

AUTOMATIC GRINDING

MAUS





FLEXIBLE MACHINES



ROBOTISED CELLS

FLEXIBILITY AND PRODUCTIVITY: THE EXCLUSIVE ADDED VALUE OF AUTOMATIC GRINDING

One of the hi-tech areas in which MAUS excels is automatic grinding, a sector in which the company has a consolidated reputation for setting the worldwide benchmark. Indeed, MAUS is the only company anywhere in the world that is able to offer a comprehensive range of products and solutions for the automatic grinding of parts weighing from 1 kg (2.2 lb) to 10000 kg (22000 lb). The range can be adapted to meet the full spectrum of scales of production, from low volumes - where the highest levels of flexibility are required - to medium and large volumes.

Thanks to the experience accumulated over the course of twenty-five years in the industry, MAUS is able to provide:

- Flexible grinding machines
- Robotised grinding cells
- Grinding cells for the automotive industry
- Combined grinding cells
- Integrated grinding cells
- Turnkey systems.

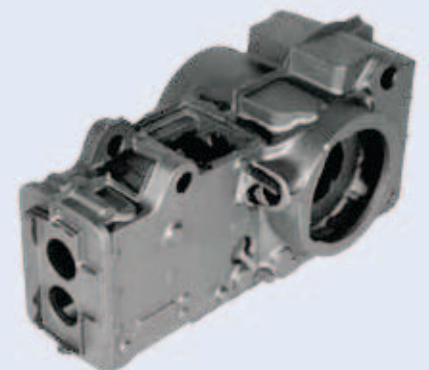
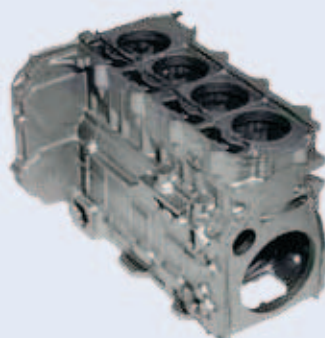
The exclusive added-value solutions delivered by MAUS have what it takes to meet the increasingly in-depth requirements of end users in terms of the **manufacture of parts with extremely competitive unit costs.**

These solutions feature:

- very high levels of flexibility,
- unrivalled versatility,
- high levels of productivity,
- excellent reliability,
- consistent finishing quality.

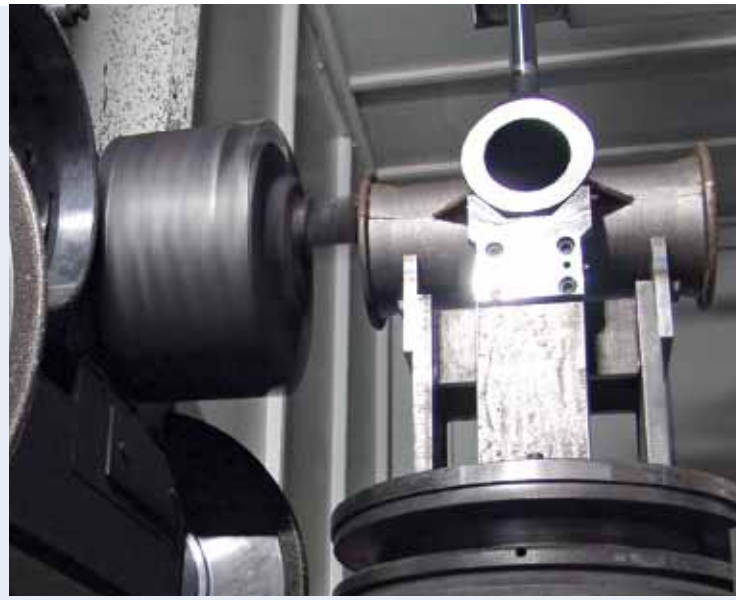
The main sectors of application include: job foundries, captive foundries, automotive, municipal works, fittings, railway and special applications.

	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
SAM JB Series	1-800	1764	2000	80	800	32
ROBOGRIND Series	1-10000	22000	3000	120	2000	80
SAM AUTO Series	1-800	1764	1500	60	800	32
SAM COMBI Series	1-800	1764	1600	63	800	32
SAM HYBRID Series	1-800	1764	1600	63	800	32





GRINDING CELLS FOR THE AUTOMOTIVE INDUSTRY



COMBINED MACHINES

The in-depth analysis carried out by MAUS on the actual requirements of the market has led to the conviction that there is no such thing as the perfect solution to meet all the different manufacturing requirements - rather, there are specific production approaches for which the right solution has to be provided on a case-by-case basis.

In this context, MAUS focuses on providing the solution that is best suited to the specific requirements of the customer: the only real objective is to guarantee the production of the parts with extremely competitive unit costs. Alongside grinding, MAUS also offers other mechanical machining such as turning, drilling, milling, measuring, calibration, control and automatic handling of parts.

This makes it possible for MAUS to increase the added value conferred upon the part, thereby providing the customer with the advantage of being able to see, in an even shorter timeframe, the return on its investment.

MAUS: AUTOMATIC GRINDING SOLUTIONS THAT NEVER STOP



AUTOMATIC GRINDING



SAM: FLEXIBLE GRINDING MACHINES

SAM flexible grinding machines are particularly suited to the production of small and medium-sized production batches, for parts with a unitary weight of between 1 kg (2.2 lb) and 800 kg (1764 lb). The remarkable flexibility of the range enables the complete grinding of the part in the machine, as well as facilitating rapid change-over while the machine is running and easy off-line programming.

SAM automatic grinding machines offer high levels of rigidity and excellent material removal capacity, with spindle power from 3 kW (4 hp) to 150 kW (200 hp).

As an optional extra, SAM machines can be fitted with a laser to match the part being processed; in this way, it is possible to monitor and compensate automatically the tolerance of the casting, achieving an increase in the added value conferred upon the part due to the greater precision of the processing operation and, therefore, of the ground part.

Moreover, SAM machines are able to cut the risers automatically for parts up to 800 kg (1764 lb), thus reducing significantly the cost of the operation.

	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
SAM JB 300	20	44	450	18	250	10
SAM JB 600-G	150	330	850	34	450	18
SAM JB 1200-L	250	550	1200	47	650	26
SAM JB 1600-U	800	1764	1600	63	800	32
SAM JB 2000-U	600	1322	2000	80	800	32





ROBOGRIND: ROBOTISED GRINDING CELLS

With ROBOGRIND range, MAUS has leveraged all of its years of experience in the sector, applying its expertise to robots that can manipulate either the part being processed or the tool carrying out the processing operation. The company's expertise has made it possible to extend its grinding solutions to include automated robotised process for single parts weighing up to 10000 kg (22000 lb). The robotised solution affords high versatility, which is particularly useful in relation to the production of similar structure. This allows the end user to have access to a solution that benefits from unmanned production, with fully automated handling and palletisation. Wherever possible,

the robotised cell enables the user to organise the manufacturing operations with minimal supervision: the part is identified, loaded, ground and then replaced on the conveyor or pallet, ready for the subsequent operations. The input of the operator is thus reduced to a minimum and is almost exclusively geared towards guaranteeing the correct logistics of the cell, at the input (unprocessed parts) and output (ground parts) stages. Robot and flexible grinding machines enable the resolution of a multitude of manufacturing issues relating to feasibility,

economic viability and the safety of the working environment and of complex tasks that can be only carried out with recourse to specialist manpower, which is becoming increasingly difficult to source.

The robotised solution is particularly suited to the grinding of large, heavy parts, where it is preferable to manipulate and orient the tool rather than the part itself. This option is made possible thanks to the availability of robots with wide operational fields and payload capacity for fixtures and tools of up to 1500 kg (3300 lb).

ROBOGRIND Series	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
ROBOGRIND Series	1-10000	2-22000	3000	120	2000	80



AUTOMATIC GRINDING



SAM AUTO: GRINDING CELLS FOR AUTOMOTIVE

Globalisation demands that ever-greater attention be focused on the reduction of cost - an objective that can be reached to the automation of the processes of forming, the production of cores and other and other operations, since grinding is one of the most expensive manufacturing operation and also because it is so difficult to source the specialist manpower required.

MAUS offers a range of grinding machines and cells called SAM AUTO, which afford the possibility

for small- medium and large production batches at the lowest cost per part and with the fastest cycle time up to 500 parts per hour for brake discs and up to 300 parts per hour for engine blocks.

The parts processed by the SAM AUTO range are: engine blocks and heads, crankshafts, turbochargers, exhaust manifolds, brake discs and drums and wheel hubs.

Based on the size of the production batch, MAUS proposes solution with SAM-series machines or with grinding cells and lines that are custom-designed to meet the specific requirements of the project. These systems can be equipped with automatic loading and unloading of parts, tool magazines and other features to reduce the intervention of the operator to the minimum.

	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
SAM 300-D	60	132	500	20	300	12
SAM 500-P	120	265	650	26	450	18
SAM 1000-P	300	660	800	32	600	24
SAM-HV	150	330	700	28	500	20
SAM-HD	800	1764	1500	60	800	32





SAM COMBI: COMBINED GRINDING MACHINES

With SAM COMBI range of machines, MAUS offers yet another set of solutions for the automatic grinding of small and medium-sized production batches. These machines include an additional processing operation that makes it possible to avoid having to transfer the part to other production centers. The additional mechanical finishing operations are: turning, drilling, milling and tapping. The SAM COMBI solution enables the customer to carry out , within the same machine the set of processing operations that are complementary to grinding, thereby markedly increasing the added value of the ground part.

In this way, SAM COMBI guarantees that the customer benefits from the optimisation of its investment, rendering the purchase of complementary machinery unnecessary. Moreover, SAM COMBI also reduces the cost of the fixtures, which in this instance are produced for a single machine, and it also reduces the time-to-market,

thanks to a drastic reduction in the direct manufacturing times and the lead times. Moreover, it also lowers the handling costs of the part, which does not need to be transferred from one machine to another. The parts processed on the SAM COMBI include: valves, fittings, manhole covers, compressors and much more besides.

	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
SAM 600 COMBI	150	330	850	34	450	18
SAM 1200 COMBI	250	550	1200	47	650	26
SAM 1600 COMBI	800	1764	1600	63	800	32



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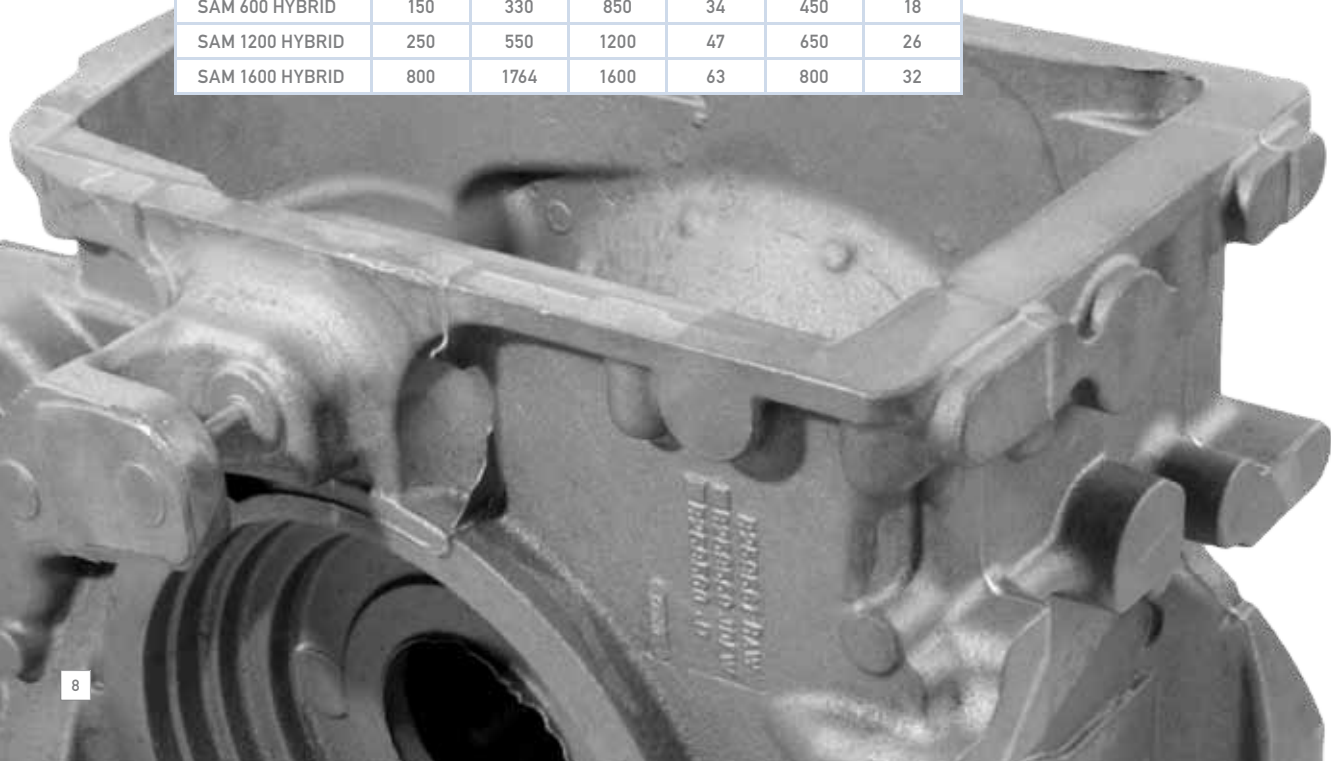


SAM HYBRID: INTEGRATED GRINDING MACHINES

Certain foundry parts need multiple operations to be carried out, from the cutting of risers to internal and external grinding. This variety of functions requires the machine to have many characteristics, such as great rigidity, high power installed and versatility of tool positioning.

This made it effective to integrate the functions of the SAM series with those of the ROBOGRIND series, making it possible to carry out various processing operations simultaneously, thereby reducing the cycle times and, therefore, the cost of grinding.

	Max. part weight		Swing		Max. part height	
	kg	lb	mm	inch	mm	inch
SAM 600 HYBRID	150	330	850	34	450	18
SAM 1200 HYBRID	250	550	1200	47	650	26
SAM 1600 HYBRID	800	1764	1600	63	800	32



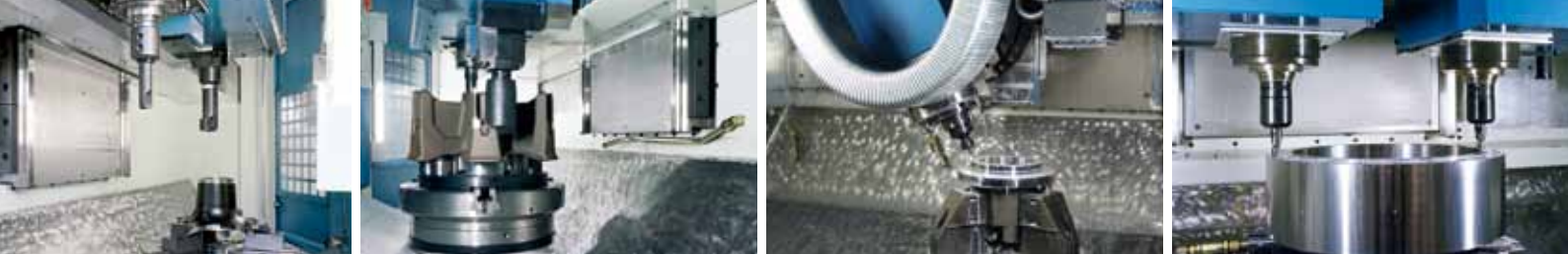


TURNKEY SYSTEMS

MAUS provides the most effective solution for automatic grinding, both in terms of the types and weights of parts processed and in terms of the production layout. MAUS's solutions guarantee cost-effectiveness, making it possible to achieve the most competitive cost per part, thus generating the highest level of profitability throughout the life of the system. By working closely with the customer, MAUS is able to offer a

complete range of solutions that includes the automatic handling of the parts, integrated mechanical machining, measurement and control operations and, last but not least, the end-to-end flow of the manufacture of the part. By analysing the customer's specific needs, MAUS is able to come up with the most effective response.





MECHANICAL MACHINING: ADDED VALUE TO FOUNDRIES

Foundries are being asked more and more often to provide processed castings and assembled groups. Therefore, it is becoming increasingly necessary to carry out the mechanical machining of parts, increasing their added value with a view to making the entire production process more competitive. In order to meet these requirements, MAUS now offers - alongside grinding - a complete range of MTM series multitasking vertical lathes and flexible machining lines for brake discs, brake drums, wheel hubs, flywheels, bearings, gears and much more besides. The MTM series guarantees the widest possible versatility, integrating processes that are complementary to turning, such as: drilling, tapping, milling and measuring.



MTM Series			300 - 500 - 1000	
Max. turning diameter	mm	inch	200 - 1000	8 - 40
Max. turning height	mm	inch	200 - 500	8 - 20
Swing	mm	inch	600 - 1400	24 - 55
Spindle torque	Nm	lb*ft	1000 - 24000	737 - 17680
Max. loading capacity	kg	lb	300 - 3500	660 - 7700
Tool magazine positions		N.		14 - 100

Moreover, the MTM series delivers high levels of productivity and reliability, high precision, exceptional flexibility thanks to the integrated automation of pallet changer and automatic tool magazine and easy and fast change-over, as well as unrivalled containment of the manufacturing costs. The application sectors are: energy, automotive, general mechanical parts.





SERVICE: CUTTING-EDGE TECHNOLOGIES TO GUARANTEE EFFICIENT PRODUCTION

SERVICE

MAUS develops a wide range of services with high levels of added value that are geared towards the correct utilisation of the installed machines and systems. The solutions cover everything from the initial phases of the customer's decision-making process all the way to those concerning the commissioning of the production system.

After the installation of the systems, MAUS continues to supply the customer with reliable support services throughout the warranty period and even beyond, through a series of targeted inspection visits. All relevant technological innovations are communicated to the customers, so that the investment retains the highest possible value and benefits from constant technological updating.

TRAINING CENTER
On a regular basis, MAUS holds in-depth refresher courses on the utilisation of its systems. These courses are run by specialist personnel and are geared towards maintaining a constant flow of know-how from MAUS to its customers.

PRODUCT MANAGEMENT, INSTALLATION AND START-UP
Technical consultancy on the process and optimisation of "turnkey" solutions.

POST-WARRANTY SUPPORT
Teleservice, immediate worldwide availability of spare parts, on-site technical support.

PREVENTIVE MAINTENANCE
Checking the general condition and performance of the installed machines, preventing slow-downs in the production chain.

TECHNOLOGICAL UPGRADES
Consistent upgrades of the processes and performance of the installed machines and systems.



PRODUCTION PROGRAMME

AUTOMATIC GRINDING



VERTICAL TURNING - FLEXIBLE LINES



VERTICAL TURNING - MULTITASKING MACHINES



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