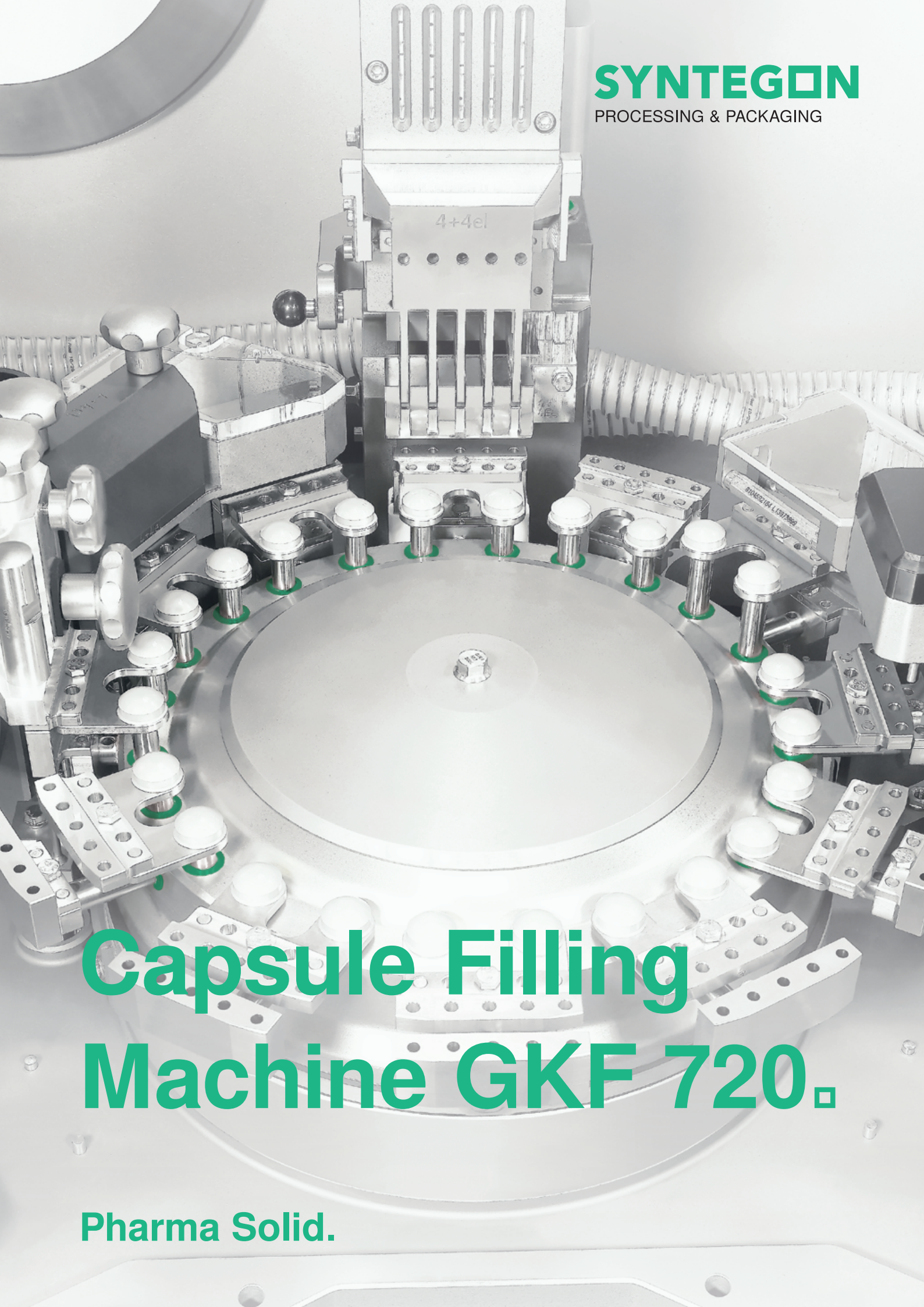




SYNTEGON

PROCESSING & PACKAGING

Capsule Filling Machine GKF 720.

Pharma Solid.

6.100

employees

64.000

machines in the installed base

Count
on it.

30

locations

50

years in business

1.3 billion

euros annual sales

1.100

service specialists

2.000

patented inventions

Syntegon Technology is your reliable partner for process and packaging technology in the global pharmaceutical and food industries. Whether you are an aspiring start-up or a global market leader, we offer intelligent and sustainable solutions for everyone.

Individual machines, systems or services – as a full-service provider, we take responsibility right up to fully integrated end-to-end solutions. Fields of application in the pharmaceutical industry are the production, processing, filling, inspection and packaging of liquid and solid active ingredients in all common

packaging materials. In the food industry, we offer solutions for the primary and secondary packaging of dry, liquid and frozen food as well as process technology for the production of confectionery.

We are at your side from project planning, development and implementation to comprehensive digitization, qualification and validation services. In addition, you always have access to our worldwide network of service specialists who support you throughout the entire machine life cycle.

One platform for all requirements

from galenical development (R&D set-up) to small scale batch manufacturing, based on more than 50 years of experience in capsule filling.



GKF 720, the highly flexible machine platform, easily adaptable to changing market requirements.

Basic execution in OEB3 or customized containment solutions up to OEB5, with efficient cleaning strategies.

GKF 720 is a highly flexible capsule filling machine, designed to dose powders, granules, pellets, (micro-) tablets or liquids into hard capsules. With an output of up to 43 500 capsules per hour, it is the first of its generation to have a modular design and flexible plug-in station: a dosing module can be changed in less than five minutes. The exchange is simple and failsafe. Special focus was put on efficient product change-over and cleaning.

The GKF 720 ensures optimal capsule handling and dosing: the automatic troubleshooting (ASB) sorts out jammed capsules, and the 100 % detection of not opened capsules reliably discovers and removes unopened capsules.

YOUR BENEFITS

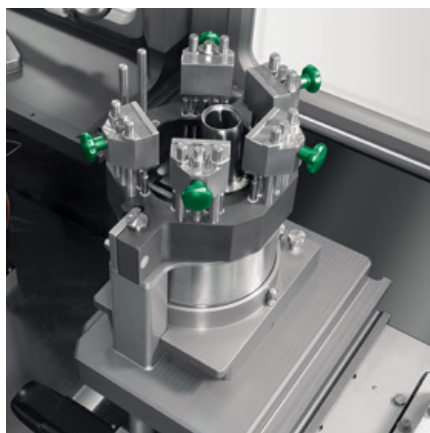
- ❑ Proven GKF machine technology
- ❑ Versatile filling options
- ❑ Flexible use for different products, also in combination
- ❑ Intuitive operation via HMI
- ❑ Containment concepts (OEB 3-5)
- ❑ Fast and easy modification
- ❑ Good accessibility from all sides
- ❑ Cleaning concept for fast and easy but thorough cleaning
- ❑ Various PAT technologies for quality control (QC) available
- ❑ High yield / high OEE
- ❑ Special feature: APD technology (Automated Process Development) based on Design of Experiments (DoE)

Dosing applications

Equipped with the respective filling station, the GKF 720 achieves precise filling results from free-flowing to cohesive powders, as well as for products of a liquid or pasty nature. We offer customized solutions for critical product properties and product combinations – regardless of their physical properties.

POWDER/PELLETS

Dosing station with optimized slide-gate technology for the filling of powders, granules and pellets. For powders, the proven tamping pin method is used; with pellets the exact dosing is achieved using a fixed or height-adjustable dosing disc.



PELLETS

The pellet station is a gentle, precise, and compact option for the volumetric dosing of pellets with different characteristics.



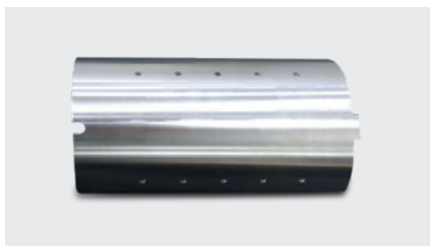
(MICRO-) TABLETS

The tablet station is a gentle and precise solution for the dosage of single and multiple tablets into capsules – from big oblong to micro-tablets.



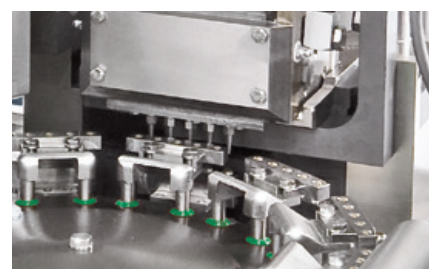
VACUUM-WHEEL DOSING

Highly accurate, agglomeration-free dosing of powders (e.g. micro dosing of inhalable products or pure APIs).



LIQUIDS

The liquid station with its integrated drop retraction feature enables the precise volumetric dosing from hydrophilic to thixotropic liquids. It also has the ability to heat or cool liquids during the filling process. Two independent heating / cooling circuits secure gentle product handling in the system.



COMBINATIONS

A wide array of product combinations is possible on the GKF series, thanks to its modular assembly. Various successful projects prove our expertise.



Integrated inspection technology

Sampling or 100 % monitoring with inspection systems

The integrated and fully automated capsule-weighing unit IPC (In-Process Control) provides the user with a statistical overview of the capsule gross and net weight. The entire process takes place within the machine cycle and does not need an operator-induced interruption of the production process. The system supports/enables the statistical fill weight evaluation during a pharmaceutical production, as well as a cross reference check of system integrated inspection technologies, such as our NWDS (Net Weight Detection System).



- The weighing process is automated and performed without influence on the production speed of the GKF
- Sampling cycles can be set/activated via recipe or independently by the user on the HMI
- The integrated gravimetric load cell provides a weighing accuracy of 0.05 mg
- All recorded data are fully integrated in the batch protocol
- Designed for wet cleaning (OEB 4/5)

LINE COMPETENCE

Syntegon provides complete line solutions, tailored exactly to your requirements and designed to meet your individual needs.

■ GKF 720 and the checkweigher KKE 1700 are the ideal duo for capsule filling and weighing.

For further details regarding KKE 1700, please refer to our KKE flyer.

INTEGRATED IPC – YOUR BENEFITS

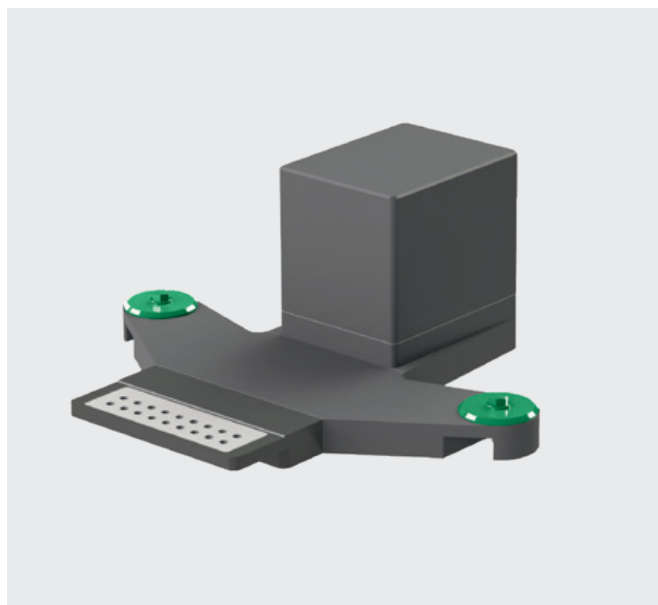
- Integrated In-Process Control (IPC)
- Gross and net weight determination
- Target/actual comparison according to interval-based samples
- Feedback loop for automatic dosing adjustment
- Available for all dosing technologies
- Designed for wet cleaning
- All data documented in batch report



Checkweigher KKE 1700

Net Weight Detection System (NWDS)

The integrated capacitive weighing station automatically detects deviations in the filling volume and controls the filling processes accordingly. Calibrated measurement data provided by the integrated IPC allow the capacitive and gravimetric weighing results to be compared and validated at regular intervals.



NWDS – YOUR BENEFITS

- Inspection of up to 43 500 capsules per hour
- Identification of process-relevant data in real time
- Precise net weight control
- All data documented in batch report
- Designed for wet cleaning

Process Analytical Technology (PAT Classic)

HIGH-PRECISION QUALITY ASSURANCE WITH PAT CLASSIC

The process analytical technology PAT Classic ensures quality assurance during the entire filling process.

POWDER BED DETECTION

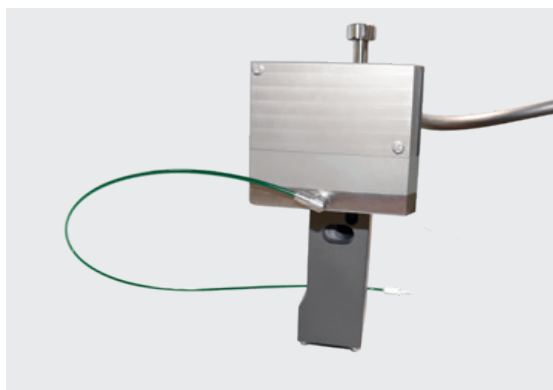
The height of the powder bed is scanned to within +/- 2 mm to achieve highest dosing accuracy and lowest residual waste at end of batch.

TRANSFER FORCE DETECTION

System will stop machine in case of rising transfer forces to avoid mechanical damages.

CLOSING FORCE DETECTION

The system monitors the capsule closing process after filling. If the closing force of a specific capsule deviates from a preset value (minimum/maximum value, to be taught in prior to batch start), additional measures for quality control can be taken, in regard to empty capsule quality or machine set-up.



PAT CLASSIC – YOUR BENEFITS

- Inspection of up to 43 500 capsules per hour
- Identification of process-relevant data in real time
- Capsule length control
- Enhanced product quality
- All data documented in batch report

GKF 720

High containment solution for highly potent pharmaceuticals

As a manufacturer of highly potent solid pharmaceuticals (HAPI), you have high HSE requirements. The GKF 720 HiProTect capsule filling machine is designed to process powders, (micro-) tablets, tablets and liquids. It offers you an automated, washable containment ensuring the highest protection for operator, product, machine and environment up to an OEB value of $0.1 \mu\text{g}/\text{m}^3$.

WASHABLE CONTAINMENT WITH MINIMAL WATER CONSUMPTION

The four-stage cleaning process requires only a small amount of water.

Stage 1:

Manual dry pre-cleaning by integrated suction hose removes highly potent product residues.

Stage 2:

Automatic wetting system with 150 milliliters of water only. A specially designed spray nozzle generates finest mist to bind highly potent airborne particles.

Stage 3:

Automated flushing of the processing area with a maximum of ten liters of water removes product residue and can be repeated depending on the degree of soiling. This process step is freely programmable according to your specific requirements.

Stage 4:

Manual flushing with spray gun is possible if necessary.



Pre-cleaning and flushing of the processing area



NEW DOOR CONCEPT AND RAISED TABLETOP CONTACT AREAS

During the cleaning process, the drive section and the dosing stations of the GKF 720 are waterproof at all times: the specially designed raised tabletop contact areas safely avoid water penetration.

The system also offers an improved door concept with particularly narrow slits between doors and frame. The glass doors allow maximum visibility of the process area. Another advantage: the smooth and stepless surfaces are easy to clean.

For more details please refer to our pharma solid containment brochure.

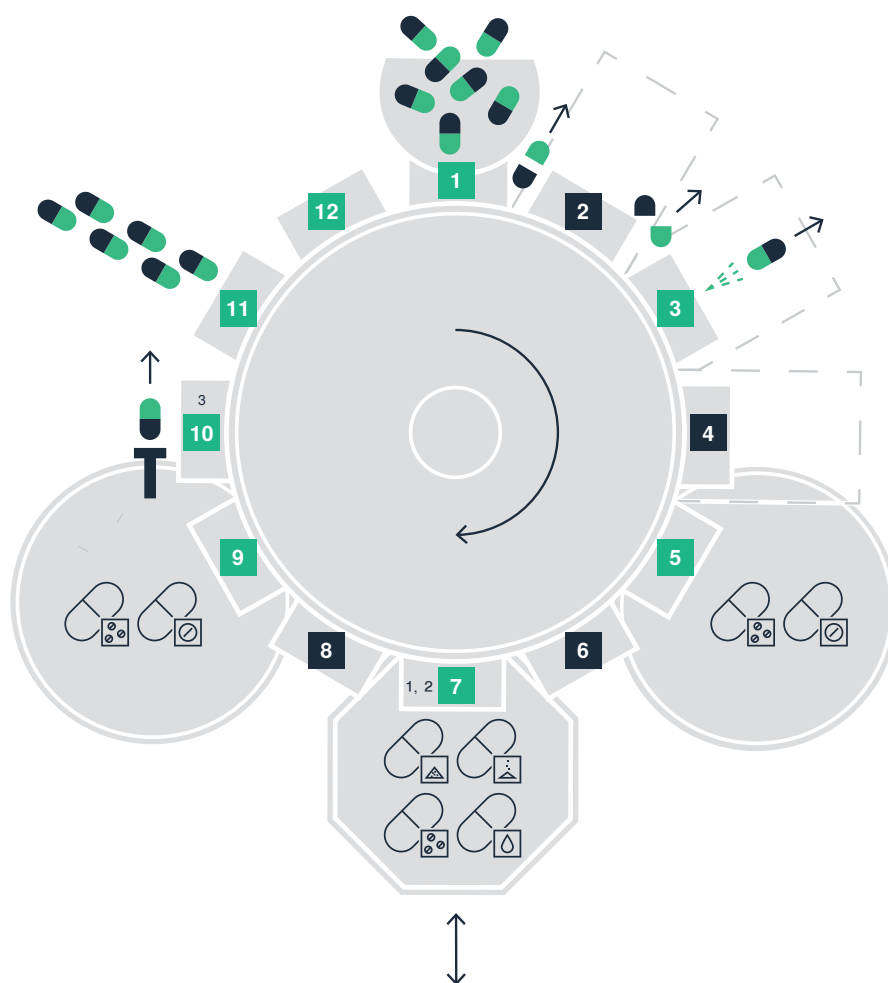


The raised tabletop contact areas protect the technical room from water penetration

Filling technologies and dosing options at a glance

The GKF 720 doses powders, pellets, (micro-) tablets and liquids, as well as combinations reliably and precisely. The platform can meet your specific requirements.

FUNCTIONAL DESCRIPTION



- | | |
|--|---|
| 1 Capsule alignment and separation | 8 Empty station |
| 2 IPC with gravimetrical weighing and sampling | 9 Dosing station for pellets or (micro-) tablets |
| 3 Faulty-capsule ejection of unopened capsules | 10 Capsule closing station
³ optional PAT classic sensor for closing force detection |
| 4 Empty station, optional capsule body scanner | 11 Capsule ejection |
| 5 Dosing station for pellets or (micro-) tablets | 12 Segment cleaning with compressed air and empty capsule ejection |
| 6 Empty station | |
| 7 Variable dosing module for quick exchange.
Available options are: powder tamping pin,
powder minibowl, powder dosing wheel, pellet,
(micro-) tablet, dosator and liquid
¹ optional PAT classic sensor for powder slug transfer force detection
² optional PAT classic sensor for powder bed height detection | |

Technical data

Based on many years of experience, we have designed a future-proof platform that consistently adapts to your production requirements. The cGMP-compliant machine meets all demands for the highest pharmaceutical and operator safety standards, also convertible into containment.

OUTPUT

- 3000 – 43 500 capsules/h

WEIGHT

- approx. 1600 kg

CONNECTIONS

- Compressed air supply Ø 13 mm
- Vacuum connection Ø 30 mm
- Main electrical connection

FEEDS

- Powder feed Ø 100 mm
- Pellet/tablet feed Ø 100 mm
- Empty capsule feed Ø 100 mm
- Liquid feed

STANDARD EQUIPMENT

- Basic machine with separate electrical cabinet
- HMI control panel
- 21.5" touchscreen on swivel arm
- Machine control system based on industrial PC
- Empty capsule supply hopper with minimum and maximum level control
- Dosing station

- Product supply hopper with minimum and maximum level control
- Capsule closing station
- Capsule ejection station
- Segment cleaning station
- Energy monitoring:
 - Electrical process data (energy consumption, production and standby times, etc.)
 - Control of compressed air consumption
- Simple plug-in of capsule segments

CLEANING

- All stations suitable for wash down

AVAILABLE DOSING STATIONS

- Powder dosing station
- Pellet dosing station
- (Micro-) tablet dosing station
- Minibowl station (R&D purpose)
- Vacuum wheel dosing (fixed and volume adjustable dosing wheels)
- Liquid dosing station

OPTIONAL

- Capsule cap and body detection scanner

- ASB function (automatic troubleshooting)
- "No body no fill" / "No cap no fill" on all filling stations
- Height adjustable dosing disc
- Integrated gravimetric scale for In-Process Control (IPC), including sampling
- NWDS (Net Weight Detection System) for 100 % net weight inspection
- Tablet counting system
- Feedback loop
- Single capsule ejection
- Enhanced segment cleaning
- Special features:
 - PAT technology
 - APD technology (Automated Process Development)
- Wetting function
- WIP (wash-in-place) via integrated spray nozzles
- Moveable machine execution

ACCESSORIES

- Vacuum pump
- Vacuum cleaner for dust suction
- Empty capsule feeder (option)
- Product feeder (option)
- Capsule deduster (option)
- Metal detector (option)
- External In-Process Control IPC (option)
- Drum distribution system (option)

Pellet filling with NWDS



Highly modular – for quick product changeovers

Small batches require frequent product changeovers in a short time. With an output of 43 500 capsules per hour, the GKF 720 is the first of its generation to have a modular design and a flexible plug-in station: a lifting unit allows modules to be changed in less than five minutes. The exchange is simple and failsafe, enabling even inexperienced operators to perform the task.

Your selection of stations:

POWDER TAMPING STATION:

Optimized suction technology for reduced dust exposure; improved accessibility; automatic height adjustability; enlarged dosing station.

PELLET STATION:

Automatically height-adjustable pellet station with optional capacitive NWDS for 100 % IPC. This system can be counter-checked via in-built gravimetric sampling scale or downstream 100 % checkweigher KKE.

(MICRO-) TABLET STATION:

Optimized for minitabets via tablet disc or other tablet forms via linear infeed; tablet count is available for both variants.

POWDER MINIBOWL:

A station for small product volumes and minimized residue.

MICRODOSING:

Patented, volume adjustable station for micro-dosed powders, 100 % weight control with NWDS and gravimetric counter check by IPC, including readjustment of the dosed mass.

DOSATOR STATION FOR POWDER OR PELLETS:

Powder dosator is operated with compression, pellet dosator with vacuum.

LIQUID FILLING STATION:

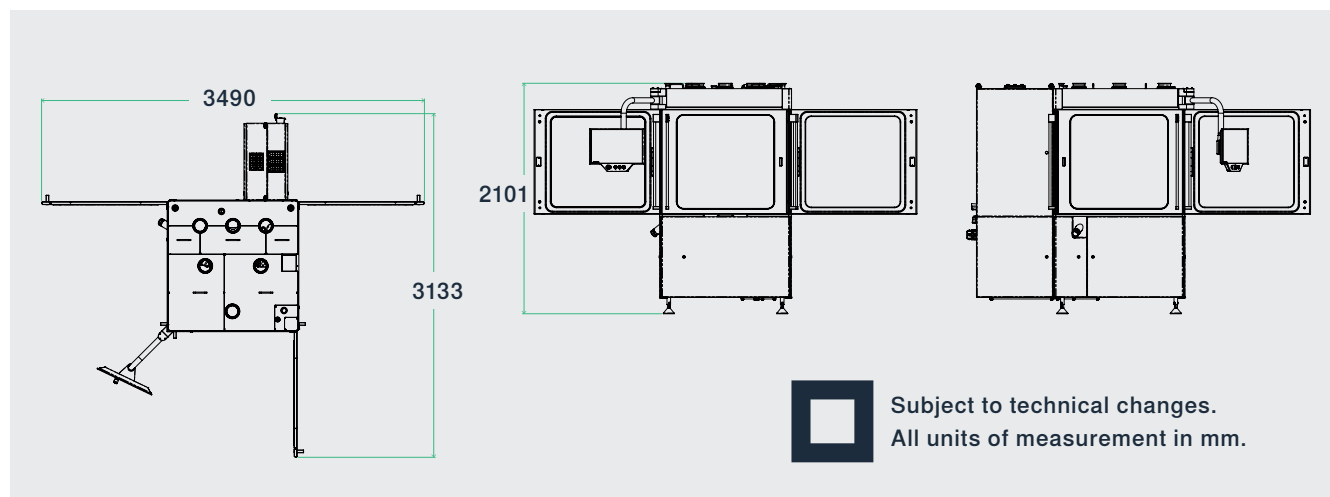
High-precision dosing based on a servo controlled liquid pump for a wide viscosity range (oil to paste to wax).

MODULARITY – YOUR BENEFITS

- Setup / time
- Rapid change of flexible plug-in dosing modules for excellent flexibility
- Yield
- OEE
- Easy and fast cleaning

Layout and top view

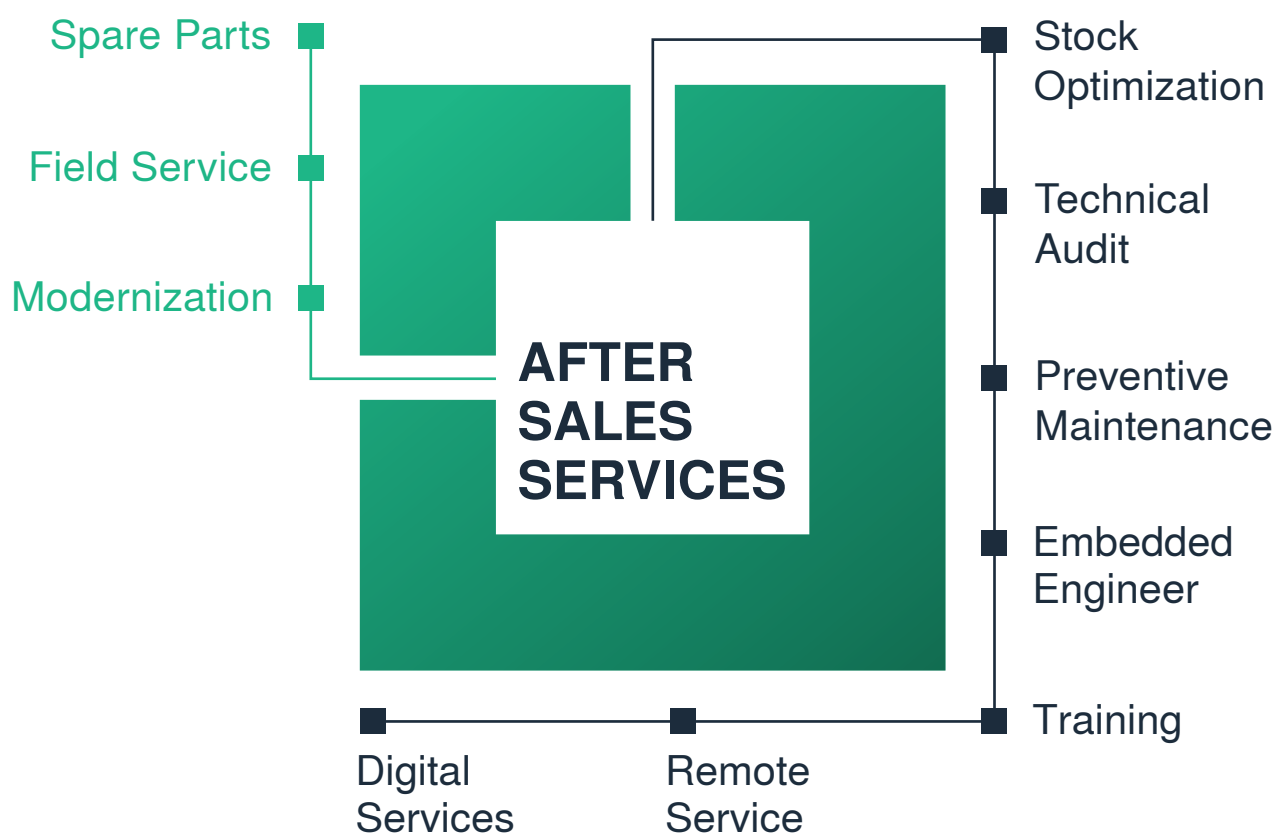
for both standard GKF 720 OEB3 & GKF 720 HiProTect OEB5



Customized service solutions for the entire life cycle of your machine.

By investing in a Syntegon packaging machine, you gain access to an extensive range of services. We are always there for you, providing reliable services from a single source, all over the world. It begins during the project phase with services such as process consulting, system planning, or lab services. Service continues during operation: from spare parts and field service offerings to

stock optimization, modernization, and preventive maintenance, all the way to remote and data-based services and training. Whether it's a customized solution or a standard service – together with us you achieve maximum output with minimum downtime and optimize the profitability of your machines.



For detailed information
please visit our homepage:
www.syntegon.com/services

Connect with our team.



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