

# KORSCH Global Service Network



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## A Specialist's Range of Products

An Innovative Solution for Every Tablet Compression Application



## Innovations Made in Berlin Since 1919



### Focus Drives Perfection

Specialization is the key. Since 1919, KORSCH has focused on its core competency of tablet compression technology.

This focus and resulting experience base is the foundation for the broadest and most innovative product line for tablet compression technology.

KORSCH offers an optimal solution for virtually every tablet compression application – through initial feasibility, research, scale-up, clinical production, and full scale 24/7 production.

KORSCH presses are used successfully all over the world and are supported by a global network of sales and technical service specialists.

[www.korsch.com](http://www.korsch.com)

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## R&D Line

KORSCH-MEDELPHARM R&D product portfolio addresses and overcomes longstanding challenges, from early-stage powder characterization and formulation development, to predictive scale-up and production support. The combined KORSCH-MEDELPHARM R&D equipment lineup includes:

- Single-Punch Technology
- Compaction Simulator Technology
- Small-Scale Rotary Technology
- R&D software to collect and analyze compression data
- Dry containment (DryCon®) and wash-in-place containment (WipCon®) solutions across the full range of OEB 3, OEB 4, and OEB 5 applications.

Covering the full spectrum of tableting technology from single-layer to five-layer as well as core coating capabilities, the R&D product equipment portfolio serves as a versatile complement to KORSCH's multi-layer production machinery.



## XP 1



The XP 1 Research Tablet Press is a single punch machine which is specifically designed to permit initial feasibility, screening, and solid product characterization. The XP 1 permits very small material quantities to be utilized and characterized very quickly with minimal set-up and cleaning time. The XP 1 offers a proven, rugged, and portable design, which ensures precision operation over the long term. A full instrumentation package allows precision measurement of press force and punch displacement. Together with the KORSCH PharmaResearch, the XP 1 offers a comprehensive data acquisition and analysis capability.

### Technical Data:

Tools:	TSM/EU/B/D/EK 0
Compression Force:	50 kN
Tablet Ø max.:	25 mm
Tablet Output max.:	up to 3,600 tablets/h



## XL 100



The XL 100 Research Tablet Press is a portable, robust, small-scale rotary press and is widely considered to be the standard for product development. The XL 100 offers an exchangeable turret, a mixed tool turret, a gravity and power feeder, and an integrated electrical cabinet. A superior GMP design ensures efficient cleaning and fast product setup. The press may be fully instrumented to permit comprehensive data collection analysis with the KORSCH R&D software PharmaResearch. An optional production control module permits the manufacture of clinical batches with press force control, single-tablet rejection, and full array of electronic audit trails.

### Technical Data:

Punch Stations:	13/12/10/8
Compression Force:	10/60 kN
Tablet Ø max.:	11/13/16/25 mm
Tablet Output max.:	up to 93,600 tablets/h*

\* With single tool, 13 punch stations, 11 mm tablet Ø



## STYL'One Nano



**Benchtop Compaction Simulator** – The compact and portable STYL'One Nano is a revolutionary benchtop compaction simulator, which is ideal for small material quantities. An integrated data acquisition and analysis system offers a simple and powerful tool for material characterization. A unique drive system permits a range of standard compression profiles, including the ability to replicate precompression and main compression on a small rotary tablet press.

### Technical Data:

Tool type:	EU/TSM B+D, EU-1-441 and non-standard
Die type:	BBS, BB, B, D and non-standard
Compression Force:	50 kN
Tablet Ø max.:	25 or 40 mm (non-standard)
Tablet Output max.:	1,800 tablets/h



## STYL'One Evo



**Versatile Compaction Simulator** – The STYL'One Evo is the most advanced compaction simulator in the world. With the capability to replicate any high-speed production press, the STYL'One Evo offers unlimited flexibility, including single-layer, multi-layer, and tablet-in-tablet formats. A GMP Production module permits the production of small clinical batches, complete with force monitoring, tablet rejection, and audit trails. The system can work in a punch displacement mode like any rotary press, or with preset compression force targets to accelerate the execution of compression profiles.

### Technical Data:

Tool type:	EU/TSM B+D and non-standard
Die type:	BBS, BB, B, D and non-standard
Compression Force:	50 kN (80 optional)
Tablet Ø max.:	25 or 40 mm (non-standard)
Tablet Output max.:	1,750 tablets/h



## X 3

**Dedicated Single-Layer Mid-Range Production** – Suitable for product development, scale-up, clinical production, mid-range production and continuous manufacturing, the X 3 is a single-sided rotary press that redefines this market segment, with a new approach to architectural and ergonomic design. The machine features an integrated electrical cabinet, a dual compression column for both pre and main compression, a fully sealed design, and unsurpassed accessibility for cleaning, changeovers and maintenance. The X 3 is fully prepared to fit into the smart factory concept with intelligent components Industry 4.0 ready.



## X 3 SFP



**Ideal Tablet Press for Single-Layer Mid-Range Production** – The X 3 SFP is a single-layer only execution with a new approach to architectural and ergonomic design elements, which were previously available only on larger machines. The X 3 single-layer compression cycle ensures excellent weight uniformity at high speeds with one of the longest feeder lengths in the mid-range segment.

### Technical Data:

Punch Stations:	37/34/28/23/16
Compression Force SFP:	40/80 kN
Compression Force MFP:	20(5)/40/80 kN
Tablet Ø max.:	11/13/16/25 mm
Tablet Output max.:	266,400 single-layer tablets/h* 133,200 bi-layer tablets/h*

\* With single tool, 37 punch stations, 11 mm tablet Ø

## X 3 MFP



**Flexible Single and Bi-layer Mid-Range Production** – Based on the same platform as the X 3 SFP and sharing the same design advantages, the X 3 MFP adds a new level of flexibility to the mid-range production segment. The X 3 MFP offers a single-layer and bi-layer capability in one machine with a simple conversion process to permit maximum flexibility and productivity. The optional bi-layer conversion kit includes two smaller feeders, bi-layer cam tracks, and a first layer tamping station. Automated first-layer sampling at production speeds is achieved with a retractable design of the second layer feeder.

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## XL 400<sup>4</sup>

**The Fourth Generation** – The XL 400<sup>4</sup> offers a new level of innovation and advancement, while maintaining the flexibility that is the hallmark of the XL 400 design. New features include:

- Integrated Electrical Cabinet
- Advanced Torque Drive
- Contamination free machine base and Multi-Function Column
- Clean and transparent design concept for streamlined product changeover
- Smart touch HMI with comprehensive on-board help
- Isolated dust collection housing with optimal access for cleaning
- Technological breakthrough with the use of intelligent components, ready for Industry 4.0



## XL 400<sup>4</sup> SFP



**Maximum Efficiency for Single-Layer Production** – The XL 400<sup>4</sup> SFP is a single-sided high-speed rotary tablet press dedicated to single-layer tablet production. The XL 400<sup>4</sup> SFP offers streamlined product changeover, unique accessibility to the compression zone and extremely quiet operation. A compression dwell bar between pre and main compression dramatically extends dwell time for the most difficult products. The extended feeder length ensures exceptional tablet weight uniformity at high speeds.

### Technical Data:

Punch Stations:	47/44/35/29
Compression Force SFP:	100/100 kN
Compression Force MFP:	5/20/100 kN
Tablet Ø max.:	11/13/16/25 mm
Tablet Output max.:	up to 338,400 single-layer tablets/h* or 169,200 bi-layer tablets/h* or 141,000 tri-layer tablets/h*

\* With single tool, 47 punch stations, 11 mm tablet Ø

## XL 400<sup>4</sup> MFP



**Most Flexible Tablet Press in the World** – with the capability to produce single-layer, bi-layer, tri-layer, tablet-in-tablets, and microchip-in-tablets on the same machine platform. The modular Multi-Function Platform design features a pre-configured carrier plate and head piece that permits the installation of a wide range of compression roller modules, feeder modules, and cam track modules that offer a “plug and play” approach for maximum versatility. The result is an unprecedented advancement in tablet press technology with maximum efficiency and utilization from a single tablet press.

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## X 5

**Single-Sided Maximized** – The KORSCH X 5 is a new addition to the KORSCH equipment portfolio that dramatically increases single-sided tablet output while maintaining the company’s hallmark ergonomics and fast change design. With die turret design, the X 5 offers an output capability that is 20 % higher than most single-sided tablet presses on the market without a significant increase in the machine footprint. Furthermore, the X 5 features an optional turret segment design. For example, the standard B turret with conventional dies has 43 punch stations, and the segmented execution offers 54 punch stations, which represents a 25 % increase in machine output.



## X 5 SFP



**Maximum Output for Single-Layer Production** – The X 5 SFP is a single-sided high-speed rotary tablet press dedicated to single-layer tablet production. With a powerful torque drive, a long feeder design in relation to the pitch circle, and a precision tablet weight control, the X 5 is geared for high-output manufacturing. A compression dwell bar between pre and main compression dramatically extends dwell time for the most difficult products.

### Technical Data:

Punch Stations:	Conventional Turret 58/52/43/35	Turret with 3 Segments 77/54/42
Compression Force SFP:	100/100 kN or 20/100 kN	
Compression Force MFP:	20/20/100 kN or 20/100/100 kN	
Tablet Ø max.:	11/13/16/25 mm	11/16/25 mm
Output max. 1-L:	417,600 tablets/h*	554,400 tablets/h**
Output max. 2-L:	208,800 tablets/h*	277,200 tablets/h**
Output max. 3-L:	174,000 tablets/h*	231,000 tablets/h**

\*With single tool, 58 punch stations, 11 mm tablet Ø

\*\* With single tool, 77 punch stations, 11 mm tablet Ø

## X 5 MFP



**Flexible Single, Bi, and Tri-Layer High-Speed Production** – with the capability to produce single-layer, bi-layer and tri-layer tablets on the same machine platform. The modular Multi-Function Platform design features a pre-configured carrier plate and head piece that permits the installation of a wide range of compression roller modules, feeder modules, and cam track modules that offer a “plug and play” approach for maximum versatility. The X 5 MFP offers maximum efficiency and flexibility in high-speed, high-volume production environments.



## XT 600



**High Speed Double Rotary Press** – The XT 600 combines the latest in KORSCH technology in a cost effective and extremely efficient design, which offers a new standard in high-volume tablet production. The robust and elegant design ensures maximum output, the flexibility of an exchangeable turret, as well as bi-layer conversion functionality. The XT 600 is ideally suited for high-volume and large batch campaign production, and features an advanced control system and intuitive HMI.

### Technical Data:

Punch Stations:	Conventional Turret 85/77/65/53	Turret with 5 Segments 112/85/60
Compression Force:	60/60 up to 100/100 kN	
Tablet Ø max.:	11/13/16/25 mm	11/16/25 mm
Output max. 1-L:	1,020,000 tablets/h*	1,344,000 tablets/h**
Output max. 2-L:	306,000 tablets/h*	403,200 tablets/h**

\* With single tool, 85 punch stations, 11 mm tablet Ø

\*\* With single tool, 112 punch stations, 11 mm tablet Ø



## XL 800



**The XL 800 Double-Sided Tablet Press** is the largest press of the XL-series and is designed for high speed, high volume, and fully automated production. The XL 800 enables the production of single, bi-layer tablets as well as tablets with special parameters, such as a large diameter or a deep fill. The XL 800 is the highest output tablet press in the world, offering an extremely robust and rugged design which permits precision tablet weight control at the highest production speeds.

### Technical Data:

Punch Stations:	95/87/71/59
Compression Force:	100/100 kN
Tablet Ø max.:	11/13/16/25 mm
Tablet Output max.:	up to 1,026,000 single-layer tablets/h* or 342,000 bi-layer tablets/h*

\* With single tool, 95 punch stations, 11 mm tablet Ø



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## DryCon®

Dry containment kit (DryCon®) permits a containment level of OEB 3/4 and includes:

- Pressure monitoring in the compression zone
- Reinforced compression zone inner casing
- Pneumatic window lock, controlled via the HMI
- Split discharge chute design
- Tri-clamp connections on discharge chute channels
- Tri-clamp connection on machine feed pipes

Additional features allow contained intervention in compression zone during operation:

- Glove Ports
- Rapid Transfer Port (RTP)
- Manual Vacuum Hand Wand

The system can be enhanced with contained make/break connections:

- Contained air handling system
- Contained material feed
- Contained tablet discharge



## WipCon®

WipCon® containment execution permits a containment level of OEB 4/5 and is designed based on two main technical requirements in addition to the DryCon® features:

- Dust tightness suitable for OEB 4/5: compression zone as an isolator
- Washing in Place functionality with inherent watertightness

The features listed for DryCon® are included in the WipCon® execution.

SMEPAC testing confirmed containment capability of WipCon® design.



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## XT 600 HD

**Heavy-duty Double Sided Rotary Press** – The robust XT 600 HD for large formats and high compression forces, permits the production of single-layer or bi-layer tablets. With versatile turret configurations for up to 35 mm punch shafts, the machine offers an automated tablet weight control system and therefore meets all requirements of a modern rotary press. The tablet press is best suited for the production of salt tablets, catalysts, dish washer tabs, fertilizers, as well as industrial and homecare cleansers.

### Technical Data:

Punch Stations:	65/53/39
Compression Force:	120/120 kN
Tablet Ø max.:	18/27/34 mm
Filling Depth max.:	40 mm
Tablet Output max.:	546,000 tablets/h*

\* With single tool, 65 punch stations, 18 mm tablet Ø



## TRP Technology



**KORSCH TRP presses** are built to operate in the most demanding production environments and are especially suitable for the high-output production of large format with maximum press forces and large deep filling depths. The robust design and meticulous selection of materials and surface treatments, ensure extended run durations in any 24/7 production setting. Roller guided or standard mushroom head press tools are available. The TRP design offers up to five-layer capability depending on the model.

### Technical Data:

Punch Stations:	up to 84*
Compression Force*:	up to 200 kN*
Tablet Ø max.:	up to 64 mm*
Filling Depth max.:	up to 60 mm*
Tablet Output max.:	up to 378,000 single-layer tablets/h**

\* Depending on TRP model

\*\* With single tool, 84 punch stations, 27 mm tablet Ø



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## Continuous Manufacturing

Continuous process technology continues to gather momentum in the pharmaceutical industry. KORSCH has partnered with L.B. Bohle and a consortium of technical specialists on a fully integrated continuous process line which incorporates NIR technology on a fully integrated supervisory control system.

The KORSCH press is in itself a continuous processing machine and therefore it is ideally suited for this new manufacturing trend. Our machines incorporate automated tablet testing systems, proven PAT for tablet weight regulation, and an optional Wash-in-Place (WIP) capability for in-line cleaning. A centralized control and supervisory system maintains process control and collects production data, from initial blending, tablet compression, and tablet coating.



## KORSCH Control System

The next-generation KORSCH control system and process visualization complies with "Industry 4.0" concept. A standard OPC UA Server permits press parameters to be passed to a SCADA or Historian system. Advanced capabilities further leverage data through edge computing or secure cloud solutions for OEE assessment, predictive maintenance and data sharing with external systems. The control system interface provides an intuitive operating environment, with a Smart-Touch HMI. The comprehensive on-board help includes a vast array of multi-media files to present procedures and to support the operation and maintenance.



## Edge Computing

KORSCH has developed an **Edge Computing** solution that permits full transparency across multiple machines from a central supervisory workstation. Applications include:

- Performance Insight – which records and displays key process parameters in real-time
- Machine Monitor – which monitors maintenance cycles and equipment calibration status
- Notifier – which sends a real-time message to site personnel based on any fault that occurs across the installed base to speed remedial action and reduce downtimes

Our Edge Computing solutions are tailored to the customer's requirements and are developed collaboratively to maximize machine performance and OEE.



## PHARMAVIEW®

**Augmented Reality Support** – KORSCH PharmaView® is an interactive operational assistant based on Microsoft HoloLens augmented reality technology. The smart glasses beam holograms and additional information into the user's actual visual axis, enabling guided, hands-free setup, operation, and maintenance. The remote service via video call function permits a secure, streamlined, remote troubleshooting capability that will save time, reduce costs, and improve overall efficiency and uptime. KORSCH PharmaView® offers hands-free, interactive capabilities:

- Holographic Support for production, trouble shooting and maintenance
- Access to Multi-media Support Files
- Augmented Training



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## Tablet Press as a System

KORSCH offers fully integrated tablet compression systems, consisting of the tablet press and related peripherals which are specified by KORSCH engineers to maximize efficiency, from material feeding through automated tablet collection. KORSCH has extensive experience in all aspects of tablet compression technology and can leverage best practices to provide optimal solutions. Building the right system is not simply a matter of placing the peripheral equipment around the press, but rather, in the specification and integration of these systems to provide a seamless design for any application.

### Material Feeding System

Our engineers can design the perfect feeding system and choose from a range of technologies to match the feeding system to the application. Overhead feeding systems, posts hoists, mezzanines, and Y-pipes may all be adapted to the compression room design.

### Magnesium Stearate Spraying System

KORSCH can integrate a variety of spray devices, and machine change parts that permit magnesium stearate to be applied to the punch faces and the die wall. This operation is fully integrated to the tablet press control system.

### Tablet Diverter

Our engineers will adapt an automated tablet collection system, based on tablet count, and container size, to permit the press to run without operator intervention in the compression room.

### Dust Collection

The capacity of the dust collection system is critical to insure long run durations and optimized production yields. Selecting the right dust collection design is especially critical for multi-layer applications to insure precise layer separation.

### PharmaCheck® Tablet Tester

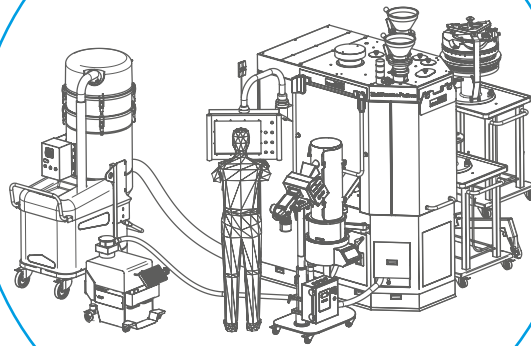
The PharmaCheck® works together with the press to achieve optimal tablet quality without operator intervention. From sampling through transport of the tablets by Venturi system, to measurements with closed loop feedback to the press, KORSCH manages and integrates the complete operation, and data exchange.

### Turrets and Fast Change Parts

Additional turrets and fast change parts will insure maximum machine utilization and efficiency in any production operation. The strategic use of turret sizes will permit outputs to be optimized for every tablet shape and size.

### Tablet Deduster and Metal Detector

Our engineers will specify the proper technology based on the tablet size, output rate, and tablet collection system, and fully integrate these peripheral components in the tablet press control system.



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