



*Tableting solutions for the  
pharmaceutical industry*





### **Delivering Solutions – Application Expertise**

We are thoroughly familiar with your products and applications! Romaco specialises in engineering technologies for solid pharmaceutical dosage forms. Our concepts and system solutions are inspired by the rich experience and know-how of our 600-strong team of employees.

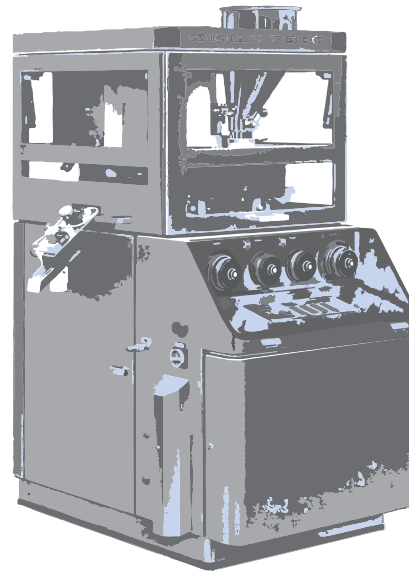
### **Creating Value – Enhanced Performance**

Profit from Romaco's excellent value for money! We help you optimise your OEE balance systematically. With our efficient production and service management, we cut the running costs for your machines and increase your output in the long term.

### **Exploiting Technologies – Product Diversity**

Our product diversity knows no bounds! The modular concept behind Romaco machines and equipment is the key to your success. With seven product lines, we are in a position to respond promptly and flexibly to changing market requirements. Together we are stronger!





## Delivering Solutions

### A tradition of expertise

In 1885, Fritz Kilian submitted his very first patent application for a rotary tablet press; this same principle still underlies even the most advanced tableting machines today. Romaco Kilian's tableting expertise has been built up over more than a century and we haven't stopped learning yet. New insights are regularly incorporated into the development of new applications.

Romaco Kilian not only develops tablet presses to satisfy even the most challenging

requirements; we are also very careful to keep an eye on the big picture: We create solutions which guarantee a sustainable return on investment throughout the machine's service life.

We offer a broad portfolio for:

- Mono-layer tablet production
- Multilayer tablet production
- Core tablet (tab-in-tab) production
- Tablets to meet the most diverse requirements

As well as solutions for:

- Laboratory
- Scale-up
- Production

As a provider of integrated solutions, Romaco Kilian has the ability to listen closely to your needs and help you select the most suitable tablet press for your particular application.



### Single-layer tablets

- Single-layer tableting with a maximum output of 1,020,000 tablets per hour
- Optimised filling systems for products with various flow properties
- Special coatings for particularly abrasive products
- Compression of any tablet form possible
- Self-learning control system



### Multi-layer tablets

- Multi-layer tableting with a maximum output of 510,000 tablets per hour (rotary press) or 450 tablets per hour (single stroke press STYL'ONE)
- Special fill shoe system: compression of up to five layers with three different products
- Vacuum system to avoid cross-contamination between the tablet layers



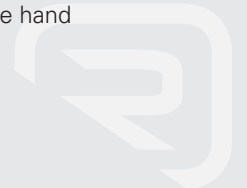
### Core-tablets (Tab-in-Tab)

- Precise core feeding system with high capacity for different formats (up to 140,000 tablets per hour)
- Automatic core positioning system with very high precision ( $\pm 0.2$  mm)
- High-performance camera ensures a continuous core localisation
- Automatic correction of the core position
- Single or double layer core-tablets or bulls eye tablets



### Effervescent tablets

- High speed production of effervescent tablets
- Including reliable and break-free transfer to downstream equipment
- Mono- or bi-layer production
- High yield with very sticky products
- Clear separation of the layers in bi-layer production
- Tablet press and connected downstream equipment out of one hand





### *Delivering Solutions*

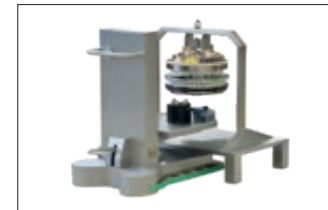
#### **Pharmaceutical tablet presses for any demand**

Romaco Kilian provides innovative standard and special tableting solutions. Decreasing batch sizes, frequent product changes and increasing cost pressure – the pharmaceutical industry is facing major challenges. Romaco Kilian provides an adequate response with its innovative standard or special tableting solutions; ensuring that companies are well prepared for the international competition and benefit from the excellent productivity, great flexibility and high equipment availability.

#### **High-end high speed tablet presses**

- cool – fast – clean
- Optimised for temperature sensitive and high-volume products
- Single- and double-sided rotary presses
- Available in four configurations: for single-layer and multi-layer tablets, core-tablets (Tab-in-Tab) as well as for tamper-resistant formulation (TRF)
- Hygienic design for easy, fast and effective cleaning
- For applications that require a maximum level of efficiency at a minimum level of wear
- Compression of more than 1 million tablets per hour





### Standard tablet presses with exchangeable die table

- Suitable for a wide variety of pharmaceutical applications
- Compression of all types of granulates including bad-flowing products and for direct compression
- Output of up to 330,000 tablets per hour
- Successor to the industry-standard TX/T300

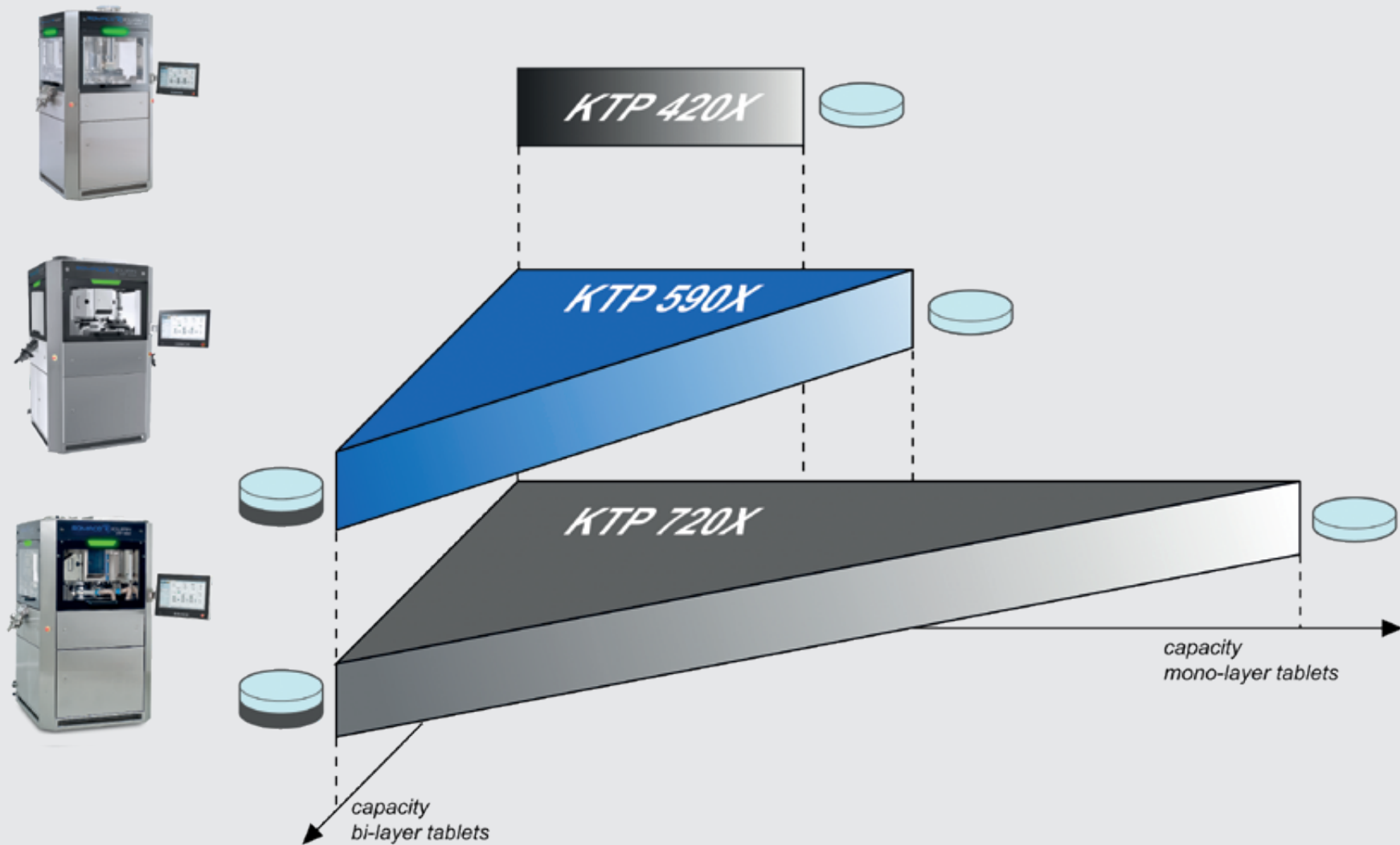
### Laboratory and pilot plant presses

- Versatile single stroke presses for R&D applications, small batch sizes and clinical batches
- As rotary machines also usable for pilot productions
- Suitable for all types of tablets
- Pressing of up to five layers with three different products
- Core-tableting (Tab-in-Tab) feature available
- Highly automated analysis software for R&D operation or in-process troubleshooting

### Accessories

- TabTrans
- Tablet check unit
- Deduster/metal check
- External lubrication system
- Vacuum cleaner
- Bulk fill
- Die table storage device
- Die table transport trolley
- 2<sup>nd</sup> set of change parts
- Change part storage trolley
- Compression tooling
- Tool storage and cleaning







### Maximum efficiency, minimum TCO

The KTP series of high speed tablet presses for the pharmaceutical industry is extremely versatile and has already won Romaco Kilian the iF Design Award. The newest generation combines Kilian's extensive expertise regarding product properties and behaviour with current customer requirements for efficiency, optimised production and in-line quality data acquisition.

The KTP series is available in the following configurations:

- Mono-layer
- Bi-layer
- Core (tab-in-tab)
- Effervescent
- Poorly flowing materials

The reduction of product loss, weight deviation and contamination to a minimum, coupled with the proven durability of Kilian's wear parts, adds up to consistently high levels of efficiency.



Low product loss

### Cool – fast – clean

The Romaco Kilian KTP series is based on a thoroughly convincing design concept: cool – fast – clean.

#### Cool

stands for all measures for keeping the process temperature to below 30 °C, making the KTP series ideal for processing temperature sensitive medications such as Ibuprofen. Special compression rollers, bolts and bearings reduce mechanical friction to a minimum. The efficient cooling of the torque drive and the V-ring seal for the die-table avoids unwanted heat.

#### Fast

denotes the optimised set-up, retooling and cleaning times of the rotary press and the extra-high tablet output.

- Up to 1,020,000 tablets an hour for mono-layer
- Up to 510,000 tablets an hour for bi-layer
- Up to 140,000 tablets an hour for tab-in-tab



Intuitive and ergonomical HMI screen

The die-table, tablet chutes and fill shoes can be swung out, so that fewer adjustments are needed. Product and format changes are simple and fast because no special tools are required. In order to shorten the retooling and cleaning times, the number of product-contacted format parts has been systematically reduced and access to the various components is now easier than ever.

#### Clean

refers to the optimised hygienic design, which allows for optimal cleaning and makes the process more reliable. The hermetic separation between the compression and service areas prevents tablet dust from entering the machine compartment during the production process. The patented punch bellows moreover protect the tablets from possible contamination with lubricants.



Minimum number of contact parts

*Exploiting Technologies  
KTP 420X / 590X / 720X series  
from Romaco Kilian*





## High-tech concepts for effervescent products

Romaco is the leading supplier in the effervescent sector. Our all-in-one solutions integrate four process steps: tableting, as well as primary, secondary and final packaging. Various transfer systems round off the portfolio. The fragile effervescent products can be packed in heat-sealed strips or tablet tubes. Each effervescent line is individually configured according to the application – the sole criterion is our customer's requirement.

## Solutions inside KTP Series

Effervescent powder is often hygroscopic, sticky and has poor flow properties. The Kilian KTP Series can also operate with three pairs of compression rollers in mono-layer mode and is hence ideal for compressing effervescent products.

- Tableting in three steps: tamping, pre-compression, main compression
- Extended dwell time due to "28/41" tooling increases time for de-aeration and reduces risk of capping
- Special fill shoe and paddle wheel design
- Constant powder distribution in the die
- Homogeneous compression
- Optional stearate spraying system reduces ejection force

## Solution for tablet transfer to primary packaging machine

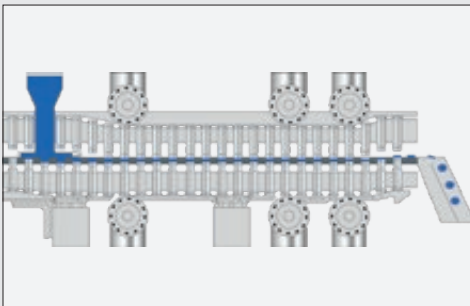
Romaco's special transfer technology TabTrans is much more than just a conveyor belt for effervescent tablets. It assures fast controlled and damage-free transfer of the fragile tablets from the tablet press to the primary packaging machine.

This includes

- De-dusting
- Integral process control (IPC) with selective sampling
- Built-in metal check unit for detecting foreign particles

TabTrans is a compact all-in-one unit and significantly reduces the overall production line length.

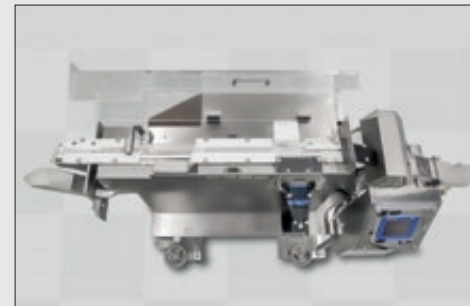
## Exploring Technologies Applications



Mono-layer with 3 compression rollers



Kilian "28/41" tooling



TabTrans





## The small giant

Many pharmaceutical manufacturers search for a robust, reliable and compact tableting machine. Romaco Kilian meets these requirements with its rotary tablet presses S 250 SMART and S 370 Prime. With an output of 330,000 tabs/h, the exchangeable die table and the suitability to compress any powder mixture, it is ideal for small and mid-sized batches.

### S 370 Prime

The S 370 Prime was developed to enable fully automatic pharmaceutical production for low initial capital investment. The press is designed and manufactured in Germany, guaranteeing the highest possible quality. The fact that tablet control systems can be connected directly means that in-process and automatic weight controls are now possible on the press. Extreme precision goes hand in hand with constant high quality, ensuring an output of 330,000 tablets per hour - typical German-made.

## Reliable - robust - compact

- All electronic components are integrated in the machine body
- No external electrical cabinet required, saving valuable space on the production floor
- Machine can be easily moved to another position in the production area if required, giving added flexibility

## Technical highlights

- GAMP compliant automation
- Fast turret exchange due to the integrated die table lifting system
- Patented, wear-free brake magnets
- Easy replacement of all components and wear parts
- Large, intuitive 19" touch panel (HMI)
- Direct connection of tablet control system and other complementary equipment such as dedusters or metal check units

## S 250 SMART

This machine is characterised by high production stability and outstanding quality results. The latest model series of S 250 replaces tried-and-tested technologies with a state-of-the-art control unit and exchangeable die table.

The S 250 SMART is available as:

- SMART Tradition
- SMART Classic

*Exploiting Technologies  
The Romaco Kilian S 370 Prime  
and S 250 SMART*



*Fast exchange of die table*



*Die table production: highest precision*



*Patented brake magnets*







### Compact model for various requirements

The KTP 180X is a compact rotary tablet press for the pharmaceutical industry which meets a wide variety of different requirements. The machine offers unique scale-up possibilities and is the ideal solution for R&D applications, clinical batches and small-scale production.

### It is available in two configurations:

- KTP 180X Production
- KTP 180X Laboratory

### Monitoring system and data acquisition

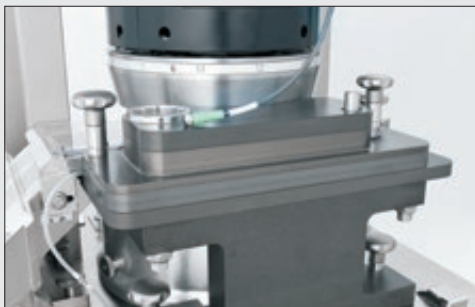
- Completely automated machine without hand wheels
- Operation via an integrated HMI with a 12" touch screen
- Monitored machine parameters in the R&D version: upper and lower compression forces, ejection force, pre-pressure force, upper and lower punch displacement measurements
- Data acquisition system integrated into the operating software

### Very good accessibility and easy operation

- Fast and easy cleaning of the production area with opened window flaps: minimisation of change-over and cleaning times
- Mechanical area easily accessible for maintenance work
- Easy access to all product contact parts for assembly and disassembly without tools

### Technical highlights

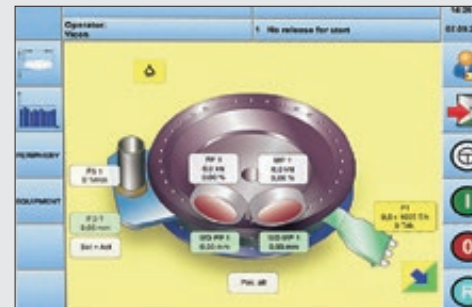
- Exchangeable die table in a very compact design
- Unique scale-up possibilities due to a scientific approach
- Patented wear-free brake magnets
- Optional individual selection by means of compressed air



*Easy access*

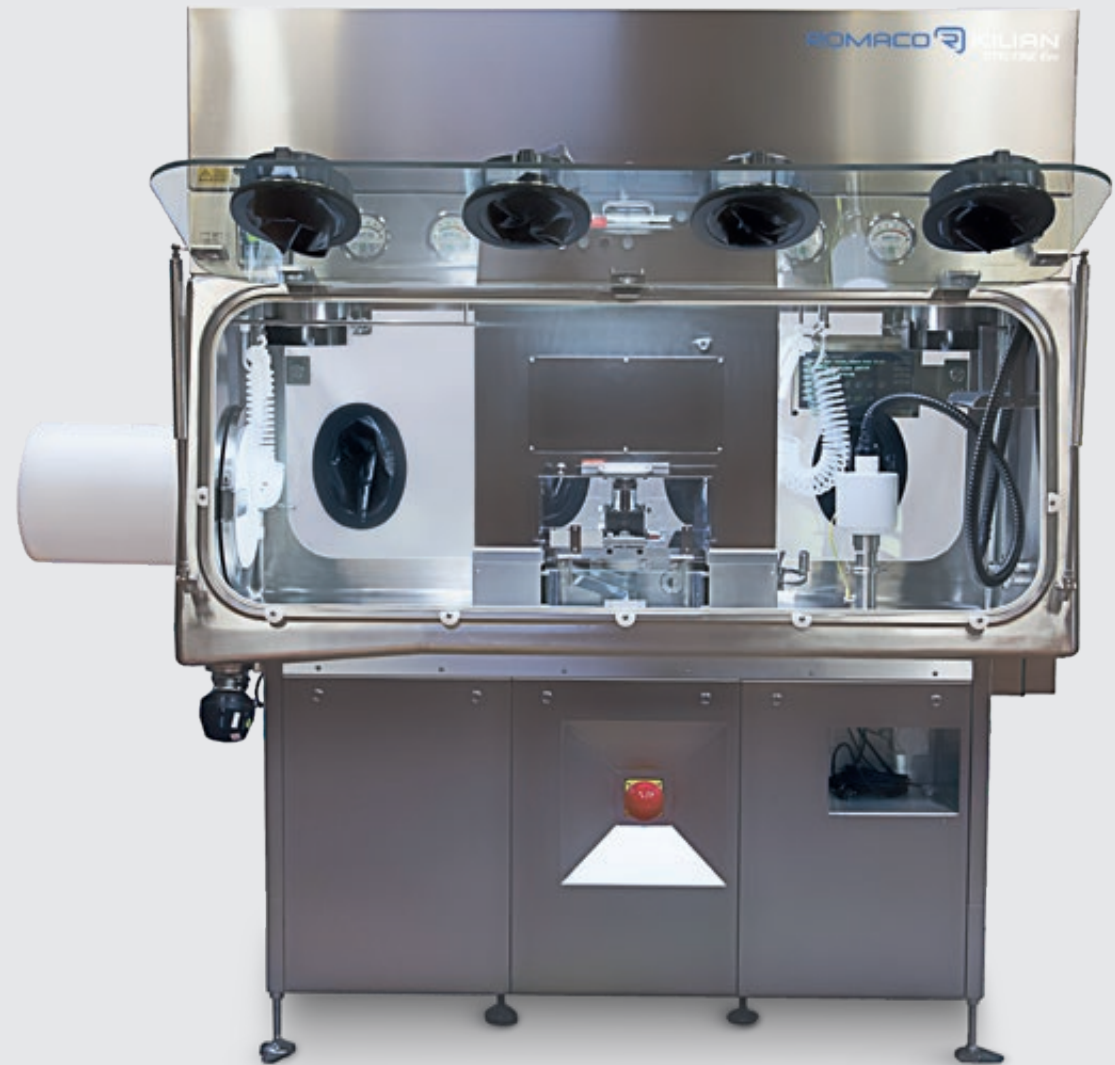


*Easy cleaning*



*Self-explanatory menu*





## The R&D solution

The Romaco Kilian STYL'ONE Evolution is a single-stroke tablet press that is predestined for an array of R&D applications as well as for the production of clinical batches.

Highlights:

- Replication of all standard rotary tablet presses
- Efficient development of new formulations
- ANALIS: Intelligent PAT software
- Suitable for mono-layer, multilayer (5 layers with 3 different products) or core tablets
- Also available with enhanced operator protection or as a high containment package

Apart from developing new formulations faster and more efficiently, STYL'ONE can also be used to optimise existing tableting processes on rotary presses.

## STYL'ONE Evolution – from research to scale-up at production speed

The STYL'ONE Evolution can perform fully automatic compression studies in addition to compression force or displacement controlled cycles. It allows realistic simulations of production presses with up to 2.6 G punch acceleration at speeds of up to 390 mm/s (e.g. 100 rpm on a KTP 420X). The availability of press profiles for all standard rotary tablet presses ensures a fast and easy set-up phase. This high speed single-stroke tablet press achieves a maximum output of 1,750 tablets an hour (in mono-layer mode). The roller compaction package RoCo™ can be used to manufacture pellets and provides a convenient tool for granulation studies.

## KIM – Kilian in-line measurement system

This system measures powder deformation properties to enable formulations to be developed faster, with less product and closer to the tableability limit. It uses ultrasonic measurements as a novel and simple way

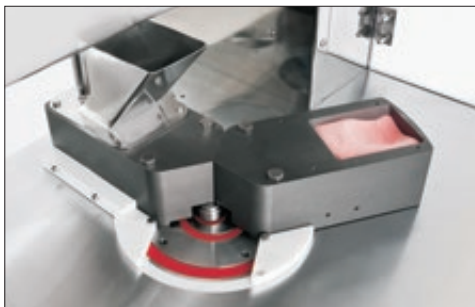
to obtain supplementary information during the compaction process.

These values can be leveraged for data driven development of formulations.

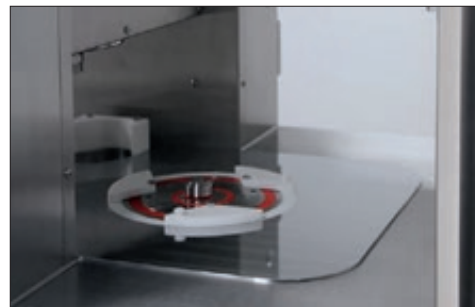
Typical applications:

- Determination of deformation behaviour (elastic, plastic or brittle) as a function of compression
- Determination of the product properties, e.g. the deformation behaviour of a material, in order to simplify the definition of the additives which are mixed with the API
- Determination of the product's percolation behaviour
- Determination of mixtures which could have capping tendencies or other quality deficiencies at high mass production speeds
- Determination of the moduli of elasticity and Poisson's ratios, e.g. as a basis for FEM simulations

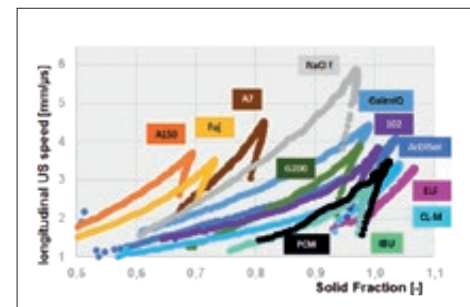
*Exploiting Technologies  
STYL'ONE series from Romaco Kilian*



*Innovative filling system*

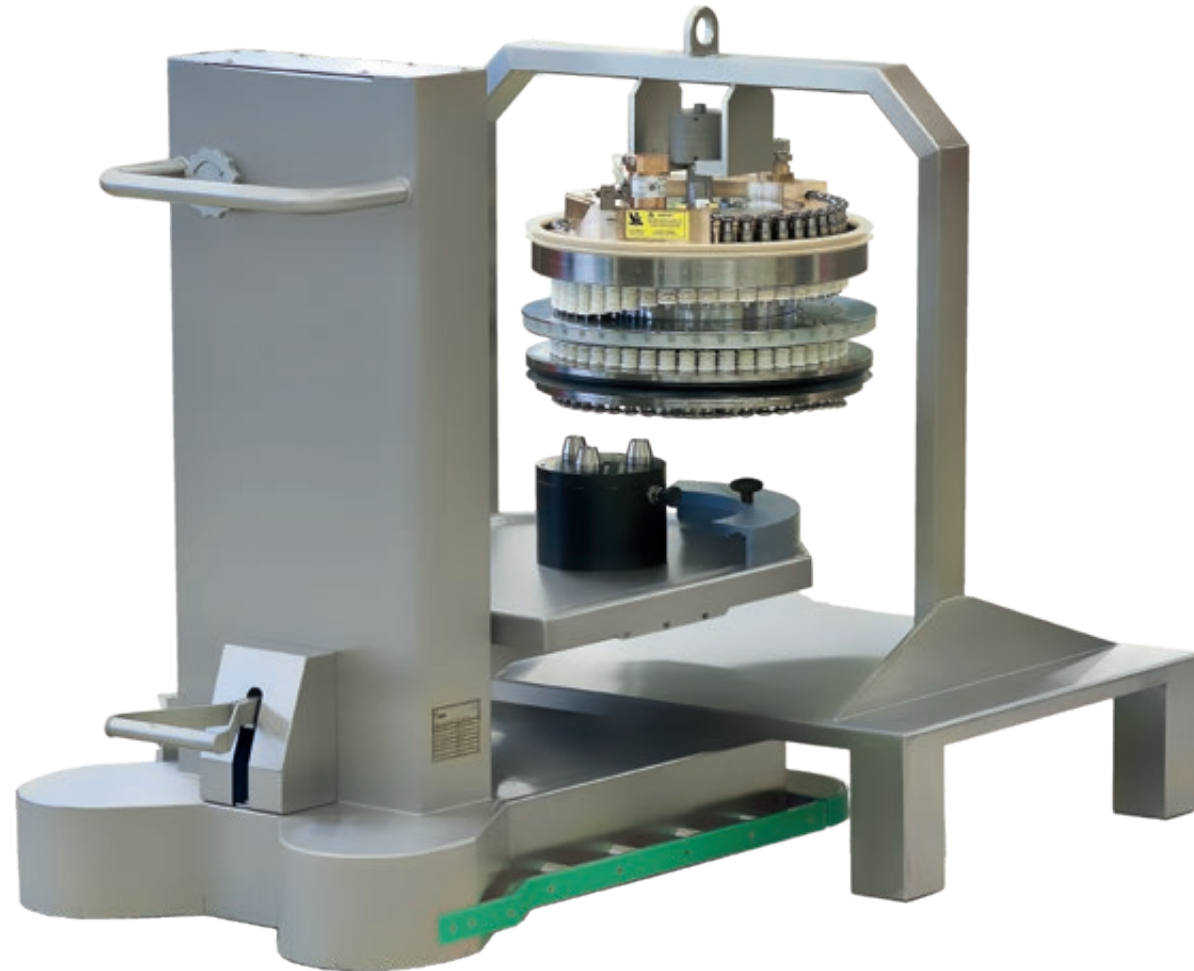


*New exchangeable worktable*



*KIM – Data curves of different excipients*



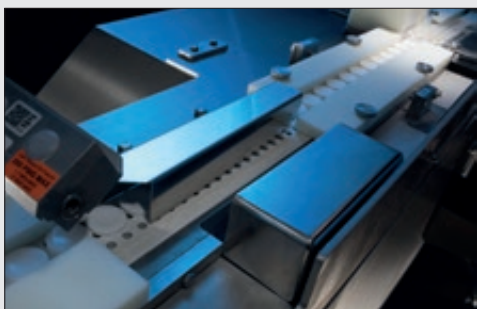


### One partner responsible for all

Romaco Kilian delivers more than just tablet presses. We provide tableting solutions from a single source. With Kilian accessories we enable our customers to take full advantage of integrated custom fitting. This allows for better performance through the entire process. We provide support from one contact without interfaces. A true one stop shop!

### TabTrans - for fast, clean, compact and damage-free tablet transfer

TabTrans is more than just a conveyor belt. It is more than just bringing tablets from A to B. It isolates the tablets, it controls and guides even fragile effervescent tablets intact to any downstream equipment. It dedusters tablets on the way to the downstream equipment and has an integrated metal detection and reject /sample gate. This all-in-one compact unit significantly reduces the overall line length.



Tablet transportation

### Tablet check units

Direct connection with the Kilian tablet press enables our customers to have sample tablets checked automatically. The collected data can be used for automatic in-process control with real inline weight regulation and be displayed in the batch report.

### Deduster/Metal check

Tablet dedusting and metal detection are integrated and controlled by the tableting system. Available from different brands and in various executions.

### External lubrication system

External stearate spraying and dosing device for the efficient compaction of sticky products. This lubricates the punch pressing surfaces and die walls for an improved tablet quality while keeping the ejection forces at the lowest possible level.

### Vacuum cleaner

Industrial vacuum cleaners perfectly fitted to the requirements of the tablet press.



RQ 100

### Bulk fill

Next step in a fully automated pharma production. Automatic drum or container change controlled via your HMI.

### Transport trolley/Storage device

For optimised die table change, easy transportation and safe storage – perfectly adjusted to your equipment.

### Change part storage trolley

Lockable and movable storage device for a 2<sup>nd</sup> set of change parts, providing systematic part storage with shadow-board system for completeness check at a glance.

### Tooling

High quality compression tools matching the required application, available for all different tool standards.

### Compression tool storage and cleaning

Professional equipment for fast and economic tool cleaning and storage.



Tooling

## Exploiting Technologies Accessories









## Romaco Kilian - KiTech

KiTech, Romaco Kilian's test laboratory, aims to provide customers with direct access to a vast range of know-how in the field of powder analysis, from granulation through compression to analysis of the end product. Alongside compression tests and studies or training for customer employees, Romaco Kilian also particularly focuses on ways to optimise tableting processes and systems in order to achieve maximum overall equipment effectiveness (OEE).

## Analysis – scale-ups – training

- Optimal testing of product and tableting properties in the lab and on laboratory presses
- Advice on product optimisation using different granulation methods
- Scale-up simulations for all large rotary presses
- Scale-up verifications on production presses
- Six fully equipped pressing rooms for compression tests and project surveys
- Training for operating and maintenance staff on various levels
  - Basics
  - Advanced
  - Pro

## Enhanced performance and efficiency

- Analysis and optimisation of all machine parameters to enable full use to be made of capacity and enhance efficiency
- Access to all current machine features such as:
  - Different fill shoe systems
  - Smooth running compression rollers
- Development of new machine features for specific customer products
- Optimisation consulting for existing processes

*Exploiting Technologies  
Romaco Kilian - KiTech*



*Detailed product analysis*



*Detailed project analysis*

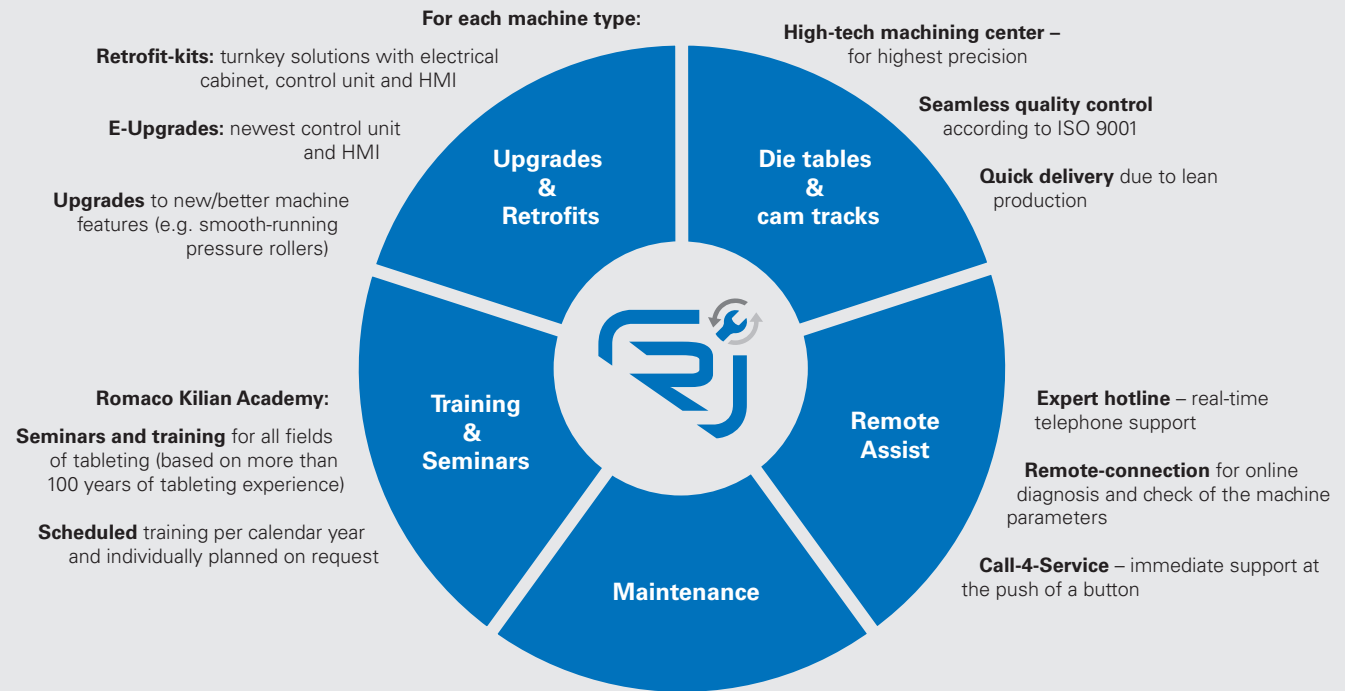


*Pressure measuring for scale-up*



*Customer Service*

**Reliable – competent – global  
From installation through the  
entire service life of the equipment**



**Maximum Output** with minimum wear thanks to optimal maintenance

**Maintenance contracts** for regular checking, calibration and maintenance of the equipment

**MQ included** (maintenance qualification) in each maintenance



*Training*



*PartGuard*



*Remote Assist with smart glass*



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 **KILIAN**

 **NOACK**

 **SIEBLER**

 **PROMATIC**

 **MACOFAR**

 **BOSSPAK**

