Production of Sand Lime Brick and Fitting Pieces

Purpose Built Using Proven Technology.

Masa – your partner for the successful production of building materials.
With intelligent and flexible solutions, Masa leads its customers to success.
Experience, reliability and passion are the basis for a long lasting partnership.
www.masa-group.com
The secret of our success is the future profitability of our customers.
Masa is the world’s leading manufacturer and supplier of plants, machinery and components for the building materials industry. Our experience, the quality of our products and the constant dialogue with our partners have contributed to the success of our customers worldwide.

The planning and design of our plants encompass all the basic principles which are fundamental to “Engineered in Germany”.

Quality: Proven technology, customised solutions and durable equipment
Profitability: Economical – without compromising efficiency
Safety: Comprehensive safety solutions in consultation with the customer

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Note
In general Masa plants are equipped with all the necessary safety guarding to local standards. For reasons of clarity, some photos are shown without safety guards.
Experience is our strength. Flexibility takes us forward.

Masa is able to look back on more than 100 years of company history. Our experience, the quality of our products and the constant dialogue with our partners, have contributed to the success of our customers worldwide.

Our head office with departments for development and production of concrete block making machines and plants is situated in Andernach, between Frankfurt/M and Cologne. A second location for the development and production of plants and machinery for concrete slabs, AAC blocks and sand lime bricks is situated in Porta Westfalica. Furthermore subsidiaries for sales and services are established worldwide: in USA, China, Russia, India and Dubai, responsible for the Middle East.

Success is a strong basis
Throughout our long company history, we have been significantly influenced by the many developments in the building materials industry. The experiences gained over the years in both technical and functional capacities now benefit both the customer and ourselves. This continuity means the customer can be safe in the knowledge that Masa has created solutions which are built to last and can be quickly modified on demand.

Flexible in global markets
As a result of globalisation on the world economy, we have benefitted from our growing reputation for providing solutions. Different markets present specific requirements for which we develop individual solutions. In the end, there are no two products alike; every single solution is based and optimised on the individual wishes of the customer.

Safety and environment protection
On designing a plant, safety is of paramount importance, whilst incorporating ease of operation. Another aspect of vital importance is protection of the environment, hence Masa’s solutions for power efficiency, dust protection and the reduction of noise emission.
Turn-key Plants: Efficient and profitable.

First class products, high efficiency and profitability, a result of the integration of individual components which is crucial to the smooth operation of an economical sand lime brick plant. Masa has all the necessary experience for the production of high quality sand lime bricks. A distinct advantage for our customers is that large turn-key plants or single components are from one supplier – Masa, your partner, from planning and design, through manufacturing, assembly, commissioning, training and support during the start of your production.

Careful planning is the most important factor for the economic success of a production plant. The local requirements and possibilities as well as the longterm growth potential have to be taken into consideration right from the start. Our engineers define the machine designs and capacities as well as the process sequence and arrange the plant components in the given space. Complete turn-key plants are assembled from a selection of standard components that can be integrated into the customer’s required solution. This modular system ensures correct interpretation of the customer’s requirements within a short delivery time.
Automatic control system. The long process from raw material storage to the finished high quality sand lime brick product requires ultimate design and coordination of the individual plant components. The control system is capable of ensuring this. In Masa plants, all processes are controlled automatically. Process sequences and conditions are continuously supervised electronically and displayed on a screen. Usually, SPS and PC control systems are used as hardware components.

01 Raw material storage, dosing, and mixing
02 Reactor and chemical reaction
03 Masa double shaft mixer
04 Hydraulic sand lime brick press Masa HDP
05 Hardening car transport from the press to the autoclaves
06 Autoclaves/steam boiler
07 Packaging
08 Cleaning of the hardening cars
Storage, Dosing and Mixing of Raw Materials: The optimum sand lime brick mix design.

The quality of the finished sand lime products principally depends on the storage, mixing and dosing of the sand and lime raw materials. Masa can supply all the necessary components to ensure the best possible layout of the plant.

Mixing plants
The different sand and lime types required for different recipes are stored separately. Depending on the sand moisture, water is added to the additional mixing process.

Reactor
A belt conveyor transports the sand lime compound into the reactor. After approximately two hours, the reaction of lime and water is completed. Calcium oxide and water have combined to calcium hydroxide. This pre-mix is processed in the press.
The correct mixing and preparation of the sand-lime compound requires precise control at every step of the process and a coordinated arrangement of the plant layout.

The press plant is the heart of the sand lime brick making process. Masa can offer various tried and tested press models for this task. The hydraulic HDP presses are electronically controlled and enable a uniform, one-sided or double-sided compaction over the complete brick height.

Depending on the model, Masa sand lime brick presses are designed for different capacities. The actual capacity depends on various factors, such as the mixing recipe and the size of the final product - from small bricks to big-size plane elements. Freely programmable brick placing robots can be attached to the press.

### Capacity

<table>
<thead>
<tr>
<th>Type</th>
<th>Mould opening</th>
<th>Max. brick height</th>
<th>Press capacity in bricks per hour*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDP 800 U</td>
<td>1050 x 550 mm</td>
<td>250 mm</td>
<td>8,500 4,580 1,900</td>
</tr>
<tr>
<td>HDP 800 N</td>
<td>1050 x 770 mm</td>
<td>300 mm</td>
<td>8,500 4,580 1,900</td>
</tr>
</tbody>
</table>

*The calculation of the capacity per shift is based on an efficiency factor of 90%. Real capacity is dependant on factors like mixture of raw materials and product size.
The hydraulic pressing system enables single or double-sided compaction and the manufacture of different shaped features, e.g. chamfers, pricer holes or tongue and groove systems.
The Curing Process: Hot steam for hard bricks.

The sand lime bricks are hardened by means of steam in hardening chambers (autoclaves). Besides pressing, this is the second most important step in the production of sand lime bricks.

The freshly pressed bricks are hardened inside the autoclaves at a temperature of approx. 200°C in an atmosphere of saturated steam with a pressure of approx. 16 bar. This hydro-thermal hardening process takes several hours. It provokes a silicate reaction on the surface of the sand grains which stimulates the desired hardening process.

The process is constantly monitored and controlled by fully-automatic Masa measuring and control devices.

The manufacture of sand lime bricks is a complex process, but the ecological balance sheet is positive. The consumption of energy is efficient, no substances damaging to the environment are used, and the waste material can be recycled completely. In addition, the finished product guarantees an optimum interior climate and thus provides an optimum of living comfort.
Steam generation for the autoclaves.

Feeding of the autoclaves by a transfer platform.

Autoclaves for the hardening process: Product quality by means of controlled steam process.

Our ambition is to achieve a great variety of products of consistent quality and high output.
Transport and Packaging Systems: A complete solution.

The transport system is one of the most important components of a sand lime brick making plant. Hardening cars are used for smooth transport of the fresh and finished products on a rail system between the individual plant units. Transport to the press as well as transport from the brick placing robot and the autoclave feeding system are carried out this way. Finally, the products are transported to the packaging plants.

Fully automatic transfer platforms, fixing devices as well as rope-pulled conveyors and cycle pushers are used to feed and transport the hardening cars inside the factory. Masa also plans, manufactures and installs the complete equipment for the packaging of the sand lime bricks. According to a programmed pattern, the bricks or elements are taken off the hardening cars and cubed into packages - if required, on pallets. Finally, the packages are strapped vertically and horizontally.

 Conveyor system within the packaging plant.

 Strapping device for all brick sizes.

 Further transport by brick transfer device.

 Correctly packed and ready for shipment.
Efficient material flow. Plant components such as brick placing robots and brick package transfer devices guarantee a steady and smooth production sequence of the Masa sand lime brick making plant.
Manufacture of Plane Elements and Fitting Pieces: Individual solutions tailored to fit.

As part of the complete product range for the sand lime brick production Masa can offer plants and equipment designed for the manufacture of fitting pieces and plane elements. Fitting pieces save time and money because they can be manufactured according to the individual architectural requirements of a building. Practically all shapes, e.g., bevels, slopes and cavities, are possible.

The fitting piece press DORSA 2000 (special press with sawing lines and placing robot) is the heart of the fitting piece production that runs parallel to the normal sand lime brick production. Autoclaves, hardening cars and transport devices can be used by both systems.

All fitting pieces and plane elements are manufactured without waste at costs comparable to those for bricks made on a “normal” sand lime brick press. The fitting pieces are sawn to the required shapes directly when they are still green and then stacked on hardening cars. Thanks to flexible control programmes, the DORSA 2000 press can cut the sand lime blocks to the required sizes and shapes.

The dimensions of the sand lime elements refer to the contract-specific requirements:

- **Length:** up to 1250 mm
- **Height:** up to 648 mm
- **Wall thickness:** up to 365 mm

### Capacity

<table>
<thead>
<tr>
<th>Product group</th>
<th>Type</th>
<th>Mould opening</th>
<th>Max. brick height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elements</td>
<td>HDP 1200 J</td>
<td>1110 x 772 mm</td>
<td>650 mm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product group</th>
<th>Type</th>
<th>Mould opening</th>
<th>Wall thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fitting pieces</td>
<td>Dorsa 2000</td>
<td>1250 x 650 mm</td>
<td>100 - 365 mm, up to 100 fitting pieces per hour</td>
</tr>
</tbody>
</table>

* Theoretical capacity, depending on the raw materials used. For the capacity per shift, a realistic efficiency factor has to be taken into consideration.
Transfer of the elements to the sawing line.

For the manufacture of large sizes. The element press HDP 1200 J.

The future starts now. The modern manufacture of sand lime fitting pieces and plane elements combine the advantages of precast building elements with all possibilities of individual architecture. This concept represents the future.

Shell built of sawn fitting pieces and plane elements.
Additional processing: Fitting pieces and plane elements.

**Sand lime brick sawing plants**
Masa fully automatic sand lime brick sawing plants combine efficiency with high demands on quality and minimum amount of waste. Using intermediate storage tables in combination with trimming saws reduces the cutting waste to a minimum. The fitting pieces and plane elements are cut to the required size by various techniques. The architects drawings showing the dimensions of the individual fitting pieces are read by the computer programme interface.

The optimum process sequence is controlled via the interfaces. The implemented software package guarantees perfect co-ordination of the following modules:

**Element management**
The element management system for the sand lime blocks is the basis for defining the individual fitting pieces of a wall. Additionally, this reduces waste. The process is designed for the specific capabilities of the sawing plant and an optimum capacity.

**Saw control system**
By means of the machine software (SPS), the sawing sequence of the fitting pieces are determined so that the sawing tasks are executed in an optimum order.
Logistics
Excellent logistics are the basis for the correct processing of tasks. The cutting sequence is recorded in detail, enabling a controlled re-start of the sawing plant.

Individual element sizes, saw control and logistics are implemented into the database-aided client-server system.

Sawing client
• Start and stop of the sawing process
• Overview of the sawing sequence
• Views of elements and pallets

Logistics client
• Composition and sending of sawing tasks
• Visualisation of the task processing

Database server
• Administration of elementing data
• Tracking of current production data
• Data backup
Service: There is no limit to our partnership.

Whether you purchase a complete production line or a single component, it is the start of a long lasting relationship with Masa. Our service does not stop with the handover of the equipment to the customer – but lasts for the lifetime of the machine.

Assembly and commissioning
After delivery, plants are installed and commissioned by our own qualified and experienced engineers.

After sales service
With programmed visits by our experts, a preventative maintenance programme is agreed to maintain high productivity and minimise downtimes.

Training of operators
During the installation and commissioning of the equipment, the operators are given training and familiarisation with all the plant components and after the final test run, should be able to run the plant themselves at the agreed productivity.

Product advice
Masa’s vast experience of manufacturing concrete elements ensures both visual and technical qualities of the finished product.

Service hotline
Masa has a 24 hour Service hotline for the customer to assist in the diagnosis of any malfunctions or when problems in the production system occur.

Online Tele service
Today, technical support for the equipment is provided in most instances online. Updates and programme modifications can also be done via modem/router, without having Masa engineers on site.

Spare parts service
With our flexible system and worldwide spare parts locations, if necessary, we are able to supply quickly and cost effectively within 24 hours, unless the parts have to be manufactured specially.

Machining center

Own fitters: Masa competence on site.
Masa – your partner for the successful production of building materials.
Masa is the world’s leading manufacturer and supplier of plants, machinery and components for the building materials industry. This brochure describes equipment for the manufacture of sand lime bricks – other brochures are also available, giving an overview of capacities, plant layouts and components for the manufacture of concrete blocks, concrete slabs and AAC blocks.

Masa – the one company to talk to for all solutions. A complete range of machinery to produce all types of building materials.

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