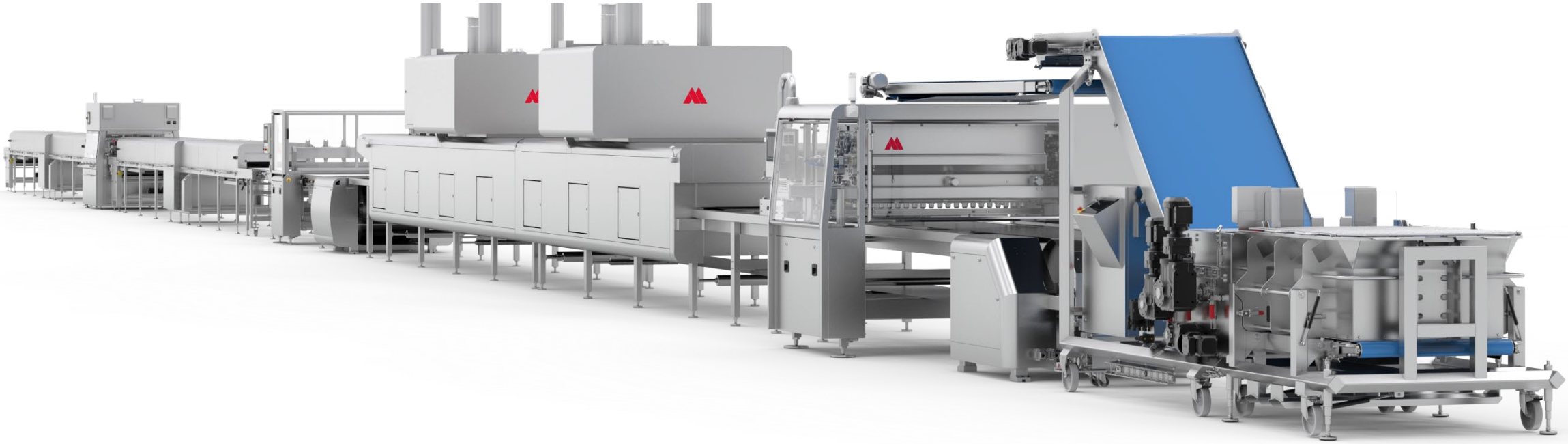


Top 4 challenges in bakery production

And solutions to resolve them and increase your production capacity

The constant challenge to do more with less

The challenges in the bakery industry are centered around continuously changing environmental hurdles, financial constraints and an increasingly global customer base that are forcing flexibility. These changes demand many industrial bakeries to innovate and associate a more flexible production capacity.

Only by doing so can they efficiently make several types of products in response to newer trends. Therefore, in this highly competitive and changing environment, retailers – together with suppliers – are constantly looking for innovative products to create a head start.

Aasted has been supplying complete processing lines, machinery and equipment for the chocolate, bakery and confectionery industries worldwide. With more than 100 years of experience, we are sharing the most critical challenges we have discovered while working with bakery production.

Bakery industry landscape is becoming more conscious towards cleaning and sanitation. Hygienic design requires bakery equipment to:

Be easily cleaned, allow dry and wet cleaning

Complete scope of machines with focus towards cleaning.

Provide easy access for inspection and maintenance

Off-line function allows to run the line while cleaning/maintaining.

Allow to get back in production as fast as possible

Modules ready to be put back in the machine and run in <15 min.

The typical and most critical challenges we have discovered while working with bakery production

Challenges	Consequences
1. Lack of hygiene and easy access for cleaning	✓ Not keeping up with health regulations ✓ Extended downtime ✓ Loss in market share due to not living up to customers' requirements
2. Lack of production agility and flexibility	✓ Prolonged downtime ✓ Limited product landscape ✓ Lower sales/margins ✓ Competitors outperforming
3. Lack of production uniformity and efficiency	✓ Lower earning ✓ Giveaways ✓ Longer production run ✓ Customer complaints
4. Strenuous maintenance	✓ Poor quality of products ✓ Extended downtime ✓ Loss in production ✓ Generally, additional manpower is simply required as a result of higher maintenance – both electrical and mechanical personnel.

1. Lack of hygiene and easy access for cleaning

The industry challenge

What is the root cause of this challenge?

In the past, machines have been built in aluminum or steel, which did not always allow for full washdown. Even if cleaning is possible, bakery solutions tend to be not flexible, especially in the areas where the dough makes contact. The industry challenge is deciding when to do a fast clean, deep clean, or both.

This can lead to:

- Poor hygiene and not keeping up with health regulations
- Extended downtime due to timely cleaning
- Having to say no to certain products as no guaranty on cleanability can be given (no access to clean the machines)
- Eventually, loss in market share

The solution

- ✓ Alice II and/or Alice Classic with a high-speed wire cutter head is easy to remove, access, and clean. The head can be rolled off and changed in less than 10 minutes.
- ✓ Alice II and Alice Classic are built entirely in stainless steel. This increases flexibility when choosing cleaning agents, especially when using a high acidity or alkaline content in your production.
- ✓ Alice Classic, Alice II and Aasted Dough feeder are built-in stainless steel, making them safe and available for food production. It lives up to the latest food-grade standards.
- ✓ Aasted Dough feeder provides a modular two-belt solution that can be taken apart to get better access for cleaning. Being stainless steel provides you with an easy and thorough wash down opportunity.

2. Lack of production agility and flexibility

The industry challenge

What is the root cause of this challenge?

For many smaller and midsize companies and co-packers, flexibility is key to stay competitive in the market. The biggest obstacle is to introduce new products easily and with minimum investment.

This is especially crucial for co-packers to be able to meet their customers' needs. The ability to rapidly alter the production with diverse products can provide manufacturers with a distinct competitive advantage.

This can lead to:

- Lack of efficiency (line uptime)
- Prolonged downtime
- Limited product landscape
- Lost co-pack opportunity’s
- Lower sales/margins
- Competitors outperforming

The solution

- ✓ Alice II is based on the Aasted modular system with the possibility to change between 1-2 or 3 heads and run extruded, wire cut, or deposited products on the same machine.
- ✓ The Alice II has a broad range of tools that can be added to the head, from extruding plates, pivoting nozzles, encapsulated die plate to wire cutter and/or twin cut, etc. All the different tools together with 1-2 or 3 heads, give you the most flexible machine in the market today.
- ✓ Commonly, extruders can be very limited in handling different types of masses and apply large amounts of stress on raw materials. Alice II and its pressure-controlled feeding system is extremely gentle when handling and maintaining materials.
- ✓ The Aasted Dough feeder provides complete control of the dough supply. The rollers pressure the dough at two different heights making it very gentle and secures that your production doesn’t suffer from shearing or smearing.

3. Production uniformity and efficiency

The industry challenge

What is the root cause of this challenge?

Older or less advanced machines cannot provide the needed production control and ensure uniformed product to avoid waste and giveaway.
This can then lead to weight inaccuracy across production lines resulting in many lines running overweight to ensure that the final packing weight is not below what is stated on the labels.

This can lead to:

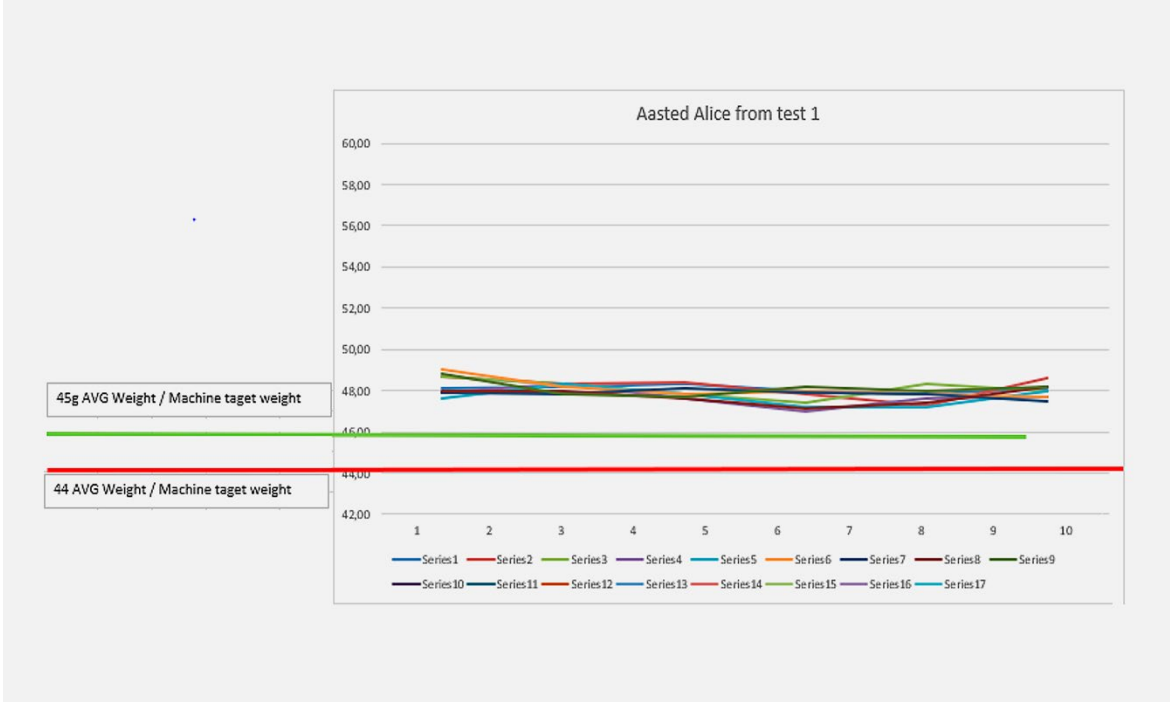
- Lower earnings
- Giveaways
- Longer production run to fill orders
- Customer complaints

The solution

- ✓ Alice II and Alice Classic with a wire cutter can run productions with pump systems (pump house). This system guarantees passivity and constant dough flow, ensuring the best weight accuracy and product uniformity across your production.
- ✓ Furthermore, Alice II tools and wire cut attachments, ensures a higher level of production efficiency.
- ✓ The controlled dough supply of the Aasted Dough feeder will help ensure weight accuracy and efficient dough supply..

3. Production uniformity and efficiency

Existing extruder weight deviation.



Alice™ II weight deviation on same product.

4. Strenuous maintenance

The industry challenge

What is the root cause of this challenge?

Maintenance has a tremendous impact on the company's proficiency in optimizing its production system in order to meet long-term objectives. Generally, a production system in which maintenance is not given attention may easily lead to the system producing defective products as a result of machine defects.

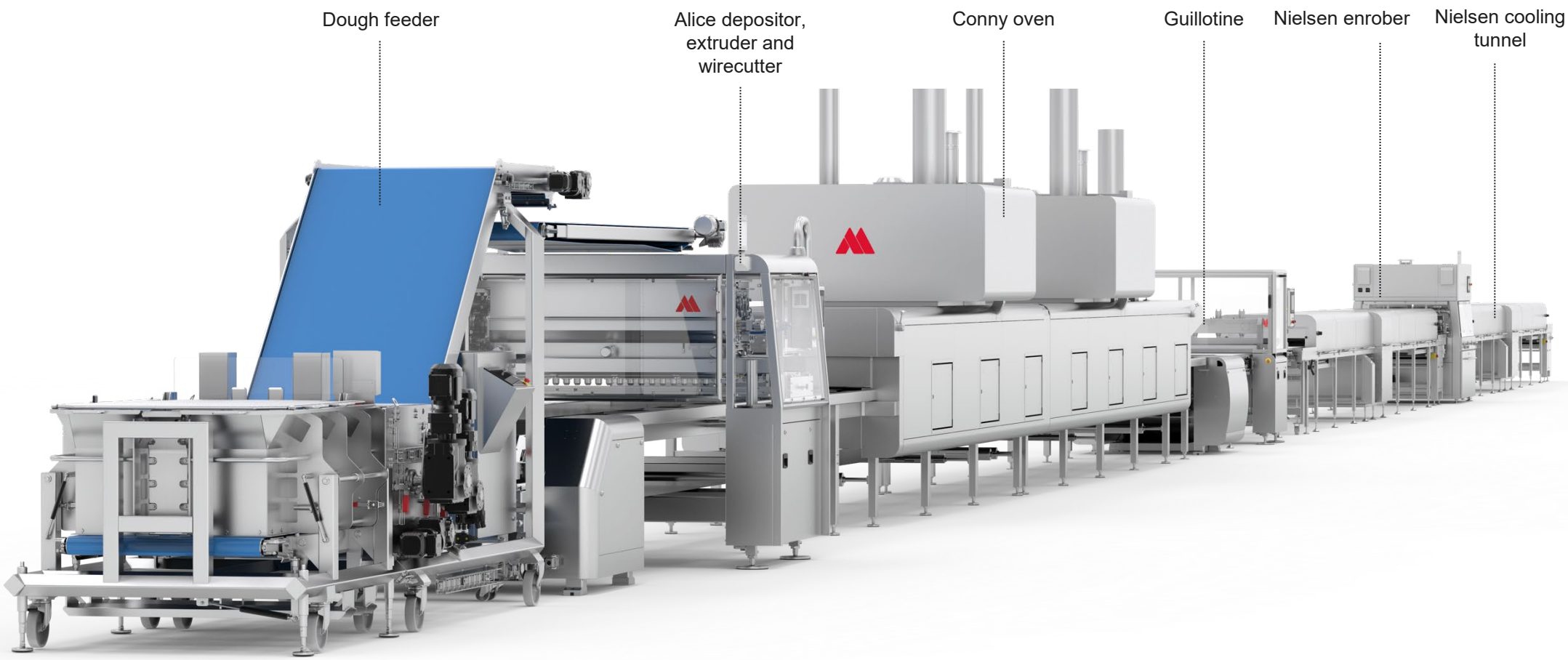
This can lead to:

- Poor quality products
- Extended downtime
- Loss in production

The solution

- ✓ Alice II and Alice Classic with a High-speed wire cutter have an off-line function that allows you to remove the extruder head and the cutting mechanism while the production is still running.
- ✓ The new Aasted Dough feeder has three modules. The modular system consists of a hopper, feeding and conveyor modules. This allows the machine to be taken apart and be moved into smaller units providing you with easy access and fast changeover

Aasted Bakery line



Dough feeding

The industry challenge

- Lack of hygiene and flexibility to clean the machine
- Difficulty changing belts
- Limited process adjustments
- Lack of mobility
- Increased maintenance

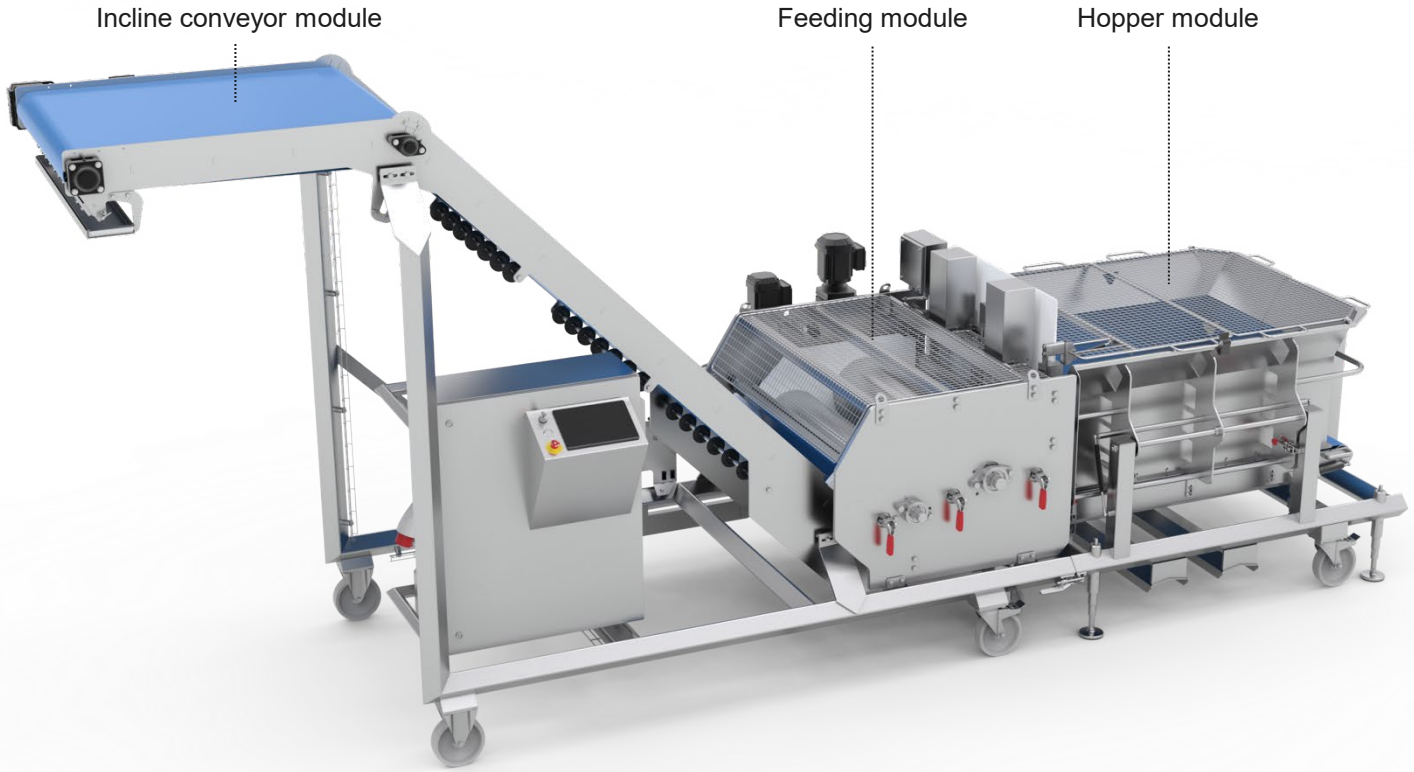
This can lead to:

- Product quality variation
- Increased downtime
- Loss in production
- Product contamination between product runs

The solution

- ✓ Aasted Dough feeder provides a modular two-belt solution that can be taken apart to get better access for cleaning.
- ✓ The unique two roller feeding module allows for extremely gentle dough handling and prevents your production from shearing and smearing. By individually adjusting the two rollers' height, you can control the speed and pressure applied to your mass.
- ✓ Aasted Dough feeder is built entirely in stainless steel. The unique three-part module system can be easily split into sections, allowing thorough wash-down opportunity while the belts are off and access to allergy care the machine.

Dough feeding to forming equipment



For automated, controlled and gentle transportation of dough. A three-part modular system allows for the right configuration for specific applications.

Belt widths: 800, 1000, 1200, 1500 mm

Depositing and extruding

The industry challenge

- Lack of production agility and flexibility
- Ability to handle different types of masses
- Lack of hygiene, access to clean
- Production performance. Production uniformity, weigh accuracy
- Strenuous maintenance

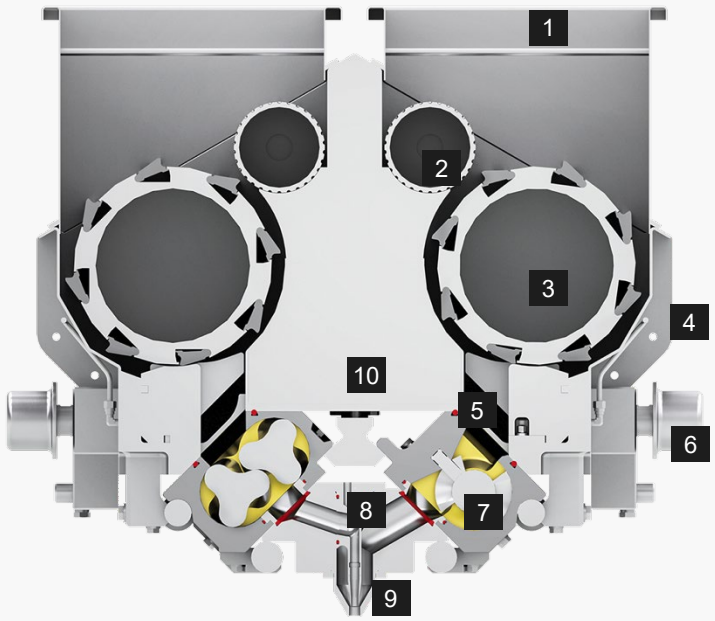
This can lead to:

- Poor quality of products
- Lower earnings
- Extended downtime
- Loss in production
- Product contamination between product runs

The solution

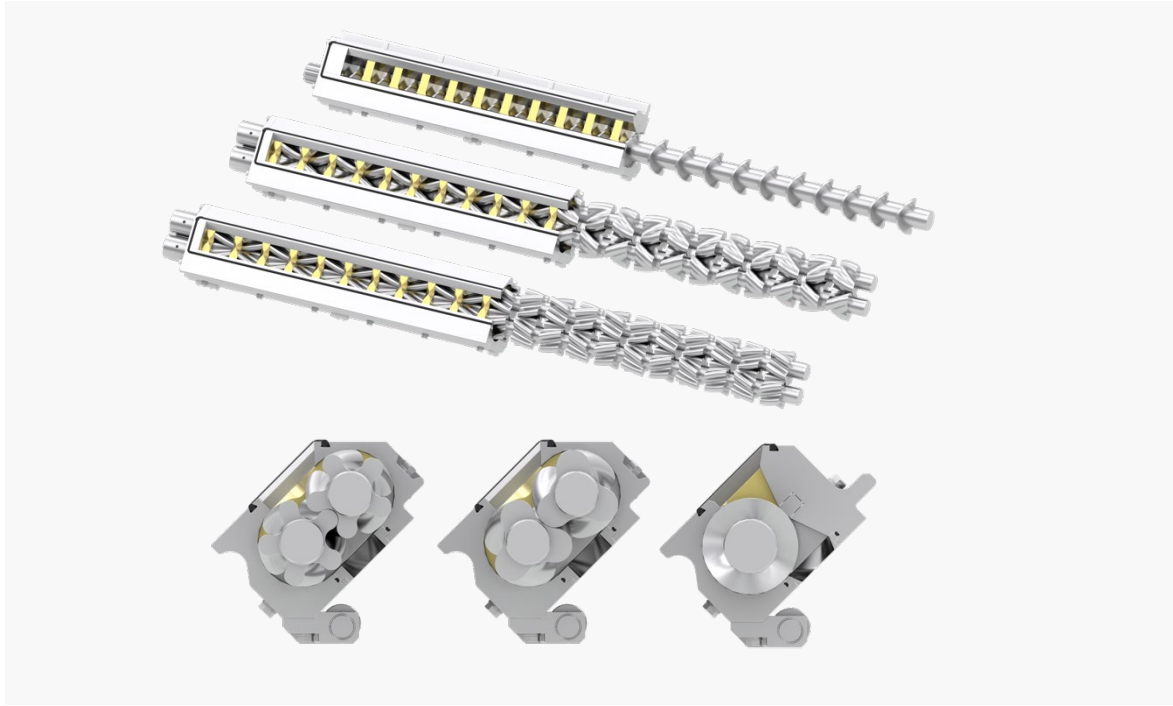
- ✓ Alice II and its pressure-controlled feeding system is extremely gentle when handling raw materials and maintaining their structure. It ensures accurate deposits and less deviation.
- ✓ The modular design allows you to change tools, like pivoting nozzles, wire cutter, etc., all connect automatically and swiftly vary depending on your product.
- ✓ The off-line function allows you to remove the head while the production is still running with alternative machines on the line.
- ✓ Alice II is built entirely in stainless steel, making it a hygienic solution. You can run products with a high content of salt and high acidity or alkaline production.

Alice™ II - The feeding principle



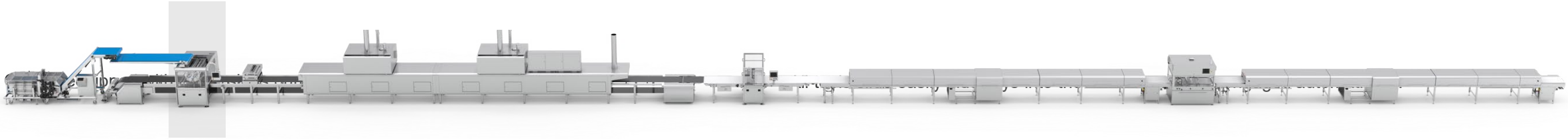
1. Easy to remove stainless-steel head.
2. Assisting feed roller with independent speed control. The function is to gently guide the mass to the main feed roller – the FlexBooster™ technology.
3. FlexBooster™ feed rollers in all stainless-steel with active wings for highly efficient, slow running and gentle pre-feeding. First in, first out pre-feeding of mass.
4. Housing. A closed heavy-duty stainless-steel housing with full seam welding.
5. Measuring volume for detection of pre-feeding pressure.
6. Rollers for the off-line function.
7. Pump house/CamRotor™ is optimized for accuracy and gentle handling of ingredients. Choose either the GearPump or the patent protected Sine Pump CamRotor.
8. Die plate. A broad portfolio of die plates and tools are available to shape and form precisely the product you are looking for.
9. Nozzles. Fast changeover of nozzles and dies and quick connections.
10. Heavy Duty mechanism to lift and lower/release the CamRotor™ profiles automatically.

Flexible solution



Can be equipped with either sinus pump or gear pump, depending on product.

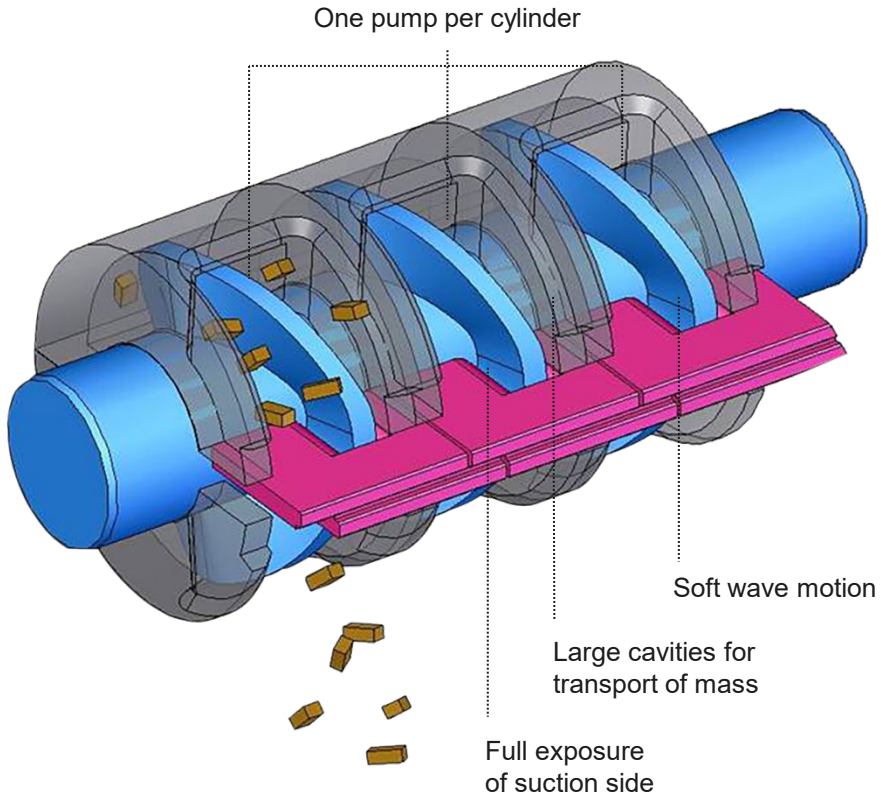
All tools slide easily sideways into the machine and are engaged automatically.



The Camrotor™ concept

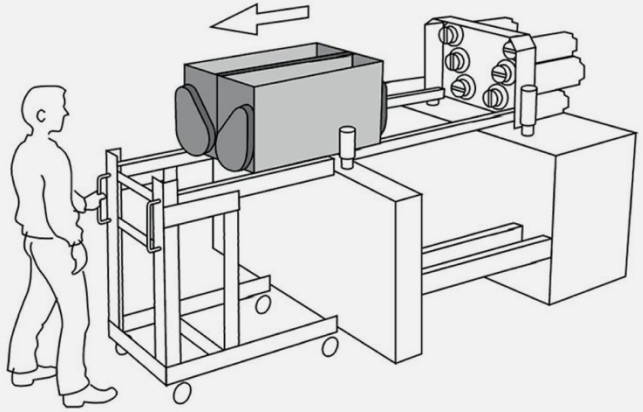
Effective suction lift

- ✓ The Camrotor™ provides a gentle yet efficient lift to the mass fed from the FlexBooster™, thus reducing the feeding pressure – the reason why shear and rheological changes are kept at a minimum.
- ✓ The Camrotor™ ensures optimum accuracy across the full width of the machine.



Off-line function for cleaning and fast changeover

1



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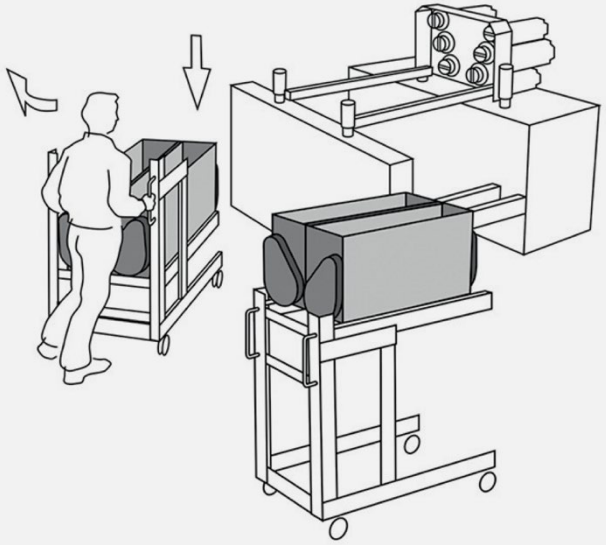

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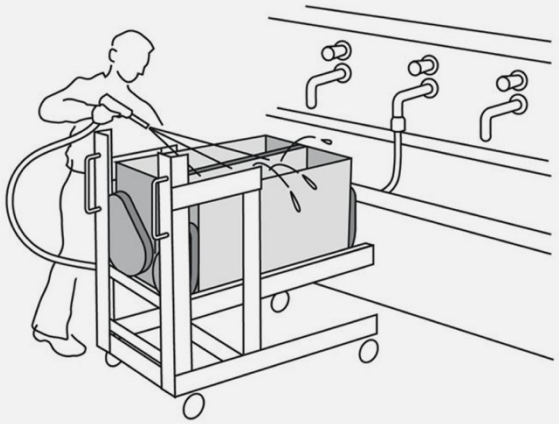
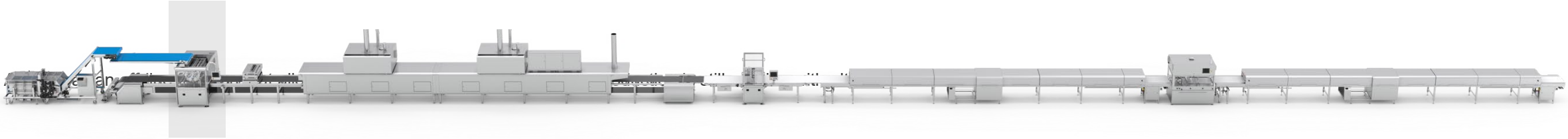


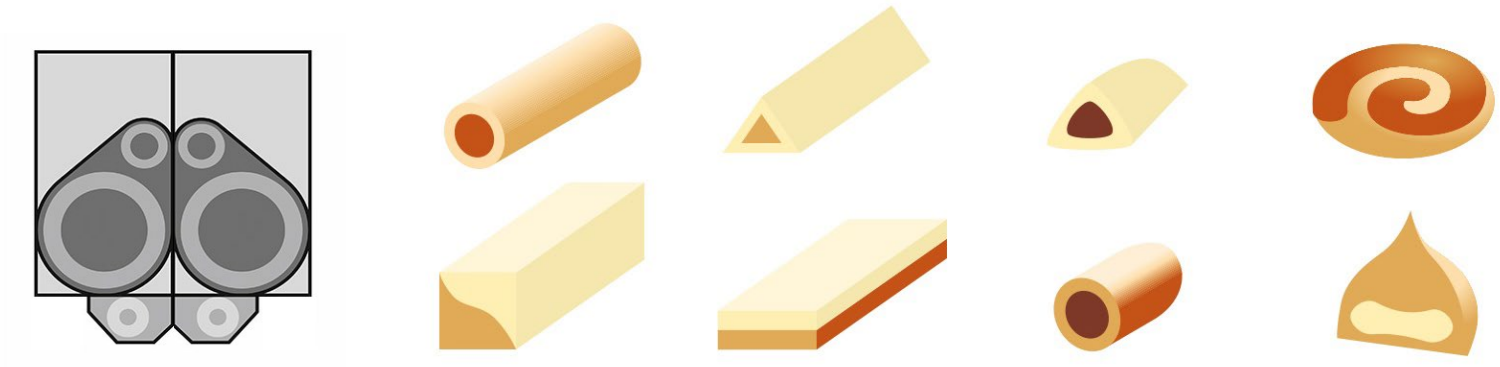


Off-line function for cleaning and fast changeover

Flexible and efficient

- ✓ The Alice system on Z and ZX bases are designed for easily sliding the Alice head offline onto a cart
- ✓ This gives you the possibility to have a second Alice head already cleaned and ready to slide back onto the Alice base, thereby being ready for production in less than 15 minutes.

Product possibilities



EXTRUSION

Extrusion of especially difficult, sticky masses

The industry challenge

- Lack of flexibility withing recipe range
- Handling of difficult masses
- Slab production
- Lack of hygiene

This can lead to:

- Poor quality of products
- Lower earnings
- Extended downtime
- Loss in production
- Additional investment in cutting and spreading table

The solution

- ✓ With Alice™ S, you can produce more sophisticated products – combine masses that are very different in nature, from liquid to very high viscosity, co-extrude, combine colors, flavors and inclusions.
- ✓ Aasted also offers customized tools made just for specific requirements. This will enable you to create any shape and combination you want.
- ✓ To provide your products with even more variety, Aasted offers a vast portfolio of decoration units.

Extrusion by Alice™ S

For especially sticky, dense and stringy masses

- ✓ Alice™ S is an extruder for handling sticky, dense, and stringy medium to high viscosity masses applying a torque above 2000 Nm. Alice™ S can be used for single or double-layered products. The head is engineered for high torque with few moving parts in an all-stainless-steel construction.
- ✓ The all-stainless-steel design meets the requirements for frequent cleaning, where sanitation is of extreme importance. As an extruder, the Alice™ S can be adjusted with a vertical head movement and can be fitted with a number of forming and cutting tools.

High speed wire cutting

The industry challenge

- Hygiene
- Changeover
- Strenuous maintenance
- Weigh STDV across the belt
- Efficiency in product placement

This can lead to:

- Additional downtime
- Unstable baking
- Product quality variation
- Loss in production

The solution

- ✓ The Alice™ Classic Modular system allows you to easily take the head and wire cut module offline to clean and maintain.
- ✓ Head is built entirely in stainless steel.
- ✓ Alice™ Classic with a high-speed wire cutter, provides a gentle and accurate dosing and a high-speed wire cutting mechanism. It supplies the flexibility to adjust parameters and optimize your cutting performance on the fly. For efficient placement of cookies.
- ✓ The Alice wire cutter can be equipped with a filler block or pump house, giving optimal weight accuracy.

Alice™ Classic with a high-speed wire cutter

1. **The ultimate combination of high speed and capacity**
   Alice™ High-speed wire cutter is a combination of a sophisticated high-speed wire cutting mechanism and a new extrusion head for high capacity and accurate dosing of dough with high amounts of inclusions. Alternatively, the wire cutter can be supplied with our new dual color extrusion head.

2. **Adjustable cutting performance**
   It is possible to adjust the following cutting motion parameters on the fly:

   1. Up to 250 cuts/min.
   2. Cutting length from 50 to 120 mm
   3. Vertical drop height from 5 to 15 mm
   4. Center line from 0 to 20 mm
   5. Trimming of the pressure between wire and cutting die from 0 to 20 mm

3. **Dosing performance**
   Large rollers provide gentle dough handling while the stainless-steel filler block ensures a reliable and gentle dough extrusion with accurate weight control across the band.

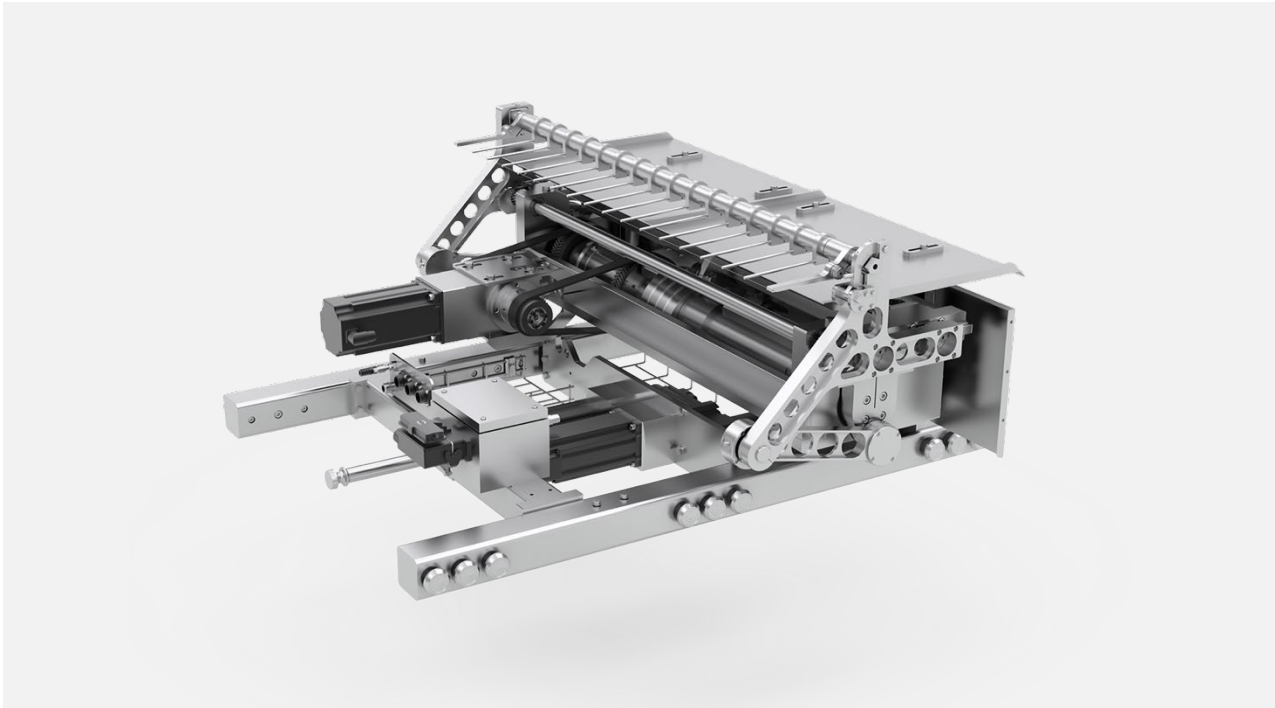
Alice™ Classic with a high-speed wire cutter

Features

- ✓ Easy access to the cutting mechanism
- ✓ Fast changeover of wire cutter frame
- ✓ Off-line function of complete extruder head for an easy access for cleaning and service
- ✓ Fully adjustable cutting performance
- ✓ Repeatable/adjustable parameters
- ✓ Gentle dough extrusion with accurate weight control
- ✓ Automatic clutch connection between head and drives
- ✓ Belt widths: 1000, 1200, 1500 mm

Alice™ Classic with a high-speed wire cutter

Alice Classic head easy to remove, access, and clean.
Furthermore, the filler block can be slid sideways out onto a service trolley.



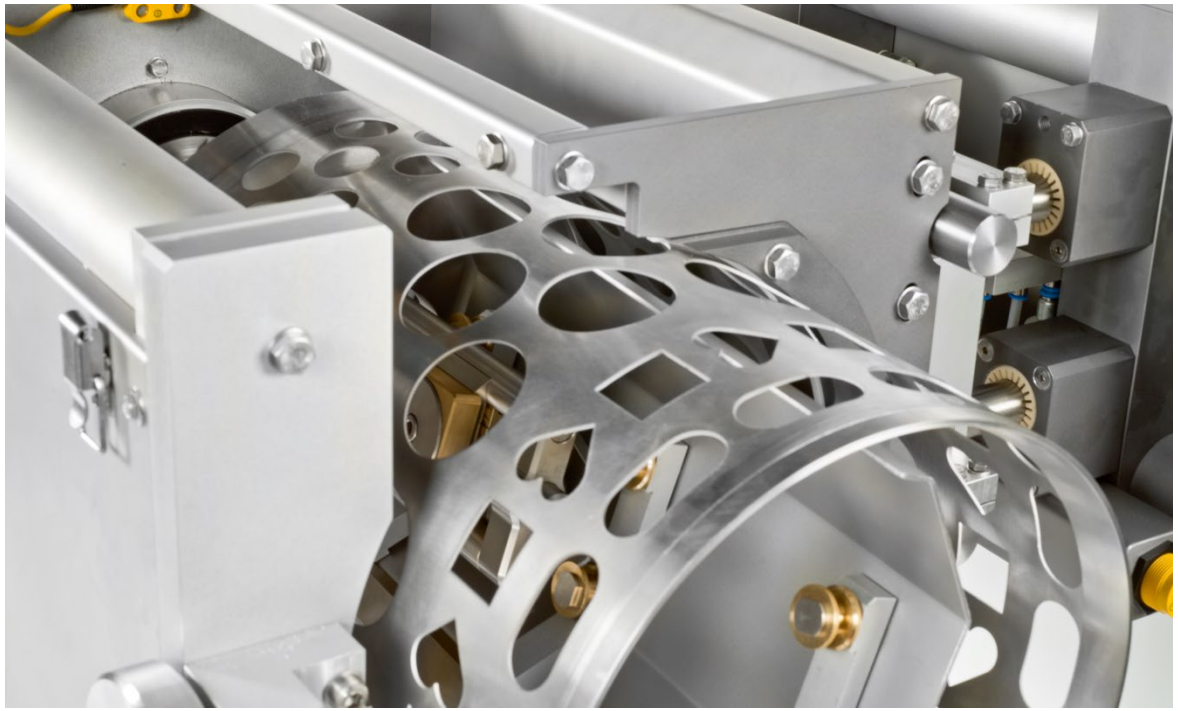
Fully accessible cutting mechanism with an attached cutter frame
via a rail system for a swift and easy shift of the wire cutting frame.

Bertha™ stencil depositor

State-of-the-art rotating stencil depositor

- ✓ With the rotating stencil depositor Bertha™, you will be able to handle meringue masses, sponge dough, butter dough, chocolate and many more. The Bertha™ is designed on a C-frame with wheels allowing fast servicing and cleaning.
- ✓ The stencil drum operates at a high precision resulting in a reliable forming process. An internal scraper allows a cut that creates a precise and uniform product. The PLC and HMI make it easy to operate and allow remote access.
- ✓ Belt widths: 400, 600, 800, 1000, 1200, 1500 mm

Bertha™ stencil depositor



State-of-the-art rotating stencil depositor.

Cutting – guillotine cutter

The industry challenge

- Sticky mass cutting, build on cutting blades
- Cleaning of the cutting knives
- Distortion of the product

This can lead to:

- Product deformation, smearing
- Extended downtime when cleaning
- Loss in production

The solution

- ✓ All these issues are solved by using Aasted Ultrasonic guillotine.
- ✓ Aasted Ultrasonic guillotine uses a high frequency guillotine blade to precisely cut soft, sticky, fragile and/or filled products. Meaning you avoid deformation, smearing or build-up on blades due to ultrasonic high frequency vibrations.
- ✓ Operator maintains control over cutting speed, length of cut and ultrasonic amplitude during production. The adjustable cutting profile accommodates changing product requirements and allows your production line to adapt.

Cutting – guillotine cutter

For cutting precisely soft, sticky, fragile and/or filled products

- ✓ Aasted's guillotines can work with mechanical movement or with entirely free programmable servo-controlled motions at medium and high capacity. Our guillotines feature ultrasonic or stainless-steel mechanical blades, with basic or special blade design. The guillotines can also be designed to cut on a moving belt split – depending on the product you want to cut.
- ✓ Every extrusion is carefully and precisely cut into bars, bites or smaller portions. The guillotines work with any mass of your liking, be it simple or multiple layers, dense or sticky.

Sprinkling

The industry challenge

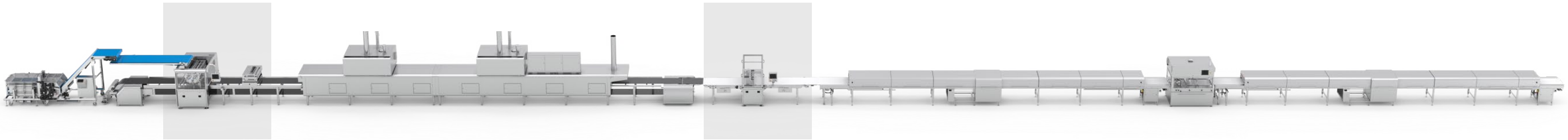
- Finding the right sprinkler for the right product
- Debris and collection of extra sprinkling material
- Control of the sprinkling material in the following cooling tunnel
- Change over of the sprinkling material

This can lead to:

- Poor quality of products
- Increased downtime during changeover
- Unnecessary waste
- Loss in production

The solution

- ✓ Aasted has a wide range of sprinklers in our product portfolio. Including roller and vibratory systems.
- ✓ When it comes to the collection of extra sprinkling material, there are multiple ways to deal with it, from semi-automatic to fully automatic solutions.
- ✓ It can be collected before or after the cooling tunnel.



Baking – ovens

The industry challenge

- Energy consumption and efficiency
- Output of product per m^2 space. Faster baking times
- Baking control
- Flexibility, range of product types
- Maintainers
- Grooving with demands for me output

This can lead to:

- Higher cost of running an oven
- Need for longer oven to achieve required output
- Longer downtime a changeover, eventually loss in production

The solution

- ✓ Aasted Conny Convection baking ovens give our customers the most efficient oven on the market today due to the right combination of air velocity and temperature.
- ✓ The additional air velocity allows for faster baking times without drying the product due to efficient bake control.
- ✓ With only one burner per zone, the maintains on the Aasted convection oven is minimum. Moving your oven or extending it is easy with the modular oven system from Aasted.

Baking – ovens

Bakes everything from biscuits, cookies, muffins to pizzas and much more

It is engineered to provide you with uniform and perfect baking, fast heating and minimum energy consumption.

Operation characteristics

- ✓ Easy operation
- ✓ Hygienic design (options for full access to baking chamber)
- ✓ Modular design for easy installation and future expansion
- ✓ Low maintenance – 1 burner per zone
- ✓ All bake air blowers equipped with VFD for air flow adjustment

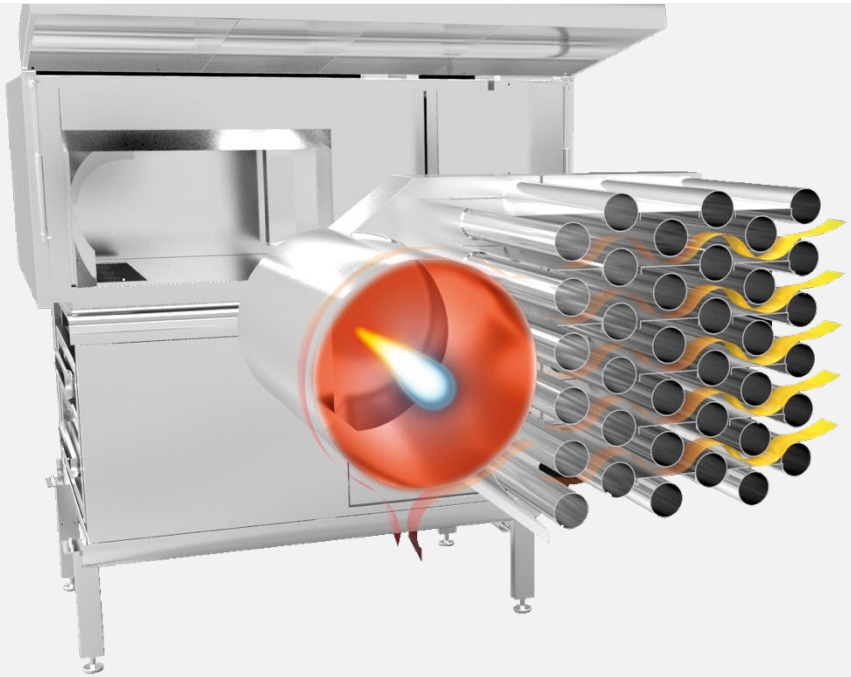
Baking – ovens

Bakes everything from biscuits, cookies, muffins to pizzas and much more

It is engineered to provide you with uniform and perfect baking, fast heating and minimum energy consumption.

Baking Characteristics

- ✓ Faster baking times due to efficient convection heat transfer
- ✓ Lower temperatures / Low energy consumption
- ✓ Uniform baking process / Even coloring across band
- ✓ Fast change-over and reaction time
- ✓ No flash heat
- ✓ Full moisture control



Heavy-duty and highly efficient heat exchanger.

Direct Fired ovens

The direct-fired oven is preferred for several products, such as hard biscuits and crackers. The Aasted Conny Direct Fired oven always provides a uniform baking process, fast heating and high temperature.

Operation Characteristics

- Easy operation
- Hygienic design
- Easy access to the inside of the oven
- Large baking chamber cleaning doors every 2 m
- PID temperature control of zones
- Single combustion blowers, top and bottom heat through control valve
- Up to 1000°F used for high temperature baking
- Combines with convection ovens for hybrid baking
- Each burner has its own control box with ignition and flame detection
- Gas and air pipes are pre-assembled from factory
- Individual manual gas valve on each burner
- Belt widths: 800, 1000, 1200 and 1500 mm

Cooling

The industry challenge

- Belt cleaning
- Control of the humidity, temperature and convection

This can lead to:

- Product quality variation
- Extended downtime when cleaning
- Loss in production

The solution

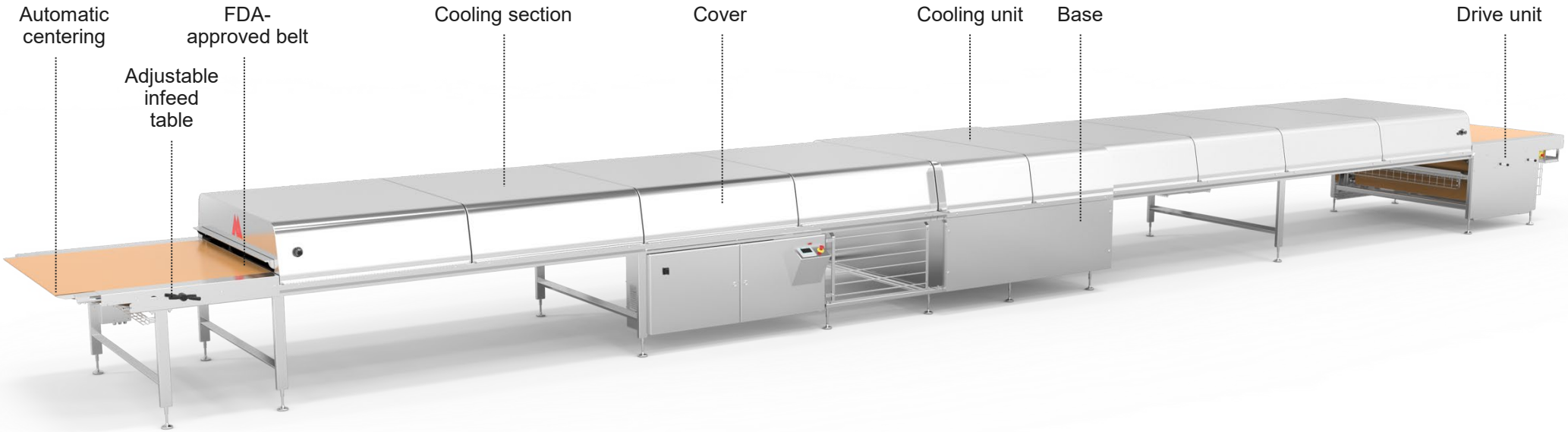
- ✓ To ensure the easiest way to clean your belt, to remove any residual, our protein line optionally comes together with an in-line washing machine
- ✓ Furthermore, Nielsen cooling tunnels come with a humidity control, the temperature can be set from the display of the machine.
- ✓ This allows you to optimize and control the climate surrounding your product, prepare it for the cutting and handling down.

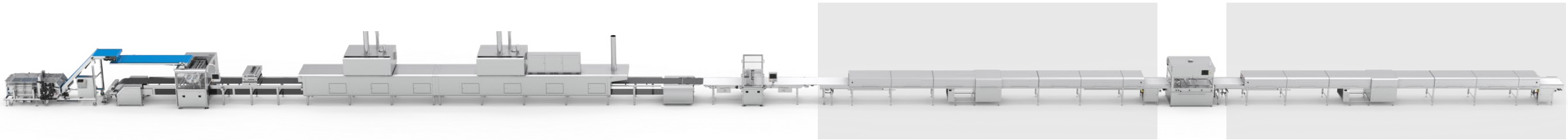
Nielsen cooling tunnels

Designed with a focus on design and hygiene

- ✓ Aasted Nielsen cooling tunnels are designed with a focus on clean and straightforward design. In combination with the de-humidifier, the re-circulation fan works to control the complete climate in the tunnel. Aasted cooling tunnels guarantee even and constant cooling of the product.
- ✓ To ensure the highest possible degree of hygiene: all air guiding plates, supporting plates for the belt, shafts and rollers can be removed from the cooling tunnel without the use of tools. This is for easy cleaning of any part in the tunnel.

Nielsen cooling tunnels



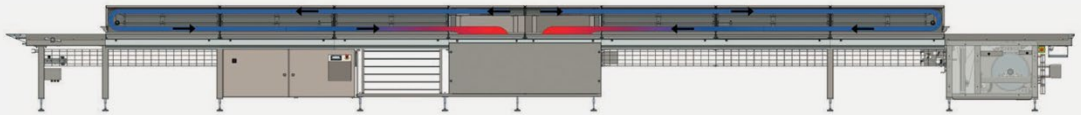


Nielsen cooling tunnels

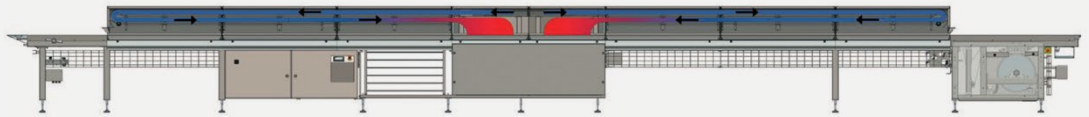
Rapid cooling of bakery products

- ✓ The cooling tunnel features easily adjustable stainless-steel air plates for radiation and/or convection cooling. Water-cooled stainless-steel bottom plates for rapid forced conduction cooling for bakery products can be added.
- ✓ Nielsen water-cooled bottom plates can be divided into two zones for even greater control and feature a special water circulation design to ensure uniform water temperature throughout

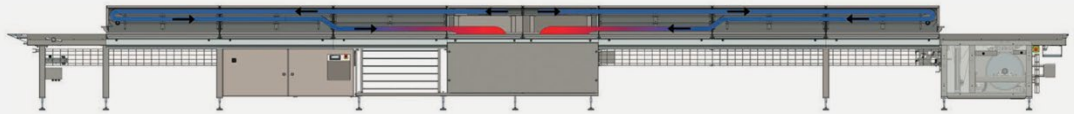
1. Direct cooling (air circulation above and under the products)



2. Indirect cooling (chilled air falls down over the articles by radiation)



3. Combined indirect/direct cooling (the two methods combined)



Enrobing/bottoming

The industry challenge

- Sugar free chocolate has difficult flow properties
- Low index of chocolate when double enrobing
- Blocking in enrobing
- High energy consumption

This can lead to:

- Chocolate waste
- Poor quality of product
- Increased downtime
- High energy costs

The solution

- ✓ Aasted offers tempering technologies that allow you to control the tempering process by letting you choose chocolate exit temperature and viscosity of the chocolate.
- ✓ The Energy Enrobing Concept injects tempered chocolate directly into the consumption flow/flow pan to ensure optimal consistency.
- ✓ The solution can help you save up to 80% of your energy costs while maintaining tempering index and temperature at a constant level.

Nielsen enrobers

Nielsen Energy

A revolutionary enrober giving you efficiency and quality enhanced enrobed products. Also available in an XXL version for large scale production.

Nielsen Master

Accurate and reliable enrobing for any type of product. Also available in an XXL version for large scale production.

Nielsen Junior

Flexible and accurate enrobing in a compact and high-quality design for medium and large sized production.

Junior Bottomer

An enrober for bottoming with chocolate and compound masses for chocolate, bakery and confectionery product.

Aasted is in the business of helping

What we help with:

- ✓ Making your production reliable and stable, we focus on up-time
- ✓ Building knowledge and competencies, we help on- and off-site
- ✓ Developing breakthroughs within end-products or processing technologies
- ✓ Support your green ambition and environmental footprint
- ✓ Driving Total Cost of Ownership (TCO)

How we help:

- ✓ Offering patented technologies and solutions
- ✓ Sharing unique know-how obtained through years of chocolate, confectionery, and bakery expertise
- ✓ Physical and virtual availability of our experts
- ✓ Complete program for all masses in the processing value chain
- ✓ Small- and large-scale solutions
- ✓ Development and testing at Aasted Technology Center

Case story

Entering a new market with a high product flexibility

Challenge

A Co-packer bakery owner needed a single extruder for an oat and peanut butter product for a project in a US company. Due to peanuts being an allergen, the machine had to be able to be cleaned 100%. Furthermore, it had to be flexible, do more than one product to ensure this extruder could work for future projects.

Solution

The Aasted Alice, with its modular head, allowed the customer to slide the head off and 100% allergy clean the parts of the machine that had dough contact. The three head extruder allowed to run this single extrusion project but gave the co-packer a more flexible machine that he could use for future projects.

Result and value created

With the Aasted solution, the Co-packer was able to follow hygienic regulations and clean the machine accordingly. Furthermore, while this particular project ran for only one year before the product got taken out of the market, a three-head extruder's flexibility allowed to continue to use the same solution but for different products.

Case story

Weight accuracy and unnecessary waste and giveaway

Challenge

The engineering director from a large bakery based in LA, US, had an older extruder making single and co-extruded products that couldn't ensure uniform products. This led to weight inaccuracy across the production line, resulting in running overweight products to ensure that the final packing weight is not below what is stated on the labels.

Solution

Aasted Alice extruder and the pump house system guaranteed passivity and constant dough flow, ensured the best weight accuracy and product uniformity across the whole production line.

Result and value created

This allowed the customer to lower target weight, still supply his customers with the required product, and avoid unnecessary waste and giveaway.

Don’t believe us?

Welcome to our world

www.aasted.eu