HERZOG

Automatic milling machine HS-F 1000

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Compact and robust design

Setting the standard for automated sample preparation

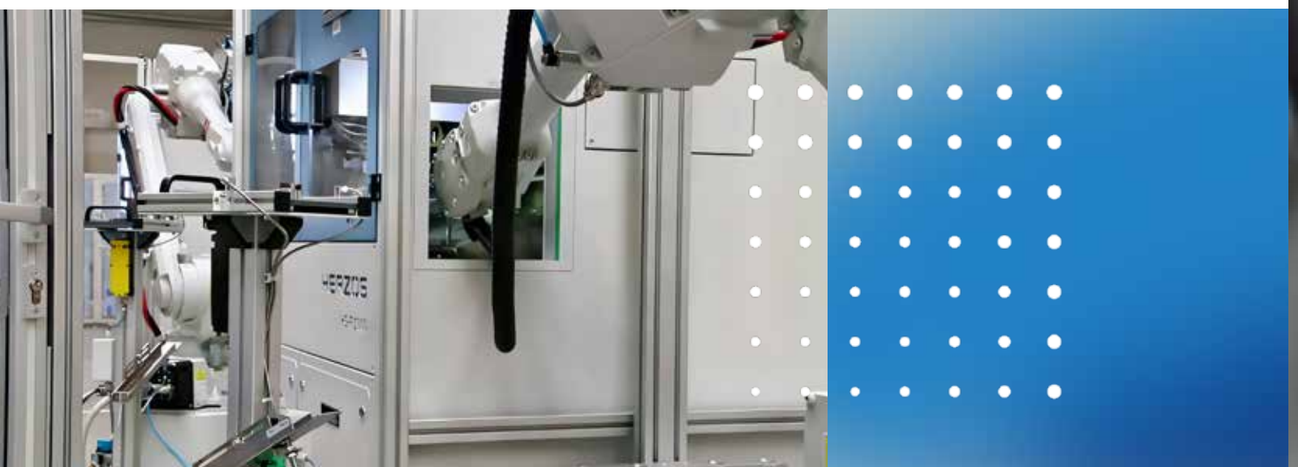
Automatic Milling Machine

The HS-F 1000 is an automatic milling machine that sets the standard for automated sample preparation. It delivers maximal quality, reliability, and flexibility with minimal processing times.

Designed for compact installation in laboratories and container-robot systems, it combines innovative technology with a robust and space-saving design. The HS-F 1000 is ideal for quality control with easy automation and exceptional performance.

Specially Designed for Sample Preparation and Quality Control

The milling machine HS-F 1000 combines innovative technology and full flexibility with compact and robust design. Key features are shortest preparation time, easy automation, and top-level quality- at an unbeatable price. The HS-F 1000 has been specially developed for requirements of QC laboratory with all the decade-long HERZOG expertise in engineering and sample preparation.



HS-F 1000

Ideal for quality control with easy automation and exceptional performance.

Speed

The operator, the robot or a linear conveyer drops the sample at the transfer position of the HS-F 1000. As the HS-F 1000 mills the bottom sample surface, the sample is already in a defined zero plane position. Time consuming measurement of sample height is therefore not needed. Subsequently, the mobile support -coming from above- clamps the sample and transfers it to the milling spindle where it is milled from below. This sequence -speed-optimized in all sub-steps- is saving valuable seconds which is especially important for time-sensitive production samples.

Flexibility

The design of the HS-F 1000 guarantees high flexibility to meet the particular needs of the customer. During manual operation, the operator inserts samples via the front door. The default input position is on the left machine side but might be easily changed to the right side. In automatic mode, samples can be inserted either via the lateral or the back-loading openings using a robot or a linear conveyer. The different access possibilities open up many options to integrate the HS-F 1000 in any kind of automation setup.

Compactness

The HS-F 1000 is a very compact machine that allows an uncomplicated installation even in tight locations and compartments. The volume of the HS-F 1000 is significantly smaller than standard CNC mills used for sample preparation. During installation, machine dimensions permit an uncomplicated transport through regular industry doors.

In container labs, the HS-F 1000 easily fits into standard cabins and gives you more leg and elbow room. In larger robot cells, the small machine base provides space for more and bigger equipment to be integrated in the automation.

Easy Maintainability

Despite the small machine size, the HS-F 1000 has an excellent serviceability and accessibility. The interior has been optimized to guide all chips fallen off into the front chip containers for manual or automatic removal. Comfortable access can be made to the main machine parts including spindle, motors and v-belt for maintenance, exchange, and repair. Switch cabinet and majority of pneumatic components are located at the rear side and are easily reachable for operators and service engineers.

Stability

Due to simulation-based design methods the HS-F 1000 has been optimized for sample preparation purposes. The machine frame is characterized by FEM-optimized shape and perfect damping through mineral composite casting.

This leads to significantly reduced vibration levels and brilliant milling results even for extremely brittle pig-iron samples and enables a longer service life for the milling tools.

Designed for Smart Industry Solutions

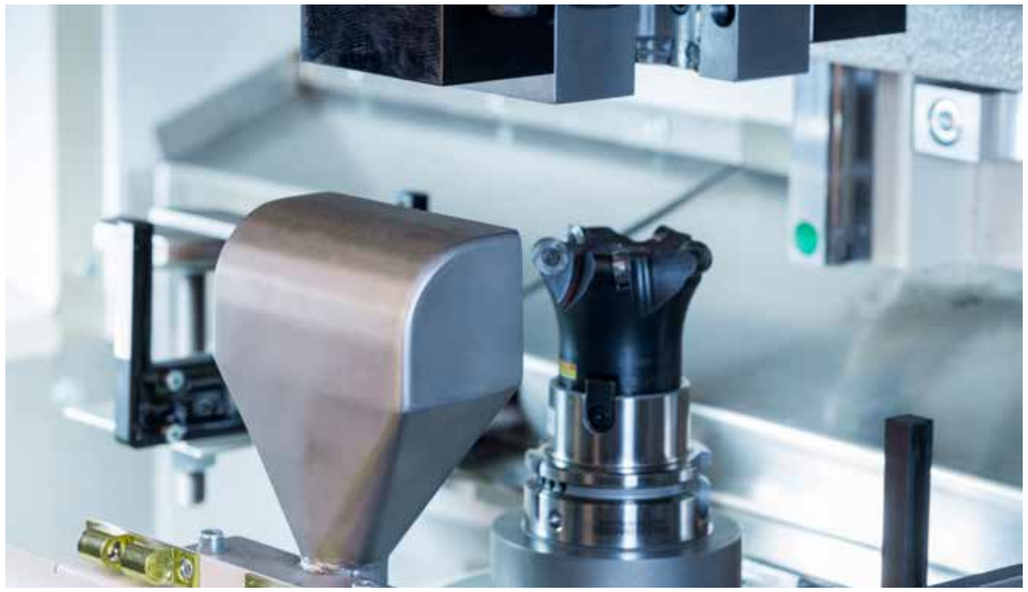
The HS-F 1000 is designed for smart industry solutions and enables tool condition monitoring and predictive maintenance. This improves the service life and analytical performance of the laboratory. Intelligent sensor and vision technology in combination with the PrepMaster Analytics software make it possible to automatically monitor the wear level of the cutting tips of the milling tool used.

If necessary, a tool change can be initiated fully automatically without operator intervention.
In addition, milling processes in which the required milling depth has not been obtained due to various reasons can be detected fully automatically.

Automatic Chip Collection for Combustion Analysis

Two different systems are available for the collection of chips used for combustion analysis. The chips produced by the plane cutter head used for sample processing can be collected by a funnel device and fed into a cup or pneumatically into a turntable magazine. These spiral shaped chips are particularly suitable for manual combustion analysis.

For automatic combustion analysis, we have developed a special chip module that produces short chips with a granular morphology using a cylindrical milling cutter. These chips are particularly easy to handle and dose. The chips can either be collected in a cup or pneumatically transferred to a turntable magazine or the CNS Lab for fully automatic analysis.



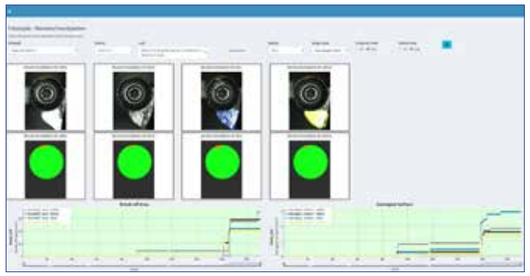
Numerous Options

The HS-F 1000 offers numerous options and can be flexibly configured for all customer applications. The four-position tool changer integrated in the machine (optional) provides the necessary milling cutters to cover all applications within a laboratory. If additional tools are required, these can be accommodated in an optional external 6-position tool changer. In this case, the milling tools are changed with the help of the robot via the side access of the HS-F 1000.

Samples can be fed into automatic systems not only by means of a robot, but also via linear handling systems from the side or via backloading access. Input and output magazines can also be integrated.

The HS-F 1000 can be adapted for processing non-ferrous samples, e.g. from the aluminum sector. For this purpose, a spindle motor with higher rotational speeds is used and the machine interior is retrofitted to handle the lighter chips.

Waste chips can be automatically removed from the HS-F 1000 by means of a pneumatic system. If required, a briquetting press can be connected.



PrepMaster Vision dashboard for wear detection of cutting chips

The machine interior can optionally be monitored with up to two cameras. In the event of a fault, the buffered video footage can be used to carry out a simpler and more targeted error analysis via the PrepMaster Analytics software.

Design Options

- PrepMaster Analytics TCM module HS-F 1000
- PrepMaster Vision module for wear detection of cutting tips
- Internal four-position tool changer
- External 6-position tool changer
- Deburring tool for round samples
- Sample feeding via linear handling systems (side and backloading)
- Chip collection device for plane cutter head (combustion analysis)
- Chip module for granular chips (combustion analysis)
- Pneumatic chip transport, storage in rotary disk magazine (combustion analysis)
- Pneumatic chip transport, connection to CSNLab (combustion analysis, granular chips)
- Equipment variant for processing of non-ferrous samples
- Integrated camera
- Automatic removal of waste chips with connection to a briquetting machine

Technical Description

Model	**HS-F 1000**
Color	RAL 5007/7035
Documentation	1 set English/German
Dimensions	**L x W x H**
Machine	Approx. 1300 mm x 1000 mm x 1900 mm
Machine incl. packing	Approx. 2250 mm x 1400 mm x 2430 mm
Weight	
Machine	Approx. 2200 kg
Machine incl. packing	Approx. 2500 kg
Power supply and consumption	
Voltage	400 V, 50 Hz, 3 phases, or as required
Neutral conductor	Not required
Power consumption	Approx. 17 kVA
Compressed air supply and consumption	
Pressure	Min. 5 bar, max. 10 bar
Consumption	Approx. 750 dm^3N per sample
Sample clamping device	
Type	2 parallel clamping jaws, self-centering
Clamping region diameter	30-55 mm, other on request
Clamping region thickness	7-60 mm, other on request
Processed samples	
Material	Steel, iron and non-ferrous
Form	Round, oval, double thickness after pin cutting, square samples with two parallel clamping faces
Sample hardness	Max. 65 HRC depending on the cutting tips
Processing parameters	
Cutting depth	Max. 2 mm programmable in steps of 0.05 mm
Processing cycle duration	Depending upon the program Approx. 18 s
Processing programs	
Numbers	16, more on request
Sample cooling	
Cooling type	By means of cooling nozzles
Cooling media	Compressed air
Sample input and discharge	
Input method	Manual at the supporting point Optional with a linear transport or robot system
Discharge method	Manual at the supporting point Optional with a linear transport or robot system

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