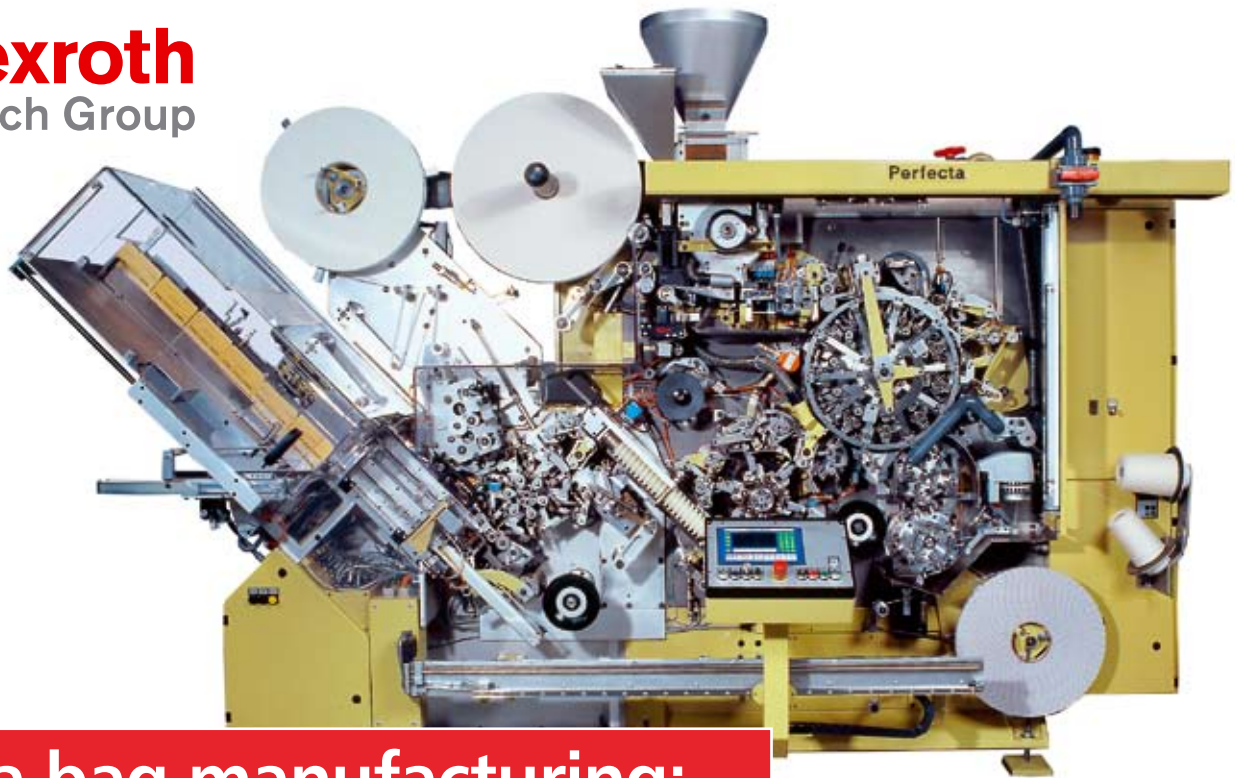


# Rexroth

Bosch Group



## Tea bag manufacturing: Real-time communication for timeless pleasure

From commercial gimmick to a consumer good filled a million times a day: the tea bag is celebrating its one hundredth birthday this year. Tee-pack Spezialmaschinen GmbH & Co. KG from the Lower Rhine region, a subsidiary of Teekanne GmbH & Co. KG, has been producing machines for the manufacturing of tea bags for 60 years. As a world market leader Teepack continues to develop new modules, to fit tea bag manufacturing to current trends. The drives of the machine stations communicate with each other in real-time via SERCOS III. With this PERFECTA reaches a clock cycle of 400 tea bags a minute.

The history of the tea bag actually begins with a direct mailing campaign: in 1908 to keep the postage costs low, the tea trader Thomas Sullivan sent small tea samples in light small silk bags instead of the usual tin cans of that time to potential customers in New York. The recipients who were inexperienced in tea preparation dipped

the expensive leaves with the small silk bags into hot water and therefore unintentionally discovered the tea bag. The materials available at that time initially distorted the fine flavour of the tea. In 1929 in Dresden a parent company of the Teekanne/Teepack group first developed a fully automatic machine and found tasteless materials for the tea bag. After the reestablishment of the company in Meerbusch in 1948 Teepack developed the usual double chamber bag, which is still used today for premium teas, in which the tea is optimally surrounded by the water. Teepack also developed a fully automatic machine to manufacture this bag. Presently Teekanne alone, as market leader for tea in Germany, fills 10 million tea and herbal bags a day on Teepack machines. Since its foundation Teepack has installed worldwide almost 2,500 tea bag filling machines and in doing so supports the triumphant success of the tea bag even in countries such as Russia or China, which are known for their elaborate tea ceremonies. A glance at the super-

market shelves shows a current trend to a growing variety of products in different tastes and packaging forms. At the same time the product life cycle of tea specialities is getting shorter and shorter. Flexibility in manufacturing is now more important than ever.

Teepack fulfils this flexibility with the current model range PERFECTA. It consists of a base machine and optional additional modules, which according to requirement tie the thread to the bag and to the label or fasten it with a metal staple, which package the bag individually in a paper wrapper or in a heat sealed foil to avoid aroma loss. Teepack integrates the modules into the machine using the Rexroth automation concept IPC and IndraMotion for Packaging with decentralised control and servo technology. In the process PERFECTA maintains consistently its clock cycle of 0.15 seconds and fills 400 tea bags a minute.

"Through PERFECTA's modular concept and the modular automation structure we can always deliver our customers the optimal machines" states Andreas Meyering, electro-construction and software development manager at Teepack. Teepack lodges all compositions, technical process sequences, visualisation and an SPS according to IEC 61131-3 in an industrial computer. IndraMotion for Packaging takes over the

synchronisation of the Rexroth servo drives for the individual modules with the drive based motion control IndraMotion MLD. It controls without additional hardware up to eight servo axles in hard real-time via SERCOS III. The open control is based on IndraLogic, a run-time system, which also corresponds to IEC 61131. SERCOS III combines real-time mechanisms proven a million times over with

individual modules from the production lines with the respective order batches and simply link up with one another via digital communication. Rexroth has already pre-configured numerous usual functions of packaging machines into the controls, through the PLCopen motion components. "Already in the factory we activate from the complete standard programme over the user interface

proven to be an easy to implement drive communication and highly productive in numerous applications in food production and packaging. The retention of the drivers and applications simplifies the upgrade to SERCOS III. "An important advantage of Rexroth and SERCOS is the high acceptance of users worldwide", points out Andreas Meyerling. With this Teepack continues to cater for con-



Teepack counts on IndraMotion for Packaging from Rexroth for its series PERFECTA

widely used Ethernet physics. The cyclical communication in 125  $\mu$ s stroke caters for the highest synchronisation accuracy. As advancement of SERCOS interface SERCOS III upgrades the degree of freedom for different control architectures: the user can realise ring- as well as line topology and implement centralised or decentralised concepts.

The manufacturer spanning standard connects the complete drive-, periphery- and safety communication on the fast Ethernet physics as universal bus for automation. Hardware redundancy and numerous already predefined diagnostic possibilities increase machine availability. Furthermore the real-time compatible cross communication links several controls electronically to a production network. With this users can combine very flexibly

the actual physically available additional modules and necessary servo drives on the respective machine. This reduces the proliferation of options with the software and enables a quick subsequent integration of additional modules at the customer's", Andreas Meyerling explains a distinct advantage. The motion control synchronises the individual modules with the PERFECTA stroke without additional control interventions and takes over the format and composition conversion automatically from the main control. SERCOS III supports hot plugging, the adding or removing of individual drives whilst in operation, without the operator having to completely shut down and reboot the system so that the control recognises the new configuration. SERCOS interface has already been

venient and timeless pleasure in tea all around the world.

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