

HSC GENERAL OVERVIEW











Pioneering high-speed milling has a name: exeron. Our HSC series impresses with maximum efficiency, absolute precision and excellent quality in the machining of workpieces. Our development is geared towards the varying requirements of our customers. Whether proven standard solutions or special customer-specific applications – our HSC series fulfils all requirements. Comprehensively thought through and automatable. A love of innovation and more than 40 years of experience make the difference. On this basis, we develop machines that give you clear advantages on the market. With exeron you have a strong partner in various areas in the world of the highspeed milling. Our HSC series covers a wide spectrum: from compact systems for small workpieces to an impressive workspace of 800 x 900 x 540 mm and 210 tool pockets. For even more efficiency and productivity in your tool and mould making. Designed and made in Germany.

SAMPLE PARTS

HSC MP7

Versatile, extremely precise, highly efficient: The HSC MP7 sets new standards for modern milling machines in the high-end range. Mechanical engineering with high stiffness and damping optimised for linear direct drives ensures that the machine is ideally prepared for optimal machine dynamics, maximum precision and perfect workpiece quality.























- **e** High-quality interior design in stainless steel
- **e** Large distance between spindle nose and table as well as generous Z-axis travel distance
- **e** Convenient and powerful CNC control technology Heidenhain TNC 640
- **c** Covered measurement system
- e Internal spindle length sensor system
- e Preparation for automation

	HSC MP7/3 three axes	HSC MP7/5 five axes
Travelling distances X x Y x Z	730 x 340 x 400 mm	730 x 250 x 400 mm
Travelling distances B x C		B ±105° x C infinite
Workspace X x Y x Z	640 x 340 x 400 mm	640 x 250 x 400 mm
Clamping table/faceplate	580 x 460 mm	Ø 185 mm
Distance table/spindle nose	550 mm	450 mm
Workpiece weight max.	550 kg	60 kg
Dimensions W x D x H	2,400 x 2,370 x 3,000 mm	2,400 x 2,370 x 3,000 mm
Spindle speed	42,000 rpm	42,000 rpm
Spindle power \$1/\$6-40%	10/13,5 kW	10/13,5 kW
Tool magazine	30/60/90 HSK-E40	30/60/90 HSK-E40
Rapid traverse X x Y x Z	40 m/min.	40 m/min.
Rotation speed B/C		190/250 rpm
CNC control	Heidenhain TNC 640	Heidenhain TNC 640

Option Integrated pallet changer HSC MP7/P

Complete, efficient, trendsetting: The optional pallet changer makes the HSC MP7 ideal for the fully automatic, high-precision production of electrodes and parts. The integrated workpiece handling system, which is completely separated from the workspace, enables considerably greater machine utilisation to be achieved.



- **e** Available for various clamping systems
- **e** Two magazine levels with max. 40 pallet places
- **e** Maximum transfer weight pallet changer 15 kg



HSC MP9

Flexible, precise, efficient: Our latest family member, the HSC MP9, combines microprecision with the big ideas of an innovative series. The pioneering machine development is based on intensive discussions with users – it is characterised by maximum precision, large machining volumes, efficiency, reliability and longevity.





















e High-quality interior design in stainless steel

€ Large distance between spindle nose and table as well as generous Z-axis travel distance

e Convenient and powerful CNC control technology – Heidenhain TNC 640

e Laser measurement system outside the workspace

e Internal spindle length sensor system

e Preparation for tool and workpiece automation



HSC MP9

	five axes
Travelling distances X x Y x Z	955 x 625 x 400 mm
Travelling distances B x C	B ±105° x C infinite
Workspace X x Y x Z	725 x 625 x 400 mm
Clamping table/faceplate	Ø 412 mm
Distance table/spindle nose	600 mm HSK-E40 586 mm HSK-E50
Workpiece weight max.	250 kg
Dimensions W x D x H	2,610 x 3,080 x 3,150 mm
Spindle speed	42,000 rpm HSK-E40 36,000 rpm HSK-E50
Spindle power S1/S6-40%	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50
Tool magazine	30/60/90/120 HSK-E40 27/54/81/108 HSK-E50
Rapid traverse X x Y x Z	60 m/min.
Rotation speed B/C	100/100 rpm
CNC control	Heidenhain TNC 640

COOL BASE CONCEPT

Meeting the highest standards during daily operation requires a sophisticated cooling system so that you can keep a cool head at all times, even during the hottest production phases. The pioneering exeron cooling concept consists of:

- Combined gantry and bed cooling
- Spindle and surface cooling
- Cooling of all axes, including slides, linear guides and drives



- **e** More power
- More precision
- **e** More durability

HSC MP11

Large, economical, durable: The HSC MP11 rounds off the size of the HSC MP line upwards.

Various practical customer requirements were incorporated into the development of the machine: Precision, large machining capacity, profitability, reliability and durability. In addition, the largest family member is characterised by numerous clever ideas. Combining all innovative improvements in a single system results in maximum precision and efficiency.









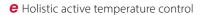












e High-quality interior design in stainless steel

• Design for minimum quantity lubrication, dry, cutting oil, minimum and wet machining

e Internal spindle length sensor system

e Tool magazine for up to 210 tool pockets

 Preparation for various automation and cell solutions with tool and workpiece automation

e Comfortable and powerful CNC control technology of the latest generation - Heidenhain TNC 640





	HSC MP11/3 three axes	HSC MP11/5 five axes
Travelling distances X x Y x Z	1,055 x 900 x 540 mm	1,055 x 760 x 540 mm
Travelling distances B x C		B ±105° x C infinite
Workspace X x Y x Z	800 x 900 x 540 mm	800 x 760 x 540 mm
Clamping table/faceplate	850 x 1070 mm	412 x 412 mm
Distance table/spindle nose	720 mm HSK-E40 706 mm HSK-E50/HSK-F63	720 mm HSK-E40 706 mm HSK-E50/HSK-F63
Workpiece weight max.	1,000 kg	350 kg
Dimensions W x D x H	2,390 x 4,500 x 3,350 mm	2,390 x 4,500 x 3,350 mm
Spindle speed	42,000 rpm HSK-E40 36,000 rpm HSK-E50/HSK-F63	42,000 rpm HSK-E40 36,000 rpm HSK-E50/HSK-F63
Spindle power S1/S6–40%	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50/HSK-F63	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50/HSK-F63
Tool magazine	max. 210 HSK-E40 max. 189 HSK-E50 max. 154 HSK-F63	max. 210 HSK-E40 max. 189 HSK-E50 max. 154 HSK-F63
Rapid traverse X x Y x Z	80 m/min.	80 m/min.
Rotation speed B/C		100/100 rpm
CNC control	Heidenhain TNC 640	Heidenhain TNC 640

MORE SPACE FOR GREAT IDEAS

The HSC MP11, which is constructed in the gantry design, is available in a 3-axis and 5-axis configuration.

The 5-axis version deliberately relies on the counter bearing solution for the 4th axes. The possibilities of wet and graphite machining round off the wide range of applications of the HSC MP11.

The latest generation of Heidenhain control and axis control technology ensures the best results in interaction with the maintenance-free linear direct drives.



- **e** Large workspace
- **e** Perfectly accessible despite large dimensions
- **e** Maximum precision even with large workpieces



HSC 300

Compact, high-precision and versatile: The HSC 300 is a genuine all-rounder and a guarantor of exceptional performance. Optimal results in graphite and hard machining – in a particularly small space with manageable investment costs.















- Construction with high stiffness for optimal machine dynamics, high precision and perfect workpiece quality
- **e** Machine base frame made from mineral cast for maximum vibration damping
- **e** Direct travel measuring systems resolution 0.01 μm
- € Vector-controlled high-frequency spindle for the use of tools from 0.2 to 16 mm in diameter
- **e** Heidenhain CNC control technology specially designed for HSC technology
- **℮** Optional: Graphite extraction
- Prepared for automation and cell integration
- HSC 300/5 HSC 300/3 three axes five axes Travelling distances X x Y x Z 550 x 340 x 355 mm 515 x 340 x 355 mm Travelling distances B x C B ±105° x C infinite Clamping table/faceplate 470 x 400 mm Ø 100 mm Distance table/spindle nose 495 mm 324 mm Workpiece weight max. 500 kg 12 kg 2,000 x 2,350 x 2,450 mm 2,000 x 2,350 x 2,450 mm Total dimensions (W x D x H) Spindle speed 42,000 rpm 42,000 rpm Spindle power S1/S6 – 40% 10/13,5 kW 10/13,5 kW Tool magazine 16/40 HSK-E40 16/40 HSK-E40 Rapid traverse $X \times Y \times Z$ 30 m/min. 30 m/min. Rotation speed B/C 120/250 rpm CNC control Heidenhain TNC 640 Heidenhain TNC 640

Option Integrated pallet changer HSC 300/3P

Complete, efficient, trendsetting: The optional pallet changer makes the HSC 300 ideal for the fully automatic, high-precision production of electrodes and parts. The integrated workpiece handling system, which is completely separated from the workspace, enables considerably greater machine utilisation to be achieved.



- **e** Available for various clamping systems
- **e** Two magazine levels with max. 40 pallet places
- Maximum transfer weight pallet changer 15 kg



HSC 600

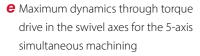
Space-saving, dynamic, universal: The HSC 600 is a powerful high-end machining solution for universal 5-axis use in tool and mould making. The extremely small footprint of this high-end machine also makes it ideal for use in locations where space is limited.











- **e** Extremely small footprint
- **e** Ideal accessibility for operators and automation concepts
- **e** Construction with high stiffness for optimal machine dynamics, high precision and perfect workpiece quality
- € Temperature-controlled machine base frame made from mineral cast with extreme stiffness and high thermal inertia
- **e** Direct travel measuring systems resolution 0.01 μm
- **e** Vector-controlled high-frequency spindles for the use of tools from 0.2 to 25 mm in diameter
- **℮** Heidenhain CNC control technology specially designed for HSC technology



	HSC 600/3 three axes	HSC 600/5 five axes	
Travelling distances X x Y x Z	585 x 550 x 400 mm	650 x 550 x 400 mm	
Travelling distances B x C		B ±100° x C infinite	
Clamping table/faceplate	530 x 900 mm	Ø 410 mm	
Distance table/spindle nose	600 mm HSK-E40 586 mm HSK-E50	600 mm HSK-E40 586 mm HSK-E50	
Workpiece weight max.	600 kg	200 kg	
Dimensions W x D x H	2,200 x 2,400 x 2,900 mm	2,200 x 2,400 x 2,900 mm	
Spindle speed	42,000 rpm	42,000 rpm	
Spindle power S1/S6–40%	10/13,5 kW HSK-E40 24,8/33 kW HSK-E50	10/13,5 kW HSK-E40 24,8/33 kW HSK-E50	
Tool magazine	30/60/90 HSK-E40 27/54/81 HSK-E50	30/60/90 HSK-E40 27/54/81 HSK-E50	
Rapid traverse X x Y x Z	50 m/min.	50 m/min.	
Rotation speed B/C		80/80 rpm	
CNC control	Heidenhain TNC 640	Heidenhain TNC 640	

Integrated tool measurement

All high-speed cutting centres from exeron are equipped with high-precision laser measurement systems "Made in Germany" as standard.

This means that a high degree of precision

This means that a high degree of precision and reliability can be achieved even in the toughest of conditions and with long program runtimes.



- **e** Highly dynamic measurement of all tool characteristics
- **e** Continuously good part accuracy
- **e** Detection of changes in geometry and tool breakage



AVAILABLE OPTIONS

Axis drives



Feed axes with highly dynamic linear direct drives



Feed axes with ball screw drive technology

Tool measurement



High-precision laser measurement system for setting and monitoring tools

Easy clean concept



A sophisticated interior concept for effortless machine cleaning

Spindle



High-frequency spindle with ceramic ball bearings with up to 42,000 rpm and tools with a length of up to 210 mm

Low noise concept



Noise minimisation thanks to an acoustically optimised, encapsulated workspace

Fire protection



CO₂ fire extinguishing system for automated 24/7 operation

Dust extraction



High-performance extraction for graphite machining



High-performance extraction for graphite machining, optionally with directed supply air flow

Cool base concept



Intelligent cooling system for the maximum temperature stability of all accuracy-relevant machine components

Tool changer



Integrated tool magazine with capacity for up to 210 tools

Pallet changer



Integrated workpiece handling system with capacity for up to 40 pallets

Tool cleaning



High-pressure spray mist to reliably remove soiling from the tool

CHALLENGE US!

Customer solutions

Every order is different. State-of-theart HSC machines from exeron enable you to optimally fulfil your customers' requirements. We often find that the right solution already exists in our standard range - with some minor adjustments, if necessary. In case of more complex requirements, our technical expertise is an unbeatable advantage: We will develop the ideal machine for your milling tasks together with you. Your need, our consultancy service and our specialist know-how are guaranteed to lead to success. If you have any questions, please contact our Application Technology and Service departments directly. Our experts are your problem solvers. From the design to the start of production and ongoing operation.

Customer-specific solution:

Pallet changer with 160 workpiece pockets for very small workpieces in a magazine with high storage capacity. The HSC machine fully automatically withdraws the workpieces from the rotary magazine for machining. The operator benefits from excellent accessibility, which ensures that workpieces can be individually loaded into the magazine manually using the freely rotatable levels.





HEIDENHAIN TNC 640: THE BEST FOR YOUR APPLICATIONS

With regard to control technology, at exeron we have full conviction in the HEIDENHAIN TNC 640. With good reason. Its clear text programming means that it is not only easy to learn, but also the most.

Ultimately, it "grew up" in tool and mould making, where the requirements for accuracy and surface quality are extremely

A further important advantage for you: We make the TNC 640 control software available to every customer in their language.

ASQ ADVANCED SURFACE QUALITY CONTROL

Conventional milling has its limits. Until now, the influence of certain physical effects – such as the "thermal squall effect" of milling spindles – were virtually unavoidable when milling complex surfaces. This resulted in inaccuracies in the surface quality that had to be subsequently compensated.

Our unique ASQ (Advanced Surface Quality Control) process prevents such inaccuracies and thus sustainably optimises the surface quality of milled parts. ASQ is a control engineering process based on the state model that is used to optimise surface quality and Z-accuracy.

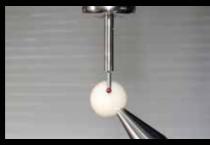
By means of control-related interventions

- such as absorbing minimal vibrations
- it is capable of improving the quality of milled surfaces to such an extent that rework is reduced or completely unnecessary.



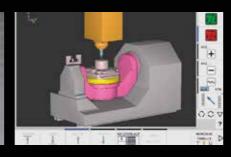
HSC motion guide of the highest

The TNC 640 not only smooths the milling paths, but also analyses the milling path curve with regard to vibrational excitations and thus prevents all machine vibration. In addition, it always adheres to the programmed tolerance during vibration-absorbing interventions in the motion guide. The also applies to tool alignments in the space – which produces unparalleled milling results in 5-axis simultaneous machining.



Automatic recalibration of the kinematic transformation

Accuracy requirements are becoming ever higher, especially in the area of 5-axis machining. For example, complex parts must be produced to precision and with reproducible accuracy, even over long periods of time. However, machine components are subject to relatively strong temperature fluctuations during machining as a result of axis movements and the spindle. The kinematic transformation chain should also be adapted to these changes in order to achieve optimal machining results. HEIDENHAIN controls with the KinematicsOpt software option will assist you with this complex task.



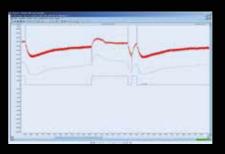
Dynamic collision monitoring (DCM)

Modern machine tools and controls help to make the machining process ever better and efficient. In order not to jeopardise the high productivity, collision-related interruptions and downtime must be

The dynamic collision monitoring (DCM) software option offers optimal protection. DCM cyclically monitors the workspace of the machine for possible collisions between machine components. The control interrupts machining in case of an impending collision and thus ensures increased safety for the operator and the machine. In this way, DCM prevents damage to the machine and the resulting costly downtime and improves the safety of unstaffed shifts.

However, DCM collision monitoring does not only work in automatic mode, but is also active during manual operation. For example, if the machine operator is on a collision course while setting up a workpiece, the control recognises this and stops the axis movement with an error message.

Z-accuracy without ASQ



How does ASQ from exeron work?

By means of continuous state monitoring, ASQ can actively dampen and therefore compensate for physical effects such as the thermal squall effect of the milling spindle. In this way, the Z-accuracy - i.e. the accuracy of the vertical Z milling axis - is kept within much tighter tolerances than was previously possible. This is achieved by continuously monitoring the oscillation of the milling head via the ASQ software, for example. The advantages of ASQ very quickly become clear in an extra narrow tolerance band. The Z-accuracy that can be achieved with ASQ is considerably finer and always stays within this

Z-accuracy with ASQ



tolerance band after the ASO calibration phase. Without ASQ, by contrast, oscillations often go beyond the tolerance limits - with significantly higher peaks.

How do parts with ASQ from exeron

ASQ substantially increases the surface quality. For example, a surface roughness of Ra = $0.03 \, \mu m$ is possible with brass, while for steel with a Rockwell hardness of 58 HRC the figure is 0.08 µm. With a tolerance of S diff, max = $0.4 \mu m$, quadrant transition errors now only fall within the range of the wavelength of light and therefore within the visibility limit. These

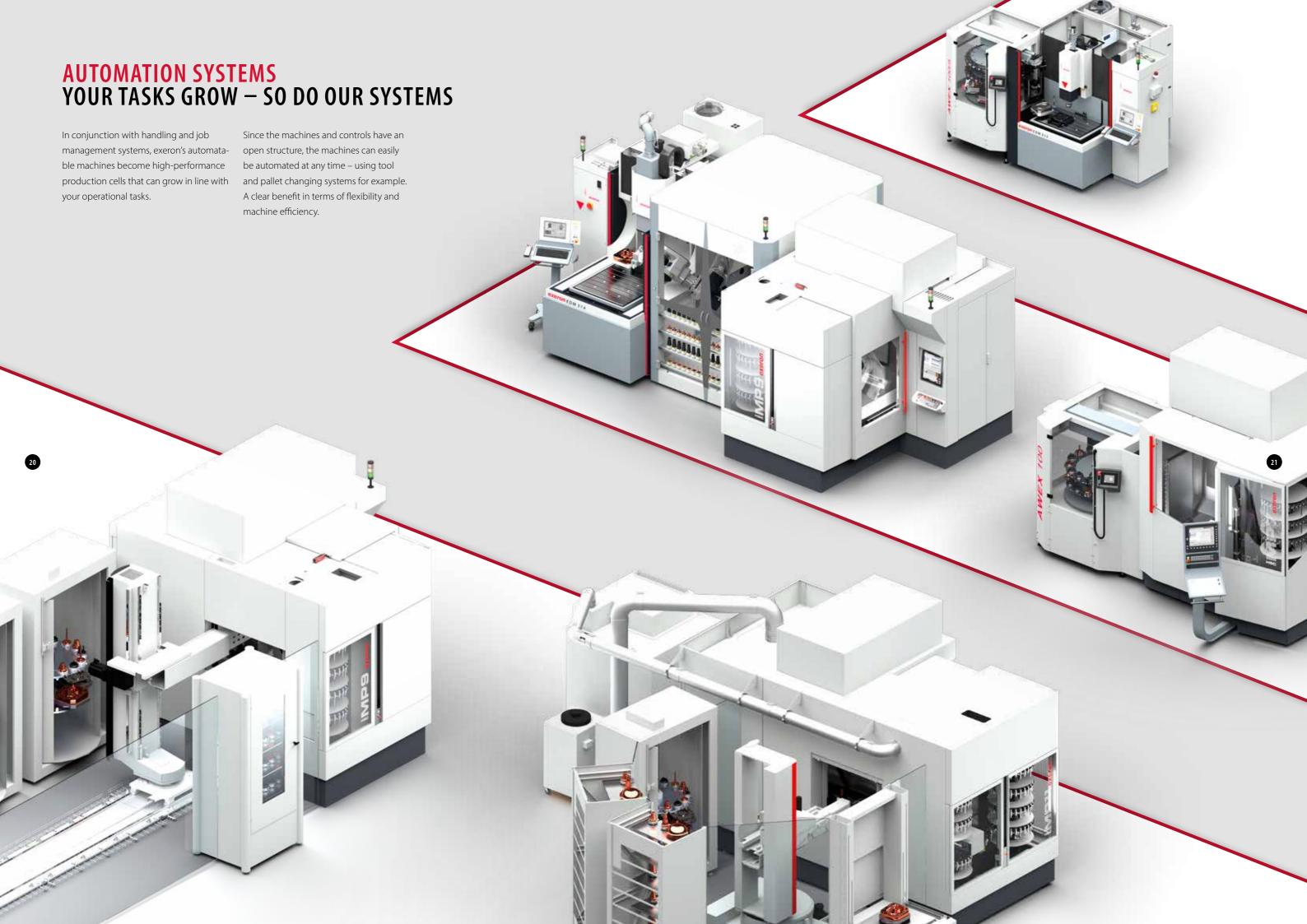


results can only otherwise be achieved with hydrostatic drive and bearing technology.

In a nutshell: With ASQ, we demonstrate the true meaning of excellent mechanical engineering - at a perfect price/perfor-









OUR APPLICATION TECHNOLOGY EXPERTISE LIVE

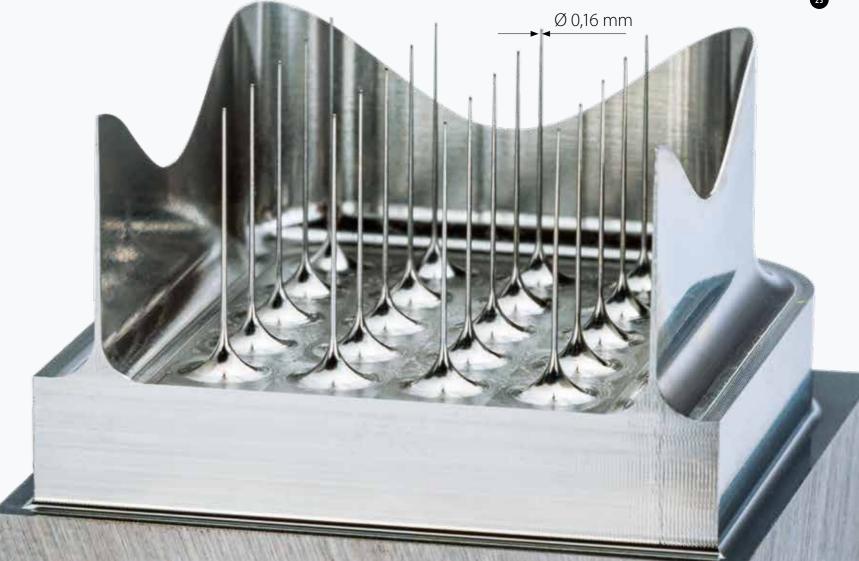
You are dealing with a difficult task and seek a competent partner. This where our application technology experts come into play – they love a challenge. They will seek the ideal solution and the optimum milling machine to enable you to machine workpieces efficiently and economically. With their extensive know-how, our Application Technology department is the link between Development and customers. Our specialists combine individual consultation, in-depth specialist knowledge and long-time experience to provide comprehensive problem-solving expertise. They will develop and test new technologies and software for you and incorporate

the latest market requirements into our machines.

In any case, our application technology experts also act out of conviction in the best possible sense: They will help you to utilise the full capability of our systems. In the process, they will develop customer-specific solutions together with you if necessary. Challenge us. We will gladly carry out a trial machining run with your workpiece because we know that the decision to opt for one of our innovative machines will be an easy one. We will be supported by a modern measuring centre that attests to the high machining precision and simultaneously fulfils our high

quality requirements.

Have we convinced you? Then we look forward to starting a cooperative partnership. We will guide you through the commissioning of your new exeron machine, support you with tailored operator training and advanced courses for maximum production success and answer any questions you may have at any time during ongoing operation. We are there for you when you need us.



EXERON SALES PARTNERS AROUND THE WORLD

We speak your language. We mean this literally and figuratively. Because we are present worldwide, you can always expect competent employees from your country, who understand you perfectly as a native speaker. As well as the concerns or problem you are dealing with.

Wherever you are, we are close at hand. With service locations and showrooms where you can see our EDM and HSC machines and experience them at first hand. That is exactly what you want! You see, we understand each other.



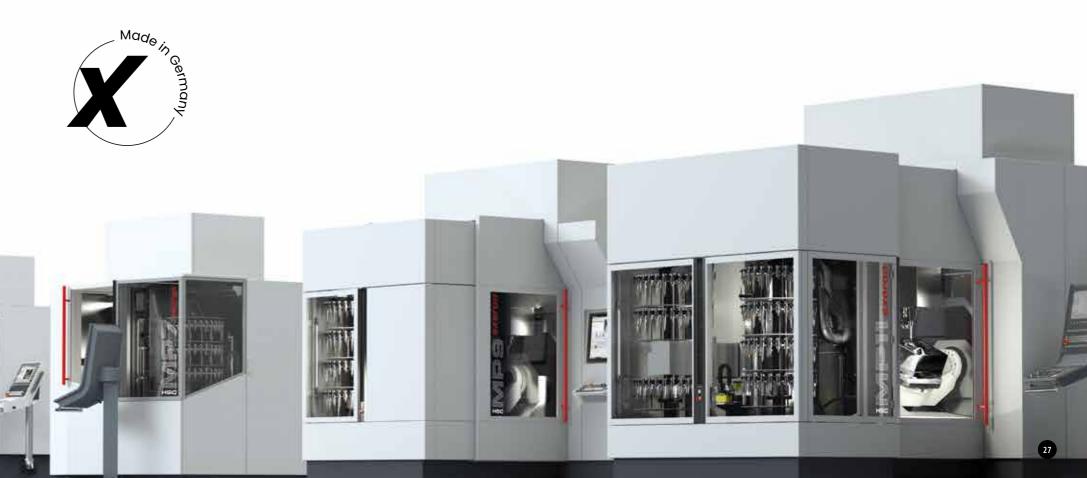
EXERON EUROPE



THE HSC LINE

We will gladly provide you with an overview of all exeron High-speed milling machines. You can find all the relevant details here and thus make a direct comparison. Technical changes that serve to further develop our machines may lead to deviations of individual parameters.

Do you have any further questions – about special requirements or the implementation of individual specifications, for example? Then get in touch! Our experts will be happy to advise you. We look forward to talking to you.



	HSC 300/3	HSC 300/5	HSC 600/3	HSC 600/5
Travelling distances X x Y x Z	550 x 340 x 355 mm	515 x 340 x 355 mm	585 x 550 x 400 mm	650 x 550 x 400 mm
Travelling distances B x C		B ±105° x C infinite		B ±100° x C infinite
Workspace X x Y x Z	515 x 340 x 355 mm	515 x 340 x 355 mm	585 x 550 x 400 mm	650 x 550 x 400 mm
Clamping table/faceplate	470 x 400 mm	Ø 100 mm	530 x 900 mm	Ø 410 mm
Distance table/spindle nose	495 mm	324 mm	600 mm HSK-E40 586 mm HSK-E50	600 mm HSK-E40 586 mm HSK-E50
Workpiece weight max.	500 kg	12 kg	600 kg	200 kg
Total dimensions (W x D x H)	2,000 x 2,350 x 2,450 mm	2,000 x 2,350 x 2,450 mm	2,250 x 2,400 x 2,900 mm	2,200 x 2,400 x 2,900 mm
Spindle speed	42,000 rpm	42,000 rpm	42,000 rpm	42,000 rpm
Spindle power \$1/\$6 – 40%	10/13,5 kW	10/13,5 kW	10/13,5 kW HSK-E40 24,8/33 kW HSK-E50	10/13,5 kW HSK-E40 24,8/33 kW HSK-E50
Tool magazine	16/40 HSK-E40	16/40 HSK-E40	30/60/90 HSK-E40 27/54/81 HSK-E50	30/60/90 HSK-E40 27/54/81 HSK-E50
Rapid traverse X x Y x Z	30 m/min.	30 m/min.	50 m/min.	50 m/min.
Rotation speed B/C		120/250 rpm		80/80 rpm
CNC control	Heidenhain TNC 640	Heidenhain TNC 640	Heidenhain TNC 640	Heidenhain TNC 640

HSC MP7/3	HSC MP7/5	HSC MP9/5	HSC MP11/3	HSC MP11/5
730 x 340 x 400 mm	730 x 250 x 400 mm	955 x 625 x 400 mm	1,055 x 900 x 540 mm	1,055 x 760 x 540 mm
	B ±105° x C infinite	B ±105° x C infinite		B ±105° x C infinite
640 x 340 x 400 mm	640 x 250 x 400 mm	725 x 625 x 400 mm	800 x 900 x 540 mm	800 x 760 x 540 mm
580 x 460 mm	Ø 185 mm	Ø 412 mm	850 x 1,070 mm	412 x 412 mm
550 mm	450 mm	600 mm HSK-E40 586 mm HSK-E50	720 mm HSK-E40 706 mm HSK-E50/HSK-F63	720 mm HSK-E40 706 mm HSK-E50/HSK-F63
550 kg	60 kg	250 kg	1 000 kg	350 kg
2,400 x 2,370 x 3,000 mm	2,400 x 2,370 x 3,000 mm	2,610 x 3,080 x 3,150 mm	2,390 x 4,500 x 3,350 mm	2,390 x 4,500 x 3,350 mm
42,000 rpm	42,000 rpm	42,000 rpm HSK-E40 36,000 rpm HSK-E50	42,000 rpm HSK-E40 36,000 rpm HSK-E50/HSK-F63	42,000 rpm HSK-E40 36,000 rpm HSK-E50/HSK-F63
10/13,5 kW	10/13,5 kW	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50/HSK-F63	10 kW/13,5 kW HSK-E40 24,8 kW/33 kW HSK-E50/HSK-F63
30/60/90 HSK-E40	30/60/90 HSK-E40	30/60/90/120 HSK-E40 27/54/81/108 HSK-E50	max. 210 HSK-E40 max. 189 HSK-E50 max. 154 HSK-F63	max. 210 HSK-E40 max. 189 HSK-E50 max. 154 HSK-F63
40 m/min.	40 m/min.	60 m/min.	80 m/min.	80 m/min.
	190/250 rpm	100/100 rpm		100/100 rpm
Heidenhain TNC 640	Heidenhain TNC 640	Heidenhain TNC 640	Heidenhain TNC 640	Heidenhain TNC 640



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exeron combines EDM and HSC competence to sustainable success for its customers and offers this as a manufacturer of efficient, reliable and durable eroding machines (EDM) and high-speed milling machines (HSC) as well as handling systems (automation) "Made in Germany". exeron stands for professionalism, quality, customer orientation, flexibility and service competence.



We reserve the right to make design changes and other changes to technical data and performance features insofar as they serve technical progress, mistakes, printing, calculation, writing and calculation errors.

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