

## 卓越磨削高性能 创新五轴新技术

FOR PERFECT GRINDING  
INNOVATIVE 5 AXIS TOOL GRINDING TECHNOLOGY



**哈维马工具磨床有限公司**  
HAWEMA WERKZEUGSCHLEIFMASCHINEN GMBH



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公司官网 Website

本企业产品不断改进, 如有变动恕不另行通知, 产品配置以双方签订合同技术协议为准



# 公司简介 ABOUT HAWEMA

哈维马工具磨床有限公司总部位于德国图宁根市，德国总部是哈维马系列产品的生产研发基地以及欧洲销售服务中心。哈维马数控机床畅销全球20多个国家，拥有德国(欧洲地区总部)、中国(亚太地区总部)等多个技术服务中心和区域专业团队。

哈维马不仅是一家高端精密磨削机床生产商，同时也是一家为医疗行业、电子工业、汽车工业、金属加工等领域提供刀具精密磨削技术和专业刀具一体化解决方案的服务商。

哈维马机床的核心是精密运动控制系统，该系统获得了全球范围内的专利，也是各种刀具磨削的精度保障。

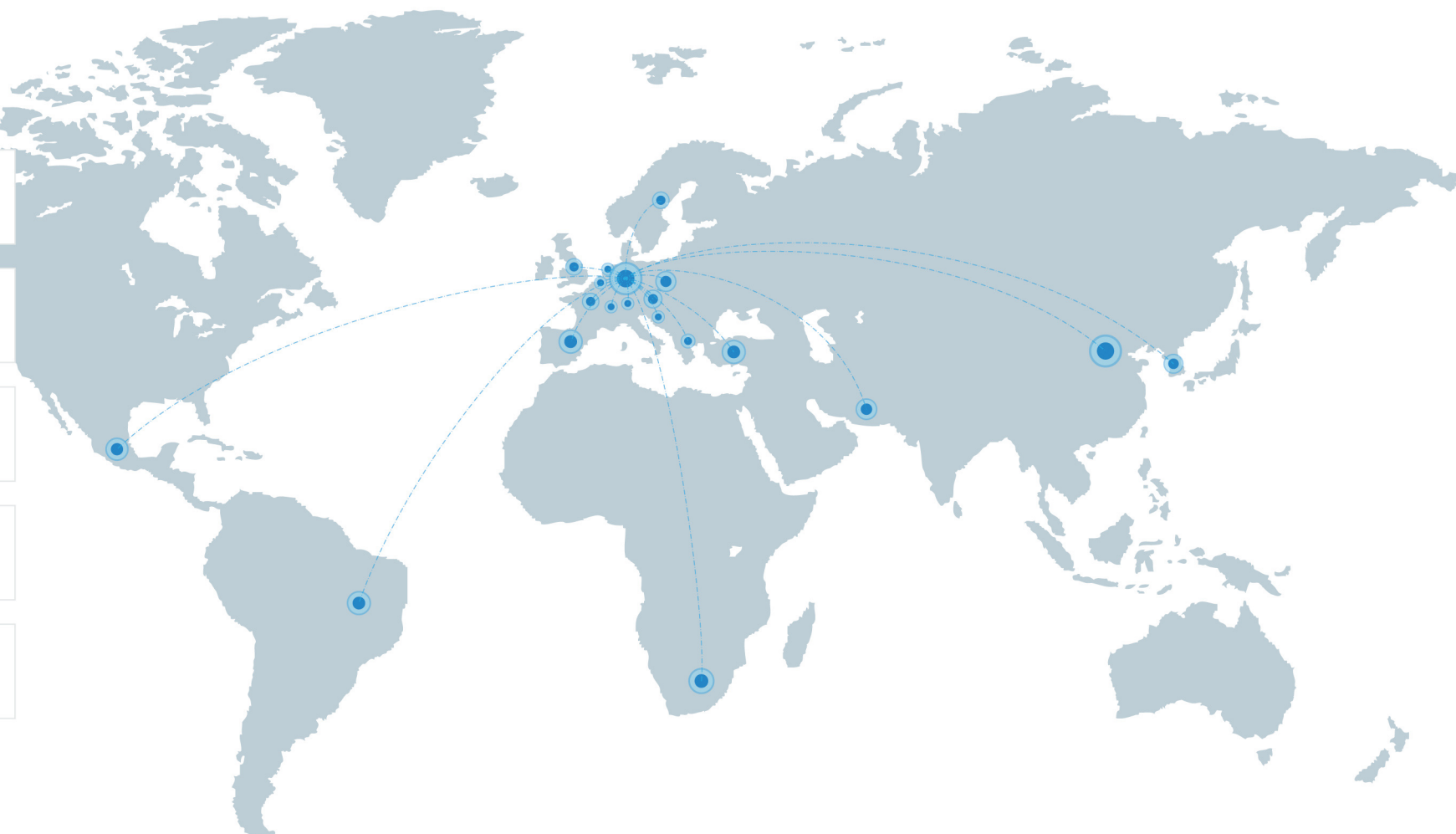
HAWEMA Werkzeugschleifmaschinen GmbH is located with its Headquarter in Tuningen, Germany. All HAWEMA CNC tool grinding machines are manufactured at the production location there. The sales and service activities are carried out Europe-wide from the company headquarters Germany. In the meantime, HAWEMAT CNC-tool grinding machines are in use in more than 20 countries. Besides Europe, agencies in China serve the international customers on site.

HAWEMA is not only a manufacturer of grinding machines, but also a solution provider in tool grinding technology as well as a developer of special tools in the fields of medical technology, the electronics industry, the automotive industry and the metalworking industry.

The heart of all HAWEMAT machines is the worldwide patented kinematic system. The grinding within the movement center leads to a high accuracy of the tool geometries.

## 我们的客户遍布全球

OUR CUSTOMERS ARE LOCATED WORLDWIDE



# 公司发展历程 HAWEMA STORY

1984  
-  
1993

创始人胡伯特·哈勒开始研发磨削设备。依靠专业的划线仪器将手动机器进行升级，也能重磨带有螺旋角的精密刀具。

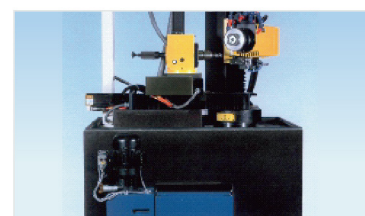
Development and selling of grinding devices by company founder Hubert Haller. With these special dividing devices, manual machines could be upgraded and high-precision tools could be regrinded in the helix.



1994

不断对高精度磨削机器进行优化改造。依据当时的最新技术研制出当下最新一代的磨削机器——UFS 155。

The ideal machine for conventional, high precision grinding in combination with universal cutter grinder UFS 155. A modern tool grinding machine designed according to the latest technological knowledge.



1996

为解决金属加工行业刀具重磨和维修问题，并满足其小批量生产需求，五轴数控刀具磨床HAWEMAT 2001应运而生。

To provide the metalworking industry with a working appliance for the reworking and maintenance of tools as well as their production in small series, the 5-axis CNC tool grinding machine HAWEMAT 2001 was developed.



2000

在HAWEMAT 2001基础上进一步开发出高精度磨床HAWEMAT 3000，该型号在刀具和零件生产领域表现卓越。

The HAWEMAT 3000 is a further development based on the HAWEMAT 2001 high-precision grinding machine. The main focus of this machine is the production of tools and parts.



2004

推出新型号HAWEMAT 2001 NUM Axiom Power。基于NUMRotoplus 软件，可以完成各种型号刀具的高效磨削。

Introducing the HAWEMAT 2001 NUM-Axiom-Power. Together with the NUMRotoplus software, the entire range of tasks in tool grinding can be efficiently mastered.



2006

推出专为刀具重磨市场研发的HAWEMAT 2001 ECO，机床配备移动电气柜和控制面板，方便使用，节省空间。

The HAWEMAT 2001 ECO was specially designed for the regrinding market. With mobile control cabinet and control panel, enables extremely space-saving use.



2009

推出世界上第一台完全在花岗岩上建造的数控刀具磨床HAWEMAT Präzisa Granite，可磨削最大加工直径为120mm的刀具和特殊刀具。

Launch of the world's first CNC tool grinding machine completely built on granite. HAWEMAT Präzisa Granite. The maximum grinding diameter of tools and special tools is 120mm.



2010

推出全新设计的HAWEMAT 3000。采用全新的机床舱设计，具备双开门结构，从根本上提高了机床的加工区域，提高了整体的实用性。

The HAWEMAT 3000 in a new design. With the new cab design, the access to the machine through the double door opening considerably larger and thus increases the overall operating comfort.



2014

推出HAWEMAT 3000 Granite。这是当时哈维马系列中体积最大、性能最优的机器，拥有当时最高精度和最优的动力学特性——源自其花岗岩结构。

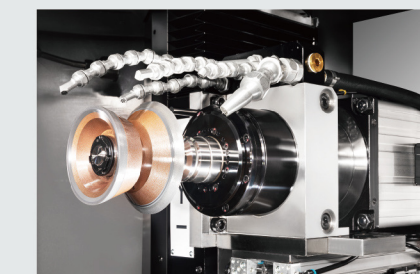
Launch of the HAWEMAT 3000 Granite - the biggest and strongest machine in the HAWEMA machine program is now also offered in granite construction. The granite elements also provide highest accuracy and dynamics.



2019

推出五轴数控刀具磨床WSA G10，采用一体式花岗岩结构，具有独特的自动上下料系统，能实现自动化的生产流程。

Market introduction of the 5-axis CNC tool grinding automatic WSA G10. Due to the unique construction of the machine with the closed granite body and the loading and unloading systems allow for a seamless process flow.



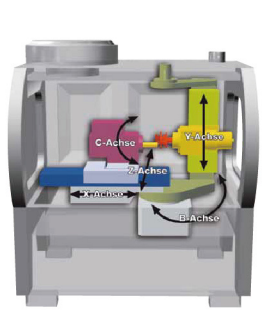




# HAWEMA H3000 GRANITE

## HAWEMA H3000 GRANITE

- 数控磨床Hawema H3000 Granite是基于集成式机舱的概念，研发出的第一台拥有花岗岩机身的机床  
The Hawema 3000 Granite CNC is the first full mineral compound base concept with integrated cabin in the field of grinding technology
- 一体式铸件机身加上X、Y、B轴上的花岗岩元素，可以减少机床的热变形，保证整个机床的高刚性  
The compact mineral casting body is reinforced by granite elements in the axes X, Y, and B. This ensures a low thermal expansion and high rigidity of the whole machine system
- 可高精度磨削直径至150mm的钻头及铣刀  
High-precision drilling and milling tools with Ø range up to 150mm
- 可广泛应用于生产高精度刀具和特殊零件  
Offers a wide range of applications especially for the production of high precision tools as well as special parts



## 技术参数 TECHNICAL DATA

最大加工长度 Complete machining max. tool length	300 mm
最大加工直径 Complete machining max. diameter	150 mm
测量系统 Measurement system	
工件测量 Tool measurement	3D测量探针马波斯 3D measurement probe Marpos
【选装】砂轮或砂轮组 [Optional] Grinding wheels or grinding wheel package	3D测量探针马波斯 3D measurement probe Marpos
高精度磨削主轴驱动 High-precision spindle drive	
20 kW/S6油冷却 20 kW / S6 oil cooled	0 - 10000转/每分钟(rpm)
直驱带气动/自动砂轮夹紧系统HSK50-A Direct drive with pneumatic/ automatic wheel-clamping system HSK 50-A	
砂轮 Grinding wheels	
最大直径 Max. diameter	125 mm
每根砂轮杆上可装砂轮数量 Grinding wheels per clamping arbour	1 - 4片 (wheels)
冷却油阀 (程序控制) Cooling valve (program-controlled)	3个 (valves)
砂轮夹紧系统 (高精度) Grinding wheel clamp (high-precision)	HSK50系统 HSK 50 system
三组砂轮转换器 (HSK 50) 3-package wheel changer (HSK 50)	最大砂轮直径125mm For wheel max. 125 mm Ø
【选装】六组砂轮转换器 (HSK 50) [Optional] 6-package wheel changer (HSK 50)	最大砂轮直径125mm For wheel max. 125 mm Ø
工件夹持轴C轴 Workpiece holder C-axis	
主轴锥度 (标准) Spindle taper (Standard)	SK 50
夹紧系统 Clamping system	机械/手动 Mechanical/manual
【选装】夹紧系统 [Optional] Clamping system	气动/自动 Pneumatic/automatic
【选装】分度头ISO 50 Indexing head ISO 50	直驱, 力矩电机1000转/分钟 Direct drive, torque motor 1,000 rpm
控制单元 Control unit	
CNC控制 CNC control	NUM-Flexium+
TFT彩色显示屏 TFT-colour monitor	19寸 (inches)
软件 User software	
NUMROTOplus®: 铣刀、钻头、特殊工具、3D模拟、3D防撞监控软件等 NUMROTOplus®: milling cutters, drills, special tools, 3D simulation, 3d collision monitoring	

【选装】过滤单元 & 内外部上下料系统 Optional filter unit & internal and external loading systems	
哈维马带式过滤器，哈维马OC 12/OC 20或者其他厂商的皆可选择 HAWEMA belt filters, HAWEMA OC 12/OC 20 or other manufacturer types	
油雾收集器 Oil mist exhaust unit	Ø 150 mm
内置圆盘上料机 Internal Pick-up-Loader ILS 35	ILS35
外部上料系统 External loading system	自动工件上料机LS 122 LS 122 for autom. loading tools or components
轴向行程 Axis travel	
纵向(X轴) Longitudinal(X-axis)	350 mm - 可选 (optional) : 420 mm
横向(Z轴) Lateral(Z-axis)	230 mm
垂直(Y轴) Vertical(Y-axis)	350 mm
分辨率(X-Y-Z轴) Resolution(X-Y-Z-axis)	0.0001 mm
速度(X-Y-Z轴) Speed(X-Y-Z-axis)	15 m/min
旋转(C轴) Rotation(C-axis)	360°
分辨率(C轴) Resolution(C-axis)	0.0001°
速度(C轴) Speed(C-axis)	1000 rpm
轴驱动 Axis drive	高性能NUM伺服电机 High performance NUM servo motor
B轴 (直驱) B-axis (Direct drive)	
摇摆轴(B轴) Pivot axis(B-axis)	力矩电机/直驱带刹车 Torque motor/direct drive
摆动范围(B轴) Swivel range(B-axis)	195°
速度(B轴) Speed(B-axis)	112°/sec
机器尺寸 Machine dimensions	
高 宽 深 Height width depth	2200   3000   2000mm
重量 Weight	5000kg
气压 Air supply	6-8bar
电源 Power supply	3x400V - 50Hz/64A
功率 Power rating	27kW
颜色 Colour	RAL 7035 亮灰色 (light grey)

## 应用领域 APPLICATION AREA

- 金属及木材加工  
Tool manufacture for metal- and woodworking
- 通用金属加工  
General metalworking plants
- 刀具磨削服务  
Tool-grinding service
- 机器和工具制造  
Machine and tool manufacture
- 医疗技术  
Medical technology
- 汽车  
Automotive industry
- IT  
IT-industry

## 数控系统 CONTROL SYSTEM

- NUM-Flexium+及数控轴驱动  
NUM-Flexium+ with digitally controlled axis drives
- 高分辨率的直线驱动 (可选用力矩电机)  
Direct drive with highest measurement resolution (possible with torque motor)

## 磨削软件 GRINDING SOFTWARE

- NUMROTOplus®  
NUMROTOplus®
- 配有各种盘轴类刀具模型库  
All profiles on shank type tools
- 自由编程  
Free programming

## 客户支持 CUSTOMER SUPPORT

- 可通过电话/视频7x24小时远程支持  
Online support 7x24h available via telephone or video call
- 在江苏、湖南、广东设有技术服务中心，支持线下服务  
Offline support in Jiangsu, Hunan, Guangdong





# HAWEMA PRÄZISA GRANITE

## HAWEMA PRÄZISA GRANITE

- 高精度花岗岩框架结构  
High precision with complete granite based machine frame

- 运动轴皆安装于花岗岩底座上  
All axis built on granite base plate

- 双轴端支承的磨削柱集成于花岗岩底座  
Double supported grinding spindle axis integrated in the granite base

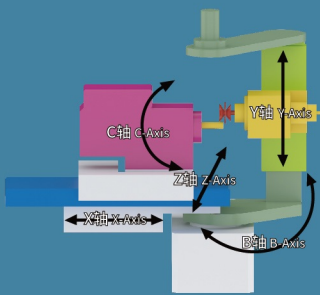
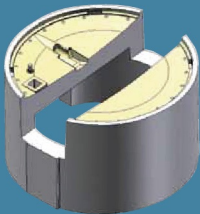
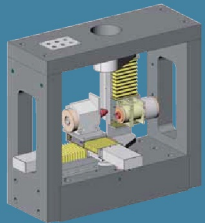
- 主轴跳动小于2µm  
Motor spindles operate with concentricity accuracies of less than 2 µm

- 采用数字CNC控制单元及NUM-Flexium+系统  
Digital CNC control unit for highest requirements, NUM-Flexium+ with digitally controlled axis drives

- 可高精度磨削直径至120mm的钻头及铣刀  
High-precision drilling and milling tools with Ø range up to 120mm

- 花岗岩框架搭配铸体底座，可减少因热传递导致的热变形，保证整个机床的刚性。磨削空间配备旋转舱门，便于操作员全方位查看与操作机床。

The complete machine base body made of granite is integrated in the mineral cast stand, which results in the lowest possible heat transfer and high rigidity of the entire machine system. The unique cab design is completely rotatable and thus offers accessibility all around.



## 技术参数 TECHNICAL DATA

最大加工长度 Complete machining max. tool length	210 mm
最大加工直径 Complete machining max. diameter	120 mm
测量系统 Measurement system	
工件测量 Tool measurement	3D测量探针马波斯 3D measurement probe Marpos
【选装】砂轮或砂轮组 [Optional] Grinding wheels or grinding wheel package	3D测量探针马波斯 3D measurement probe Marpos
高精度磨削主轴驱动 High-precision spindle drive	
20 kW/S6油冷却 20 kW / S6 oil cooled	0 - 10000转/每分钟(rpm)
直线电机带气动/自动砂轮夹紧系统HSK50 Direct drive with pneumatic/ automatic wheel-clamping system HSK 50	
砂轮 Grinding wheels	
最大直径 Max. diameter	125 mm
每根砂轮杆上可装砂轮数量 Grinding wheels per clamping arbour	1 - 4片 (wheels)
冷却油阀(程序控制) Cooling valve (program-controlled)	3个 (valves)
砂轮夹紧系统(高精度) Grinding wheel clamp (high-precision)	HSK50系统 HSK 50 system
选装 Optional	自动化3组砂轮转换器 Autom. 3 package wheel changer
工件夹持轴C轴 Workpiece holder C-axis	
直驱 Direct drive	可达2000转/分钟, SK 40 Up to 2,000 rpm, SK 40
夹紧系统(标准) Clamping system (standard)	机械式/手动式 Mechanical/manual
选装 Optional	气动/自动 Pneumatic/automatic
控制单元 Control unit	
CNC控制 CNC control	NUM-Flexium+
TFT彩色显示屏 TFT-colour monitor	19寸 (inches)
软件 User software	
NUMROTOplus®: 铣刀、钻头、特殊工具、3D模拟、3D防撞监控软件等 NUMROTOplus®: milling cutters, drills, special tools, 3D simulation, 3d collision monitoring	

【选装】过滤单元 & 内外部上下料系统 Optional filter unit & internal and external loading systems	
哈维马带式过滤器，哈维马OC 12/OC 20或者其他厂商的皆可选择 HAWEMA belt filters, HAWEMA OC 12/OC 20 or other manufacturer types	
油雾收集器 Oil mist exhaust unit	Ø 150 mm
内置圆盘上料机 Internal Pick-up-Loader ILS 35	ILS35
外部上料系统 External loading system	自动工件上料机LS 122 LS 122 for autom. loading tools or components
高质量数控轴带AC伺服电机与自动夹紧系统 Fully-fledged CNC axis with AC servo motor combined with automatic clamping system	
轴向行程 Axis travel	
纵向(X轴) Longitudinal(X-axis)	310 mm
横向(Z轴) Lateral(Z-axis)	190 mm
垂直(Y轴) Vertical(Y-axis)	220 mm
分辨率(X-Y-Z轴) Resolution(X-Y-Z-axis)	0.0001 mm
速度(X-Y-Z轴) Speed(X-Y-Z-axis)	15 m/min
旋转(C轴) Rotation(C-axis)	360°
分辨率(C轴) Resolution(C-axis)	0.0001°
速度(C轴) Speed(C-axis)	2000 rpm
轴驱动 Axis drive	高性能NUM伺服电机 High performance NUM servo motor
B轴(直驱) B-axis (Direct drive)	
摆动范围(B轴) Swivel range(B-axis)	195°
速度(B轴) Speed(B-axis)	112°/sec
机器尺寸 Machine dimensions	
高 直径 重量 Height diameter weight	2000mm   1500mm   4200kg
气压 Air supply	6-8bar
电源 Power supply	400/380 V - 50 Hz/40 A
功率 Power rating	27kW
颜色 Colour	RAL 7035 亮灰色(light grey)

## 应用领域 APPLICATION AREA

- 金属及木材加工  
Tool manufacture for metal- and woodworking
- 一般的金属加工  
General metalworking plants
- 刀具磨削服务  
Tool-grinding service
- 机器和工具制造  
Machine and tool manufacture
- 医疗技术  
Medical technology
- 汽车  
Automotive industry
- IT  
IT-industry

## 数控系统 CONTROL SYSTEM

- NUM-Flexium+及数控轴驱动  
NUM-Flexium+ with digitally controlled axis drives
- 高测量分辨率的直线驱动(可选用力矩电机)  
Direct drive with highest measurement resolution (possible with torque motor)

## 磨削软件 GRINDING SOFTWARE

- NUMROTOplus®  
NUMROTOplus®
- 配有各种盘轴类刀具模型库  
All profiles on shank type tools
- 自由编程  
Free programming

## 客户支持 CUSTOMER SUPPORT

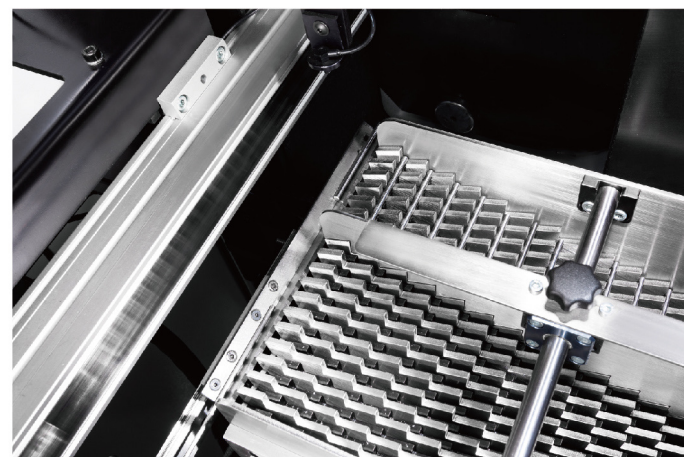
- 可通过电话/视频7x24小时远程支持  
Online support 7x24h available via telephone or video call
- 在江苏、湖南、广东设有技术服务中心，支持线下服务  
Offline support in Jiangsu, Hunan, Guangdong



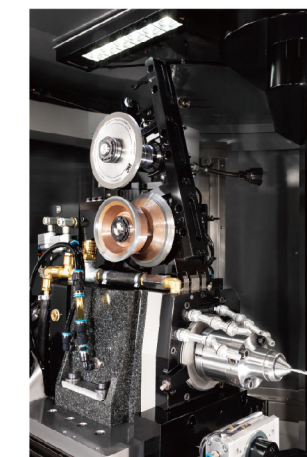
# HAWEMA WSA GRANITE 10

## HAWEMA WSA GRANITE 10

- 高精度花岗岩框架结构  
High precision with complete granite based machine frame
- 所有运动轴都集成于花岗岩底座上  
All axis built on granite base plate
- 集成于花岗岩底座的双轴端支承的磨削柱  
Double supported grinding spindle axis integrated in the granite base
- 高速工件上下料系统  
Extremely fast tool loading and unloading system
- 主轴跳动小于2μm  
Motor spindles operate with concentricity accuracies of less than 2 μm
- 数字CNC控制单元及NUM-Flexium+系统  
Digital CNC control unit for highest requirements, NUM-Flexium+ with digitally controlled axis drives



- 可高精度磨削直径为0.2mm-10mm的钻头及铣刀  
High-precision drilling and milling tools with Ø range: 0.2 mm to 10 mm
- 一体化花岗岩机体设计搭配自动上下料系统, 可实现自动化工艺流程  
Seamless process flow in one plane due to the unique design of the machine with the closed granite body and the loading and unloading systems mounted on it
- 采用C轴作为工件输送装置来完成工件上料及夹持, 确保工件高精度定位  
Unique in the grinding technology is the loading of the workpieces through the workpiece carrier (C-axis). This ensures a very high accuracy in the positioning of the workpieces



## 应用领域 APPLICATION AREA

- 金属及木材加工  
Tool manufacture for metal- and woodworking
- 一般的金属加工  
General metalworking plants
- 刀具磨削服务  
Tool-grinding service
- 机器和工具制造  
Machine and tool manufacture
- 医疗技术  
Medical technology
- 汽车  
Automotive industry
- IT  
IT-industry

## 磨削软件 GRINDING SOFTWARE

- NUMROTOplus®  
NUMROTOplus®
- 配有各种盘轴类刀具模型库  
All profiles on shank type tools
- 自由编程  
Free programming

## 数控系统 CONTROL SYSTEM

- NUM-Flexium+及数控轴驱动  
NUM-Flexium+ with digitally controlled axis drives
- 高分辨率的直线电机(可选用力矩电机)  
Direct drive with highest measurement resolution (possible with torque motor)
- 可旋转的操控面板  
Swivelling service panel for simple operation
- 电控柜中集成通用电脑——无需高昂费用即可适配最新的技术软件  
Office PC integrated in the control cabinet, allowing fast exchange with adaptation to the latest technical standards without high investment costs

## 客户支持 CUSTOMER SUPPORT

- 可通过电话/视频7x24小时远程支持  
Online support 7x24h available via telephone or video call
- 在江苏、湖南、广东设有技术服务中心, 支持线下服务  
Offline support in Jiangsu, Hunan, Guangdong



# HAWEMA WSA GRANITE 10

## HAWEMA WSA GRANITE 10

### 技术参数

#### TECHNICAL DATA

最大加工长度 Complete machining max. tool length	100 mm
最大加工直径 Complete machining max. diameter	10 mm
测量系统 Measurement system	
工件测量 Tool measurement	3D探针 (probe)
【选装】砂轮或砂轮组 [Optional] Grinding wheels or grinding wheel package	3D探针 (probe)
选装 Optional	工具探针确定棒料的伸出长度 Tool probe for determining the clamping length of blanks
高精度磨削主轴驱动 High-precision spindle drive	
20 kW/S6油冷却 20 kW / S6 oil cooled	0 - 10000转/每分钟(rpm)
直驱带气动/自动砂轮夹紧系统HSK50-A Direct drive with pneumatic/ automatic wheel-clamping system HSK 50-A	
砂轮 Grinding wheels	
最大直径 Max. diameter	125 mm
每根砂轮杆上可装砂轮数量 Grinding wheels per clamping arbour	1 - 4片 (wheels)
冷却油阀 (程序控制) Cooling valve (program-controlled)	3个 (valves)
砂轮夹紧系统 (高精度) Grinding wheel clamp (high-precision)	HSK50系统 (system)
选装 Optional	自动化3组砂轮转换器 Automatic 3 package wheel changer
工件夹持轴C轴 Workpiece holder C-axis	
直驱 Direct drive	可达2000转/分钟 Up to 2,000 rpm
夹紧系统 (自动) Clamping system (automatic)	WSA专用肖布林夹紧系统, SRS法兰 Special WSA clamping system Schaublin, SRS flange
控制单元 Control unit	
CNC控制 CNC control	NUM-Flexium+
TFT彩色显示屏 TFT-colour monitor	19寸 (19-inches)
软件 User software	
NUMROTOplus®: 铣刀、钻头、特殊工具、3D模拟、3D防碰撞监控软件等 NUMROTOplus®: milling cutters, drills, special tools, 3D simulation, 3d collision monitoring	

【选装】过滤单元 Optional filter unit	
哈维马带式过滤器, 哈维马OC 12/OC 20或者其他厂商的皆可选择 HAWEMA belt filters, HAWEMA OC 12/OC 20 or other manufacturer types	
油雾收集器 Oil mist exhaust unit	Ø 150 mm
全自动上料系统 Fully automatic loading system	
气动棒料仓 (singling conveyor) pneumatic	2.5bar
棒料直径 Blanks	4 - 10 mm
下料系统 Unloading system	UR机器人UR3 Universal Robot UR3
轴向行程 Axis travel	
纵向(X轴) Longitudinal(X-axis)	296 mm
横向(Z轴) Lateral(Z-axis)	190 mm
垂直(Y轴) Vertical(Y-axis)	220 mm
分辨率(X-Y-Z轴) Resolution(X-Y-Z-axis)	0.0001 mm
速度(X-Y-Z轴) Speed(X-Y-Z-axis)	15 m/min
旋转(C轴) Rotation(C-axis)	360°
分辨率(C轴) Resolution(C-axis)	0.0001°
速度(C轴) Speed(C-axis)	2000 rpm
轴驱动 Axis drive	高性能NUM伺服电机 High-performance NUM servo motor
B轴 (直驱) B-axis(Direct drive)	
摇摆轴(B轴) Swivel axis(B-axis)	-15° - 195°
速度(B轴) Speed(B-axis)	112°/sec
机器尺寸 Machine dimensions	
高 直径 重量 Height diameter weight	2100mm 1500mm 4500kg
气压 Air supply	6-8bar
电源 Power supply	400/380 V - 50 Hz/40 A
功率 Power rating	27kW
颜色 Colour	RAL 7035 亮灰色(light grey)

## 花岗岩结构—哈维马精度的保证

### GRANITE WE GUARANTEE PRECISION

#### C轴 C-Axis

- 工件夹持轴  
Workpiece carrier
- 全自动肖布林夹持系统集成于花岗岩  
C轴花岗岩基底中  
C-axis granite base body with integrated  
automatic Schaublin clamping system
- 力矩电机直接驱动  
Torque motor direct drive

#### X轴 X-Axis

- 全花岗岩基底  
Full granite base
- 高精度导轨集成于花岗岩基底中  
High-precision slides in the granite base
- 直线电机驱动  
Linear motor drive

#### Z轴 Z-Axis

- 全花岗岩基底  
Full granite base
- 高精度导轨集成于花岗岩基底中  
High-precision slides in the granite base
- 直线电机驱动  
Linear motor drive

#### Y轴 Y-Axis

- Y轴主体为一整块花岗岩  
Y-axis made from one granite block
- 配备高精度导轨及丝杆  
High precision slides

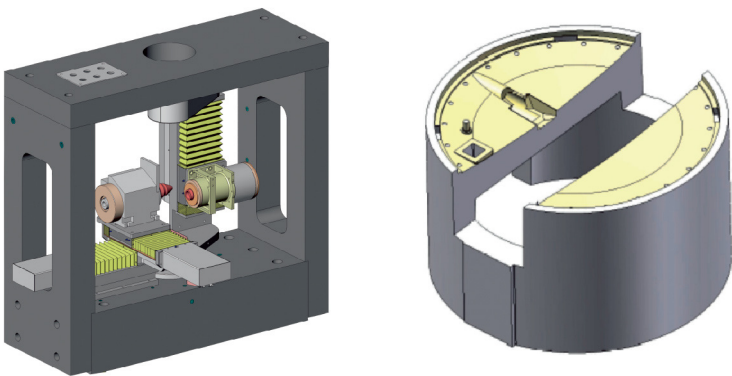
#### B轴 B-Axis

- 全花岗岩底板  
Fully Granite Plates
- 高精度  
Absolutely highest accuracy
- 210°旋转范围  
Swivelling 210°
- 数控力矩电机驱动  
Digital torque motor drive

## 花岗岩特性

### GRANITE CHARACTERISTICS

- 热膨胀度低  
Minimum thermal expansion
- 极高的刚性  
Extremely high stiffness
- 能减缓振动  
Vibration-damping
- 使用寿命长  
Longevity
- 高精度保证  
Accuracy similar to measuring machines
- 重量比一般机身轻50%  
Approx. 50% weight reduction
- 导轨和轴承的负荷轻  
Strains on guideways and bearings are considerably lesser





# 哈维马世界专利

## HAWEMA PATENTED WORLDWIDE

### 哈维马全自动上下料系统

#### HAWEMA ONE - WAY - SYSTEM



通过C轴的工件上料管道导入棒料，使用先进的长度测量系统来定位棒料，保证其位置准确性。通过使用传感器，让棒料的位置达到 $\mu$ 级别的准确性。

By feeding the blank through the workpiece carrier (C-axis), a very high accuracy and positioning is achieved very quickly via a new type of length measuring system. Using a sensor, the position of the blank is determined with  $\mu$  precision.

棒料及其他圆形、圆柱形或横截面对称的工件通过专门研发的高精度夹持系统 (C轴) 完成上料。同时，这一过程也全程由机床内部的3D检测程序来实时监控并精准定位。

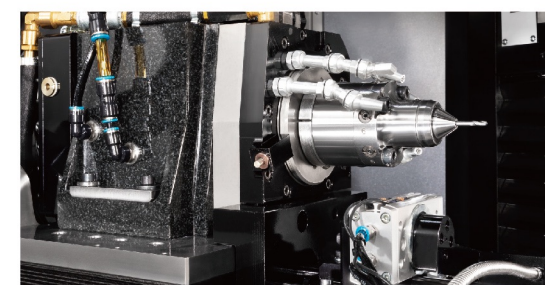
The blanks or other round, cylindrical or cross-sectionally symmetrical workpieces are loaded through the workpiece carrier (C axis). The insertion of the blank through the workpiece spindle of the C axis during lading ensures high positioning accuracy (via 3D probe system) of the blank.

在棒料通过传送仓送入工件管道的同时，已经完成磨削的工件会通过机械臂完成下料动作，被置入下料盘中。这一设计也最大地缩短了工序时间。

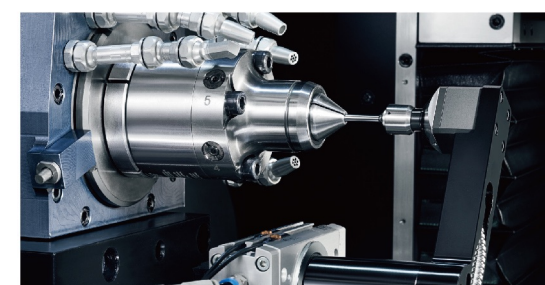
During a blank is loaded into the workpiece carrier via a supply magazine (singling conveyor), after the grinding process the finished workpiece is picked up almost simultaneously by a robot removal system and the finished tool is placed on pallets. This reduces handling time to a minimum.



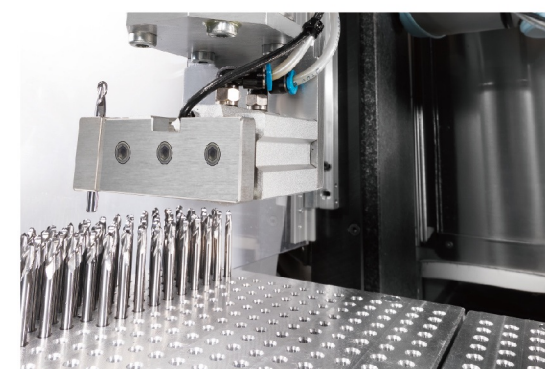
全自动棒料分拣仓 Automatic blank singling conveyor



成品取件 Pick-up



工件夹持长度测量系统  
Measuring system for determining the clamping length of tool blanks



成品下料 Pallets

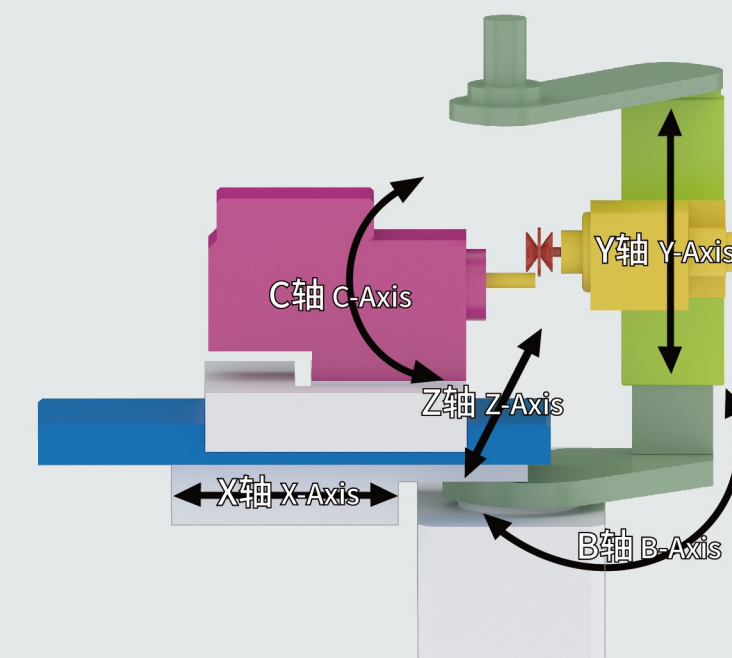
### 哈维马运动学特性

#### HAWEMA KINEMATIK

#### 5轴联动:

The ideal alignment of the 5 axes to each other allows:

- 最优的运动轨迹  
Short travel paths
- 最佳的节拍时间  
Optimal cycle times
- 一体化设计  
Compact design
- 模块化结构  
Modular construction
- 高刚度特性  
High rigidity
- 高精度  
Highest precision
- 卓越的磨削特性  
Excellent grinding facilities



双轴端支承的磨削柱保证了整个系统的高刚性、高精度。

The advantage of the double bearing mounted grinding column is the high rigidity of the entire system, which in turn results in very high precision.



# 一站式服务 可选装外部设备

EVERYTHING FROM ONE SOURCE  
PERIPHERY PROGRAMME FOR OPTION

## 哈维马修整和清洁设备

HAWEMA TRIMMING AND CLEANING EQUIPMENT

### 修整及仿形加工设备

TRUING & DRESSING MACHINE

#### HAWEMA FC-250 W

- 该设备可对金刚石和 CBN 砂轮以及完整的砂轮组件进行表面、角度和半径的有效修整和仿形加工
- 成套砂轮可直接在 HSK 50 砂轮杆上用机床修整
- 操作简单, 精度高, 性价比优
- This machine offers simple and effective dressing and profiling of surfaces, angles and radius on diamond and CBN wheels as well as complete wheel packages
- With this machine, complete grinding wheel packages can be dressed directly in the holder (HSK 50)
- The machine is easy to operate, highly precise and cost-efficient



### 洁油系统

OIL CLEANING SYSTEM

#### HAWEMA OC 20

- 全自动冷却油过滤系统, 用于清洁已使用过的磨削油
- 通过两级过滤程序清洁污油, 油会被净化到 2-3  $\mu\text{m}$  的粒径
- 油温自动冷却
- 无需频繁更换滤芯
- 可长时间保证机床内油液干净, 有利于保持机床和工具的质量
- 可按要求提供其他洁油系统
- Fully automatic oil-cooling filter system, for cleaning contaminated grinding or cutting oils
- The oil is cleaned to a particle size of 2-3  $\mu\text{m}$  by a two-stage filtration process
- The oil temperature is cooled automatically
- The filter material (filter cartridges) does not need to be replaced for years
- The liquid remains very clean over a long period of time, which benefits the quality of the machine and tools
- Other oil purification systems on request



## 哈维马外部上下料系统

HAWEMA EXTERNAL LOADING SYSTEMS

### PLS 3 上下料系统

PLS 3 LOADING SYSTEM

- 全自动上下料系统, 单次可最多上下1000支棒料零件
- 轻松切换不同直径的棒料
- 在全自动流程中节约手动换料时间
- Fully automatic loading and unloading of up to 1000 parts
- User-friendly loader software ensures easy retooling to different workpiece diameters
- By using different stop options in the automatic handling process, probing operations and thus probing times can be saved



### PLS 8 上下料系统

PLS 8 LOADING SYSTEM

- 全自动上下料系统, 单次可最多上下3500支棒料零件
- 用户友好型上下料软件确保棒料轻松切换
- 方便加工不同刀柄和不同直径的工作
- 在全自动流程中节约手动换料时间
- Fully automatic loading and unloading of up to 3500 parts
- User-friendly loader software ensures easy retooling
- Workpieces with different shank and work diameters are easy to machine
- By using different stop options in the automatic handling process, probing operations and thus probing times can be saved



### LS 122 上下料系统

LS 122 LOADING SYSTEM

- 数控轴驱动的专用传送带
- 可任意填充122支工件
- 可处理直径范围1-20mm的刀具
- 可快速切换适用于各式各样棒料的轴承套筒或塑料构件
- 用轴承套筒上料时, 需要自动液压膨胀系统
- 采用高精度自动双夹具系统上料
- Fully-fledged CNC axis on the drive for the special belt
- 122 Tools or parts can be loaded chaotically
- Tool diameter range from 1 to 20 mm
- The clamping sleeves or plastic inserts for the most diverse blanks can be changed very quickly
- When loading with clamping sleeves, an automatic hydraulic expansion clamping system is required
- When the blanks are loaded directly with a corresponding gripper an automatic high-precision clamping system is used. Loading is carried out with a double gripper system



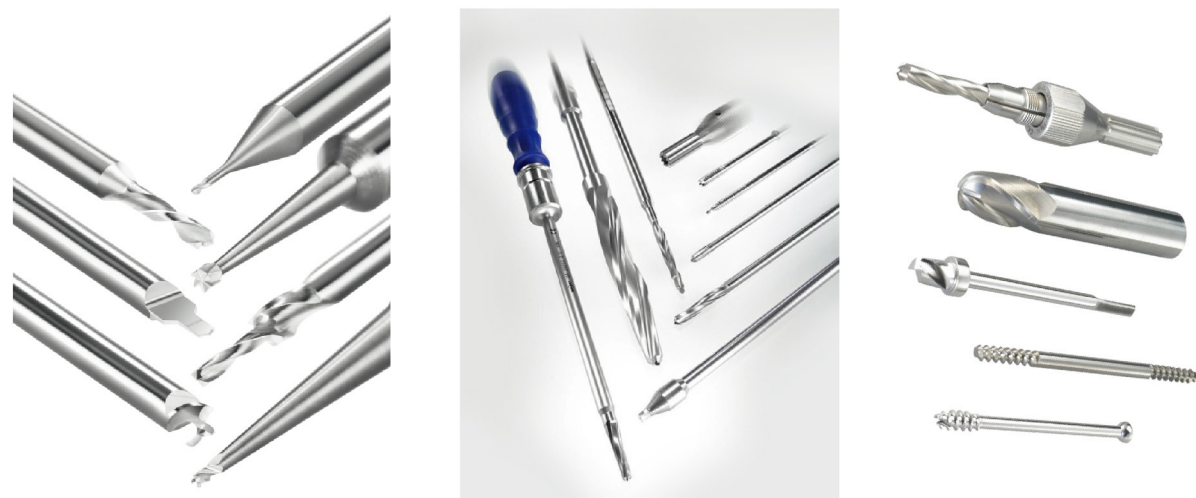


# 可磨削各种刀具

## VARIOUS TOOLS CAN BE GRINDED

哈维马机床具有极高的稳定性和加工精度，不仅能磨削标准刀具，也能磨削微型刀具及医疗领域刀具，如骨铣刀/钻头、骨螺钉、牙科工具和各种类型的特殊工件。

In addition to standart tools, the stability brought by the granite elements on the axis and machine body can also be a guarantee for high precision of the micro tools. In addition, tools from the medical technology area such as bone cutters/drills, bone screws, dental and special products in a wide variety of geometric shapes can be produced on the HAWEMAT machines with the highest quality and accuracy.



# 我们随时为您服务

## WE ARE ALWAYS AT YOUR SERVICE

“以客户为中心”的原则贯彻于我们整个产品服务中。自哈维马公司成立以来，全方位满足客户一直是企业的首要任务。为了能够灵活地响应客户的需求，我们也会与客户建立一对一的联系，这是哈维马公司与合作伙伴的沟通模式。

In all our activities, people are at the center of our attention. To satisfy the customer in all aspects has been the top priority of our employees since the foundation of HAWEMA. In order to be able to react flexibly to the wishes of our customers, we seek personal contact. This has shaped the style of our company in dealing with our business partners at all levels.

为客户需要提供定制化的解决方案也是哈维马的优势。

To harmonize general problem solutions with specific requirements, that is the HAWEMA way.

我们保证质量及效率。

We vouch for quality and performance.



安装调试  
Start up



技术培训  
Qualification



产品支持  
Support



客户服务  
Service



远程服务  
Teleservice



备件提供  
Material



改装加装  
Retrofit

## 中国区客户服务中心

### CUSTOMER SUPPORT SERVICE POINT

