

The protein- transformation is in motion.

We've got your solutions.



Alternative proteins

Sustainable processing and
packaging solutions
from A to Z.

From MULTIVAC.

MULTIVAC



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Alternative proteins.

The world population is expected to grow to almost 10 billion by 2050, posing major challenges for the food industry. One thing is certain: Current food production methods are neither geared to nor sustainable for this many people.

Proteins play a vital role in healthy nutrition. However, when they are sourced from animals, they have a negative impact on our environment: High greenhouse gas emissions, huge water consumption, large-scale deforestation and the depletion of other natural resources all contribute to this. Growing health consciousness and increasing interest in animal welfare are also driving a rethink.

The transformation is already in full swing. Alternative proteins have the potential to feed humanity more sustainably. In just a few years, they have evolved from a niche product to a growing mainstream product that is becoming more and more popular with consumers.

The range of plant-based, fermented and cell-based foods is continuously increasing. They are equally attractive for vegetarians, vegans and flexitarians. From classical meat substitutes to innovative product ideas with the potential to win over new market share.

The obvious benefits of alternative proteins are healthier nutrition, reduced CO₂ emissions and a reduction in factory farming.

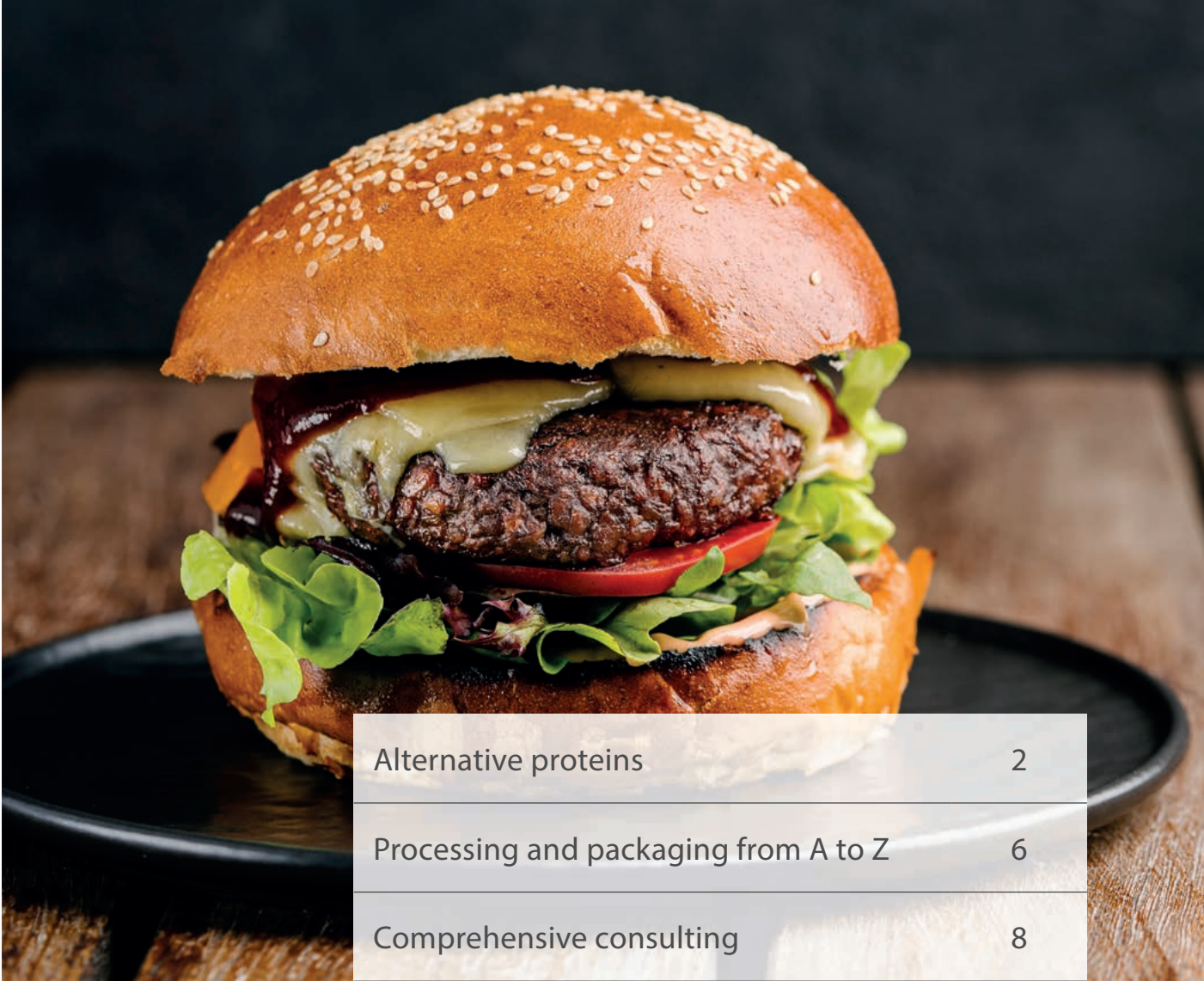
Market forecasts indicate strong growth ahead for the food industry. For example, analyzing the collaborative study by the Boston Consulting Group and Blue Horizon, the alternative protein market share is estimated to rise to as much as 22% of the total protein market by 2035.¹

However, the potential is far from exhausted. In fact, the real transformation has only just begun. Start-ups and established manufacturers will continue to refine and scale production to improve products in terms of taste and texture while making them more affordable. Supported by partners with the right vision and expertise at every step of the value chain.

Take advantage of the opportunity to shape a sustainable future. Supported by MULTIVAC as a strong partner in processing and packaging your products.

¹ Witte et al. (2021) Foods for Thoughts. The Protein Transformation.
<https://web-assets.bcg.com/a0/28/4295860343c6a2a5b9f4e3436114/bcg-food-for-thought-the-protein-transformation-mar-2021.pdf>

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MULTIVAC supports producers along the entire processing and packaging chain – from A to Z: with advanced machine technology and comprehensive line know-how, sustainable packaging development and innovative digitalization solutions. All aimed at supporting you as a manufacturer in successfully meeting the challenges of the protein transformation – over the short and long term.



An end-to-end offering to meet every requirement.

6 Regardless of where you currently stand in your company's development, we will provide you with targeted support along the way. Therefore, we not only supply the ideal machine solutions and packaging materials from a single source, but we also provide you with comprehensive advice – both for start-ups and industrial manufacturers.

From concept development to the ideal machine and line solutions, to significant increases in efficiency through digitalization. With MULTIVAC, you can count on having a high-performance partner at your side.

Comprehensive consulting

In addition to the development of customized packaging concepts and packaging consulting, sample pack production and an extensive training program, MULTIVAC offers a varied portfolio of packaging and food analysis options to meet the needs of its customers.

Machine solutions

MULTIVAC is a leading global supplier of integrated packaging solutions. In addition to manufacturing packaging machines, our focus is also on solutions for processing and slicing, for marking and labelling, and for quality inspection as well as for product and package handling.



Line concepts

We continuously strive to be the number one partner for the hygienic and sustainable processing and packaging of a wide variety of food products. With expertise from a single source: both for complete lines and for automation.

Digital products and services

With digital products and services from MULTIVAC, we offer our customers innovative solutions for monitoring, controlling and optimizing production – networked across locations and comparable across sites. Simple, convenient and “live”. For new lines as well as for retrofitting existing machines.



It all starts with comprehensive consulting.

With us, you'll find experts who understand your sector, with all its standards and regulations. Focused on your offering and your target groups,

our collaboration usually begins with holistic consulting that focuses on you and your product.



Customized processing and packaging consulting.

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At the MULTIVAC Training & Innovation Centers, the focus is always on the customer. We provide expert, manufacturer-independent advice on all packaging material and application queries – and bring packaging ideas to life in the form of prototypes or small series.



**TRAINING &
INNOVATION
CENTER**

Development of packaging concepts

Are you looking for a unique packaging solution for your products? Our experienced packaging engineers, packaging material experts and food technologists will develop customized packaging solutions that are perfectly tailored to your requirements.

Whether you are opting to prioritize maximum shelf life, minimized use of packaging materials, consumer-friendly handling, exceptional product presentation, the smallest possible shelf space or packaging materials made from renewable raw materials – our experts will provide you with comprehensive advice and develop the most suitable solution for you.

Custom packaging consulting

We support you in every phase of your product and packaging development with exactly the consulting services you need at any given time.

Our service includes consulting services relating to:

- Packaging technologies
- Packaging materials
- Packaging atmosphere
- Packaging geometries
- Opening aids
- Reclosure systems
- Package labelling
- Presentation at POS/E-Commerce
- Food technology

Production of sample packs

At the MULTIVAC Innovation Centers, you can actually hold tomorrow's packaging in your hands today. Prototypes and small batches enable coordination processes to be made more efficient and new ideas to be used for presentation in supermarkets.

Our portfolio offers:

- Feasibility studies
- Packaging tests
- Creation of prototypes
- Small batch production

Packaging training

MULTIVAC application experts optimize the interaction between packaging materials and packaging equipment on a daily basis.

This wealth of experience enables them to provide highly practical training courses on the following topics:

- Methods of film production
- Film properties
- Use of packaging materials
- Packaging technologies

Analysis

In the Innovation Center laboratory, we perform fast and accurate tests for:

- Packaging analyses
- Food analyses

For more extensive food technology analyses, our experts work closely with independent institutes. This enables us to offer our customers a comprehensive range of analytical services quickly, directly and all from a single source.



Best in class with innovative packaging solutions.

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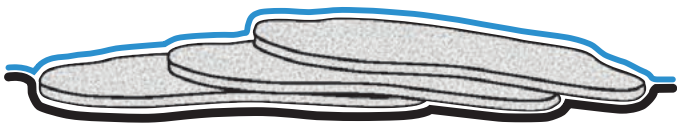
MULTIVAC offers an extensive range of solutions for the professional packaging of foods based on alternative proteins – from large-capacity packaging in the gastronomy sector to classic retail packaging and creative packaging concepts for snacks.

Our experienced packaging technicians, packaging material experts and food technologists develop customized packaging solutions that are perfectly tailored to your requirements. Safe. Hygienic. Ecological. Cost-effective. They take into account the special requirements of your products in terms of product protection and shelf life, as well as sustainability criteria and current consumer trends.

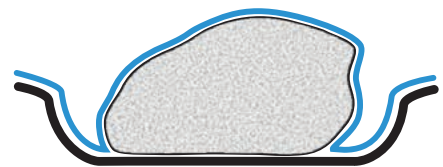
Vacuum packs

Packaging under vacuum enables longer product shelf lives, since their biochemical deterioration can be slowed down by removing the air surrounding them. Because the products are compressed in the process, vacuum packs made of flexible film are only suitable for non-pressure-sensitive foods. With vacuum packs, it is also possible to fill and pack hot products. Here the vacuum is created by a special steam purging process which also contributes to a long shelf life.

Vacuum packs



MultiFresh™



MultiSkin™



Skin packs

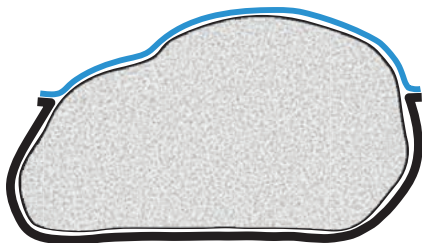
MultiFresh™

In MultiFresh™ vacuum skin packaging, special skin films are used to enclose the product without tension – like a second skin – and seal it over the entire surface with the bottom film, tray or flatboard. To activate the film properties, the top film passes through a heating station and is then pre-stretched in the sealing tool.

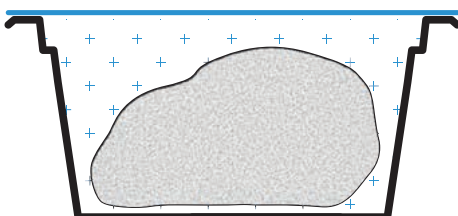
MultiSkin™

In the MultiSkin™ process, the top film encloses the product skin-tight and is sealed to the bottom film, tray or flatboard via perimeter sealing.

FormShrink



Modified Atmosphere Packs



Shrink packs

FormShrink

Special, extremely shrinkable thermoforming films are used in the FormShrink process. The finished pack passes through a shrink unit. The shrinkage of the film is activated by the application of heat from hot water, allowing the film to form a tight seal with the product.

Modified Atmosphere Packs

Modified Atmosphere Packaging (MAP)

In modified atmosphere packs, the air in the pack is replaced by a mixture of gases tailored to the product to preserve its shape, color and freshness. The modified atmosphere usually consists of a mixture of carbon dioxide and nitrogen.

Our packaging concepts are perfectly tailored to the specific requirements of your products and target markets. Using the most sustainable packaging materials possible is a given for us. We also place a high value on attractive packaging design – eye-catching at the point of sale, provided with all relevant consumer information, supporting the brand image and open for advertising messages and promotions.

More sustainability thanks to innovative concepts.

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Paper-based packaging solutions.

MULTIVAC PaperBoard enables you to increase the recyclability of your packaging concepts and reduce plastic consumption by up to 85% during pack production.

The use of functional layers allows paper-based packs to be produced that meet all the requirements for specific barrier properties, tailored to the respective products.

MULTIVAC PaperBoard packaging solutions can be produced on thermoforming packaging machines and traysealers. And their paper and plastic parts can be separated quickly and safely after use to be fed into separate material cycles.



Recyclable plastics.

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Packaging made of only one material can be fed into the relevant recycling loop after use, sorted by type. In addition to the established recycling processes for packaging made of glass, metal and paper, this is increasingly also true for packaging made of mono-plastics such as APET.

With MULTIVAC APET+ films, you benefit from packaging solutions where both the bottom film and the top film are made of monomaterial and can be recycled by type. Since APET+ does not require an additional and non-grade-specific sealing layer, plastic consumption can be reduced by up to 15% compared to standard APET materials. APET+ can also be produced from up to 90% recycled PET (rPET), which again significantly reduces the carbon footprint.





Machine solutions of the latest generation.

18 With decades of experience in the processing and packaging of all types of food, MULTIVAC is ideally positioned to support start-ups in the alternative protein sector as well as manufacturers who are currently

still active in the meat, cheese/egg and fish sectors and are now looking to diversify into a new market segment.





MULTIVAC

Processing and packaging with MULTIVAC.

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MULTIVAC solutions fit seamlessly into your new or existing production environment – as stand-alone machines as well as automated and integrated lines with central control.

Each of our solutions is individually designed in terms of product feeding, the packaging process, pack discharging, labelling, quality inspection and final packaging. Reliable and durable, they become a resilient link in your production chain.

Processing

- Slicing



e.g. S 800 / S 1600 slicers

Packaging

- Thermoform packaging
- Tray packaging
- Flowpacking



e.g. Thermoforming packaging machines R 085



Marking and inspection

- Labelling
- Printing
- Quality control



e.g. L 310 full wrap conveyor belt labeller

Automation

- Handling
- Transport
- Palletizing



e.g. Handling module H 244

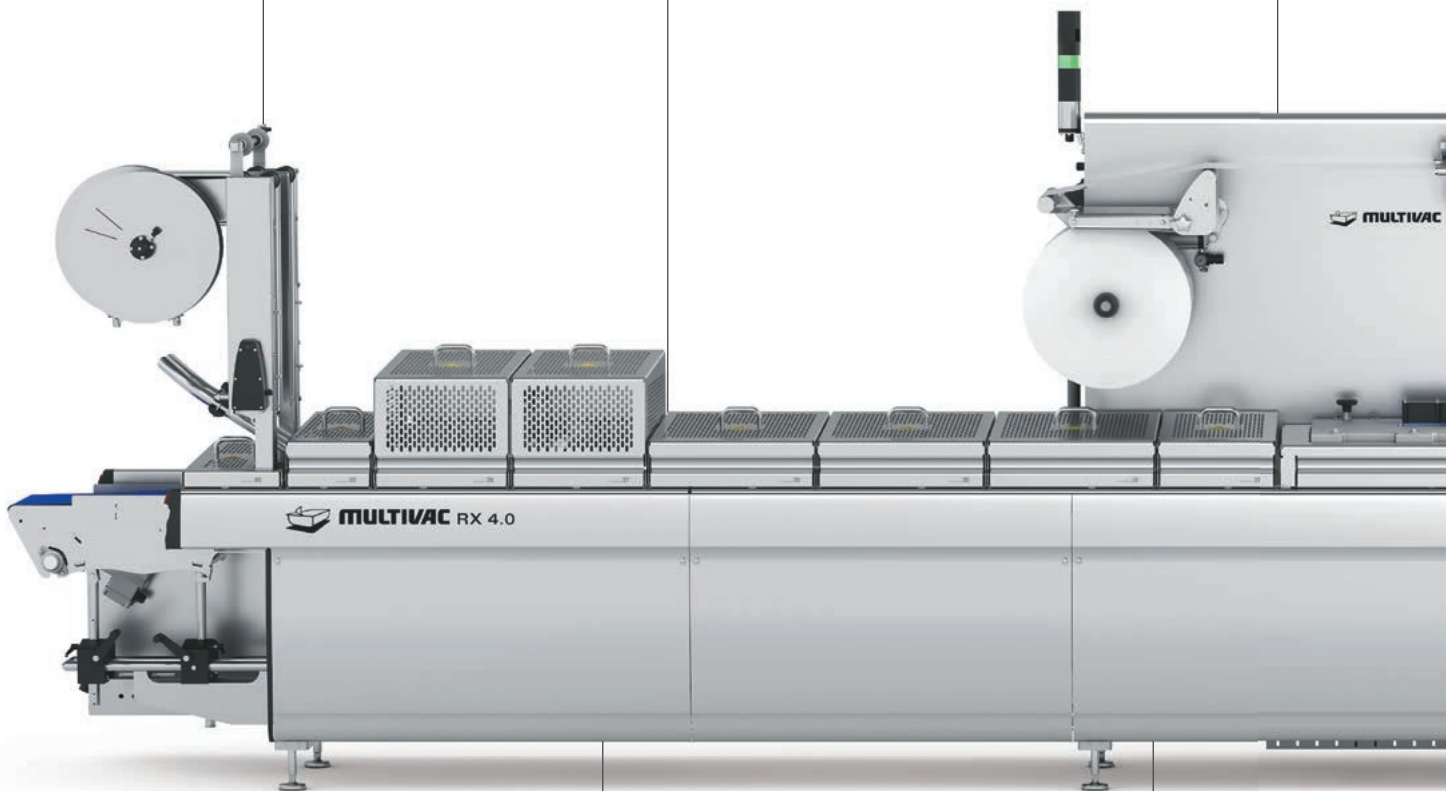
Thermoforming packaging machines for large pack variety.

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Reliable discharge and separation systems

Precise cutting systems for individual pack shapes

High seal seam quality for maximum pack reliability



Maximum operator safety through comprehensive protective devices

Easily removable panels

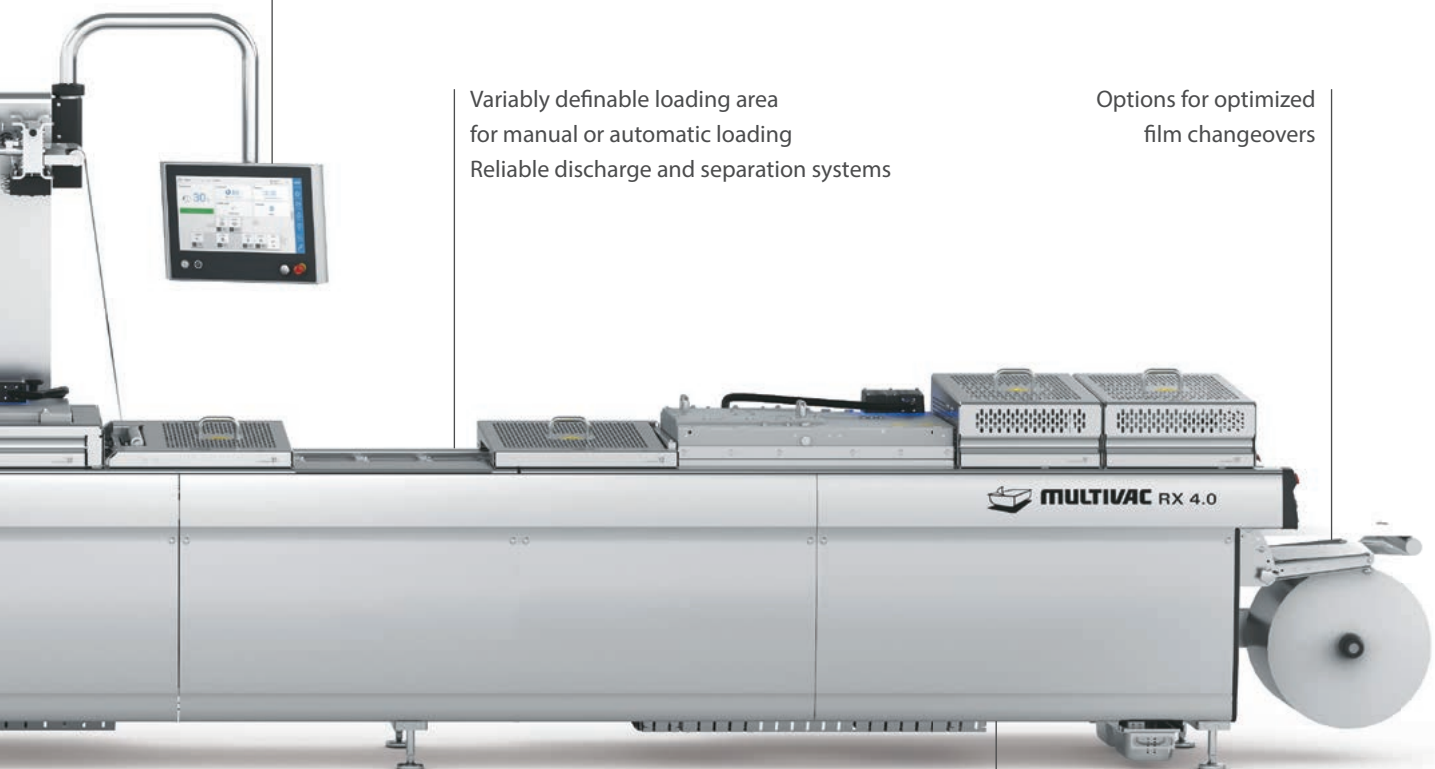
You too can benefit from the advantages of MULTIVAC thermoforming packaging solutions:

- High production output and pack quality
- Individually tailored solutions in terms of pack shape, opening aids, reclosure, etc.
- MULTIVAC Hygienic Design™ for fast and reliable wet cleaning
- Process reliability and durability
- Reduced use of plastic films and energy
- Wide range of configurations and upgrades

Easy operation and maximum reliability thanks to Multi Sensor Control, Smart Services and Pack Pilot

Variably definable loading area for manual or automatic loading
Reliable discharge and separation systems

Options for optimized film changeovers



← Running direction

Fast format changes thanks to long-life, high-performance lifting units

Traysealers with maximum flexibility and reliability.

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With the MULTIVAC X-line, robust mechanical design and control with innovative features, such as Flow Manager and Multi Sensor Control, enable you to pack your products with maximum flexibility and consistent reliability – even at maximum output and in continuous operation. With the TX models, the frequent product, film and tool changes typical of most traysealers can be carried out with minimal production interruptions. In fact, operators need less than ten minutes to change an X-tool die.

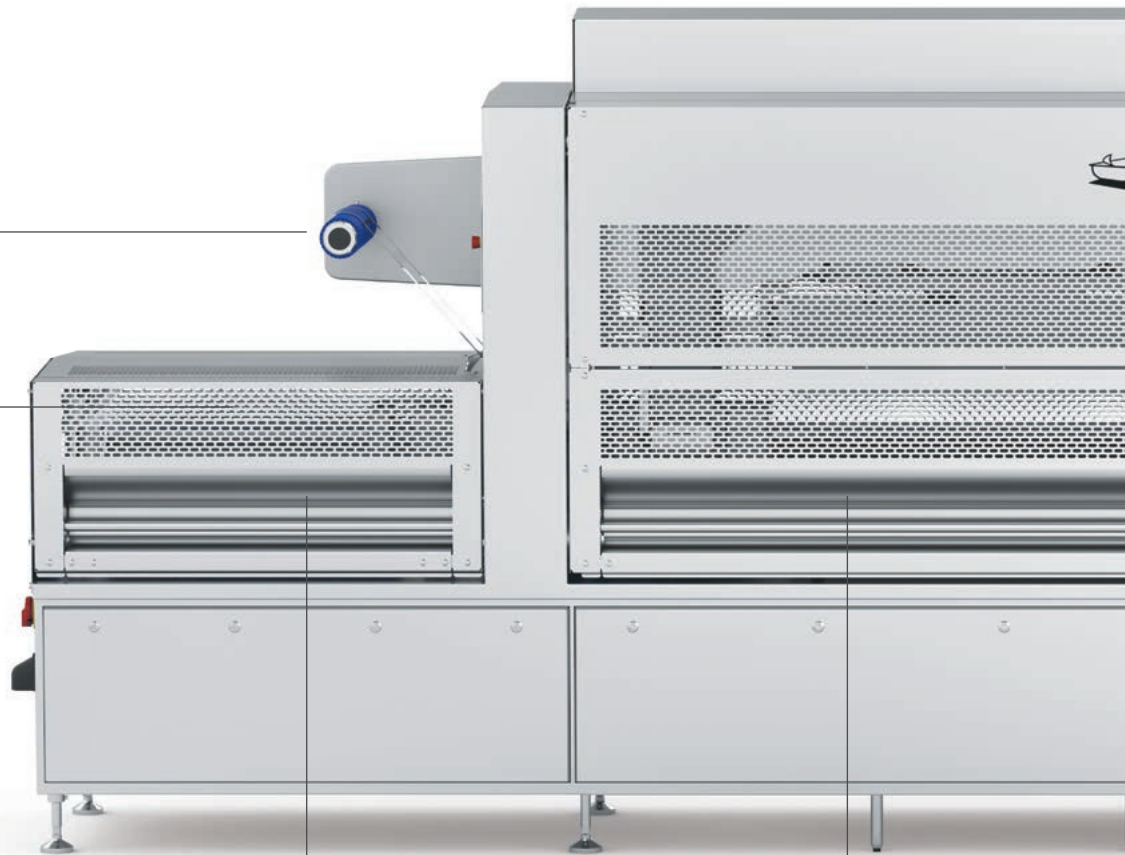
You also save valuable time during cleaning. Thanks to MULTIVAC Hygienic Design™, even assemblies inside the machine, such as the gripper and belt systems, are hygiene-optimized and easily accessible.

Fast film changes and reliable film transport

Robust, space-saving and modular design

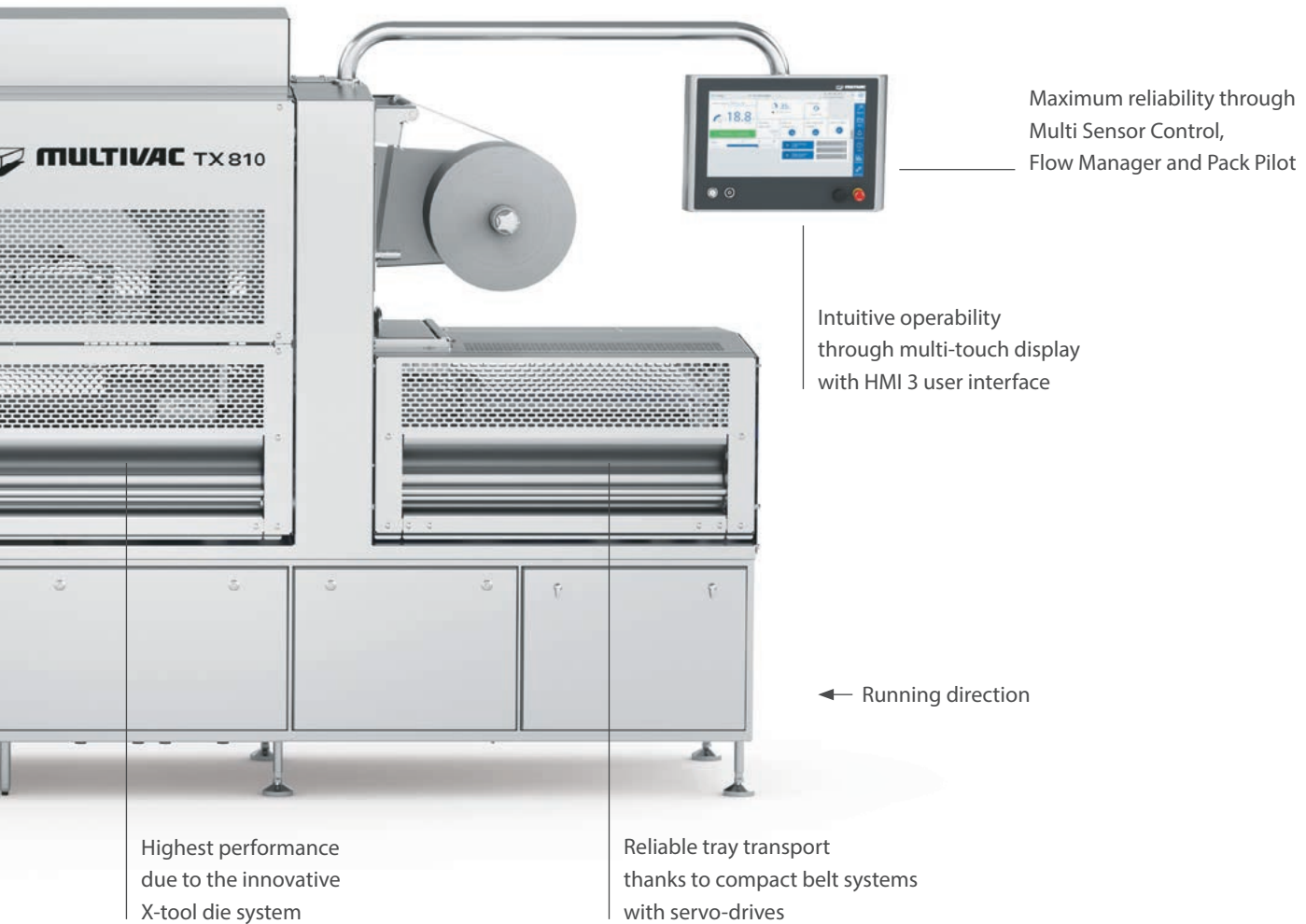
Quick and easy to clean thanks to MULTIVAC Hygienic Design™

Maximum flexibility thanks to fast and ergonomic tool changes



You too can benefit from the advantages of the MULTIVAC X-line:

- MULTIVAC Hygienic Design™
- High production output and pack quality
- Individually tailored solutions
- Maximum performance on a minimum footprint
- Energy efficiency
- Pioneering ergonomics and user-friendliness
- Durability
- Comprehensive range of solutions for tray infeed and discharge
- Individual solutions for tray loading
- Complete offering for packaging lines

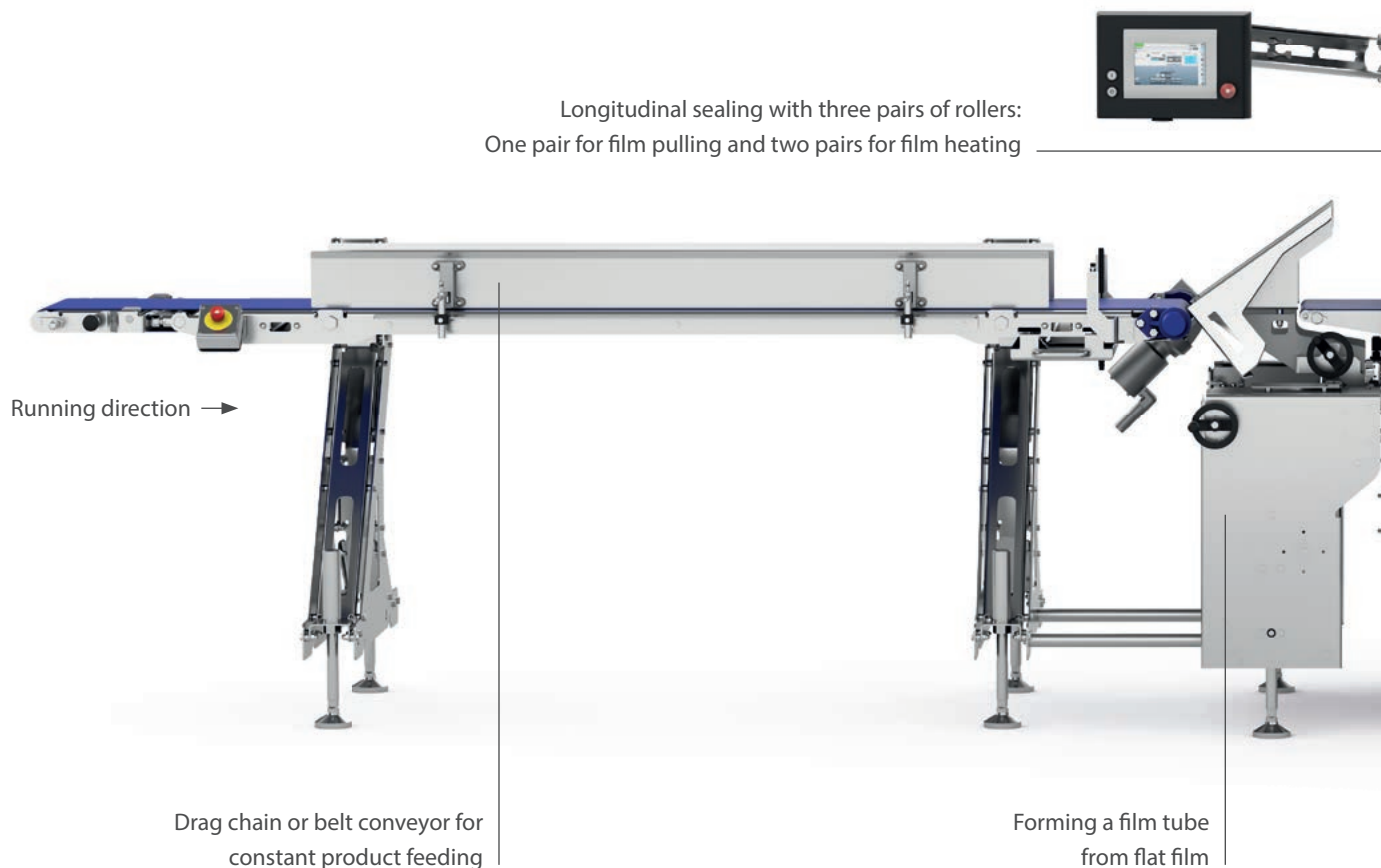


Flowpacking made easier, more precise and more hygienic.

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The MULTIVAC W 500 embodies the evolution of flowpacking technology and combines outstanding performance with precision and convenience. Developed for a wide range of applications and products, the exceptionally flexible new flowpacker supports the use of sustainable films and paper-based materials.

Deliberately designed with an open layout, it sets the stage for perfect hygiene, easy product changeovers, easy access and maintenance, reduced cleaning requirements and minimal downtime.



You too can benefit from the many advantages of the W 500:

- State-of-the-art servo drive technology for maximum throughput and outstanding process control
- Speeds of up to 120 packaging per minute and film speeds of up to 30 m/min
- Independent speed adjustment of the rollers for wrinkle-free longitudinal sealing
- Integrated gas analysis system and MAP modified atmosphere packaging
- Adjustable forming set in widths up to 200 mm and heights up to 120 mm with adjustable longitudinal sealing
- Recipe storage of most parameters for continuous perfect packaging quality, even with frequent product and material changes
- MULTIVAC Hygienic Design™ in open cantilever design



Film unwind (max. width 650 mm and max. diameter 350 mm), second film unwind optional

Servo driven module for hermetic cross sealing in best quality

Inspection systems for monitoring products and packages.

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Brand protection and consumer safety are becoming increasingly important. With innovative inspection systems from MULTIVAC, you benefit from efficient quality control and can ensure that the pack and its labelling are flawless.

From foreign object detection through weight control to end-of-package inspection, we offer you a broad a wide range of solutions that enable you to meet legal requirements while complying with the highest quality standards.

Weight control

MULTIVAC checkweighers are available in different weighing ranges and designs:

- Checkweigher
- Checkweigher with metal detector
- Integrated ejector

Metal detection

MULTIVAC has IFS-compatible, space-saving and highperformance detection solutions for contaminants with magnetic and non-magnetic metals in its range:

- Metal detectors
- Integrated ejectors



They can also be used to check the completeness of the package contents.

Packages containing metallic components such as clips, etc., can also be inspected with X-ray inspection systems.

X-ray inspection systems from MULTIVAC comply with the requirements of national and international standards food safety standards such as HACCP, IFS or BRC.

You too can benefit from the advantages of MULTIVAC inspection systems:

- Efficient automatic quality control of all packs
- Reliable rejection of incorrect or contaminated packs
- Combinability of different inspection methods in one device
- High reliability and durability
- Seamless integration into automated lines

X-ray inspection

X-ray inspection systems detect metallic and non-metallic foreign bodies such as stones, glass or bones.



Checking labels, texts and packaging.

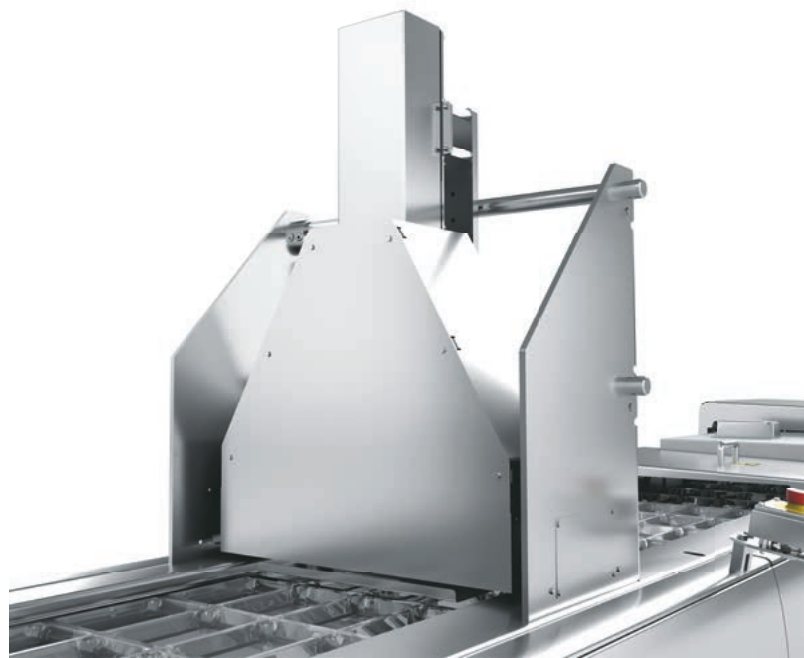
30 Optical inspection systems for label and pack checking are integrated into MULTIVAC labelling systems or designed as a stand-alone inspection solution with a separate conveyor belt. Packs outside the tolerance range can therefore be rejected.

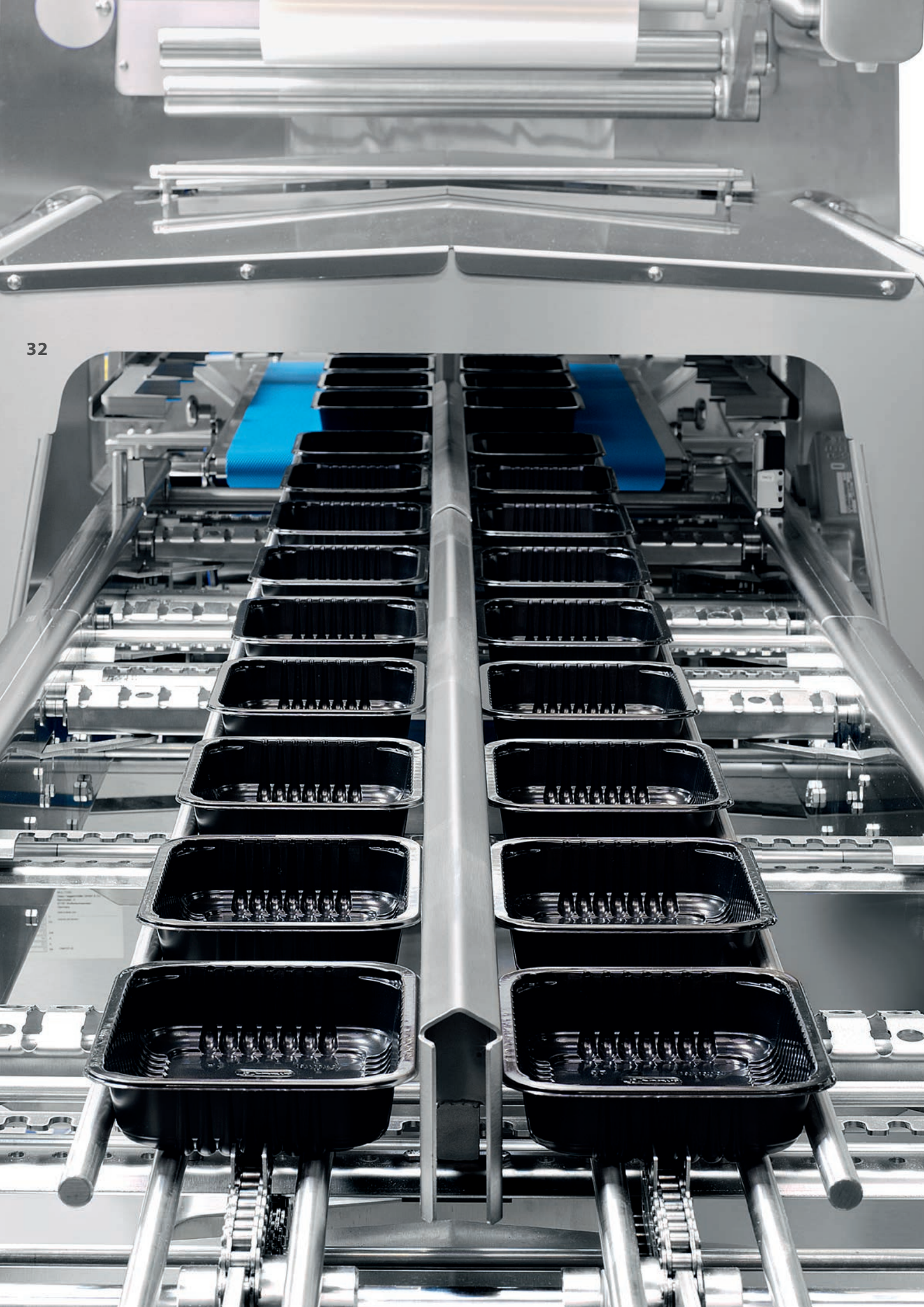
What's more, camera-based systems enable you to check, for example, whether a product is correctly positioned in the pack or whether a pack has been completely filled.



**You too can benefit from the advantages of
MULTIVAC label and pack inspection:**

- Customer and consumer protection
- Protection of your own brand
- Avoidance of product recalls or penalties due to incorrect labeling
- Continuous quality improvement
- Seamless integration into automated lines





Gaining an edge across the board.

MULTIVAC has many decades of experience in the development of automated and integrated packaging solutions. Each of our solutions is individually configured to suit your needs in terms of product infeed,

packaging process, pack discharging, labelling or marking, quality control and final packaging – and they can be supplied as a turnkey solution on request.

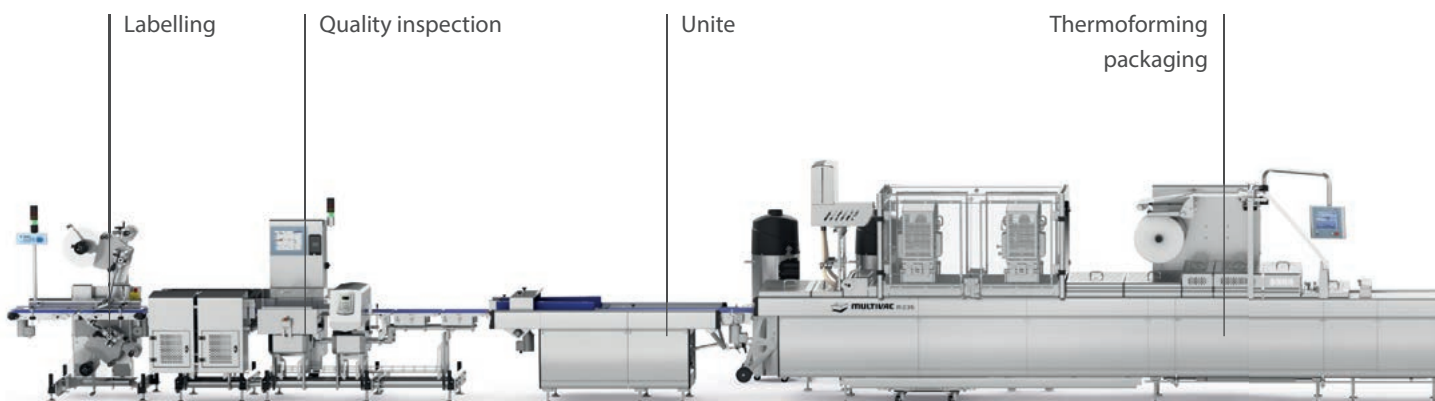


Automated, integrated and all from a single source.

34 As a main provider, MULTIVAC takes on full project responsibility for integrated line solutions. On the one hand, we have an extensive portfolio of MULTIVAC products in the areas of processing, product feeding, packaging processes, pack discharging, labelling, quality inspection and end-of-line packaging. And on the other, we are an experienced engineering partner

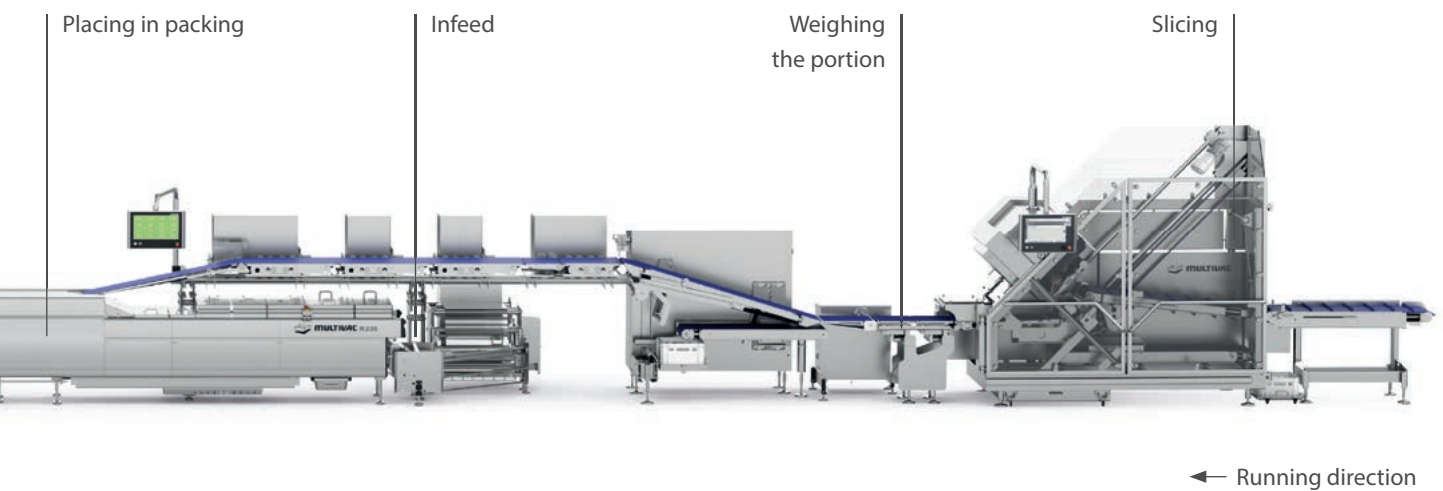
who collaborates with expert suppliers along the entire value chain. Comprehensive support throughout the entire life cycle of the line completes our range of services.

Vegan cheese line



You too can benefit from the advantages of automated and integrated MULTIVAC solutions:

- Synchronization of all line components
- Simple control of all line components via a uniform user interface
- Increased efficiency of the entire process
- Simplified product changeovers
- Reliable product transfer
- Higher process reliability
- Complete traceability of the packaging level
- Storage of recipe data at line level
- Uniform process qualification



Creating value together in the MULTIVAC Technology Network.

36 To implement your ideal line solution, we have been working with reliable partners for many years – in the MULTIVAC Technology Network. This ensures that you

can count on the best possible solutions across all processing areas.

Vegan minced meat



Vegan spread



← Running direction

Vegan nuggets

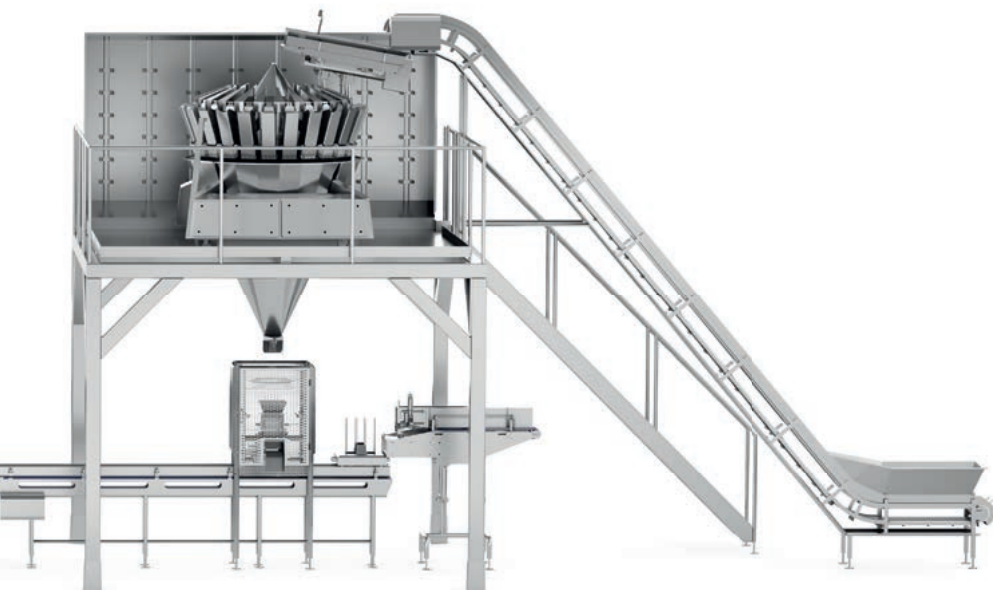


The following line solutions for vegan and vegetarian foods were developed in collaboration with our partners.

A central MULTIVAC contact person plans and implements the overall solution for you – everything from a single source.



← Running direction



← Running direction

Digitalization delivers clear benefits.

38

Transparent processes and process data in real time make an extremely valuable contribution to the efficiency and profitability of packaging systems and lines. With digital products and services from

MULTIVAC, we offer our customers highly innovative and future-proof solutions for monitoring, controlling and optimizing production.



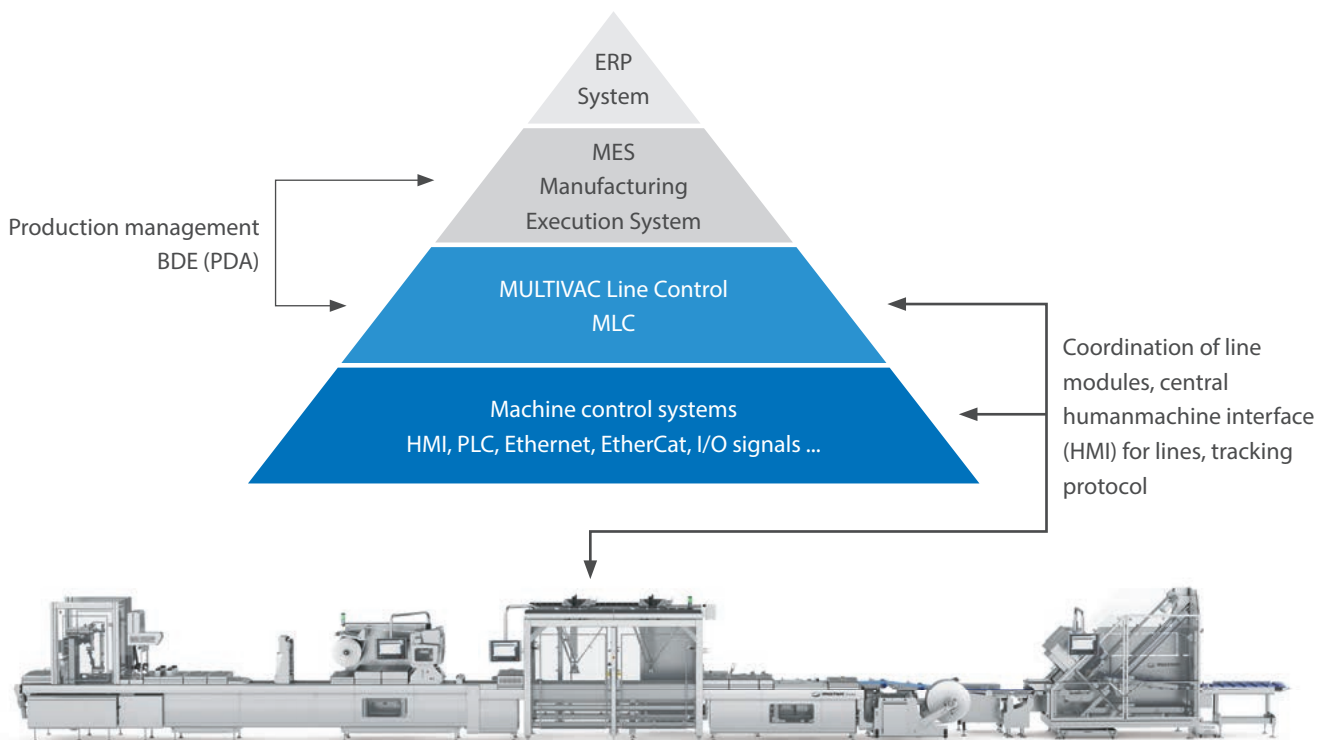


Line control and operation: easier and more efficient thanks to MLC.

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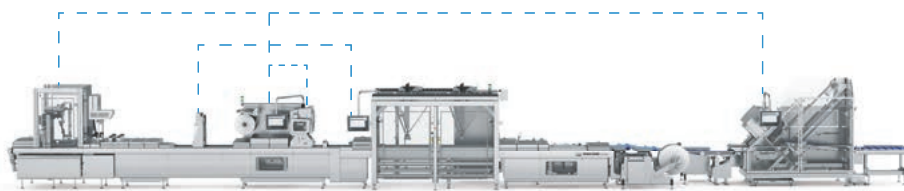
MULTIVAC Line Control (MLC) enables MULTIVAC lines to be operated with exceptional efficiency. It includes functions for starting, stopping, ramping up and emptying, as well as changing recipes on the entire line. Our solution makes line operation considerably easier, minimizes possible operating



errors, and ensures reliable and reproducible processes – an ideal platform for easily connecting a packaging line to your ERP, MES, MRP or PPS system.





Starting and stopping the line Starting and stopping the line Starting and stopping the line



	Box packing	Labelling	Packing	Loading	Cutting	
Product A 	Setting A	Setting B	Setting C	Setting D	Setting E	Line recipe for product A
Product B 	Setting D	Setting E	Setting B	Setting C	Setting A	Line recipe for product B

➔ Central change of line recipes ensures that machine settings are always altered quickly and reliably

Smart Services for machine monitoring, control and optimization.

42

With Smart Services from MULTIVAC, you can monitor, control and optimize your production – networked across locations and comparable. Simple, convenient and “live”.

The use of MULTIVAC Smart Services does not require a high initial investment, because the modular range of digital assistants can be flexibly adapted to the respective MULTIVAC machine or corresponding line components. For new lines as well as for retrofitting existing machines.

This means that our customers benefit equally in all operational and strategic areas, from the machine operator to the operations manager.





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MULTIVAC is on site for you worldwide.

The MULTIVAC Group employs some 6,900 people worldwide. The company is represented on all continents with over 80 subsidiaries worldwide.

More than 1,000 consultants and service technicians support customers around the globe. Their know-how and experience ensure maximum availability of all installed MULTIVAC machines. Anytime and anywhere.

165
countries where
MULTIVAC delivers
products and
services.

6,900
employees
worldwide.

200,000+
packaging machines sold.

80+
subsidiaries
worldwide.

13
production sites
worldwide.

1.4
billion euros
in sales
(MULTIVAC Group
2021).



MULTIVAC is a member of the German Association for Alternative Protein Sources (BALPro), a network promoting ecologically sustainable improvements in food production.



MULTIVAC is part of the R-Cycle cross-industry initiative whose objective is to jointly develop the circular economy for plastic packaging based on an open and globally applicable tracing standard.



MULTIVAC supports the Blue Competence initiative of the VDMA the German Mechanical and Plant Engineering Industry Association (Verband Deutscher Maschinen- und Anlagenbau).

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