITIONER

CM series for pre-conditioning with addition of liquids and steam, providing optimum mixing and retention time. Dual conditioning for perfect blending with liquids and extended conditioning time, as well as availability of CRT first-in-first-out solutions. Hot start conditioning also available.

EXTRUDER EX0618-0621, EX1018-1021, AND EX1250

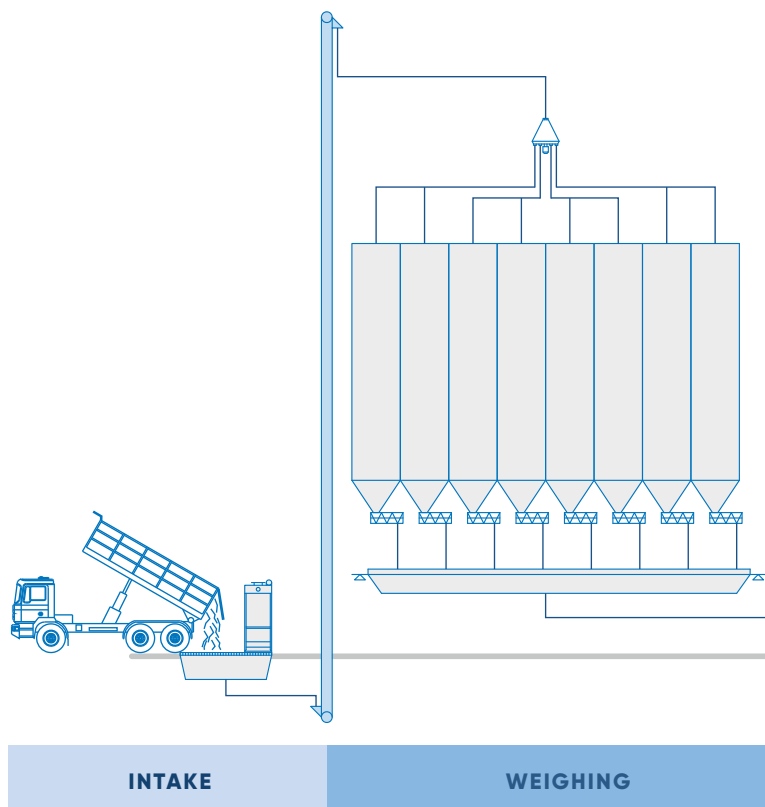
High-performance extruders, providing low operating costs combined with exceptional feed quality and unique process flexibility. Capacity: up to 20 t/h.

ECS AND FLEXTEx

Expansion Control System for in-line control over extruded feed expansion/sinkability. FlexTex for easy adjustment of extrusion SME during operation.

DRYER

Combi-zone dryer for the improvement of fish feed and pet food, covering a variety of production capacities (up to 30 t/h) and product sizes (0.6-40 mm).



Additional unique features minimize the spread of product moisture and make it energy efficient.

COATER

Vacuum coater VAC - simple design for unique results, e.g. adding large amounts of liquids, no product damage, and production of special products. Capacity: up to 25 t/h and up to 35% added oil/fat.

COOLER

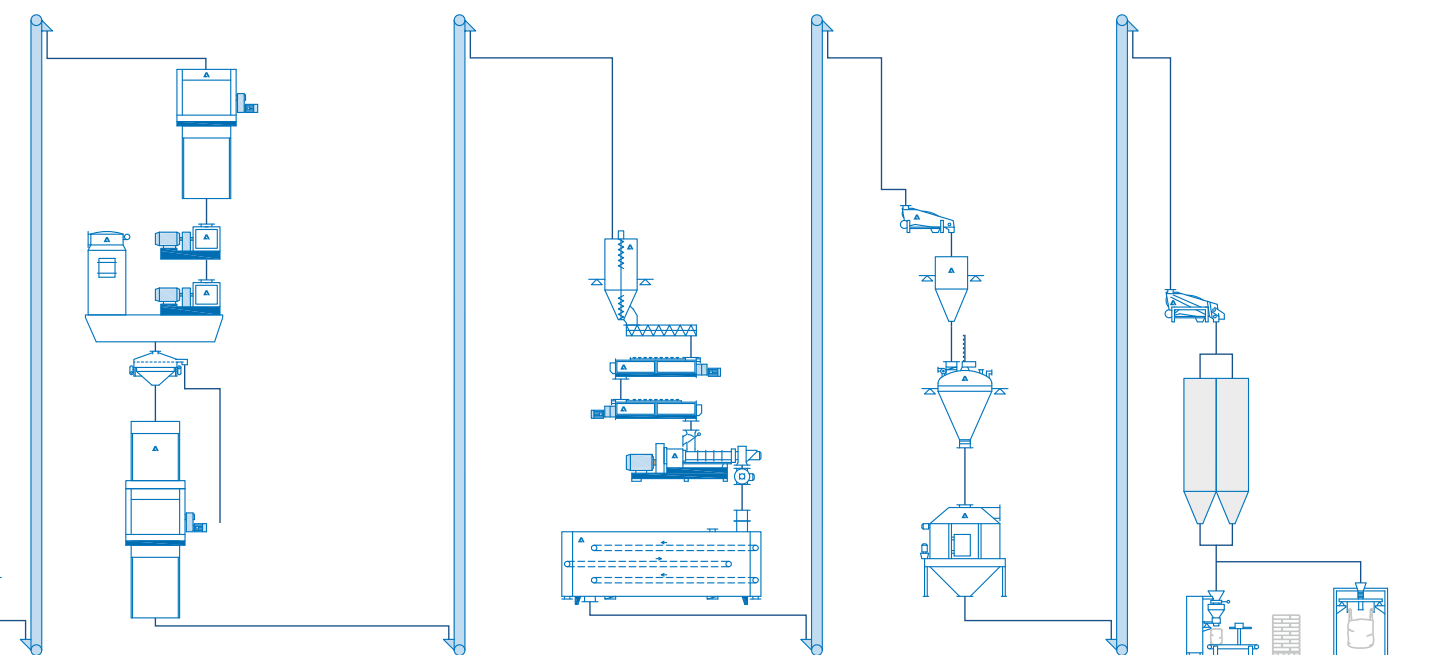
Vertical or horizontal coolers - orientation determined by the customers applications and preferences.

Vertical counterflow cooler, model PCF.

Capacity: up to 20 t/h.

PROCESS AUTOMATION

Automation systems are available as basic control systems, as fully automatic systems for control of each process machine or complete process lines. The system ensures cost-effective processing and consistent feed quality. The plant design with integrated automation solutions provides traceability of ingredients and process parameters.



GRINDING & MIXING

EXTRUSION & DRYING

COATING & COOLING

SILO / OUTLOADING

Advanced process technologies for full feed controllability

THE ANDRITZ FLEXTEX SYSTEM REDUCES DOWNTIME AND OPTIMIZES PRODUCTION FLEXIBILITY

Changes in screw configuration, and other measures that contribute to either higher or lower specific mechanical energy (SME) values, are processes that can result in down time and increased production costs. These changeover procedures can easily take as much as two to five hours to adjust. Therefore, technological advances that focus on reducing down time, while also offering flexibility in terms of capacity and quality, are in high demand by the feed industry.

THE FLEXTEX WORKING PRINCIPLE

The ANDRITZ FLEXTEX system is able to continuously control the SME applied in the extruder during operation without changing the extruder configuration or any other parameters.

By simply changing this one parameter, the following advantages are achieved:

- Starch cook is completely controlled (up to 100%) during operation
- The bulk density of the product can be reduced by up to 30% and can be controlled with an accuracy of $\pm 5 \text{ g/l}$ (0.3 lbs/ft³)
- Higher additions of oil and less starch in the formula without significant influence to bulk density and product quality

The FLEXTEX system, located between the screw and the die plate, allows the outlet opening to be adjusted

from 3000 mm² to 100 mm² (4.65 - 0.15 in²) depending on throughput. This provides more precise control over the pressure in the kneading zone and the SME applied, reducing the energy consumed.

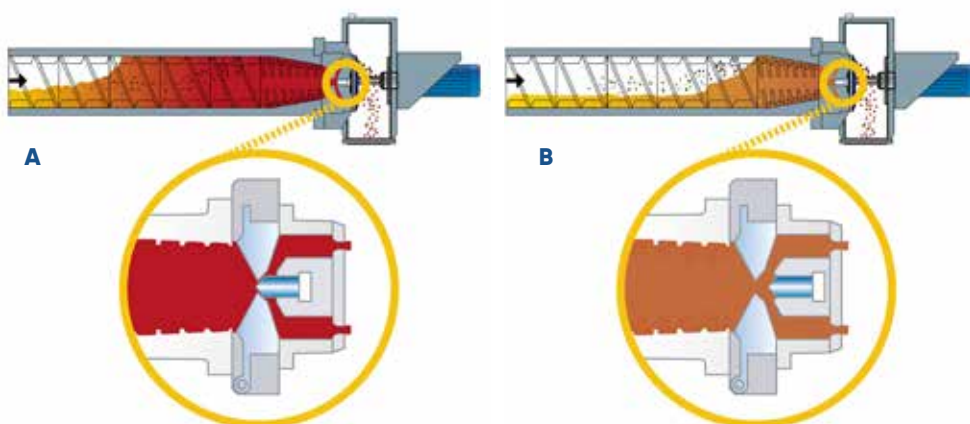
With the FLEXTEX system, the extruder operator can determine exactly how much SME the product needs. The operator then determines the set-point from either from a separate control or an integrated control; for example, kW/ton (HP/ton) dry matter, and the FLEXTEX system automatically adjusts using a hydraulically controlled piston to increase or decrease flow through the outlet.

THE MECHANICAL DESIGN

The FLEXTEX system consists of three parts:

1. The PLC control system
2. The venturi die and the piston system
3. The hydraulic station

ANDRITZ designed the FLEXTEX system with simplicity in mind. Fewer parts means less upkeep and thereby reduces your cost to maintain. The primary component of the FLEXTEX system is the piston, which is used to restrict the meal flow as well as distribute meal to the die plate. It is essential that these actions are synchronized so movement of the feed ingredients are unhindered. Changes in the meal flow due to uneven pressure at the die plate can ultimately influence the visual quality of the product. The FLEXTEX system solves any possible inconsistencies by moving axially and, at the same time, conical so meal flow remains uniform.



- A** FLEXTEX in neutral position
– no additional SME applied
- B** FLEXTEX in closed position
– additional SME applied

Keep your business growing with our global service network

Our excellent aftermarket service and support is what sets us apart from our competitors. Our cooperation with our customers does not end with the sale – or the machine installation. The good customer relationship is extended through important after-sales service and support.

OUR SERVICES

Our highly skilled and motivated employees stand ready to help you with:

- After-sales services, support, and follow-ups
- Spare and wear parts, maintenance, and repairs
- Process optimization
- Training of plant operators

FIELD SERVICES

We offer our customers excellent field services, where our service technicians come to you and your plant for assistance. The depth and experience of our field service specialists is unmatched – backed by the full knowledge and technical support that only the equipment manufacturer can provide.

BENEFITS

There are several benefits to be gained from continuous upgrades, optimizations, and services on your equipment:

- Maximum production
- Process knowledge and experience
- Reliability and cost efficiency
- Reduced life cycle costs
- Short and effective shutdowns
- Improved energy efficiency



SPARE AND WEAR PARTS

ANDRITZ spare and wear parts warehouses are located at strategic locations worldwide.



Making the means to please picky eaters

Industry estimates put the global pet population somewhere around 400 million and as human populations continue to skyrocket, so will the number of household pets. The nutritional and digestive requirements for these animals varies greatly depending, not only on the species of the pet being fed, but also upon their age, activity level, temperament, and health. Additionally, pet owners expect their pet's food to come in many different shapes, colors, and flavors and the

demand for high-quality pet food, with a pleasing visual appearance as well as the right nutritional benefits, require advanced, multi-functional equipment.

ANDRITZ manufactures the advanced machines and technologies that enable pet food processors to meet the changing nutritional needs of a wide variety of animal breeds while also realizing the demands of discerning pet food consumers and their owners.



**Just like human
fingerprints, no two dogs'
nose prints are alike.**

**ANDRITZ is unlike any
other pelleting supplier,
unique in their ability
to make an imprint
on your business.**



GLOBAL SUPPLIER – LOCAL PRESENCE

With sales, service, engineering, manufacturing and production sites located all around the world, ANDRITZ Feed and Biofuel is truly a global organization with a local presence. ANDRITZ is vital to ensuring a reliable global supply of aqua feed, animal feed, pet food, and biofuel. With full process lines accounting for half the world's production of aqua feed and biomass alone, we continuously support leading producers in achieving the highest levels in safety, quality, and control from feedstock to final product.

How can we help grow your business?

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