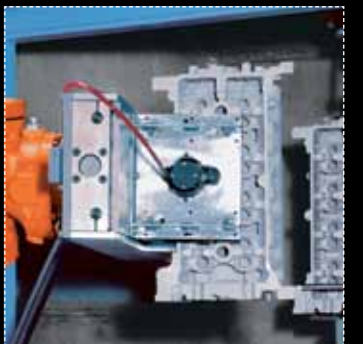
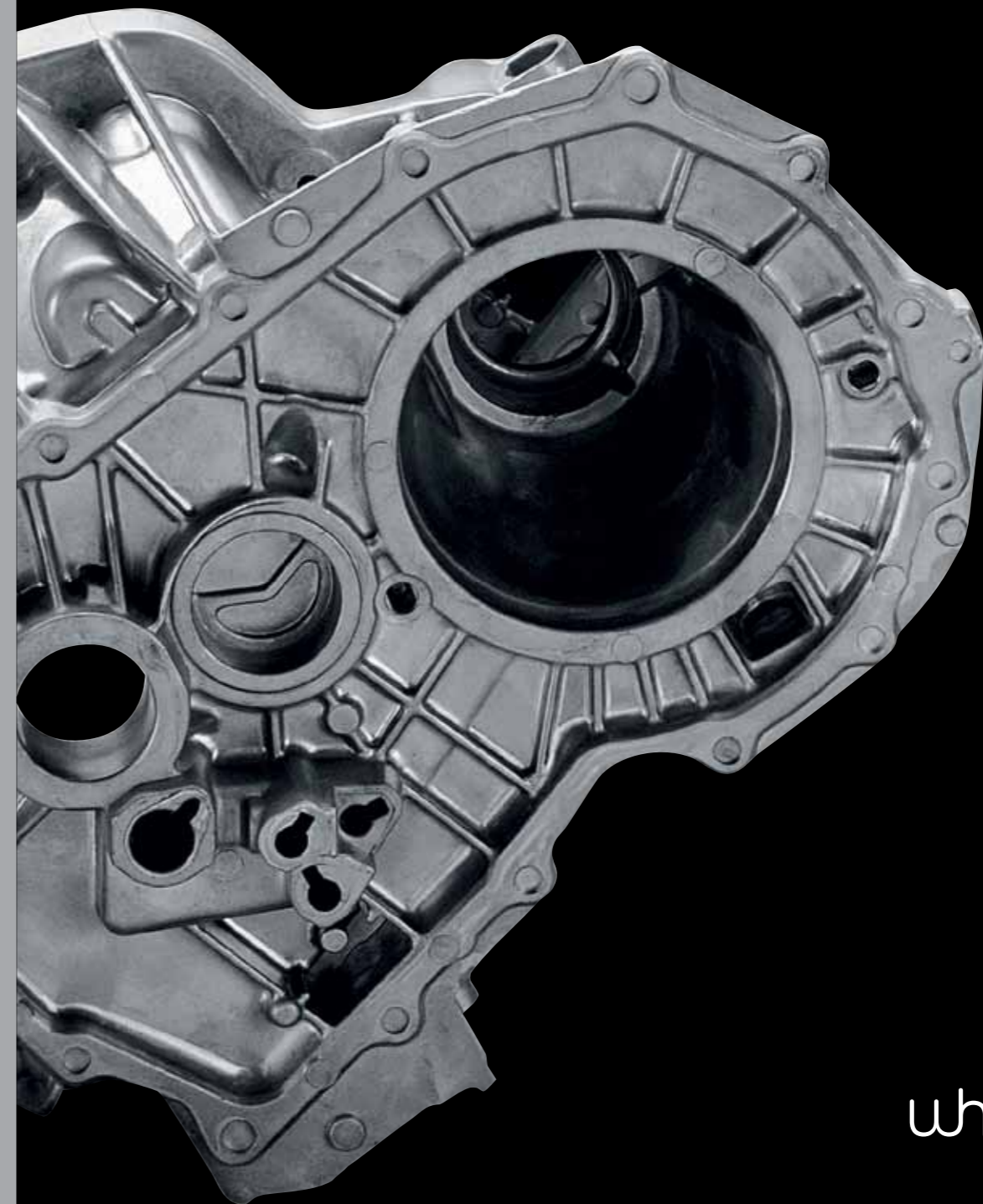


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MAC Robot/Manipulator shot blast systems



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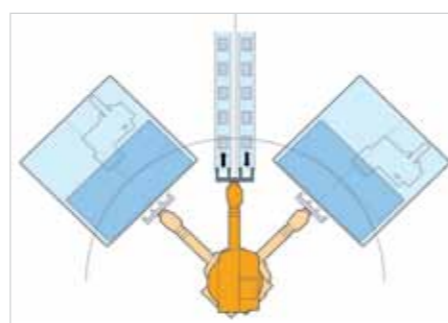
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MAC Shot blast systems for Mg and Al castings



MAC shot blast system



A perfect team: Shot blast machine and robot form one single unit (robot and one or two MAC systems)

Surface finishing of high-tech castings

As light metal is heading forward with an increasing variety of new applications, more stringent demands are placed on the quality and performance of shot blast systems. Hence, foundries in general, and the automotive industry in particular, expect a high degree of process reliability and operational consistency to ensure meticulous finishing of their castings. MAC shot blast systems offer the dependability and capacity necessary to meet these demands. They are fully automatic and very versatile. Consisting

of single or double finishing cells, MAC systems need less space and save costs. Intended for the targeted surface treatment of high-tech castings, the conceptual flexibility of MAC systems facilitates integration into complete production plants. They also feature pushbutton-controlled blast cleaning for different types of specific castings.

Range of applications

MAC systems are primarily designed for deburring and surface finishing aluminium and magnesium castings. Critical areas and complex internal passages are perfectly cleaned.

High cleaning efficiency



System configuration

MAC shot blast systems work in combination with an industrial robot, equipped with a double manipulator assembly, that handles the castings. Handling includes loading, unloading, and shot evacuation. The approximate hourly throughput is 200 castings in single cell mode, depending on their complexity. The concept offers the following advantages:

- Simultaneous operations: During shot blasting, other processes, such as shot evacuation, pickup or delivery of the castings, etc., can be run simultaneously.

- Operation overlap and the double manipulator assembly serve to shorten overall cycle times and allow for extending individual cycle phases, such as the blasting time.
- Robot gripping tools and robot arm are not exposed to the blasting stream. This minimises wear and dynamic load.
- The shot-blast machine is equipped with simple access doors provided with simple sealing elements.

Result: Maximum utilisation and protection of all structural elements and machine components help to reduce running costs.

A. Sequence of simple consecutive operations:

Loading	Shot blasting	Shot removal	Unloading	Delivery/pickup	End of cycle
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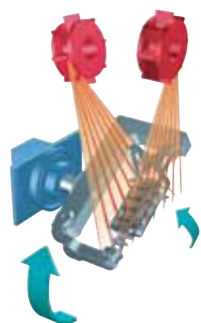
B. Simultaneous operations (MAC):

Robot	Unloading/loading	External shot removal	Delivery/pickup	Unloading/loading	External shot removal	Delivery/pickup	End of cycle
Shot blast machine	Unloading/loading	Shot blasting	Unloading/loading	Shot blasting	End of cycle	End of cycle	End of cycle

C. Simultaneous double operations (2 x MAC):

Robot	Unloading/loading 1	Delivery 1/pickup 2	Unloading/loading 2	Delivery 2/pickup 1	Unloading/loading 1	Delivery 1/pickup 2	End of cycle 2
Shot blast machine 1	Unloading/loading 1	Shot blasting 1	Intern, shot removal 1	Unloading/loading 1	Shot blasting 1	End of cycle 1	End of cycle 2
Shot blast machine 2	Shot blasting 2	Intern, shot removal 1	Unloading/loading 2	Shot blasting 2	Intern, shot removal 1	End of cycle 1	End of cycle 2

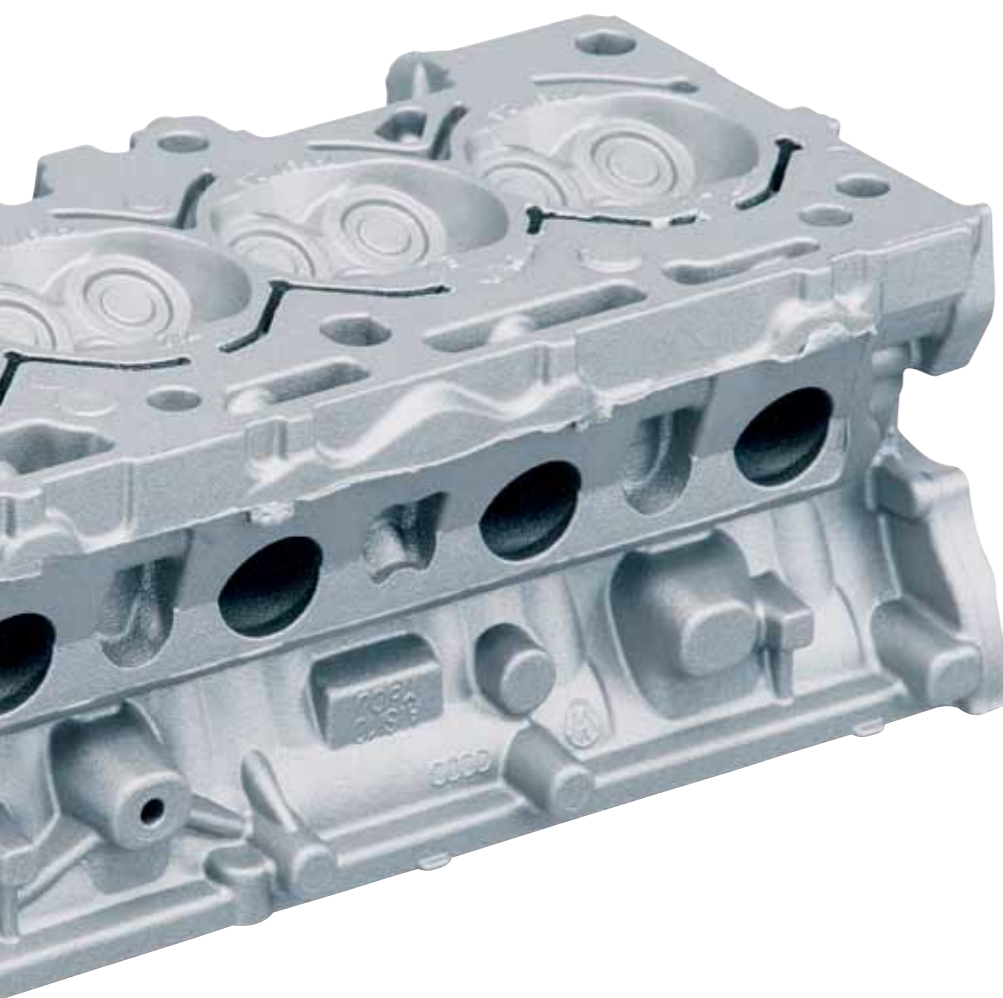
MAC Robot/Manipulator shot blast machine



"MAC MOVE" All-round flexibility in 2 axes



The double manipulator assembly permits loading and unloading within seconds

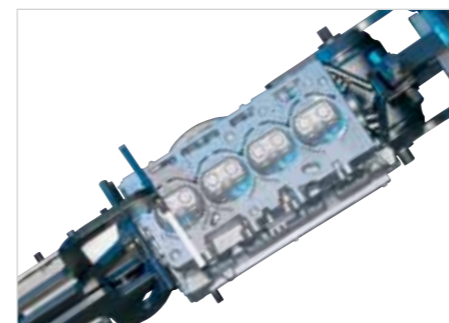


Optimised blast cleaning to suit specific types of castings

The heart of the machine is the shot blast housing with three position options for 2 or 3 blast wheels. The unit comprises a manipulator-type holder with two clamping arms – one stationary and one moving – to clamp the workpiece. Self-adjusting pressure springs firmly hold the workpiece in place and retain it even during a power failure. Replacement of the wear-resistant clamping and gripping tools is fast and simple. In the manipulator-type holder the workpiece rotates around two axes at the same time. Individually controlled cycle speeds and programmable swinging and stopping motions ensure unvarying precision and repeatability of the different cycle phases and the cleaning effect, plus the, continuous removal of shot from cavities and internal passages. The blast wheels can be arranged in three positions.

Result: Maximum workpiece mobility and distinct workpiece specific blast finishing.

An all-round perfect surface finish



Loading and unloading position



Rotation around the longitudinal axis of workpiece



Simultaneous clockwise or anti-clockwise rotation

The operating cycle

The robot with the double manipulator assembly, holding an uncleaned workpiece, moves into the machine. It then seizes a cleaned workpiece and moves it out of the working area of the manipulator. The manipulator can then be loaded with an uncleaned workpiece. The access doors of the machine close as soon as the robot arm has retracted. The uncleaned part undergoes shot blasting while shot is continuously removed from its internal passages.

The workpiece fixed in the manipulator rotates around its longitudinal and transverse axes in front of the blast wheels for thorough shot blasting of all surfaces and internal passages. Servomotors and rotary encoders control the exact position of the workpiece. Rotational speeds are set to meet individual finishing requirements. Residual shot can be evacuated inside or outside the machine. The cleaned workpiece is placed on a conveyor.

Advantages of the system

- Selective exposure to the blasting stream for maximum blasting effect and energy efficiency
- Targeted blasting of critical surfaces, cavities and internal areas
- Reduced shot consumption, minimised wear, lower maintenance cost
- Pushbutton-controlled programming from the operator panel
- Complete shot removal inside or outside the machine
- Shot blasting compartment tightly sealed off by sliding doors

The blast wheels

2 or 3 blast wheels are used for blast cleaning. Wheelabrator blast wheels are renowned for high capacity and maximum energy efficiency. Abrasive feed and dosing can be controlled from the operator panel as required. The abrasive is mechanically pre-accelerated and delivered to the throwing blades in a continuous stream. This ensures optimal utilisation of the power of the drive motors.



- 1 Wheel body
- 2 Control cage
- 3 Impeller
- 4 Blade

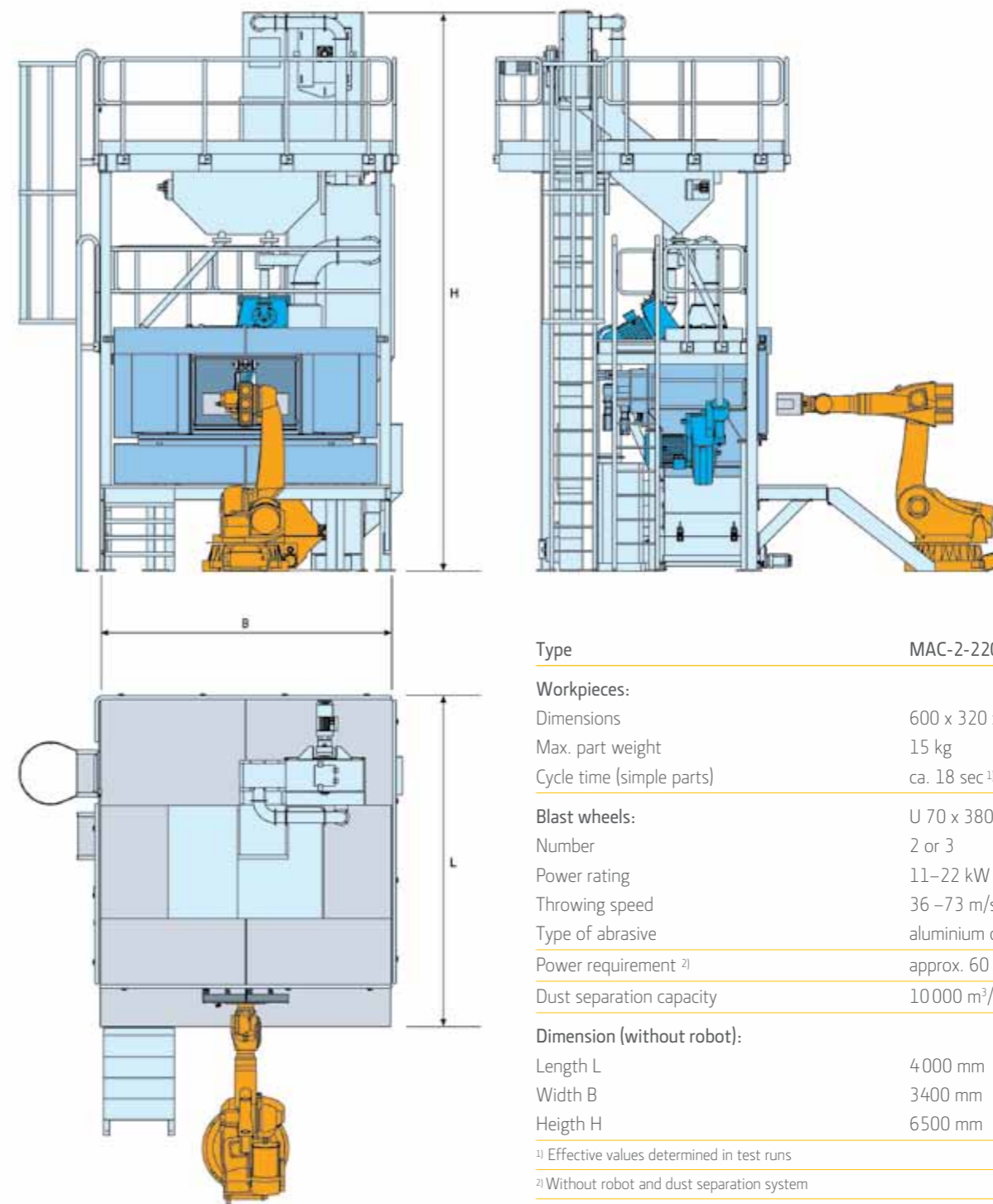
Maintenance friendly, safe and reliable



The compact, space-saving components and structure of the shot blast system facilitate fast on-site assembly and integration into existing production plants. All components, such as the shot blasting chamber, the blast wheels, and the manipulator, consist of carefully selected, wear-resistant materials to ensure long service life. Wheelabrator blast cleaning systems have exceptional design features, such as specially selected protective linings to shield the blasting chamber from abrasive impingement. Close manufacturing tolerances allow for fast installation and removal of wear parts. Only original wear parts and spare parts made of high-quality material are fully compatible with Wheelabrator shot blast systems and are tailored to suit specific applications. Integrated platforms and easy access serve to facilitate maintenance work. The system can be run without any operating personnel. Only periodic inspections are required.

The system is designed to accommodate specific requirements for the shot blasting of aluminium and magnesium castings. The pneumatic separation system, for instance, is situated underneath the shot blasting chamber to prevent metallic dust accumulation. In combination with an optional wet filter the system design complies with prevailing explosion proof guidelines.

Technical Data



Type	MAC-2-220
Workpieces:	
Dimensions	600 x 320 x 320 mm
Max. part weight	15 kg
Cycle time (simple parts)	ca. 18 sec ¹⁾
Blast wheels:	U 70 x 380
Number	2 or 3
Power rating	11–22 kW
Throwing speed	36–73 m/sec
Type of abrasive	aluminium or steel
Power requirement ²⁾	approx. 60 kW
Dust separation capacity	10 000 m ³ /h
Dimension (without robot):	
Length L	4 000 mm
Width B	3 400 mm
Height H	6 500 mm

¹⁾ Effective values determined in test runs

²⁾ Without robot and dust separation system