KSP and PSP series
Maschinen, Anlagen und Automatisierungen
Baustoffe effizient herstellen
At a glance

Which machine for which block?

Wall-building elements and vario-blocks
Vario-block system

Large formats
KSP 850/1050/1250

KS Quadro 1/1

KS Quadro 3/4

KS Quadro 1/2

α = variabel
Medium-sized formats
KSP 401/801

DF

2 DF

KS-P7

4 DF (115)

12 DF (175)

6 DF (175)

12 DF (365)

5 DF (150)

20 DF (300)
LASCO, an independent medium-sized company with profound experience in mechanical engineering is a leading supplier of technology to the forming industry since its foundation in 1863 and has been offering special solutions for the manufacture of building materials and ceramics for some decades now.

We are known worldwide for the manufacture of highly efficient equipment for the production of sand-lime blocks and blocks with siliceous aggregates. Our comprehensive solutions in this field range from double-acting (KSP) and single-acting (KSE) compacting presses to dies, wear parts and automation equipment, and from vario-block presses to complete turnkey production plants.

LASCO combines internationally recognized competence in development, design and production with highest standards of quality (DIN EN ISO 9001:2008) and the flexibility of an independent, medium-sized enterprise.

Personal service and maximum possible proximity to our customers is supported by a global network of representatives, service centres and agents in over 60 countries.

Over 300 experts are bound by one objective: the design and construction of machines optimized for the user’s success.
Quite often, well-tried solutions are the answer to modern problems. Take, for example, sand-lime blocks. As early as 1880 the first patent was granted for a process producing white blocks made of lime and silicate. And still sand-lime blocks are more than ever in demand in a society that is increasingly conscious of ecological building construction.

The sand-lime block combines the naturalness of its raw materials with good sound insulation, weather resistance and exemplary strength. It looks good and inspires to create buildings of fascinating diversity.

Its environmentally friendly extraction and the comfortable room climate it produces makes the sand-lime block attractive not only as a building material. Its processing pays off as well.

Walls are easily erected with these perfectly sized blocks and their absolutely flat surfaces and are attractive themselves - even without plaster. The use of new procedures in wall building, such as thin-bed mortar or adhesive techniques, and the use of mobile lifting gear and positioning cranes allow the efficient use of large-size blocks and wall elements. Sand-lime blocks - more than any other building material - make a decisive contribution to rationalisation of work and reduction of costs in the building trade.

For all these reasons we focused on sand-lime blocks when at the beginning of the 1990s we were reassessing the established production technology of that time thoroughly. LASCO is now building machines – and even turnkey plants – for the production of sand-lime blocks of a new quality.

This is our active contribution to a success story that still has a long way to go before it hits its peak.

This highly popular building material started a new career in many other countries around the globe. Countries such as the Russian federation and their neighbours, China, India and the Arab countries are increasingly taking advantage of the opportunity to produce quality building materials such as sand-lime blocks or other related wall-building material from their own resources.

The exemplary statics of sand-lime blocks opens up the way to a variety of applications.
LASCO technology brings them in excellent shape.

Manufacturing process of sand-lime blocks

The material flow starts with the filling of the silos with sand, lime and, if needed, silicate-containing aggregates, all of which are mixed with water in exact proportions and fed to the reactor.

The sand-lime mass remains in the reactor until the calcium oxide has converted into calcium hydroxide. After this reaction period the blocks are shaped by compacting.

After pressing the green blocks are deposited on a conveyor belt by the take-off device, stacked on hardening wagons by the programmable stacking system and conveyed to autoclaves for hardening in a pressurized steam environment. The autoclaves are designed for either roll in/roll out or single entry/exit loading/unloading.

The complete process is split up into stages that are organized fully automatically. Personnel is only required for process control and monitoring purposes.
LASCO sand-lime block presses of the KSP series are - from an engineering point of view - the production backbone of the 21st century in Germany, just as they are in a growing number of countries worldwide. These machines, first developed at the beginning of the 1990s and constantly improved in innovative details, are the reaction of mechanical engineering to market demands for higher speeds and efficiency in wall-building and higher quality building materials.

The double-acting compaction employed by the KSP makes possible the production of large-format sand-lime blocks and wall elements of impressive quality.

**Double-acting compaction**

The core aspect of the KSP is the double-acting compaction of the raw materials – i.e. from two sides - with oil-hydraulically driven upper and lower punches. Their computer-controlled movement optimises the formation of the pressure cone, thus ensuring impressive homogenous compaction of the sand-lime mass and uniform strength of the block over its whole cross-section.

The ram strokes and the compacting forces achieved per stroke are measured by a measuring systems. If necessary control systems correct the filling height to make sure that the green sand-lime blocks are ejected stroke by stroke with a high degree of dimensional accuracy and constant compaction.
The moulds are fixed by hydraulic clamping bars. This system provides for quick mould changes during format changeover.

The flexibility of the hydraulic control allows the production of blocks in different heights just by altering the filling height.

The double-acting compaction forces are a prerequisite for the production of building materials that exceed the dimensions of conventional standard block formats. Only with the introduction of double-acting presses that the production of formats such as the KS Quadro, KS-XL and panels in the required quality was possible. At present, these formats are among the most popular ones.
The KSP – the backbone of sand-lime block production...

Filling device (left) and unloading and stacking system (right) for a building material press of the KSP series.

Technical specifications:

- **A** [mm]: 5000, 6050, 6350, 6655, 7020
- **B** [mm]: 1250, 1250, 1250, 1250, 1250
- **C** [mm]: 1510, 2100, 2680, 2680, 2880
- **D** [mm]: 2680, 3015, 3590, 3335, 3410
- **E** [mm]: 3000, 3450, 4700, 5000, 5100
- **F** [mm]: 3700, 4300, 4700, 5000, 5000
- **G** [mm]: 3100, 3600, 3600, 3900, 3900
- **H** [mm]: 6100, 6100, 6100, 6400, 6400
- **I** [mm]: 5300, 5300, 5300, 6000, 6600
- **J** [mm]: 4850, 4850, 4850, 5310, 5350
- **K** [mm]: 3190, 3190, 3190, 3190, 3190
- **L** [mm]: 8600, 8600, 9600, 9600, 9600
- **M** [mm]: 9400, 9400, 9400, 9400, 9400

- Maximum block height [mm]: 250, 250, 500, 500, 625
- Press table opening width x depth [mm]: 826 x 506, 826 x 772, 826 x 772, 1100 x 772, 1100 x 772
- Drive power for press rams [kW]: 2 x 37, 2 x 55, 2 x 55, 2 x 75, 2 x 75
- Driver power auxiliary drives [kW]: 5.5, 11, 11, 11, 11
...in the 21st century.

### Technical Specifications

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**LASCO KSP and PSP series**

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Technology has major significance for achieving economic objectives. A good reason to explain the performance characteristics of LASCO presses in more detail:

**Drive**
The drive is equipped with axial piston pumps. This technology increases efficiency and the life of the hydraulic system. A reliable heating, cooling and filtering system keeps the hydraulic fluid clean and at constant temperature.

**The press frame**
Visually, the press table, cross head and side columns are the dominating elements of the press frame. These components are welded and stress-relieved design.

**The feed box**
In the feed box a patented, trapezoid mould box guided on rollers is set into oscillating motion via the separately installed eccentric drive. This is realised by means of a vibration drive, steplessly variable in amplitude and frequency. The oscillation can be compared to the shaking of a sieve when filtering sand. In the feed box a frame is installed around the oscillating mould box, running on a wear plate and scraping off redundant mass. Compared to conventional solutions this method improves the filling behaviour considerably.

The feed box of the KSE 1250 is driven by an electric motor. Compared to the conventional hydraulic drive this does not only permit soft acceleration of the feed box, but also works considerably more economically. The feed box and punches have rigid guides for constant operation.

**Conveying technology**
Green blocks that have just been compacted are susceptible to fracture and impact. To overcome this problem, LASCO has developed a particularly smooth conveying system for the journey of the “young” green blocks from the mould into the autoclaves.

The control electronics make the LASCO gripper almost as sensitive as a human hand. It grips the blocks firmly, but carefully, lifts them out of the mould and sets them softly onto the cycled conveyor band. A pulse generator records precisely the position of the conveyer belt each time. The phased sequences are freely programmable according to the size of the block.

**Stacking device**
The blocks are stacked fully automatically. Individual stacking patterns are stored in the database for every block size to ensure that the autoclave is filled to its maximum each time. The height of each curing wagon is sensed before it enters the stacking device. The target position of the gripper is calculated from wagon height and block height. The positioning of the curing wagons is effected automatically in preset steps.
Increase in efficiency through improved details.

**The control**
The complete sequence of production is monitored and controlled by a programmable logic controller. The operating personnel merely carries out monitoring and set-up functions.

The LASCO control offers a lot of advantages:
- Automatic filling height regulation depending on the pressing force.
- Consideration of special filling cycles for “critical” blocks.
- Precise approach of the filling and pressing position is ensured by hydraulic positioning of the punches.
- Shorter cycle times and higher block quality due to the integrated wagon and block height sensing system.
- Optional interfaces to a master control system.
- Entry of all production data via a central operating terminal.
- Detailed screen display of faults and warnings in plain text.
- Short setting times by means of production parameters stored in a data base.

**Options**
LASCO also offers the modernisation, extension or modification of existing lines (including competitors’ lines) and the supply of components. These include:
- curing wagons
- clamping frames and press frames
- gripper plates for varying block sizes
- hydraulic mould box installation devices
- heatable moulds
- optimized hydraulic press drives
- SPS control systems

LASCO experts analyse and optimize operational production plants. Flexibly, quickly and reliably.

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Feed box with oscillating mould box.

Autoclaves.

The fully automatic stacking system uses parameters depending on block sizes and ensures optimum utilisation of the autoclaves.
With the introduction of the PSP vario-block press, LASCO has made another decisive contribution to the building materials industry. Up to 70 percent of the labour commonly needed to saw supplementary or filler blocks from large-format blocks and panels is no longer required. In addition, around 5 percent of raw material is saved because of optimised green block lengths and waste material is reduced by about 35 percent. The patented mould system of this special press, based on the LASCO KSP series, allows the production of variable block lengths from 100 to 750 mm.

These varying block lengths are compacted longitudinally and by changing the press height. The positioning of the ram stroke in the press is computer-controlled via the interface signal of the unitizing or configuration software.

**Shifting mould**
LASCO holds a patent for its shifting frame with multiple moulds for standardized wall thicknesses. Only the mould that is in the centre at the time of the working cycle is filled and pressed. In order to produce filler blocks and elements of other wall thicknesses, the complete frame (upper and lower punches, press frame) is shifted hydraulically in horizontal direction. This operation is carried out fully automatically in a few seconds.

Optionally LASCO offers the shifting mould with two mould boxes to offer the users of the fully automatic PSP system even more flexibility in production. This version allows the manufacture of blocks in up to eight different wall thicknesses with one line non-stop directly with process-controlled instead of manual change-over.

**Green block saw**
The optional integration of a LASCO green block saw in the vario-block system allows for the first time the fully automatic and economical production of dimensionally accurate supplementary blocks in the sand-lime block.
system with one machine. Rework on individual blocks outside the process cycle will not be required anymore.

Supplementary or filler blocks are needed for the construction of walls from large-format blocks to guarantee the function (door and window openings, gable inclinations) and brickwork with appropriate bond (supplementary blocks, capstones) of individual wall sections. Gable blocks can be manufactured with the integrated green block. For this purpose the robot takes off the green block, positions it on the conveyor belts in front of the saw and cuts the green block to the right shape. Supply channels in the masonry, e.g. for electric cables and water pipes can be prepared with an optional slitting saw for the green blocks.

The whole production process control is connected with a product data base which supports the production line with integrated green block saw as well as the well-established PSP basic system with its software for production planning, unitizing and logistics. The production line with integrated green block saw is also suitable for the production of wall building blocks with silicate-containing aggregates.
A brand-new factory is more than just the sum of current technical progress. A new factory rather sets standards in automation, productivity, quality assurance, logistics - only when everything is perfect - also in its detail - and all components interact with each other optimally, the advance to a new performance dimension can be a success.

When developing, planning and building a new factory, we at LASCO give intensive thought to the competition that our customers are exposed to, now and in the future. We have accepted this responsibility several times as a general contractor for the construction of turnkey factories; factories in which our principals show their customers around to demonstrate to them how efficiently new calcium silicate blocks can be produced.
Our specific concept enables the investors to establish their plants quickly and safely, according to their production requirements (formats, production volume). The arrangement of the primary components – reactors, presses, autoclaves, wagon platforms – permits an optimum sequence of the technical production processes. Secondary components such as material transport, packing, workshop, laboratory and control room are integrated in such a way that a smooth sequence of all control functions and quality-assuring measures with the shortest possible distances is granted. Further components such as storage, boiler house, building technology and administration complete the production facilities and grant an economical overall process.

Another component of our scope of supply is the production respectively procurement of optional process components such as heat recovery, shifting platforms for efficient loading of the curing wagons, as well as fully-automatic packing systems or process-integrated colour mixing systems for the production of sand-lime blocks in individual colours.