

No.16

The First Specialized Monthly Magazine of Tray Sealer, Thermoforming and Vacuum Chamber Packaging Machinery Industry

VORMEK

Vormek an Innovation-based Machinery Company, an Knowledge & Progress Center with Superior Technology and High Reputation in its Field

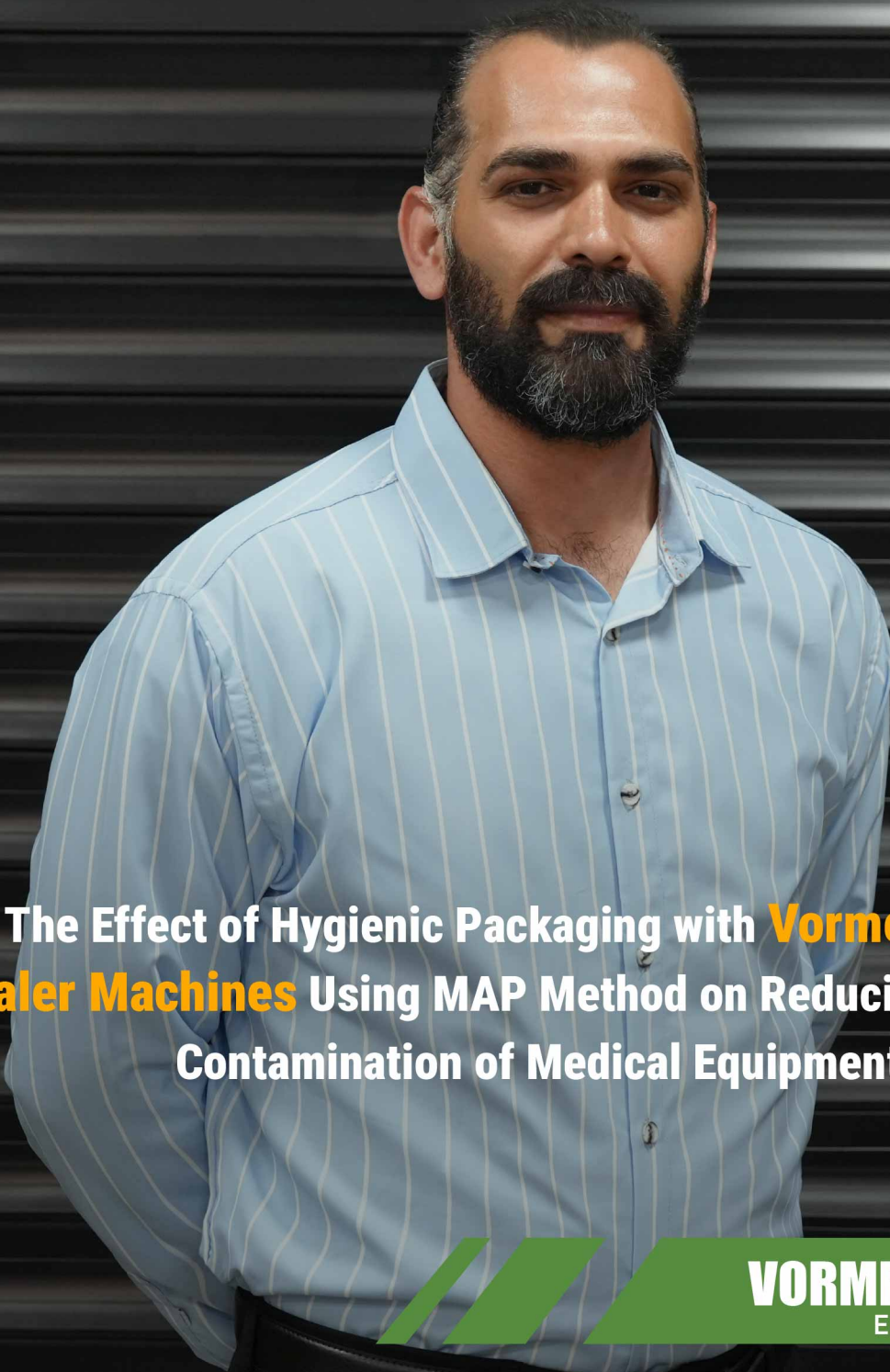
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The Effect of Hygienic Packaging with **Vormek's Tray Sealer Machines** Using MAP Method on Reducing Microbial Contamination of Medical Equipment

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SEMI-AUTOMATIC
TRAY SEALER MACHINE



AUTOMATIC TRAY SEALER
PACKAGING MACHINE

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Editor's Note

A Message of Hope in Difficult Times

Editorial: Dr. David Sterling

With greetings and respect, through the efforts of the editorial board and the editorial team of the specialized monthly magazine "Vormek", we are proud to present the sixteenth edition of the publication; an issue that I can confidently say is a turning point in the path of our specialized publications. This is because this time we have gone beyond the boundaries of food packaging and have entered the sensitive and challenging field of the application of tray sealer machines in the medical equipment industry.

In a world where precision, sterility, safety, and compliance with strict standards are the red lines of medical equipment production and packaging, tray sealer machines play an irreplaceable role. From the packaging of gauze, dressings, and surgical kits to sampling bags and single-use medical equipment, all of which require strong, microbe-impermeable, and traceable seals.

There are two fundamental questions: Has the tray sealer technology available in the country reached the necessary maturity to meet these important needs? And also, does the country's medical equipment industry have sufficient awareness and understanding of the application of tray sealer packaging machines? You will find the answers to these two questions in this issue.

Dear reader, if you are a factory manager, quality control manager, process engineer, or medical equipment designer, or even if you are looking for a deeper understanding of why and how to safely package medical equipment, do not miss this issue. The knowledge and experience embedded in this edition are directly tied to your customers and your brand's credibility.

It is hoped that this edition of "Vormek" monthly magazine will be your guiding light in selecting, optimizing, and validating the performance of tray sealer machines in medical equipment production lines. We also recommend that you share this issue with all your technical and quality assurance colleagues.

Wishing you and your business all the best.





Comparison of Thermoforming and Tray Sealer Machines in Packaging of Medical Devices and Pharmaceutical Products

Mr. Simon Füllenbach

In the packaging industry for medical devices and pharmaceutical products, choosing the right packaging technology plays a decisive role in maintaining sterility, increasing production efficiency, and managing costs. One of the common methods in this field is packaging with medical paper using packaging machines, which can generally be examined in two main categories: Tray Sealer machines and Thermoforming machines.

1. Machine Selection Based on Production Capacity

One of the most important criteria for selecting the type of machine is the daily production capacity.

In production lines with low capacity (around 1,000 to 2,000 packages per day), using Tray Sealer machines is considered a logical and economical option. These machines, with their simpler structure, faster setup, and lower investment costs, meet the needs of this production level.

In contrast, for high-capacity production, Thermoforming machines are a more optimal choice. These machines have the capability to produce up to about 7 cycles per minute. For example, if 8 packages are produced per cycle, the machine output will reach about 56 packages per minute, which indicates significantly higher productivity compared to tray sealers.

2. Space Limitations and Clean Room Conditions

In the medical and pharmaceutical industries, final packaging is usually carried out in high-grade clean room environments. Since the construction and maintenance of these spaces are very costly, space limitation is one of the fundamental challenges.

In such conditions, Tray Sealer machines, due to their compact dimensions (the smallest of which is about 1.5 × 1.5 meters), are a suitable option for limited spaces, while Thermoforming machines require much larger spaces (around 8 × 2.5 meters). Therefore, in projects where clean room space is limited, tray sealers have a significant advantage.

3. Flexibility in Product and Mold Change

The variety of products in the medical industry requires high flexibility in changing package dimensions and types.

In this regard, tray sealer machines are very flexible. Changing the mold in these machines usually takes less than 30 minutes, and the operator can quickly prepare the production line for a new product.

However, in thermoforming machines, the mold change process is more complex and time-consuming. These machines include several different molds:

- Forming mold
- Sealing mold
- Cutting mold

Changing and adjusting these molds, along with mechanical and software adjustments via the user panel, requires more time and is generally more suitable for low-variety, high-volume production.

4. Conclusion and Practical Suggestion

In summary, if production capacity is low, space is limited, and product variety is high, the tray sealer packaging machine is a better choice. Also, if high capacity, sufficient space, and continuous high-volume production are desired, thermoforming is considered a more optimal option.

The correct choice between these two technologies can have a direct impact on productivity, operational costs, and final packaging quality.



What is Medical Paper?

Medical paper is a special type of paper made from pure cellulose fibers through controlled processes. This paper has characteristics such as controlled permeability to sterilizing gases (ethylene oxide, steam, gamma radiation), appropriate tear resistance, and being free from any contamination or harmful substances.

Key Advantages of Medical Paper

1. **Sterilizability:** Medical paper allows sterilizing steam and gases to pass through while preventing the entry of microorganisms.
2. **Environmental Compatibility:** Unlike all-plastic packaging, medical paper is biodegradable and recyclable.
3. **Safety for Patient and User:** It is free from lint and dust particles, which is critical for surgical environments.
4. **Printability and Traceability:** The paper surface easily allows printing of product information, expiration dates, and barcodes.

Applications

- Packaging of surgical kits
- Packaging of sterile syringes and needles
- Packaging of medical masks and gowns
- Packaging of dental instruments
- Packaging of sterile dressings and gauzes

Relevant Standards

Medical paper must be produced and tested in accordance with international standards such as ISO 11607 (Requirements for packaging of medical devices that are sterilized) and EN 868 (Specific test methods for medical papers).





The Effect of Hygienic Packaging with Vormek's Tray Sealer Machines Using MAP Method on Reducing Microbial Contamination of Medical Equipment

Packaging using the MAP (Modified Atmosphere Packaging) method with Vormek company's tray sealer machines is considered an effective solution for reducing microbial contamination in medical equipment.

In this method, the air inside the package (containing oxygen) is evacuated and replaced with neutral and inhibitory gases such as nitrogen and carbon dioxide. The removal of oxygen stops the growth of aerobic bacteria and fungi. Additionally, carbon dioxide has bacteriostatic properties and prevents the proliferation of remaining microbes.

Vormek's tray sealer machines, with their 304 stainless steel body and hygienic design, are themselves a factor in reducing cross-contamination. The strong and flawless seal of these machines creates an impenetrable physical barrier against external contamination.

The key advantages of this technology for medical equipment include: significant reduction of recontamination after sterilization, preservation of the chemical integrity of oxygen-sensitive equipment (such as drug-eluting stents), no product deformation, and the ability to document compliance with ISO 13485 standards.

This method is highly recommended for products such as pre-filled syringes, catheters, silicone tubes, and equipment containing biological compounds. In summary, MAP packaging with Vormek's tray sealer machines creates a multi-layer protective barrier against microbial contamination and significantly increases the shelf life and safety of medical equipment.





Tyvek; A Powerful Microbial Barrier in Medical Device Packaging

Mr. Alexander Hoffmann (Deputy CEO of Vormek)

Packaging of medical equipment using Tyvek paper is undoubtedly one of the most sensitive, specialized, and advanced fields in the medical equipment industry. Tyvek, which is a non-woven material made of polyethylene with a very specific and unique structure, has been able to establish its position as one of the main packaging materials in this industry due to its exceptional properties.

Why is Tyvek paper used?

There are several reasons for using Tyvek paper in medical equipment packaging, the most important of which are:

High permeability to gas and vapor: One of the most important features of Tyvek is its high ability to allow sterilizing gases such as ethylene oxide or water vapor to pass into the package. This feature allows the sterilization process to be carried out completely and effectively, while at the same time, the packaging prevents the entry of microbes and external contaminants.

Exceptional resistance to tearing and puncturing: Unlike ordinary papers, Tyvek is very strong and resistant due to its polyethylene fiber structure. This feature ensures that the packaging does not tear, puncture, or suffer physical damage during transportation, storage, and distribution processes, and maintains its integrity.

Creating a powerful microbial barrier: Tyvek creates a very strong and reliable physical barrier against bacteria, viruses, and other microorganisms. This microbial barrier prevents environmental contaminants from penetrating the package and ensures the sterility of the product until the moment of use.

Excellent biocompatibility: Tyvek does not react chemically with the human body or with sterilizing agents. This vital feature makes this material completely safe and reliable for use in packaging all types of implantable, surgical, and diagnostic medical equipment.



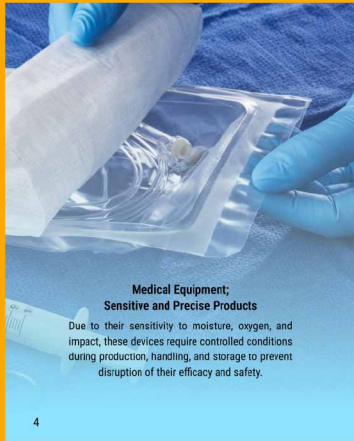
Medical Equipment

Medical Equipment; The Pillar of Modern Healthcare

Medical equipment must be manufactured under standards such as ISO 13485 and with multi-stage quality control to provide safe and accurate services, ensuring their reliability and performance in medical environments.

Innovation in Medical Equipment; From Design to Production

The design-to-production process of these devices is regulation-driven and specialized. Utilizing technologies such as 3D printing and artificial intelligence improves quality, precision, and innovation in products.



Medical Equipment; Sensitive and Precise Products

Due to their sensitivity to moisture, oxygen, and impact, these devices require controlled conditions during production, handling, and storage to prevent disruption of their efficacy and safety.

Challenges in Medical Equipment Production; Quality Over Quantity

In this industry, quality is more important than production volume. Achieving it requires process control, documentation, and compliance with stringent domestic and international regulatory requirements.

Long-Term Storage of Medical Equipment

To maintain stability and prevent degradation, medical equipment must be stored in environments with constant temperature, controlled humidity, and proper packaging to remain safe from environmental damage.

Medical Equipment Packaging; Beyond Physical Protection

Standard packaging, in addition to providing physical protection, must maintain product sterility, prevent contamination ingress, and be designed and selected in accordance with global standards.

Smart Packaging in Medical Equipment

Smart packaging with moisture, temperature, and contamination sensors monitors the internal conditions of the package and, by preventing undesirable changes, ensures the safety and performance of the equipment.

MAP

and Packaging of Sensitive Medical Equipment

In Modified Atmosphere Packaging (MAP), by replacing the air with inert gases such as nitrogen, the process of oxidation and moisture absorption is reduced, thereby maintaining the sterility and shelf life of sensitive equipment for a longer period.



Modern and Multi-Layer Packaging for Medical Equipment

Using multi-layer materials with a strong barrier against moisture and oxygen reduces the risk of contamination and degradation and protects the equipment from environmental factors and potential damage.

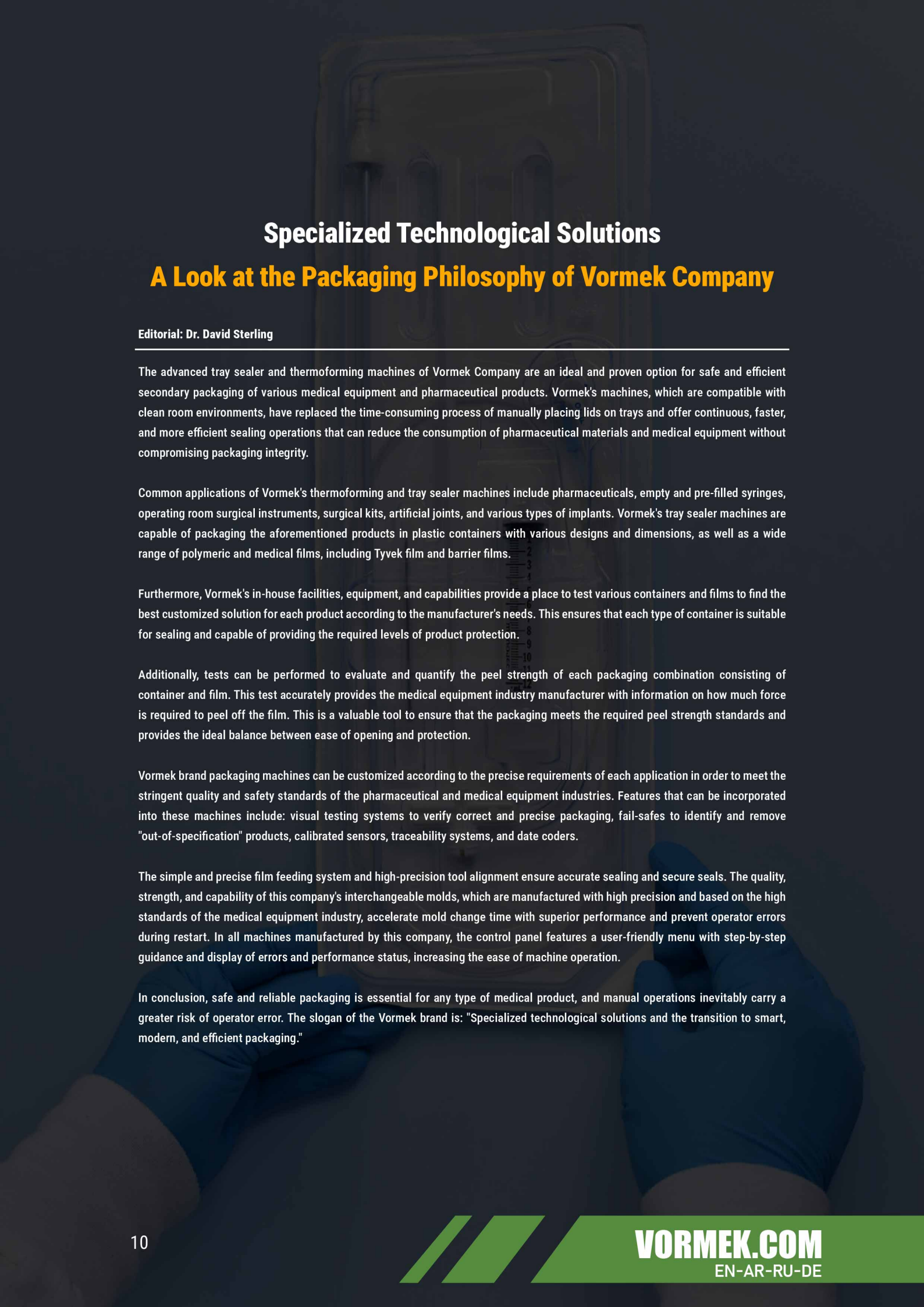
Production and Storage of Medical Equipment; Integrating Quality and Scientific Packaging

The combination of standard production, precise quality control, proper packaging, and principled warehousing ensures that the equipment maintains its performance until the time of use and guarantees patient safety.

VORMEK

Vormek is the knowledge-based company and manufacturer of Tray Sealer packaging machines with a true system in the country, which has been specializing in this field for about years.





Specialized Technological Solutions

A Look at the Packaging Philosophy of Vormek Company

Editorial: Dr. David Sterling

The advanced tray sealer and thermoforming machines of Vormek Company are an ideal and proven option for safe and efficient secondary packaging of various medical equipment and pharmaceutical products. Vormek's machines, which are compatible with clean room environments, have replaced the time-consuming process of manually placing lids on trays and offer continuous, faster, and more efficient sealing operations that can reduce the consumption of pharmaceutical materials and medical equipment without compromising packaging integrity.

Common applications of Vormek's thermoforming and tray sealer machines include pharmaceuticals, empty and pre-filled syringes, operating room surgical instruments, surgical kits, artificial joints, and various types of implants. Vormek's tray sealer machines are capable of packaging the aforementioned products in plastic containers with various designs and dimensions, as well as a wide range of polymeric and medical films, including Tyvek film and barrier films.

Furthermore, Vormek's in-house facilities, equipment, and capabilities provide a place to test various containers and films to find the best customized solution for each product according to the manufacturer's needs. This ensures that each type of container is suitable for sealing and capable of providing the required levels of product protection.

Additionally, tests can be performed to evaluate and quantify the peel strength of each packaging combination consisting of container and film. This test accurately provides the medical equipment industry manufacturer with information on how much force is required to peel off the film. This is a valuable tool to ensure that the packaging meets the required peel strength standards and provides the ideal balance between ease of opening and protection.

Vormek brand packaging machines can be customized according to the precise requirements of each application in order to meet the stringent quality and safety standards of the pharmaceutical and medical equipment industries. Features that can be incorporated into these machines include: visual testing systems to verify correct and precise packaging, fail-safes to identify and remove "out-of-specification" products, calibrated sensors, traceability systems, and date coders.

The simple and precise film feeding system and high-precision tool alignment ensure accurate sealing and secure seals. The quality, strength, and capability of this company's interchangeable molds, which are manufactured with high precision and based on the high standards of the medical equipment industry, accelerate mold change time with superior performance and prevent operator errors during restart. In all machines manufactured by this company, the control panel features a user-friendly menu with step-by-step guidance and display of errors and performance status, increasing the ease of machine operation.

In conclusion, safe and reliable packaging is essential for any type of medical product, and manual operations inevitably carry a greater risk of operator error. The slogan of the Vormek brand is: "Specialized technological solutions and the transition to smart, modern, and efficient packaging."



Saba Meditech Company

a Leader in Medical Equipment Packaging

Saba Meditech Company, as one of the leading suppliers of medical equipment in the country, has had a fruitful collaboration with us. This company manages its high production demands by operating three work shifts. However, using our tray sealer packaging machines, this is done without any limitations and in a customized manner.

Under normal conditions, this company, with just one operator, easily and accurately packages up to 3,000 products per day, demonstrating the efficiency and ease of use of our machines.

However, in the medical equipment production sector, where due to the high sensitivity of the products and the use of Tyvek paper, the sealing time is longer, our machines have performed excellently, maintaining quality assurance and international standards without disrupting the production process.

Saba Meditech Company, by possessing several different molds, has the ability to produce various types of medical packaging, to the extent that the capacity of a single mold alone is sufficient to meet the high-volume, customized needs of customers. Given that some molds have 8 cavities, this significantly increases production capacity and allows the company to effectively manage any high-volume or special-shaped orders with high flexibility and without compromising quality.

Ms. Emily Morgan the representative of Saba Meditech Company, informed us that the use of tray sealer packaging machines has allowed the company to operate in specific and sensitive markets and to be recognized as one of the distinguished suppliers in the field of medical equipment.

This type of packaging not only preserves product quality and prevents physical damage but also serves as a strategic competitive advantage, directly impacting the company's profit margin and helping to increase customer trust and loyalty. This collaboration demonstrates that our machines not only act as flawless packaging tools but also function as a key factor in creating a competitive advantage and enhancing product valuation in the medical market.





Seven Years of Successful Experience of Avita Brand in Packaging Dental Implants with Vormek's Tray Sealer Machines

Hanson Yancy

Hello, I am Hanson Yancy, holder of a PhD in Biomechanics from the University of Auckland, currently working as the Product Manager of the National Major Plan for Dental Implants of Avita Brand, affiliated with Kooshaafan Company.

The products manufactured by this company include various types of dental implants, abutments, and related prosthetic components, which are produced in 200 different sizes and cover almost all the needs of respected dentists.

In this field, the aforementioned products are made from medical grade 4 and 5 titanium alloys. After completing the production processes including CNC machining and surface treatment operations, it is time for the packaging stage. Our packaging structure is designed as a five-layer system, with the medical device or implant placed in the innermost point. Two capsules are placed in two different layers. After that, the blister container, which is usually made of PET/PE 450 or 650, is sealed using Tyvek paper with a weight of 80 to 90 grams.

The general standard of this company's products is ISO 13485. Regarding the specific standard, after the packaging process and sterilization with gamma radiation (based on standard 11137, with a dose of 25 kGy in 54 hours, more than 99.9% of bacteria and fungi are eliminated from the main product), it successfully passes the ISO 11607:2019 standard. Subsequently, two-year and five-year aging tests are successfully completed.

Ultimately, this five-layer process, along with quality sealing and compliance with relevant standards in the two-year and five-year aging tests, results in obtaining a five-year shelf life for the product; meaning that from the time of production and gamma irradiation, the dentist has up to five years to use the product.

The main needs of this production line are blister machines, CNC machines, sandblasting machines, and acid etching machines, with the bottleneck mostly in the capacity of the CNC machines, which must operate in a completely dust-free and oil-free environment with ISO Class 9. Additionally, a cutting machine is needed that can meet the company's needs for producing over 100,000 implants per year. Repair, maintenance, and support services must also be provided completely and professionally.

Vormek's machines enable customization for various types of customer packaging with specific designs, and help pass aging tests, sterility tests, dose mapping, bloom tests, etc., thereby facilitating the obtaining of production licenses both quantitatively and qualitatively.

Fortunately, throughout our cooperation with Vormek, we have not faced any particular challenges and have always experienced good quality. The ordered machine was designed and manufactured exactly according to the format and size we requested. Additionally, we were informed that the B3 series machines in this company are designed and built entirely based on the specific needs and orders of the customer.

This company is completely satisfied with its machine and has been using it for many years. Currently, we have been a customer of Vormek for over seven years.

Vormek Winter Festival

VORMEK



**Double Vacuum Chamber Packaging Machine
(Compact Duo)**

16,400 € → 13,400 €



**Automatic Tray Sealer Packaging Machine
(EcoVision)**

34,400 € → 29,900 €



**Semi-automatic Tray Sealer Packaging Machine
(EcoTech)**

19,900 € → 16,900 €

We Stood by the Producers; A Narrative of the Industry Hope Initiative

Vormek Company, as one of the most reputable designers and manufacturers of advanced packaging machines, has always considered itself responsible and committed to supporting industrialists, producers, and activists in the fields of food industry and medical equipment. In this path, paying attention to the real needs of the market and showing empathy with customers has always been a strategic principle for this company.

This company committed to providing Tray Sealer and Vacuum Chamber packaging machines to its customers without any profit and exactly at the previous prices. This practical step was considered an effective measure to reduce the financial burden on producers and maintain the continuity of their production lines.

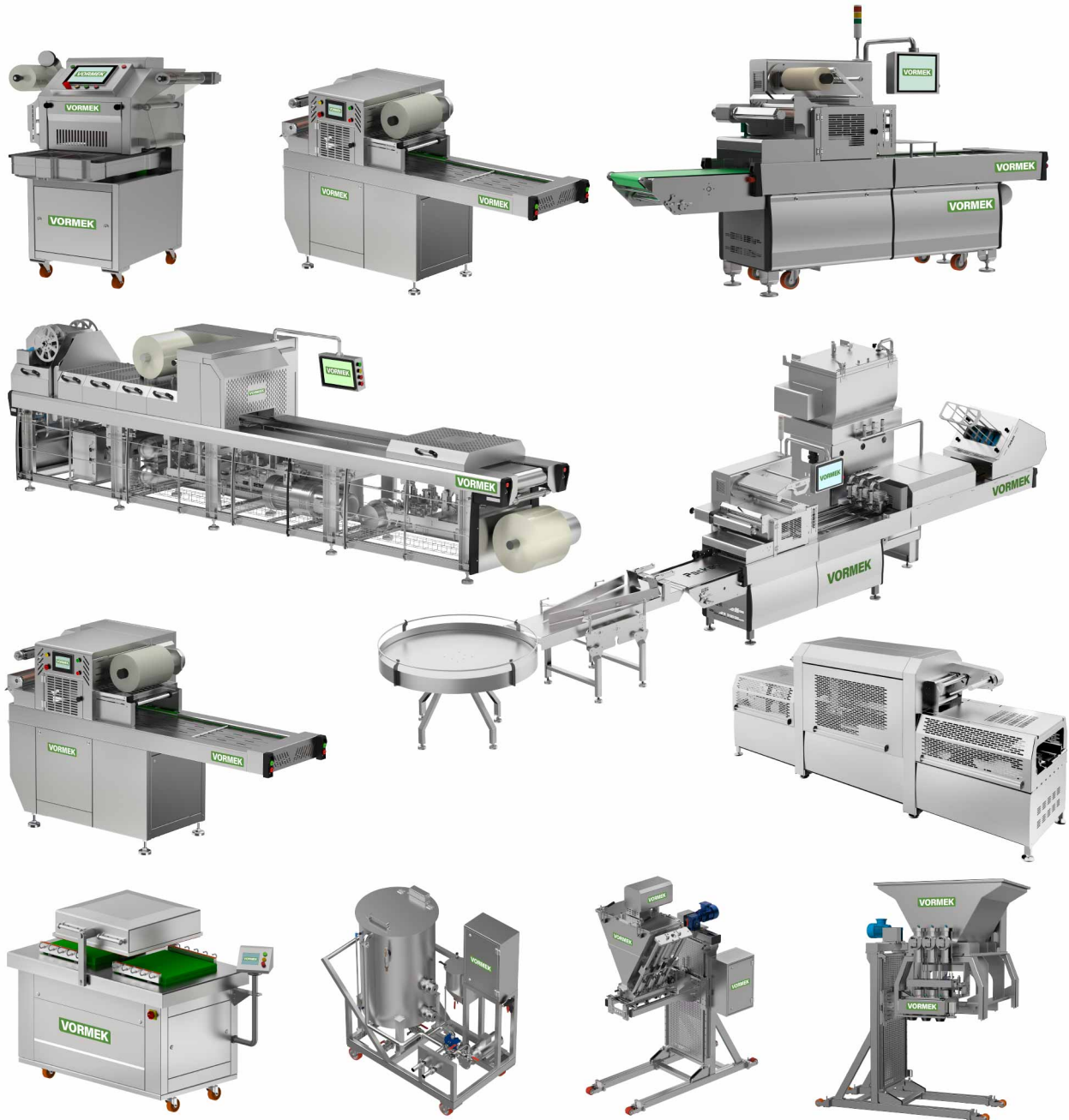
Additionally, in order to encourage direct investment and support production cash flow, all customers who made cash purchases received a special cash discount. This discount was directly deducted from the final amount and made it possible to access European-quality equipment at a much lower cost.

Among the strategic objectives of this initiative, we can mention maintaining the stability of food industry and medical equipment production lines in critical conditions, improving the level of hygiene and packaging quality using MAP and vacuum technology, preventing the increase in the final cost of products due to rising equipment prices, and strengthening the spirit of empathy and social responsibility in the country's machinery industry.

The Industry Hope Initiative was a practical symbol of Vormek Company's commitment to national production and support for Iran's hardworking industrialists. This company, relying on more than fifteen years of experience, CE and ISO 9001 standards, and 10 years of after-sales service, stood by the producers in those difficult times.

The Importance of Using Tray Sealer, Thermoforming, and Vacuum Chamber Machines in Today's Packaging Industries

- Tray Sealer packaging machines, with easy operation and simple maintenance, make it possible to package a wide variety of food products. In addition to extending shelf life, they give the product a stylish and professional appearance.
- Thermoforming packaging machines, in addition to producing trays, also carry out the filling and packaging process. These machines, in different types such as soft film, hard film, and skin pack, can package food products in a highly professional and attractive way with complete precision.
- Vacuum Chamber machines, by completely removing the air (vacuum) from inside the filled pouches, can ensure freshness, safety, and long-term preservation of food products. Furthermore, the installation of various fillers and dedicated options on these machines makes the packaging process more automated, hygienic, and faster.
- This technological combination elevates packaging standards and, while modernizing the production process, creates trust and a modern image of the producer's brand in the minds of customers.



We warmly invite you, our dear audience, to share your topics of interest with us. Your opinions and suggestions not only help enrich our content but also guide us in providing more practical material to meet your needs.

Would you like to read a report about a specific industry or a special technology in the field of packaging?

Share your thoughts with us so we can cover them in upcoming editions.