Innovative and modular

OPTIMA has developed an innovative modular filling and packaging machine, called OPTIMA MODULINE, to serve the worldwide trend towards the industrial production of even smaller batch sizes in a highly efficient manner. The core of this solution is the multi-carrier-system which has been commonly developed by Siemens and Festo, which executes the transport tasks within the machine in a highly flexible way.

Continuous process without buffer

Within the machine, the bottles to be filled are moved one after the other to multiformat-capable, individually controllable, self-moving carriers, which are driven via linear motors. In order to prevent congestions and achieve minimum buffers, these carriers are moved according to the rules stipulated for swarm behavior – either individually or in groups, but always completely synchronously to the process. The seamless integration in the existing intralogistics enables to conveniently load and unload the carriers in the system, which allows, among others, to quickly reconfigure the machine to different formats, other product types or seasonal requirements. And as the complete information, which is required to implement the finished product, is, thanks to the integrated RFID tags, stored on the individual carriers, thanks to the integrated RFID tags, individual manufacturing steps can also be performed on the system. The Motion Control system SIMOTION and the powerful SINAMICS drives support speeds of up to 4 m/s as well as acceleration values of up to 50 m/s², as well as a motion control behavior which is individually adjusted to the swarm behavior of the content using specific control algorithms.

Consistent virtualization

In order to ensure utmost efficiency in engineering and operation, the filling and packaging machine has been designed on the basis of the Product Lifecycle Management Software NX as well as the Mechatronics Concept Designer (MCD). As a result, the complete machine can be simulated as a mechatronic complete system, and all retrofit processes can be virtually planned and implemented – which allows to immediately identify possible optimization potential.

The consistent digitization turns the machine into a flexible system. At present, the machine has three modules for filling, sealing and labeling process, which are interconnected via the multi-carrier-system. If the machine is extended by further units to become a digital twin system during the design phase, the results obtained during this
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Broad range of applications

The fields of application of the multi-carrier-system are nearly unlimited. Such flexible solutions are the first choice for all industry sectors featuring a high variety of products. For example, the high number of product versions in the cosmetics industry, the quick seasonal changes in the food and beverage industries, or the industrial production of unique parts which are combined by the end customer using the online configurator. This modular concept allows the integration of systems in existing machines and transport solutions, and is not only aimed at implementing new developments, but also at the gradual retrofit of proven systems. This ensures an efficient transition to digital machine building.

OPTIMA machine – All features at a single glance

- Modular filling and packaging machine equipped with multi-carrier-system
- Individual motion control in a continuous process without buffer
- Integrated RFID tags allow individualized information – both for specific carriers and products
- Consistent virtualization by NX and Mechatronics Concept Designer (MCD)
- Speeds of up to 4 m/s as well as accelerations of up to 50 m/s²

Control and drive components from Siemens

- Motion Control system SIMOTION P320-4
- SINAMICS S 120 drives with integrated drive application “Rail Control”
- Secure and efficient communication via PROFINET, DRIVE-CLiQ

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