



# PLANT AND MACHINES

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Two-, three- und four-sided  
grinding machines

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# Two-, three- and four-sided grinding machines

Grinding machines for block, wedge and plate formats with two vertical grinding units and grinding machines with two vertical and one horizontal grinding unit.

The machines can be designed for dry or wet operation, depending on the material.

## Extensions, options:

- automatic loading and unloading systems, as well as integration into a complete plant
- Robotics
- Quality assurance
- Measurement
- Labelling, marking
- Extraction, water treatment
- Manual or automatic adjustment

## DESIGN ACCORDING TO CUSTOMER REQUIREMENTS

All plants and machines are designed and manufactured according to the specified requirements of the customer and the product.



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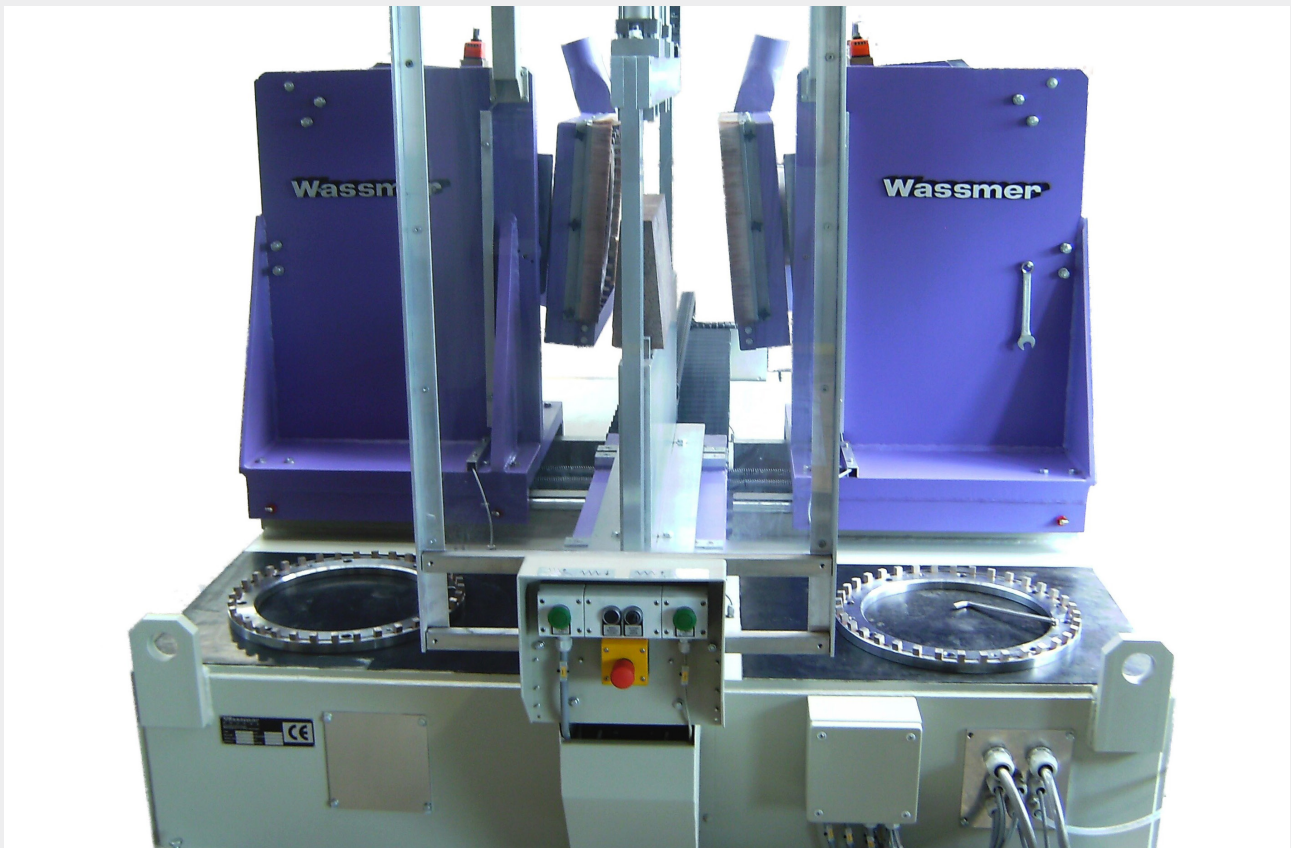
## Double grinding machine DFS-04-RS-K

With this grinding machine, refractory bricks can be milled or ground precisely on 2 sides in a plane-parallel or wedge-shaped manner. The grinding or milling units are mounted on horizontal slides on both sides, which are adjustable via ball screw spindles. 1 milling unit is mounted on each side. The work carriage is mounted on linear guides.

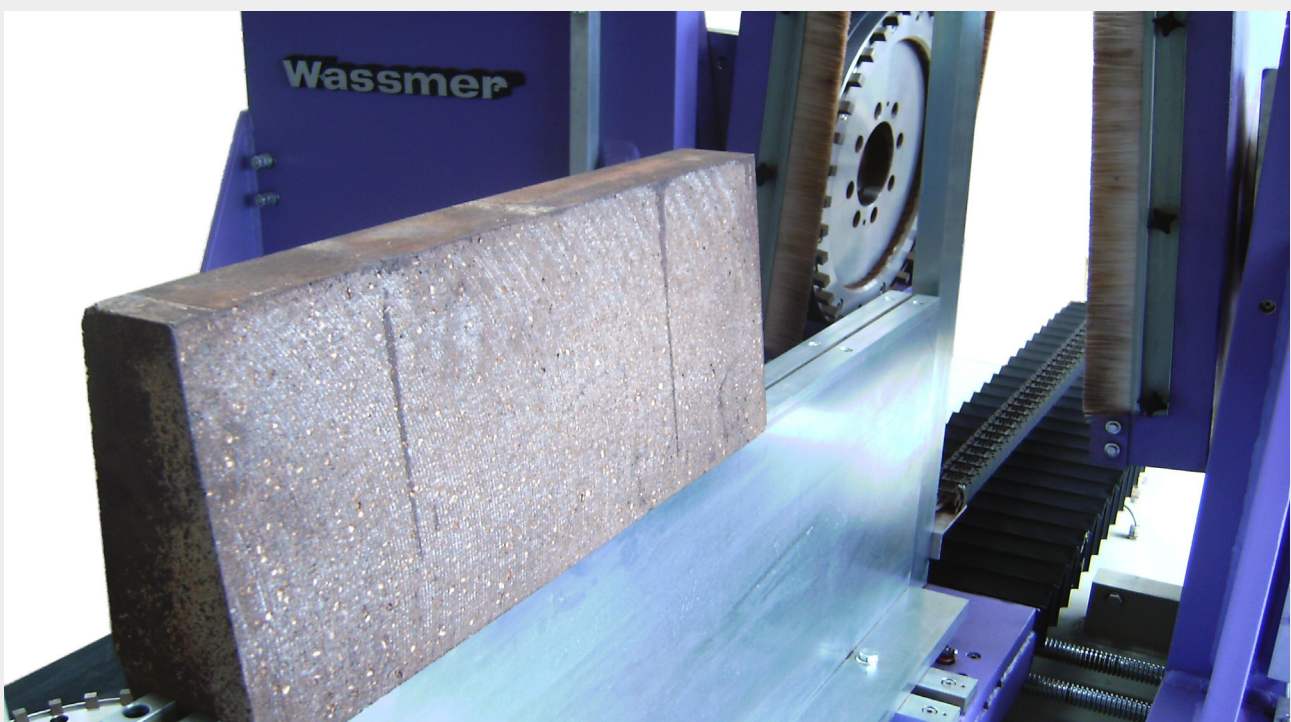
The workpieces are clamped onto the work carriage with a pneumatic clamping device. The bricks can be precisely aligned with two line lasers. The work sequence of the machine is controlled electronically. The processing tools are set to the pre-selected dimension. The forward and backward movement of the work carriage is done by a chain drive. The processing units can be swivelled to process any wedge surfaces.

- Two-sided grinding vertical
- Plane-parallel and wedge formats
- Manual or automatic width adjustment
- Work table with pneumatic clamping device
- Swivel range 0 - 12.5° / manual or automatic
- Grinding tolerance +/- 0.1 mm
- Grinding or milling depending on material
- Dry or wet processing
- Feed via chain, ball screw or toothed rack
- Infinitely variable feed
- Speed infinitely variable
- Control system SPS





## Examples of machines





## Double grinding machine DFS-04-RS-2000

With this grinding machine, refractory bricks can be milled or ground precisely plane-parallel on 2 sides. The grinding or milling units are mounted on horizontal slides on both sides, which are adjustable via ball screw spindles. 1 milling unit is mounted on each side. The work carriage is mounted on linear guides. The workpieces are clamped onto the work carriage with a pneumatic clamping device. The bricks can be precisely aligned with two line lasers. The work sequence of the machine is controlled electronically. The processing tools are set to the pre-selected dimension. The forward and backward movement of the work carriage is done by a ball screw. The machine is designed for large, heavy blocks.

- Two-sided grinding vertical
- Plane-parallel formats
- Manual or automatic width adjustment
- Work table with pneumatic clamping device
- Grinding tolerance  $\pm 0.1$  mm
- Grinding or milling depending on material
- Dry or wet processing
- Feed via chain, ball screw or toothed rack
- Infinitely adjustable feed
- Speed infinitely variable
- Control system SPS





## Examples of machines





## Double grinding machine DFS-04-RS-2

The DFS-04-RS-2 is a double-sided format grinding machine in bridge design for double-sided grinding of blocks and boards in reversing mode. Due to its particularly robust design, it is especially suitable for extremely hard and difficult-to-machine materials.

A bridge is mounted above the machine column, on which the guide elements for the horizontal slides of the grinding units are mounted.

After entering the block dimensions, the work carriage adjusts to the corresponding width and the units automatically adjust the infeed per pass according to the material specification until the target dimension is reached.

The block is manually placed on the work carriage, aligned by the laser light and pneumatically clamped.

Two lateral sensing rollers measure the unevenness of the raw block and thus automatically determine the starting position for the first grinding pass.

- Two-sided, vertical parallel grinding of blocks and plates
- Wet processing
- Fully automatic adjustment of the Grinding unit laterally
- Scanning to determine the start position
- Measuring the blocks Final dimension
- Automatic compensation of tool wear
- Feed drive with ball screw or toothed rack
- Ground supports and automatic clamping device
- Manual or automatic support adjustment
- Grinding tolerance  $\pm 0.2$  mm
- Infinitely adjustable feed
- Speed infinitely variable
- Control system SPS



# Three-sided grinding machine DFS-PSM-900-1600

The 3-sided processing machine DFS/PSM has two vertically arranged grinding units and one horizontal grinding unit for processing large blocks.

The raw blocks must be pre-measured manually and the raw dimension is entered into the control system. The supports on the work carriage and the aggregates adjust themselves automatically. The block is manually placed in the centre of the work carriage of the grinding centre and the clamping device clamps the block. Now the automatic measurement in the machine begins to determine the starting position for the first grinding pass. The grinding centre is designed for simultaneous machining of 3 surfaces in one pass. The raw dimensions have been transmitted by the control and the machining units adjust automatically. The maximum infeed is stored as a recipe in the control. After each pass, the infeed is automatically increased by this value. When the final dimension is reached, the work carriage moves to the removal position. The block must now be manually turned, rotated and reinserted.

The grinding process of the remaining 3 sides begins. After this second processing run, the block is finished grinding on all 6 sides and can be removed.

- 3-sided, vertical and horizontal parallel and angular grinding of blocks and slabs
- 2 vertical grinding units
- 1 horizontal grinding unit
- Wet processing
- Fully automatic adjustment of all grinding units
- Scanning to determine the start position
- Measuring the blocks final dimension from all three sides
- Automatic compensation of tool usage
- Feed drive with ball screw or toothed rack
- Ground supports and automatic clamping device
- Automatic support adjustment
- Grinding tolerance  $\pm 0.2\text{mm}$
- Infinitely adjustable feed
- Speed infinitely variable
- Control system SPS





## Four-sided Grinding centre D4

The grinding centre is equipped with 4 grinding units. The processing is timed in three steps. The first step is the grinding of the first wedge side on the first transport carriage. After this grinding process, the stone is automatically transferred to the second transport carriage and the first transport carriage moves to the starting position and takes over the next stone. Now, in the second step, the second wedge side is ground. The two grinding units can be swivelled horizontally and are arranged individually. The third step is the automatic transfer from the second to the third transport carriage for processing the length. The two units are vertically opposite each other and grind the stones parallel at the same time. Afterwards, the 4-sided grinded stone is automatically transferred to a buffer belt.

The ground supports, the clamping elements and the grinding units are automatically adjusted according to the programme selection.

- Two-sided horizontal and two-sided vertical grinding
- Plane-parallel and wedge formats
- Fully automatic adjustment of the transport slides
- Fully automatic adjustment of the units
- Feed drives with servo and ball screw
- Ground supports and clamping elements
- Swivelling range 0 - 20° / automatic
- Grinding tolerance  $\pm 0.1$  mm
- Dry processing
- Infinitely adjustable feed
- Speed infinitely variable
- Control system SPS

# Three-sided grinding machine with roughing unit

Roughing is carried out before the final cut.

With this procedure, unevennesses of 5mm (for fused cast stones) and 10 mm (for pressed stones) can be removed within 3-4 minutes at once when processing fused cast or pressed glass tank stones.

After roughing, the surface is fine-ground with an allowance of  $\pm 0.5$  mm.

**Advantages:**

- 1. shortening of the processing time per stone by up to 50 %.**
- 2. calculable processing times for large oversizes.**

Time required for the roughing process: 3-4min with a removal of 5 mm measured from the highest point of the surface (for a block size of 1000mm x 1000mm).

The roughing machine can be designed as a stand-alone machine or as an additional unit as part of a two- or three-sided grinding machine.







## Overview of info material:

- Single sided grinding machines
- **Two-sided and three-sided grinding machines**
- CNC-controlled machines
- Sawing machines
- Drilling machines
- Complete refractory systems, technical ceramics
- Complete systems for graphite machining
- Plants for building materials and ceramics
- Lamination machines

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