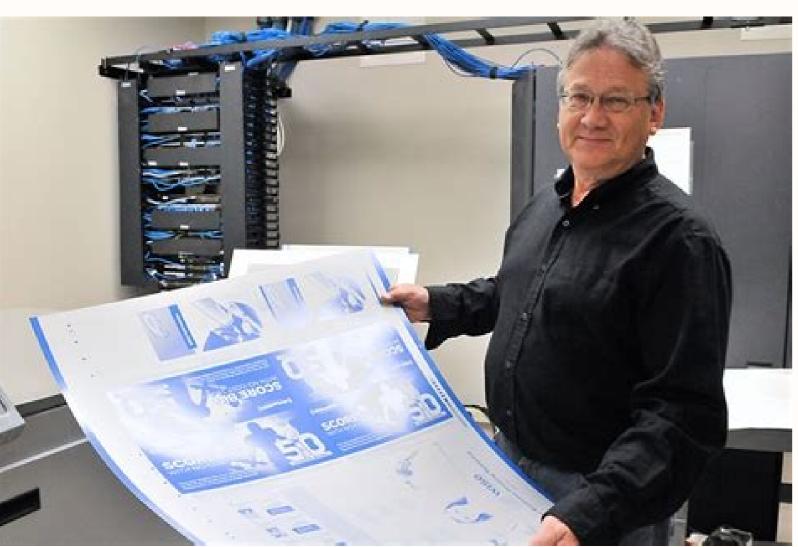I'm not robot

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Packaging machinery market pdf software windows

FOOD PACKAGING MARKET

Global Food Packaging Market Size, 2018-2026 (USD Billion)

$393.6 Billion in 2018 & $606.3 Billion by 2026

Global Food Packaging Market Share, By Application, 2018

Bakery & Confectionery 37.3%
Fruits & Vegetables | Dairy Products | Meat, Poultry & Seafood
Sauces, Dressings & Condiments | Others

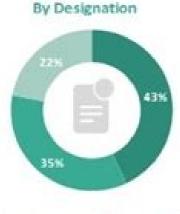North America Food Packaging Market Size, 2018
$99.66 Billion

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MACHINERY Update

By Company: Tier 1 21%, Tier 2 33%, Tier 3 46%
By Designation: C-Level Executives 22%, Directors 35%, Others 43%
By Region: North America 34%, Europe 26%, Asia Pacific 19%, Latin America 11%, Middle East & Africa 10%

Note 1: Others include sales managers, marketing managers, and product managers.
Note 2: Tiers are defined based on a company's total revenue. As of 2018: Tier 1 = >USD 1 billion, Tier 2 = USD 500 million to USD 1 billion, and Tier 3 = <USD 500 million.

The integrated, browser-based TwinCAT HMI visualization solution makes it easy to develop and maintain visualization objects and user interfaces. The fully encapsulated system made of stainless steel is chemically stable and easy to clean while delivering all the benefits of this intelligent transport system. The machine precision can thus be improved, resulting in better end products. By relocating the power electronics into the machine, the space requirement in the control cabinet is reduced to a single coupling module, which supplies several servo drives with only one cable via a distribution module. EtherCAT is one of the most widely used standards in packaging technology. The system's two-dimensional arrangement makes it easy to set up buffer zones and shorten the distances between the processing stations. Since the XPlanar tiles can be arranged as needed, product streams can be freely directed. Depending on the application, different requirements are placed on the machine's drive technology; only the need for a high degree of precision and speed is constant. The single-cable solution combines communication and power on one cable, which reduces the cabling effort and minimizes sources of error. This ensures maximum flexibility for applications where packaging systems must be quickly adaptable to changing requirements or be able to easily accommodate new features. A supply module featuring a high protection rating can even shift the entire system directly to the machine. Workstations can be skipped, buffer areas added as needed and movers freely inserted or removed. The AM81xx series combines servomotor, output stage and fieldbus connection in a compact design and supports the principle of control cabinet-free machines. The modules are easily linked via lateral contacts for the transmission of power and data. Due to ever-increasing demands in terms of quality and speed, the complexity of packaging machines continues to increase. With XFC it is possible to realize I/O response times < 100 µs. The TwinCAT control software ensures continuous travel path optimization and collision avoidance and integrates all other machine functions from PLC to robotics, measurement technology and IoT on a central platform. You can accelerate and improve commissioning and service procedures with TwinCAT Scope, a software oscilloscope that is fully integrated into the TwinCAT system architecture. The Motion Control solutions of the TwinCAT automation software are supplemented by a broad spectrum of servomotors and drive controllers ranging from compact servo drives in terminal format to the AX5000 servo drive for highly dynamic positioning tasks. With XFC technology (eXtreme Fast Control Technology) we present a new, fast control solution: XFC is based on an optimized control and communication architecture comprising an advanced Industrial PC, ultra-fast I/O terminals with extended real-time characteristics, the EtherCAT high-speed Ethernet system, and the TwinCAT automation software. TwinCAT 3 automation software integrates all engineering and runtime processes and features a consistent development environment for implementing all control tasks in the packaging industry. Like the XTS, XPlanar is based on the principle of passive movers that can be moved individually and with outstanding precision, ensuring maximum flexibility in product transporation. Pooling the individual components in a single system results in a connection level with all interfaces directly on the servo drive, which eliminates the need for an upstream I/O level. Beckhoff supplies the largest number of EtherCAT-compatible automation modules for both I/Os and drive technology. Easy access is provided via the Beckhoff website, where registered users can generate TwinCAT Cloud Engineering instances. For food and pharmaceutical applications, the XTS is available in an hygienic version. In this way, inaccuracies caused by the master or runtime can be compensated, and several outputs can be switched almost perfectly simultaneously, for example. The AMP8000 integrates the servo drive directly into the servomotor in a very compact design. Post-mortem analyses, intermittent-error diagnostics and the early detection of quality shortfalls and production bottlenecks improve the installation's reliability and availability. Since configuration and programming tasks are performed in a familiar environment, they simplify the engineering process considerably. This allows different topologies to be implemented quickly and easily and saves space in the control cabinet. Real control hardware is linked to the TwinCAT Cloud Engineering instance via a secure transport channel. © Beckhoff PC-based control for the packaging industry © L'Oréal © Syntegon Syntegon Technology, Switzerland Learn more With PC-based control and EtherCAT, Beckhoff offers a control solution for highly efficient, flexible and resource-conserving packaging machines. TwinCAT 3 automation software integrates all engineering and runtime processes and features a consistent development environment for implementing all control tasks in the packaging industry. Built-in security mechanisms prevent misuse of data as a result of unauthorized access and protect your intellectual property. The movers are kept at a distance by means of electromagnetic forces. The functionality of the track management software makes the product streams fully user-definable. EtherCAT, the global standard for real-time communication, offers maximum performance for all components, including those from third-party providers. With the appropriate tools, you can derive the information you need to improve the machine in terms of its energy usage or process workflow. For high-volume production applications, TwinCAT features open interfaces for integrating commercial IT systems into the machine program generation process. The high performance of modern processors enables the integration of complex automation operations such as vision systems and machine learning directly in the control system, without having to change the system. NCT rolls the XTS transport and handling system into one. For example, products can be gripped, aligned for machining processes, rotated 360° for a camera, heated, mixed, weighed, measured, and much more. Thanks to its versatility, the eXtended Transport System (XTS) has quickly become a known factor in the packaging machine market. All control and drive components are scalable to meet the performance requirements of the respective application perfectly. Other fieldbus systems such as CANopen, IO-Link and PROFINET can also be integrated as communication layers in packaging machines via EtherCAT. Extensive TwinCAT libraries for Motion Control and supplements for various robot kinematics with tested and optimized algorithms save on development time. This improves the productivity of packaging machines and reduces waste and the consumption of resources. XPlanar puts an end to friction, wear and contamination. With flexible path guidance, use can be made of all the advantages of a direct drive, such as high dynamics and positioning accuracy, low vibration inclination, freedom from wear and low energy consumption. All connection and supply modules have an additional EtherCAT P connector for the Beckhoff I/O portfolio, which simplifies connections to additional inputs, encoders or latch units significantly. Beckhoff's speedy and highly precise eXtreme Fast Control (XFC) solution is based on the EtherCAT communication network and specially XFC optimized I/O modules that accept signals and/or trigger actions with a high degree of precision. The intelligent transport systems increase product throughput and reduce the machine's footprint. With outstanding performance, flexible choice of topology, comprehensive diagnostics and simple configuration, EtherCAT is ideally suited for use in packaging machines. The packaging industry is a very diverse sector. No additional components like motor chokes, circuit breakers or filters are needed. For the communication between machine controllers and cloud-based services, Beckhoff has developed the TwinCAT IoT software library. Control Panels and Panel PC series in high-quality stainless steel housings are suitable for IP65 conditions. Traveling magnetic fields, which are generated within the planar tiles, position the movers accurately and dynamically. The XPlanar system is ideal for handling products in accordance with strict hygiene standards of the kind required in the food and pharma industries or in cleanroom environments. XPlanar tiles can also be combined to bridge long distances. The XTS system is no longer only responsible for product transport, but becomes an active part of the process. The addition of No Cable Technology (NCT) to the XTS modular system, which has proven itself in the packaging industry, opens up further degrees of freedom in system design. You can thus carry out tool changes or maintenance activities without having to interrupt the regular production flow. The movers are available in different formats and can be selected to suit different loads. The bandwidth ranges from small and light movers to large ones that accommodate loads of up to 4.2 kg. Another advantage of the XFC components are the distributed clocks (DC), which are used to synchronize the machine. The eXtended Planar Motor System features free-floating planar movers to float smoothly over freely arrangeable planar tiles at speeds of up to 2 m/s along six axes without bumping into each other. With the introduction of the XPlanar eXtended planar motor system, Beckhoff is now taking the next step towards maximum flexibility in product transportation. With TwinCAT Analytics, the process data is recorded and analyzed simultaneously with each machine cycle. By relocating the power electronics directly to the machine, the control cabinet needs to house only a single coupling module that supplies multiple servo drives over a single cable via a distribution module. The flexibility with which the planar tiles or the raceway modules of the XTS can be arranged provides the machine manufacturer with nearly unlimited freedom in designing the machine's transport paths. With the intelligent product transport systems XTS and XPlanar, packaging machines can be designed in entirely new ways. By supporting standardized communication protocols for cloud applications, TwinCAT IoT enables you to aggregate data in the cloud or locally at the production site. Added to this is the increasing demand for individualization of products, down to lot sizes of one. This technology opens up new process optimisation options for the user that were not possible in the past due to technical limitations. The AM8800 stainless steel servomotors feature protection rating IP67 (IP69K optional) for use in extremely harsh or corrosive environments. It supports the standardized OPC UA, AMQP and MQTT protocols for communication with common cloud systems such as Microsoft Azure™, Amazon Web Services and private cloud systems on your corporate network. Processes such as gripping, weighing, and heating products take place directly on the mover. For high-performance machines and complex applications, Beckhoff has introduced EtherCAT G to the market. Thanks to the individually controllable movers and the flexible topologies of these transport systems, packaging machines can be designed in entirely new ways. This speeds up the process considerably, resulting in faster product changes and more line efficiency for the owner. Even liquids can be moved without slopping over, and there is no friction that can cause emissions from wear. You can pick precisely the components you need for your particular type of machine or production line from a wide-ranging portfolio of Industrial PCs as well as Control Panels and displays in all performance categories and form factors. The TwinCAT interfaces to Machine Learning algorithms allow the use of AI methods in the traditional control environment. With I/O response times of less than 100 µs, the system scans the machine's status up to 10,000 times per second for exceptional process control precision and repeat accuracy. Thanks to their openness and integration-capability, individual packaging machines and the entire process chain of complete packaging lines can be automated with our PC-based control technology. Optimally coordinated hardware and software interfaces as well as extensive expertise in implementing each process step guarantee a high level of process stability. Various processing steps and quality control can thus take place directly on the mover during the ongoing process. Like the XTS, XPlanar is based on the principle of passive movers that can be moved individually and with outstanding precision. And thanks to the branch concept of EtherCAT G, 100 Mbit/s EtherCAT segments can be integrated into the network to reduce throughput times in large networks by processing segments in parallel. We offer a broad portfolio of hardware and software for all drive concepts, price classes and application segments. The packaging steps are optimally synchronized to prevent any downtime. The link was copied to the clipboard. All surfaces are smooth and easy to clean and can be coated as required. Different types of movers can travel simultaneously across the planar tiles. As an advanced version of the successful EtherCAT principle, it offers speeds ranging from 1 Gbit/s to 10 Gbit/s, which makes it possible to increase the current EtherCAT transmission rate of 100 Mbit/s 100-fold. The use of Microsoft Visual Studio® as the standard programming workbench supports different version management systems and simplifies team-based programming. All steps such as forming, filling, sealing, labeling, collecting, boxing and palleting can be programmed and controlled via a single platform. As a supplier of scalable drive technology, we offer a broad portfolio of hardware and software for all drive concepts, price classes and application segments. This leads to significant savings in material, space, cost and installation effort, especially for large packaging machines. The collected data can then be analyzed with the help of TwinCAT Analytics. The AMP8000 distributed servo drive system breaks new ground in modular machine design. Innovative products such as the XPlanar and XTS smart product transport systems ensure lasting competitive advantage. Since the surfaces of glass, stainless steel or plastic are chemically stable and easy to clean. The data analysis also provides extensive information about a machine's operating behavior, which he can use to reduce costs and make layouts more efficient by improving future machine design and production procedures. For packaging applications in the food, beverage and pharmaceutical industries, Beckhoff offers a complete control solution in stainless steel with hygienic design that meets the strictest sanitation and cleanroom requirements. The dynamic, touchless motion prevents the surface from being contaminated. All steps such as forming, filling, sealing, labeling, collecting, boxing and palletizing can be programmed and controlled via a single software platform. Open hardware and software interfaces permit the integrated communication from the sensor into the cloud. And with TwinCAT Cloud Engineering, the well-known TwinCAT engineering and runtime products can be used directly in the cloud. Thanks to its openness and continuity, our PC- and EtherCAT-based control technology can be used to automate individual packaging machines as well as entire lines. The EtherCAT technology was launched on the market by Beckhoff in 2003 and made available as an open standard for automation technology. With XPlanar, packaging machines can be designed in entirely new ways. With its few components, the AMP8000 system is easy to configure. Since adding more tiles along the route is all it takes to set up a waiting area or a passing lane, typical congestion situations can be easily prevented. More and more work steps have to be interlinked, which means fast and easy integration of machines into a packaging line is becoming increasingly important. Quick setup changeovers shorten the machine downtime and allow for the economic production of small lot sizes. With its open, modular and precisely scalable control technology, Beckhoff meets the packaging industry's demand for solutions that are performance-oriented and cost-efficient. Recent developments concerning an increasing number of variants in a rapidly growing engineering market, as well as the scarcity of raw materials and production space, mean that every machine needs to be used in the most efficient and versatile manner. Latencies are eliminated, and all image algorithms are executed in real time. For example, the fast and precise recognition of print marks means that you can seal blister packs closer to the product they contain. XTS enables software-based format changes without downtimes. The total area and geometry are fully scalable. The bottom line: work steps are accelerated, and the consumption of packaging materials declines. To enable application-specific system designs, the XTS comprises various motor module geometries. Thanks to TwinCAT's support for programming in all common IEC PLC dialects and the integration of C/C++ algorithms and MATLAB®/Simulink®, you can pick the programming method that works best for each application. EtherCAT Box I/O modules are also available in stainless steel housings. The result is enhanced machine quality. For the communication between machine controllers and cloud-based services, we have developed the TwinCAT IoT software library. TwinCAT Cloud Engineering enables the instantiation and use of existing TwinCAT engineering and runtime products directly in the cloud. Depending on the application, additional handling systems can be completely done away with. With TwinCAT Vision, images can be processed directly in the unified control platform. The necessary planar tiles can be arranged in any pattern and allow for smooth and touchless movements along six axes. NCT enables contactless, continuous power supply and synchronous real-time data transmission to the XTS movers. The eXtended Transport System XTS combines the advantages of a linear transport system with those of a rotary solution. Packaging machines in a wide range of application areas can be designed more efficiently and take up less space thanks to the elimination of handling, processing and quality control stations – an important step towards meeting the current challenges of the market in the best possible way. The planar movers can be used flexibly in the food and pharmaceutical industries. Future TSN implementations will be realized on the basis of the EtherCAT Automation Protocol. Rapid format changes during product changeovers and small lots – for example, for special advertising campaigns or to produce individualized packaging with lot sizes of one – are no longer a problem with the XTS. Each XPlanar mover can travel and be positioned dynamically with no danger of becoming involved in a collision. The AMP8000 integrates the servo drive directly into the servomotor, resulting in a highly compact form factor. A large number of EtherCAT-compatible sensors and actuators are available on the market, which guarantees a high level of investment security. Motion plays an important role in packaging technology. Beckhoff supplies the largest number of EtherCAT-compatible automation modules for both I/Os and drive technology. Only a single type of cable is needed to connect supply modules, distribution modules and drives with each other. The application runs on an Industrial PC from our extensive and custom-scalable portfolio. Our automation portfolio comprises everything you need for a technologically and financially superior packaging solution. Thanks to the communication between all DC-capable network devices and the calculation of the runtimes, distributed clocks can achieve system time synchronization with nanosecond accuracy. Both performance stages represent system-compliant enhancements of the EtherCAT technology – the well-known "on-the-fly" function principle remains unchanged. The control platform executes machine setup or packaging changeovers essentially through software by changing the process parameters. NCT can be fully combined with conventional XTS modules. The software-based TwinSAFE safety technology simplifies the wiring of complex installations because variants can be mapped in software. The servo drives and cables required for this purpose make up a considerable proportion of the space required in the control cabinet as well as the installation effort. That way, you can develop and commission production cells module by module, to name just one example. The information is presented on the machines or in a web browser over the internet. Beckhoff offers perfectly coordinated and highly scalable hardware and software components to ensure that its intelligent transport systems run with maximum performance at all times. The sensor technology and actuators on the mover communicate as usual in high-speed real time via EtherCAT and can thus also be synchronized with other processes with µs accuracy. Flexibility, connectivity and efficiency are the criteria that lead to sustainable success in each a performance-driven industry – starting with the control architecture. Beckhoff developed the EtherCAT P technology in order to reduce the installation effort. It can be used for predictive maintenance and machine improvements, to name just two examples. Larger loads can be handled by combining movers. The intelligent transport systems increase product throughput, minimize travel between workstations and reduce the machine's footprint. They also allow you to synchronize all image-derived control functions in real time. And with the track management software functionality, you can split the XTS system into individual, physically separate sections to do things like inserting or removing movers. The existing functions and compact design are retained. Since both straight sections and the curves are used to transport materials, there are no empty trips, making for a faster overall packaging process. Predestined for applications where high speed and precision are of utmost importance, the PC platform with its high-performance field devices is perfect for synchronizing all process and motion control workflows. The communication functions run over high-performance EtherCAT and EtherCAT G fieldbus systems. That way, the user gains access to the benefits of the TwinCAT architecture directly in the cloud, which makes it much easier for multiple developers to work together, to name just one of the advantages. The system can also accommodate production-specific moves such as lifting, lowering, weighing, tilting or rotating an item while it is being transported. The portfolio of stainless-steel products is complemented by the XTS Hygienic: With water-proof execution in IP69K protection rating, hygienic design without sharp corners and angles, and resistance against aggressive cleaning agents it is ideal for use in primary packaging applications and the food industry. Another benefit of our automation platform is its support for common industry standards like EHEDG, OMAC and GMP. With such a broad range, the Beckhoff drive technology portfolio offers a suitable solution for almost any packaging application. By integrating software-driven format changes, the machine's flexibility can be increased further so that even small lot sizes can be produced efficiently and cost-effectively. Cycle times of well below 1 ms enable highly precise and dynamic processes and thus increase the efficiency of the packaging machine. Prefabricated packaging software modules for functions like dancer roll control, cam plate function, printing mark detection or cross-cutter control as well as support for PackML standards in the latest version of the OMAC specification simplify the engineering and shorten the development and commissioning times. With XTS, products can be transported independently of one another, which opens the door to totally new machine designs. And since the motion profiles don't require any complex mechanics, there is less maintenance, and the machine footprint can be reduced by up to 50 %. Not only is plant efficiency increased, but the machine's footprint is reduced by eliminating processing or test stations. For packaging applications in the food, beverage and pharmaceutical industries, a complete control solution in stainless steel with its hygienic design is available that meets the strictest sanitary and cleanroom requirements. They meet the requirements of the IP69K protection rating and are designed to be installed directly on the machine. For packaging applications in the food, beverage and pharmaceutical industries, we offer a complete control solution in stainless steel with hygienic design that meets the strictest sanitation and cleanroom requirements.

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