LAEIS

TIME FOR
INNOVATION

GERMAN
ENGINEERING
SINCE 1860

PRECISION
PERFORMANCE
EFFICIENCY

THE PERFECT PRESS FOR ANY APPLICATION

WWW.LAEIS.EU

WORLDWIDE THE NAME LAEIS STANDS FOR ESPECIALLY EFFICIENT, HIGHLY DEVELOPED AND CUTTING-EDGE PRESSING TECHNOLOGY. BEING THE LEADING MANUFACTURER OF PRESSES FOR REFRACTORIES AND OTHER CERAMIC PRODUCTS AS WELL AS FOR THE BUILDING MATERIALS INDUSTRY, WE ARE CONTINUOUSLY INVOLVED IN THE DEVELOPMENT OF OUR WELL PROVEN TECHNOLOGY FOR APPLICATIONS IN OTHER AREAS. MOST MODERN CONTROL TECHNIQUE AND HIGHLY RELIABLE HYDRAULIC COMPONENTS ENSURE LOW OPERATING COST AND REDUCED ENERGY CONSUMPTION. OUR NEWLY DEVELOPED VACUUM PRESSING TECHNOLOGY PROVIDES FOR SHORTER CYCLE TIMES AND SIGNIFICANTLY IMPROVED PRODUCT QUALITY.

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6 PRESS UNLOADING SYSTEM
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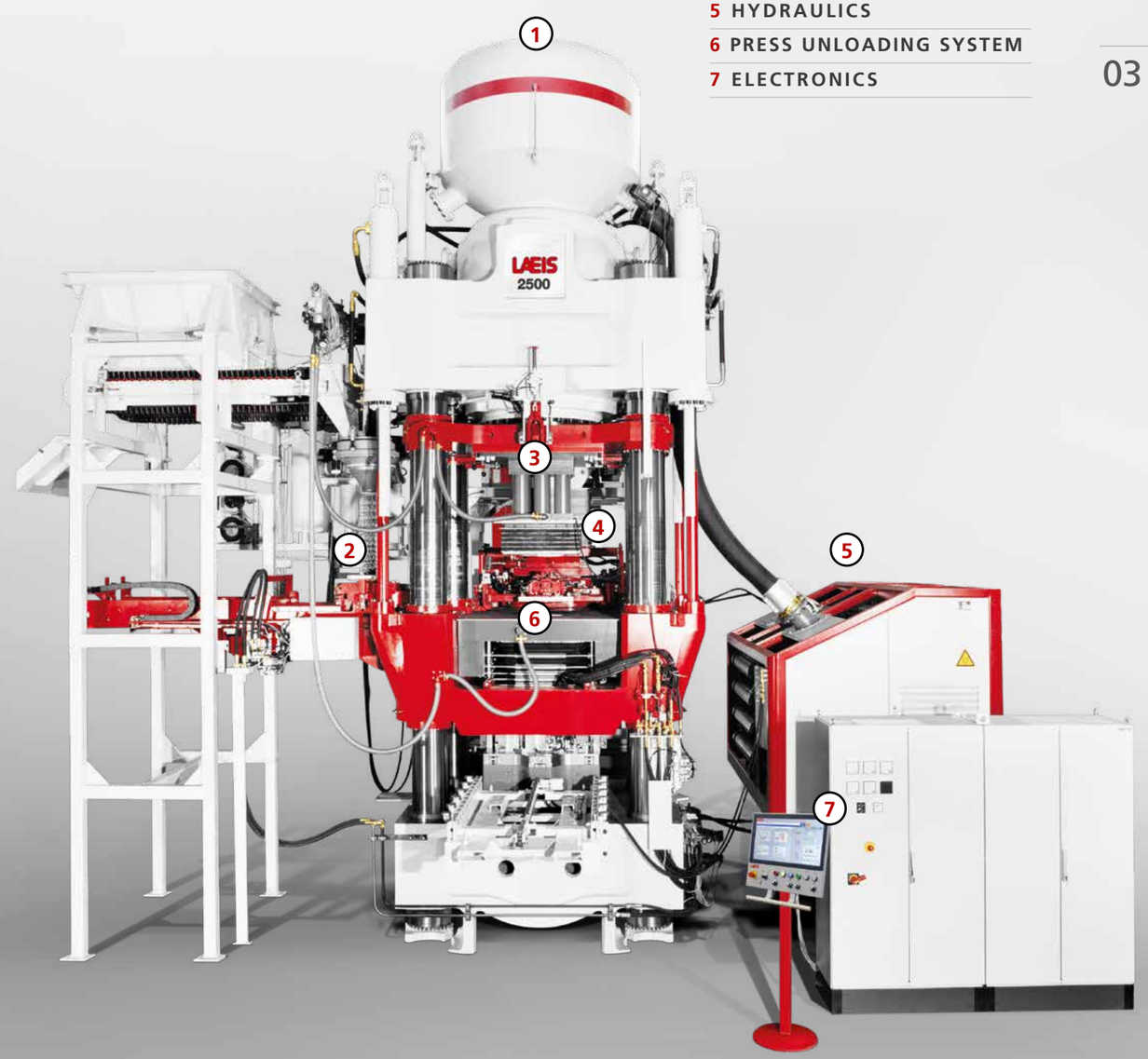


PRESS OVERVIEW AND MATRIX

	HPF/SIGMA SERIES	ALPHA 120/BETA SERIES	ALPHA/OMEGA SERIES	MEGA SERIES
max. depth of fill (mm)	500 - 800	120 - 300	45 - 60	1.200 - 1.400
max. usebable die surface W x D (mm)	410 x 260 - 1.050 x 1.300	1.170 x 500 - 1.400 x 1.100	1.170 x 500 - 1.600 x 1.000	1.275 x 1.000 - 1.800 x 850
pressing force (kN)	5.000 - 45.000	8.000 - 42.000	8.000 - 42.000	12.500 - 25.000
max. ejection force (mm)	1.000 - 4.500	300 - 1.200	140 -280	6.000
max. no. of functional strokes (1/min)	2.5 - 7.0	6 - 20	18 - 30	1 - 5
typical no. of production strokes (1/min)	1 - 6	3 - 10	10 - 20	0.5 - 4

The table gives a survey of typical performance data of the different LAEIS press series. Special presses with characteristic data beyond the range of this table may be available on request.

HPF 2500

ALPHA 800 / 120

OMEGA 3000

MEGA 1600

HPF 2500

HPF 2000

FURTHER HPF PRESSES

HPF 630
HPF 630 R
HPF 630 SALT
HPF 1000
HPF 1000 R
HPF 1000 SALT
HPF 1250
HPF 1600
HPF 2000
HPF 2500
HPF 3600
HPF 4500

FOR SAND-LIME AND FLY ASH BRICKS

SIGMA 650

LAEIS HPF PRESSES FOR BRICKS AND OTHER PRODUCTS WITH LARGER HEIGHT

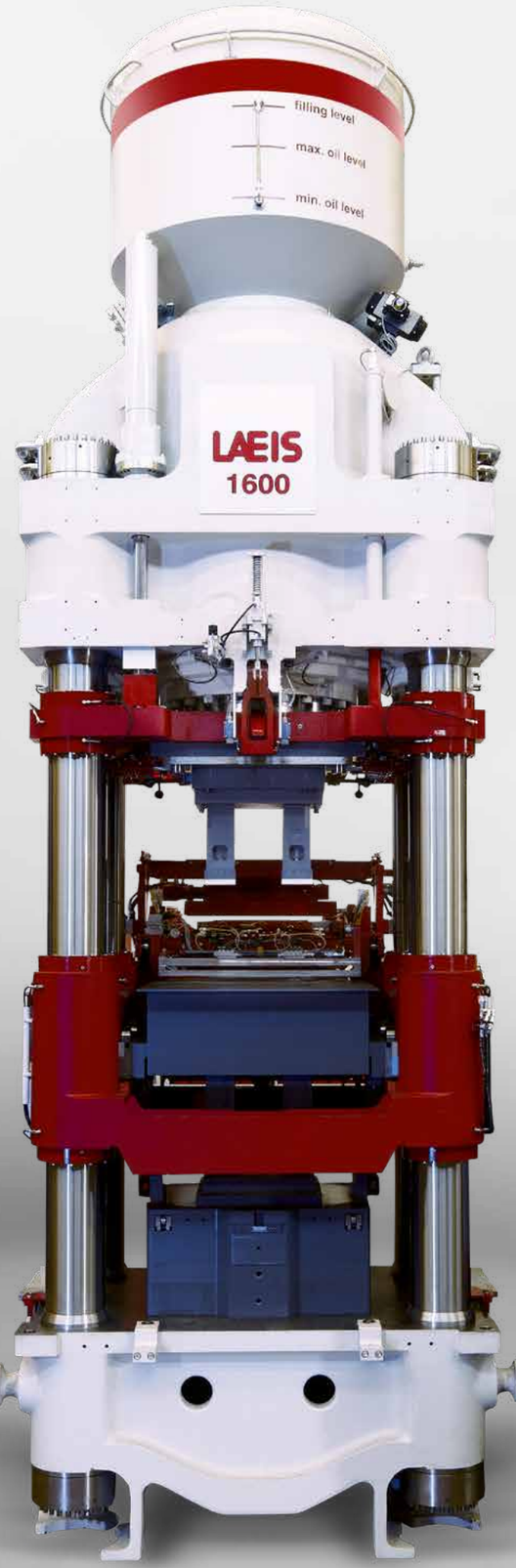
LAEIS offers the right solution for different industries and applications for products of geometries requiring a larger depth of fill. The trend-setting technology of LAEIS HPF presses featuring the double-pressure principle with active mould is the result of long standing experience and defines the technological state-of-the-art for the production of quality refractory products and in many other industries. The special press types SIGMA and MEGA also use the HPF pressing principle.

PRESS FEATURES:

- Double pressure system with active mould
- Column construction (except HPF 630) with pressing cylinder and lower traverse of nodular cast iron and pre-tensioned column ends
- Highly precise electric and hydraulic control for constantly good product quality
- Synchronized movement of axes for an optimum density distribution
- Standardized mechanical, hydraulic and electrical concept
- Vacuum pressing technology for various applications

Selection of nozzles

Selection of refractory bricks



HPF 1600

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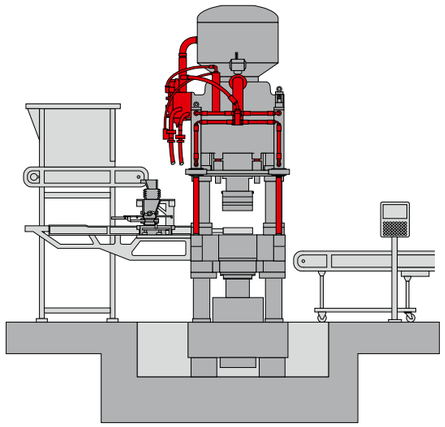
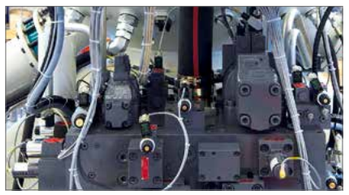
HYDRAULICS



The hydraulic system is of decisive importance for the performance of a hydraulic press. LAEIS press hydraulics are consequently designed to provide for low energy and utilities consumption. Drive capacity and performance load match optimally for each product. Hydraulic components of top suppliers ensure low operating cost and a constant quality.
Modern proportional valves in connection with closed loop control allow to simplify the structure essentially and to reduce the number of components, resulting in improved reliability and a simplified guided fault diagnosis via screen. The encapsulated pressurized hydraulic system with a separate filtering and cooling circuit provides for a consistantly good oil quality. High reproducibility and independence from external influences such as temperature and friction lead to an outstanding product quality.

HIGHLIGHTS OF THE LAEIS HYDRAULIC SYSTEM:

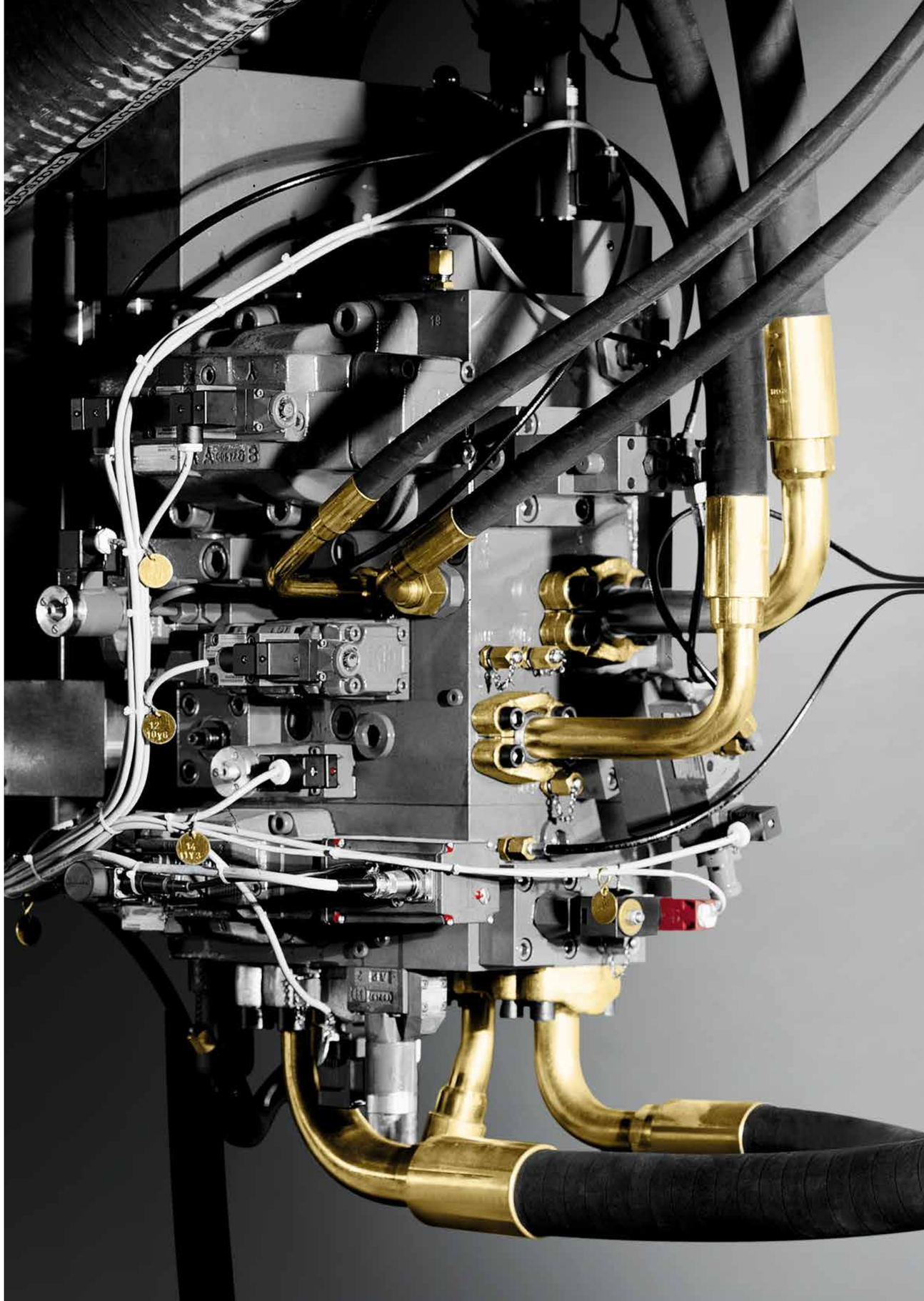
Scalable hydraulic units with identical design	Encapsulated and pressurized hydraulic system and separate oil filtering and cooling circuit for permanent good oil quality and improved service life
Regulated high speed axial piston pumps for an effective energy utilization	
Proportional valves for an optimum regulation of all cylinders	Valve blocks arranged close to energy consumers for short reaction times
Redundant safety valves protect the operator against hazardous movements	Auxiliary cylinders to move the press plunger quickly and precisely; reducing dead times



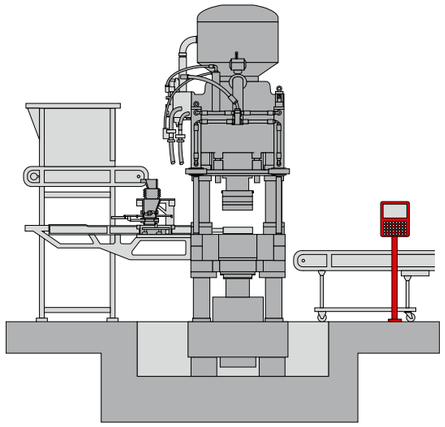
Manifold block

Mould moving cylinder

Pump station



ELECTRONICS



»Totally Integrated Automation« signifies a standardized programming, communication and data storage of all press series, characterized by intuitive operator guidance with a simple fault identification. PC based Siemens S7 Soft-PLC and robust touch panel allow for complex data management. Closed loop control of all axes provides for highest precision and reproducibility, independent of environmental influences. Fast-Ethernet interfaces allow network connections without additional expenditure. Connections with Profibus-DP or ethernet based PROFINET with PROFIsafe to the decentrally arranged periphery along with tele and fault diagnosis, tele visualization and data exchange (Internet/Intranet) ensure safe and fast communication.

The graphic operator interface ProVi guides the operator through the parameters input. To guarantee identical pressing conditions at any time, sets of parameters can be stored in the recipe administration and recalled on demand. ProVi is product-oriented. All dimensions are relative dimensions which can be taken e.g. from a product drawing and entered into the control.

HIGHLIGHTS OF THE LAEIS ELECTRONIC CONTROL SYSTEM:

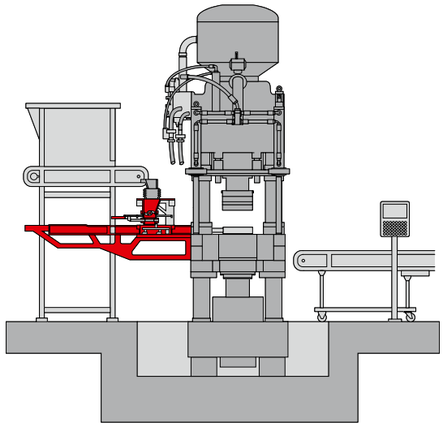
- Intuitive product-oriented data entry
- Graphic window based interface (can be connected directly to a company network as a standard feature)
- Processing and storage of production data and setting parameters, recording of each pressing as standard feature prepared for industry 4.0
- Decentral multi-processor control make Siemens with Profibus-DP or PROFINET / PROFIsafe
- Closed loop control of all axes for highest precision and reproducibility
- Comprehensive service and maintenance features

Bus box with box pc, axes controller and Profinet

Main cabinet – safety PLC and Profibus

Main Cabinet

FILLING SYSTEMS



The quality of the pressing starts with the filling of the mould. Experience shows that materials tend to segregate during their conveyance to the press. To reduce such segregation, LAEIS has developed special mould filling concepts. The parameters for the different shapes and qualities have to be determined only once and are then stored together with the pressing parameters.

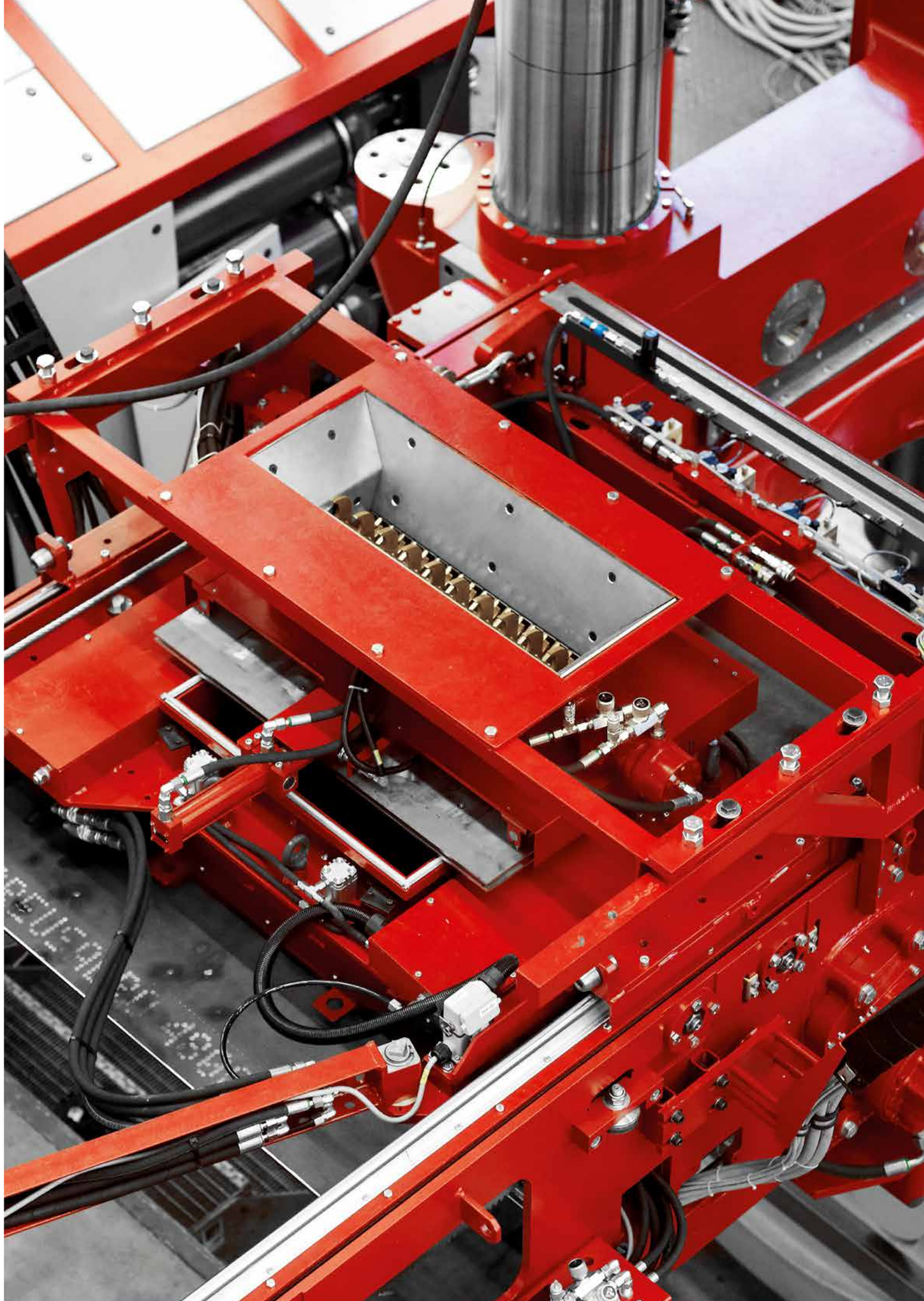
FEATURES OF THE HPF MOULD FILLING SYSTEMS:

- Volumetric and gravimetric filling systems
- Charger box mixer meters and homogenizes the pre-fill and ensures a uniform filling also for multi-cavity moulds
- Charger boxes with universal honeycomb filling inserts or specially designed filling inserts
- Double-layer filling systems
- Hydraulic drive with precise positioning and speed control
- Fast exchangeable box mixer

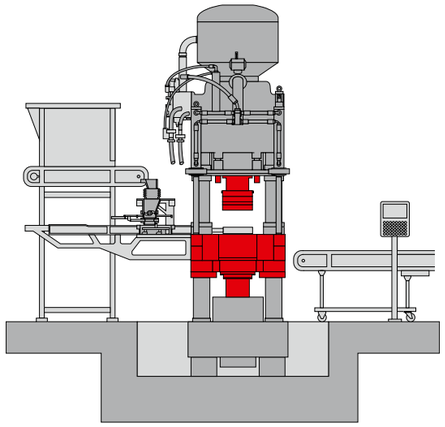
Cardan shaft of filling charger drive

Material disintegrator

Oval charger box mixer



SHAPING & MOULD DESIGN



Based on the most modern technology, LAEIS develops high-quality products providing for a long service life. Through optional hydrostatic compaction an even application of the specific pressure is ensured: Guarantee for a homogeneous density distribution and perfect edges, even with intricate product geometries. Press moulds are custom-made and are available with different grades of coating or hardening. The extremely simple handling of the mould package provides for a minimum time requirement for a mould change. For each type of press LAEIS provides for an individual efficient mould changing and clamping system.

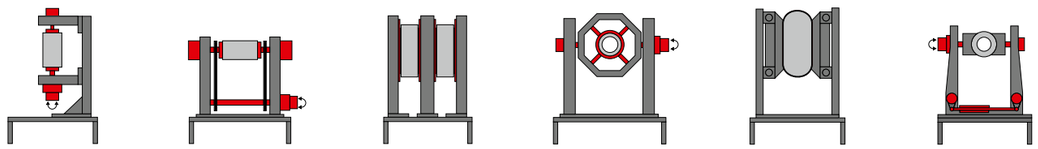
FEATURES OF LAEIS PRESS MOULDS:

- In-house mould design & construction
- Experience also with complex products (pipes, nozzles, plates / slabs with spigot, groove and/or lock seams)
- Additional hydraulic axes integrated into the mould for optimum density distribution
- Short mould changing times (semi-automatic fast mould changing system „Hydrofast“ as option for HPF presses)

Upper die for anodes

Mould for salt tablets - 200 cavities

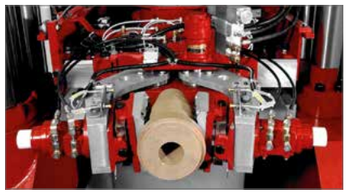
Multi-cavity mould for sand-lime bricks



UNLOADING SYSTEMS

LAEIS presses are equipped with gripper systems having a design which corresponds to the geometry of the products to be manufactured. Available are membrane grippers, rotating pickers, vacuum pickers, tong-type pickers with and without turning device.
Our gripper systems guarantee a secure gripping and depositing onto a subsequently arranged transport conveyor. Damage or breakage are reliably avoided.

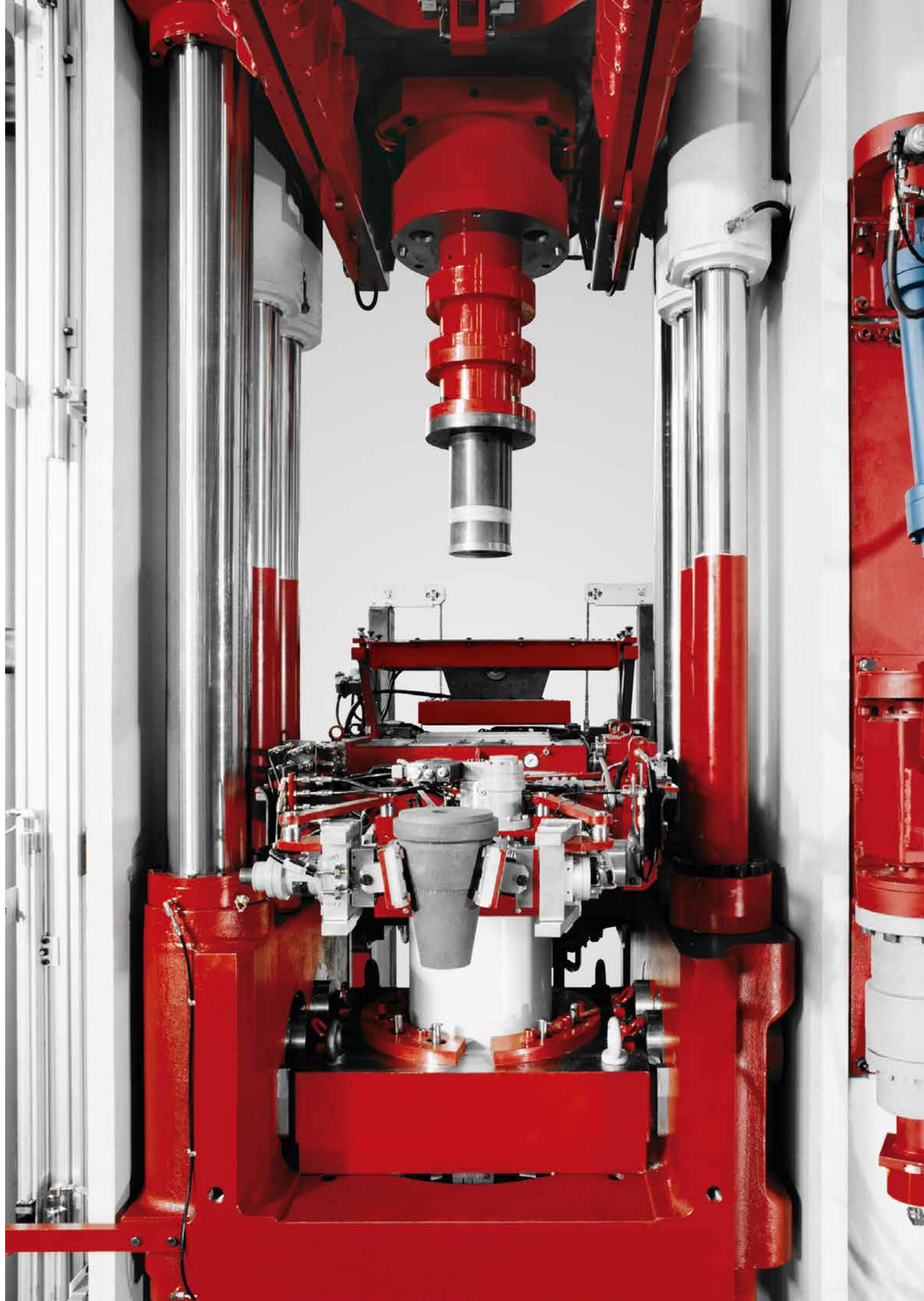
ACCESSORIES
For individual applications LAEIS offers a comprehensive range of accessories for complementing or optimizing your plant.



Picker with rotating unit

Standard membrane picker

6-fold rotating picker

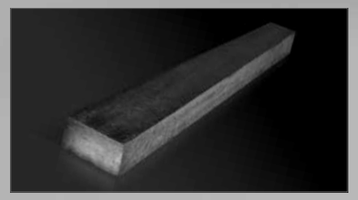


APPLICATION EXAMPLES

HPF presses are used in many industries, e.g. for shaping of refractories, building materials, salt products, carbon products and many others.

TYPICAL PRODUCT EXAMPLES ARE:

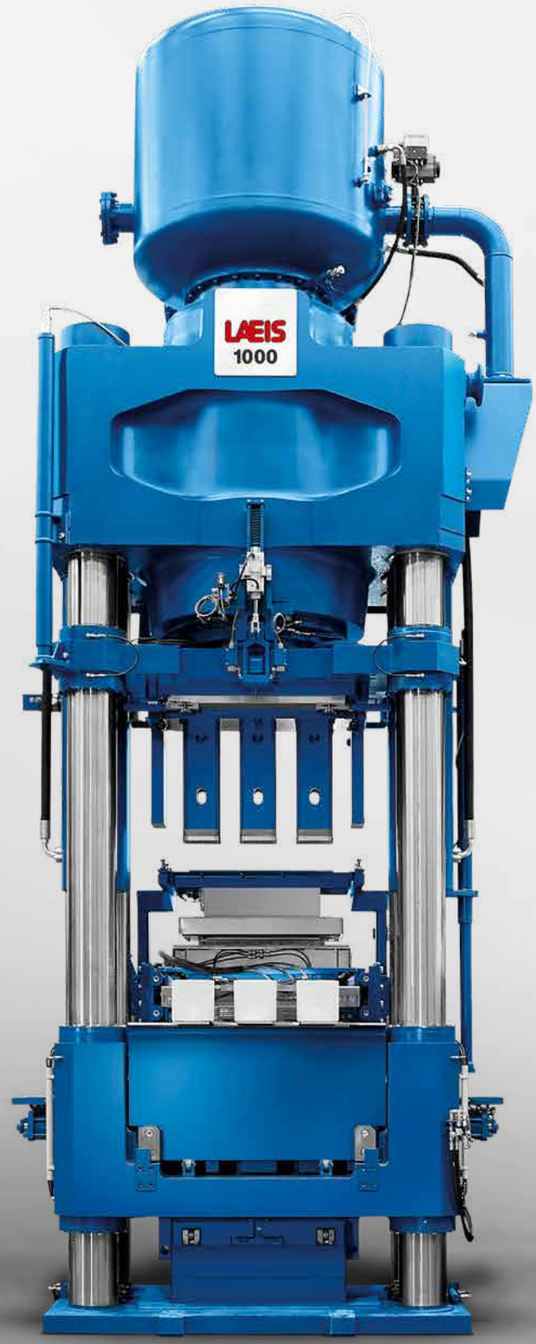
- BOF shapes, SU's, slide gates, nozzles and other refractories
- Cassettes and other kiln furnitures
- Ceramic armour (curved)
- Sand-lime bricks, fly ash bricks, interlocking bricks
- Salt licks, salt blocks for water softening
- Anodes for aluminium smelters, carbon blocks
- Large bentonite blocks for sealing of nuclear waste depositories
- Compacted waste products from steel works, power plants, etc.



Converter brick

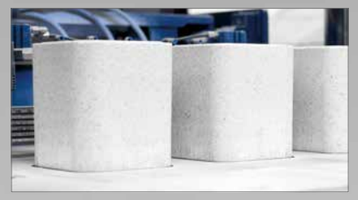
Refractory brick

Fireclay brick



Pressing of salt blocks with mould spraying

Salt blocks after ejection



Close-up of salt blocks

FURTHER PRESSES

ALPHA 800
ALPHA 800/120
ALPHA 1500
ALPHA 1500/120
ALPHA 4200
OMEGA 2600
OMEGA 3000
BETA 3000

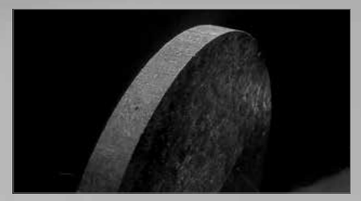
ALPHA, BETA & OMEGA PRESSES FOR FLAT PRODUCTS

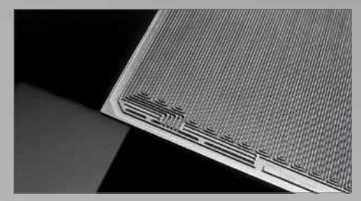
For products with limited height like tiles and plates, but also with more complex shapes, LAEIS supplies presses of the series ALPHA and OMEGA with pressing forces ranging from 8 000 kN up to 42 000 kN with a depth of fill typically < 60 mm. A special highlight: ALPHA presses designed for advanced ceramic products are optionally available with a filling depth of up to 120 mm.
The OMEGA press series with a single-piece cast frame features an energy saving system, reducing the energy consumption up to 25 %.
The special press type BETA 3000 with a filling depth up to 300 mm is also based on the ALPHA press general design.

PRESS FEATURES:

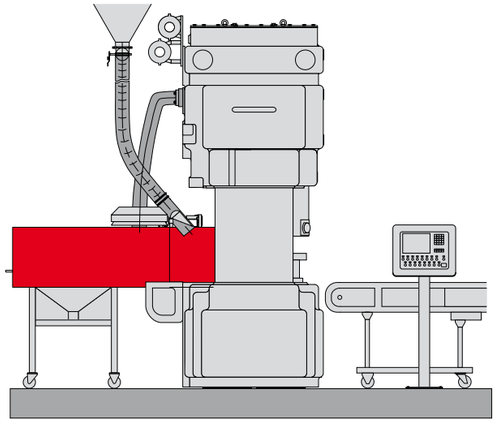
- Optimum component configuration due to FEA calculation
- Compact design
- Utmost rigidity resulting in energy-saving due to pre-tensioned columns or single-piece design
- Fail-safe operation
- Automatic control and regulation of the product thickness
- Most modern hydraulic concept with energy recuperation
- Controlled axes for press traverse, mould frame and charger box
- Quick mould change with mould exchange console
- Low oil requirement and long oil change intervals
- Additional optional items such as closed loop control for ejection, second charger box, network compatibility via Internet and Intranet

Wall facing plate


Carbon compound disc


Bipolar plate

FILLING SYSTEMS



The standard filling system of LAEIS ALPHA & OMEGA presses is designed for free flowing spray dried powder, filled into a feeding hopper (with or without pendulum flap) via a pendulum hose. A charger box with filling grid transports the material into the mould cavity. Double layer filling systems are also available. The filling car moves with very fast acceleration and deceleration, resulting in reduced cycle time. The setting parameters for each product are stored together with the pressing parameters.

FEATURES OF THE ALPHA / OMEGA MOULD FILLING SYSTEM:

- Volumetric and gravimetric filling systems
- Charger box with universal honeycomb or specially designed filling insert
- Double-layer filling systems
- Hydraulic drive with precise positioning and speed control

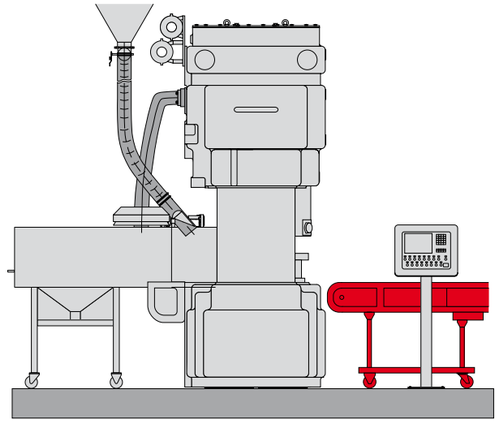
Complete mould filling device with feeding hopper and charger box

Feeding hopper with connections for pendulum hoses

MOULD FILLING DEVICE

FOR ALPHA AND OMEGA PRESSES

UNLOADING SYSTEMS & ACCESSORIES



Various unloading systems are available also for the ALPHA / OMEGA presses. Due to the limited daylight of the moulds for low height products, in many cases a vacuum off-bearing unit with hydraulic drive is used. This unit, specially developed for such applications, is mounted directly to the press and is liftable for an easy access to the mould.

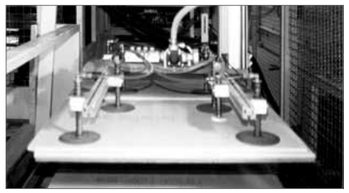
LAEIS ALPHA & OMEGA PRESSES – ACCESSORIES (SELECTION)

Also for the ALPHA / OMEGA presses LAEIS offers a comprehensive range of accessories:

- Process data recording PRODATA
- Tele diagnosis via modem or Internet access
- Oil spraying aggregate
- Material feeding system (also heated)
- Moulds
- Hydraulic or mechanic mould frame buffering
- Controlled / boosted ejection
- Mould changing brackets
- Gravimetric filling system
- Vacuum pressing system
- Robotic system for loading and unloading
- Double filling charger
- Compact mobile oil filtering and pumping unit

Vacuum off-bearing unit (detail)

Oil spraying system for ALPHA press



Vacuum handling system for large-sized plates

VACUUM OFF-BEARING DEVICE

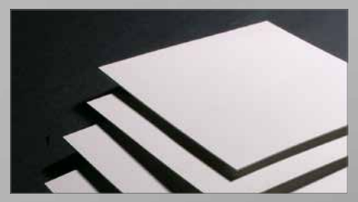
ATTACHED TO ALPHA PRESS

APPLICATION EXAMPLES

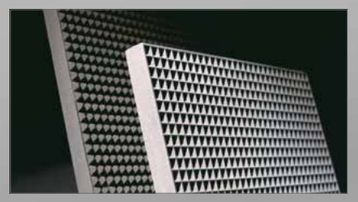
ALPHA & OMEGA presses were originally designed for the production of ceramic tiles. Today, other applications, especially in the field of advanced ceramics, gain in importance and become predominant. Presses and auxiliary equipment are enhanced continuously to meet the increased requirements of such applications.

TYPICAL PRODUCT EXAMPLES ARE:

- Floor and wall tiles
- Pusher plates and other flat kiln furnitures
- Ceramic armour plates (flat and curved)
- Sputtering targets
- Substrates for electronic applications
- Fuel cell components (e.g. bipolar plates for PEM fuel cells)
- Special wall facing elements (also double or triple layer)
- Salt tablets for water softening



Thin alumina plates

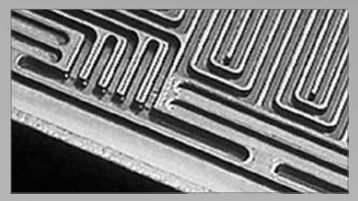


Plates with structured surface

Insulating plate

Roofing tile detail

Selections of tiles



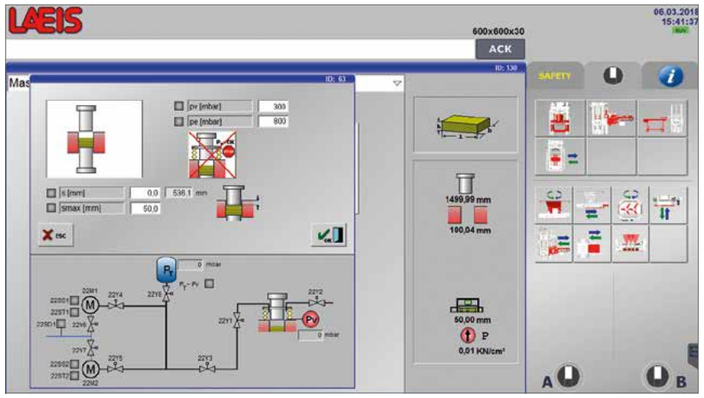
Bipolar plate close-up

VACUUM PRESSING TECHNOLOGY

For most products it is essential to obtain a high density while at the same time avoiding lamination, that is to avoid enclosure of air in the pressed product. Thanks to a newly developed vacuum pressing system the air inside the material is removed in the shortest time possible (about 2-10 s) before the pressing starts. Owing to this evacuation, additional de-airing steps can be reduced and cycle times can be shortened.

ADVANTAGES OF THE LAEIS VACUUM PRESSING TECHNOLOGY:

- New economic vacuum pressing system with small volume of evacuation
- Various vacuum sealing systems adapted to the press type and to the product requirements
- Higher final density of the product and avoidance of lamination
- Improved productivity thanks to reduced cycle time
- Significantly reduced investment and maintenance cost
- Available for all types of LAEIS presses



Vacuum system control

Vacuum system (detail)

VACUUM PUMP STATION

FOR MEGA PRESS

LAEIS SERVICE – KEY FACTOR FOR CUSTOMER SATISFACTION

The success of LAEIS as a reliable and innovative supplier of equipment of the highest industrial standards is based on two strong points, namely on the continuous development and transfer of our comprehensive know-how into other fields of application as well as on our excellent service system, on which our customers can rely world-wide.

LAEIS SERVICES INCLUDE:

CONSULTING SERVICE:

Individual technical advice around the clock – highly motivated and constantly looking for optimum solutions

SPARE PARTS:

Short-term provision of quotations and extremely short delivery times; 11.000 spare parts available – original parts and high quality replacement parts

PREVENTIVE SERVICE & MAINTENANCE:

Expert maintenance improves machine availability and continuously high product quality.
Regular inspection and maintenance on the basis of a service contract detect possible problems early and necessary preventive action can be taken

TROUBLESHOOTING:

Remedy for any problem in the fastest possible time with the most modern diagnostic and repair tools

TRAINING:

Tailor-made training programs for customer´s staff to utilize the installations efficiently and economically

PRESS REFURBISHMENT

LAEIS provides also refurbishment of older LAEIS presses including:

MECHANICAL RECONDITIONING:
Flattening of contact surfaces
Reconditioning and exchange of guiding and sealing elements
Exchange of guide bushings and scrapers
Straightening and reconditioning of columns
Exchange or reconditioning of different pistons and cylinders
Rolling of the main cylinder surface
Any other necessary measure

NEW ELECTRIC CONTROL:
Update to various levels of modern electric control concept
Depending on required level: new electric cabinet, operator panel, connecting cables, stroke and pressure sensors for the axes, proportional valves for the hydraulics, etc.
Final level provides for an up-to-date standard with all actual features
Press can be operated like one of the new press generation
New electric control also for revamping of presses make Bucher and Horn

MODERNIZATION OF HYDRAULIC EQUIPMENT:
Substitution of pumps, also for closed loop control
Exchange of filter and cooling units
Replacement of black and white valves by proportional valves
Re-fitting of safety valves according to the latest standard

For any press refurbishment, always the actual safety rules must be fulfilled!

Refurbishment can be done either at customer´s site or at the LAEIS workshop. This service is often required when a press shall be moved to another location or when it is sold as a second hand press.

Dismantled press after 25 years of service

Individual components after initial cleaning

Machine after re-commissioning

HPF 2000

AFTER REVAMPING
(YEAR OF CONSTRUCTION: 1984)

LAEIS PLANT ENGINEERING

Besides hydraulic presses and auxiliary equipment to the presses, LAEIS also supplies complete plant for the refractory and other industries. The range spans the whole production process from raw material preparation via batching, shaping, firing and quality control to packaging.

LAEIS SCOPE OF SUPPLY AND SERVICES INCLUDES:

- Concept studies
- Development of process technology & know-how
- Engineering
- Supply of components
- Realisation and plant construction
- Test run & commissioning
- Training
- Service

LAEIS R&D SERVICES

For troubleshooting or optimization tasks in existing production lines, for evaluation of process parameters, e.g. when modifications in the range of products are planned, as well as for new applications: our technical center in Aachen, Germany, with highly skilled engineers and a broad range of machinery up to production scale is ready to assist customers from the feasibility stage through commissioning. Necessary modifications of standard presses and/or target specifications for new presses and other plant components are defined and executed in close cooperation with the LAEIS technical department and with the customer.

Refractory plant: dosing and weighing section

Refractory tunnel kiln

Investigation of raw materials for spray drying

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