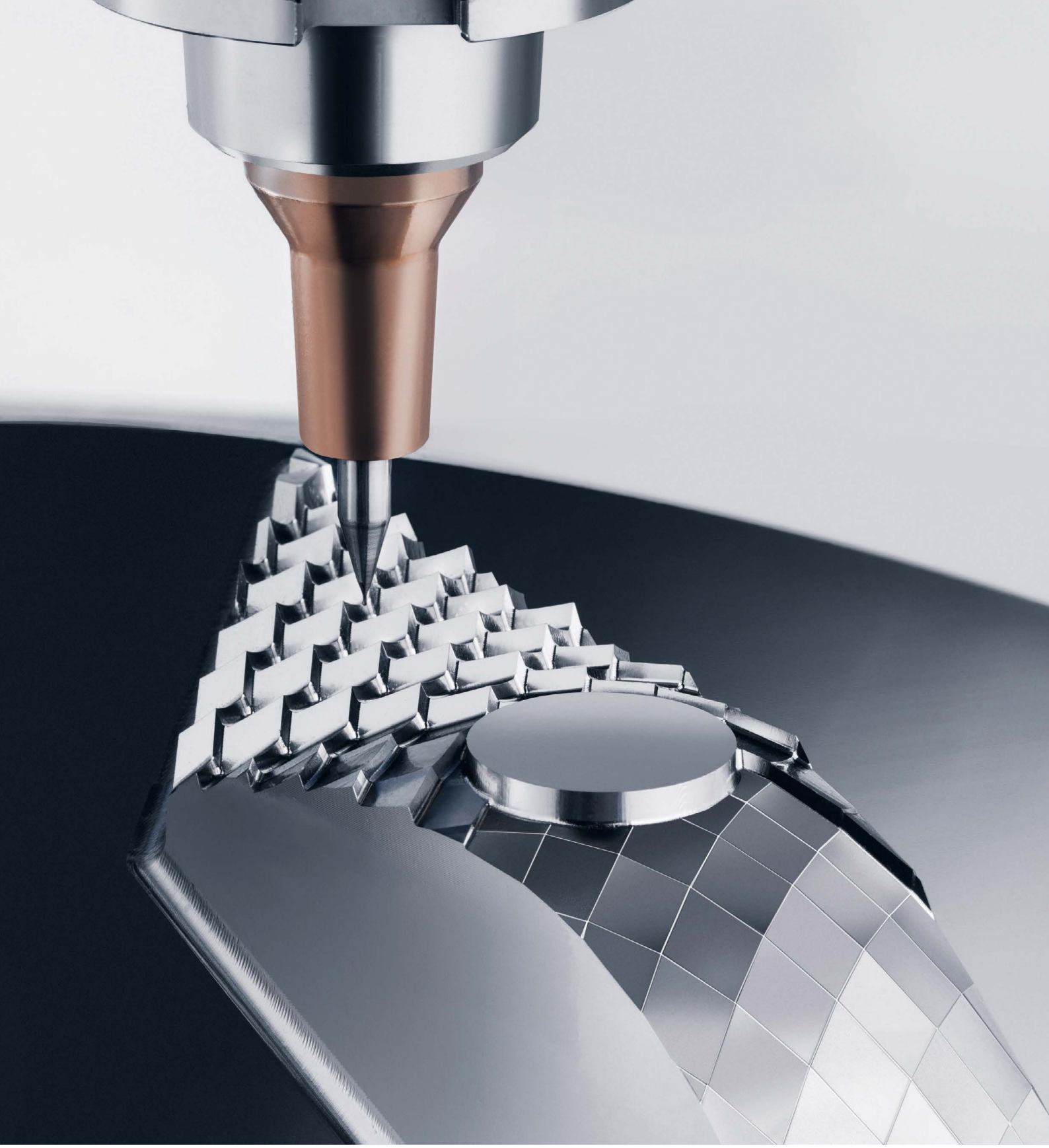
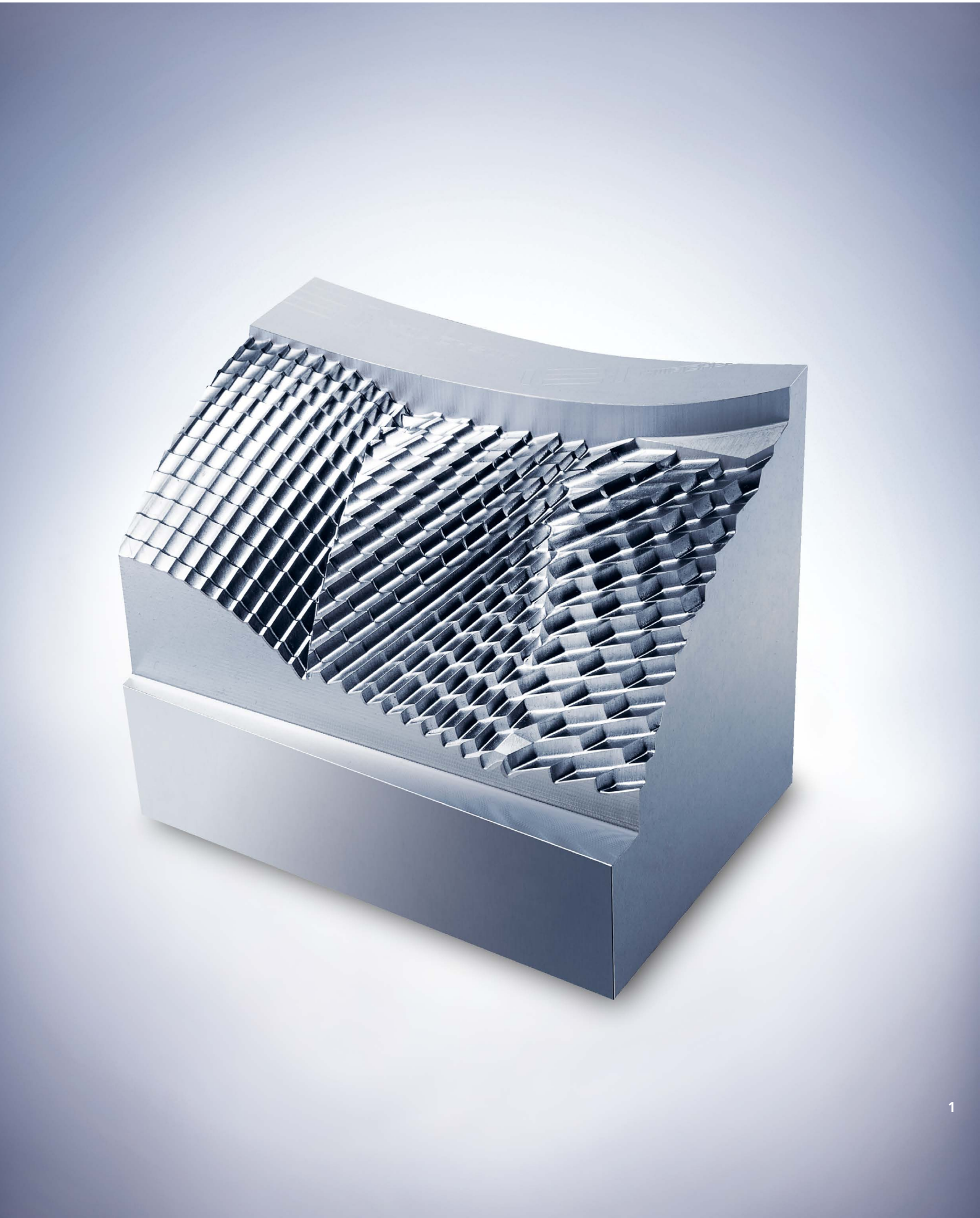


UH500

500mm Y-Axis Vertical Machining Center for
Precise Die And Mold

HWACHEON

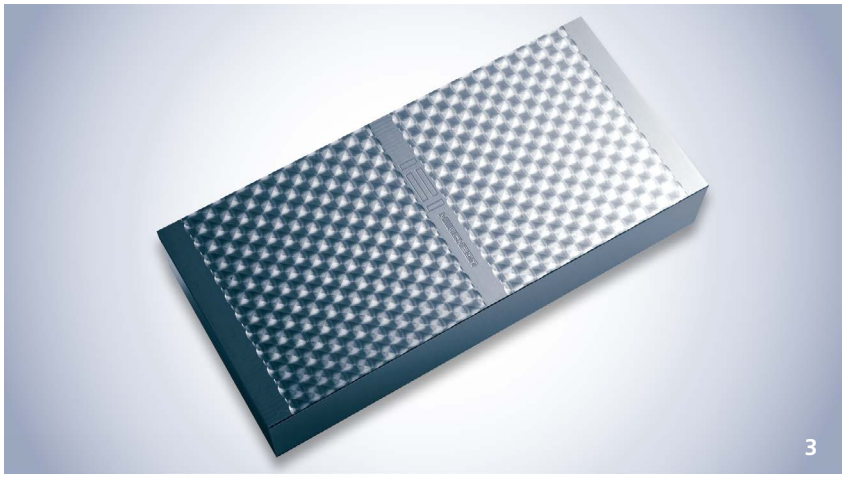


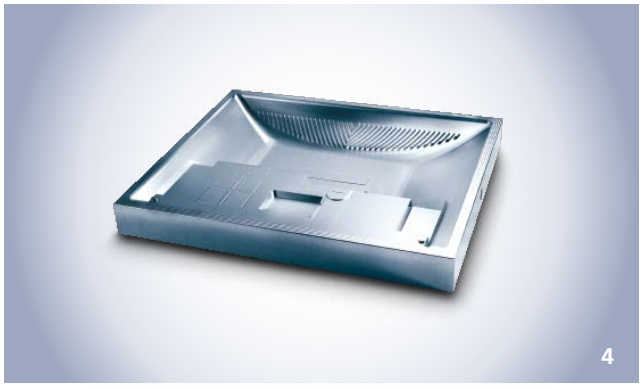
VERTICAL MACHINING CENTER FOR PRECISE DIE AND MOLD

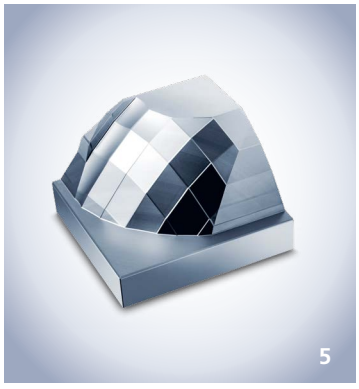
This is the perfect Die and Mold solution you've been looking for.

UH500 is a vertical die and mold center which performance is world-leading. It provides your company with a total one stop production solution, from tool selection to final product.

1 Optical Mold / Automobile / NAK80 **2** Cellular Phone Mold/ Mobile / NAK80 **3** Surface Finishing / Automobile / NAK80
4 LCD Back Cover(Cavity) / Home Appliances / NAK80 **5** Headlight Mold / Automobile / NAK80







"HWACHEON PERFORMANCE LEAVES COMPETITION IN THE DUST- THIS IS THE BEST DIE AND MOLD CENTER YOU CAN GET, PERIOD."

UH500 machining center is manufactured to perfection with Hwacheon's workmanship that is the quality recognized and envied by everyone in the industry; and it guarantees to give you a perfect result every time.

The high performance spindle which integrates Hwacheon's Oil-jet Cooling technology ensures consistent quality result after hours and hours of operation, while the machine's Optimal Machining system gives you a total production solution, from tool selection to final product. UH500 is designed using 3D simulations and the FEM analysis to achieve structural rigidity which can translate to quality product results; while the Hwacheon-designed machining software components enhance safety and the work efficiency in your organization. The UH500 is configurable with many different options so that it can integrate better in your work environment and application.

Rigid Bilateral Gate Structure Machine Frame

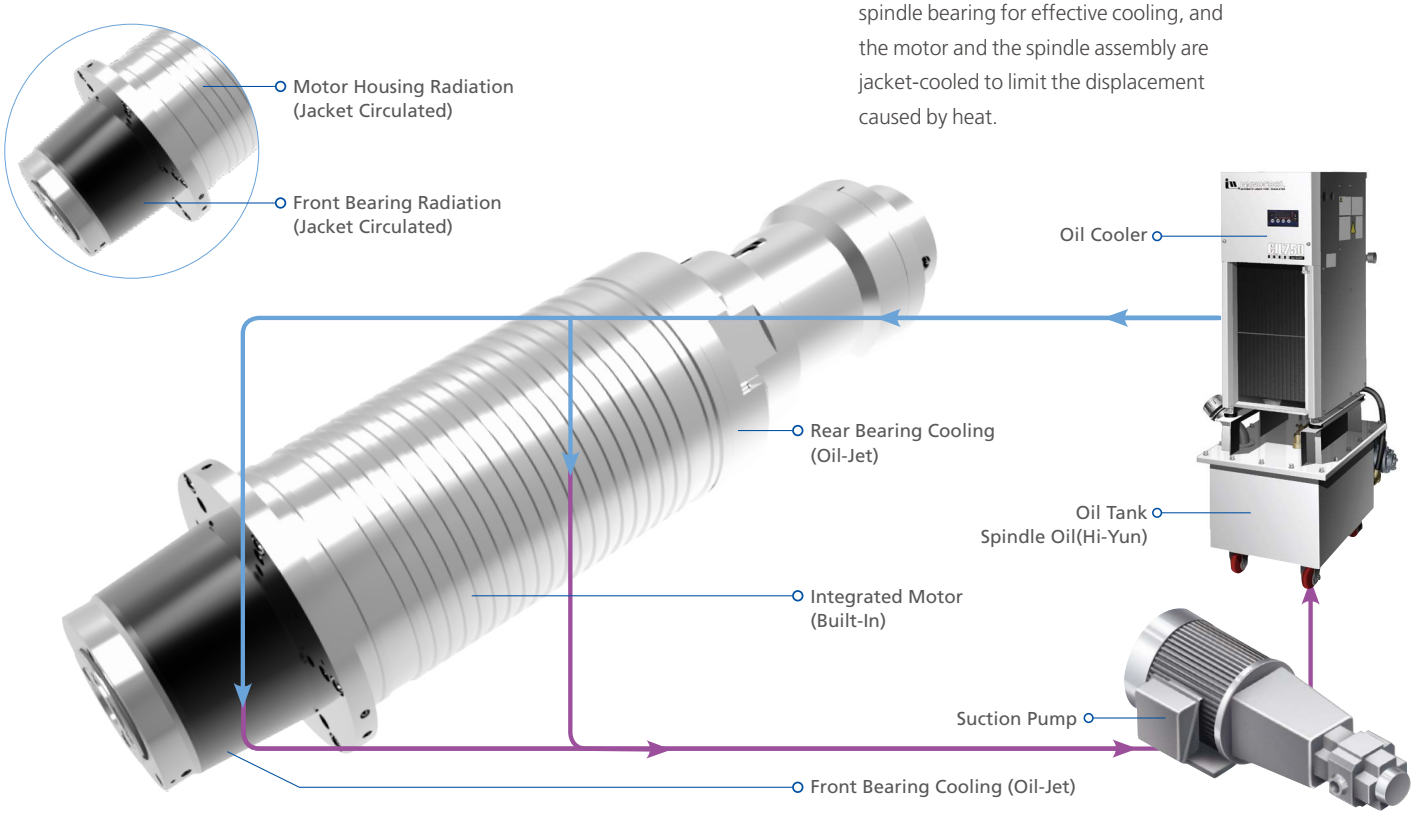
The gate structure firmly supports the X-axis drive and diverts the load, vibration, and heat from the upper section of the machine evenly throughout the frame-the feature which helps to keep the feed drive stable after hours of operation. Also, the short distance between the X-axis drive and the tool's contact point is a plus for maintaining the rigidity and for enhancing the machining precision.

Spindle Assembly

The Hwacheon clean room assembly facility, where the super-precision, super-speed spindle built inside UH500 is manufactured, maintains optimal temperature and humidity, and is kept free of any foreign substances. Only the most skilled master engineers are allowed in the assembly facility, in the production of only the best equipment to comply with the toughest quality standard in the industry.

Oil-jet Cooling System

The jet of oil is injected directly onto the spindle bearing for effective cooling, and the motor and the spindle assembly are jacket-cooled to limit the displacement caused by heat.



MACHINING SOFTWARE

The Hwacheon Machining Software Components

The Hwacheon's developed machining software monitors different variables related to the work environment and machining conditions and makes adjustments for best quality results and optimum work efficiency.

+ RELIABILITY

HTDC (HSDC + HFDC)

Hwacheon Thermal Displacement Control System (HSDC + HFDC)

HTDC integrates the Hwacheon Spindle Displacement Control system and the Frame Displacement Control System.

HFDC

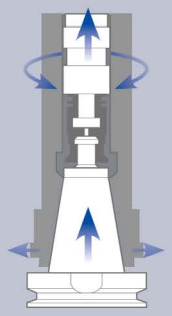
Hwacheon Frame Displacement Control System

HFDC is equipped with highly sensitive thermal sensors in the casting region where thermal activity is suspected; monitoring and correcting displacement.

HSDC

Hwacheon Spindle Displacement Control System

When the spindle rotates at high speed, the centrifugal force drives the taper to expand, causing errors in Z axis. HSDC constantly monitors the temperature at each spindle region and makes optimal prediction for thermal displacement. The system then makes necessary adjustments and effectively minimizing thermal displacement.



Static displacement compensation

The HSDC system corrects the Z-axis error occuring from the taper expansion during the spindle's high speed rotation.

PRECISION +

HTLD

Hwacheon Tool Load Detect System

HTLD constantly monitors the tool wear to prevent accidents, which may occur from a damaged tool and help to stop tool wear from deteriorating the workpiece.

(The load is measured every 8 msec to ensure accuracy)

HECC

Hwacheon High-Efficiency Contour Control System

HECC offers an easy-to-use programming interface for different work -pieces and different processing modes. The system provides a precise, custom contour control for the selected workpiece, while prolonging the life of the machine and decreasing process time. The customizable display provides real-time monitoring and quick access.

- Program offers different options for different cutting speed and accuracy for roughness and shapes.
- The customizable display provides real-time monitoring and quick, easy access.
- The program is executable on an existing NC DATA system and works with the Cycle Code system.

OPTIMA

Cutting Feed Optimization System

OPTIMA utilizes an adaptive control method to regulate the feed rate in real time, to sustain the cutting load during a machining process. As a result the tools are less prone to damage and the machining time is reduced.

SPEED +

USER FRIENDLY DESIGN, A WIDE RANGE OF OPTIONAL FEATURES

UH500 offers user friendly design and a wide variety of useful options for practical applications, so you can concentrate on what you do best: creating quality products-without losing your valuable time to the worries of machine failure and safety. A wide variety of performance upgrade options are available for faster, more precise machining.

High Performance Machining

UH500 have applied a specification for high-quality die and mold

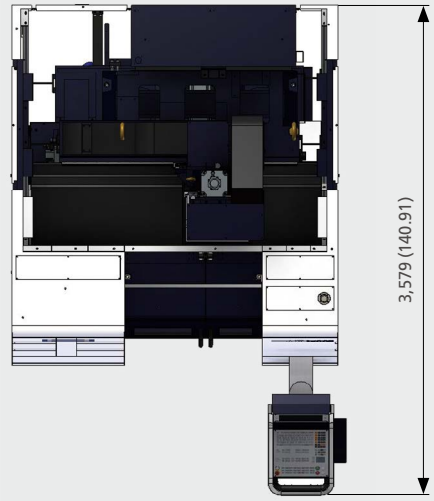
- Spindle Cooling System
- Program Storage Memory (21GB)
- Tool Life Management
- Hwacheon Artificial Intelligence Control system
- Linear Scale (Opt.)

Easy Work Setup

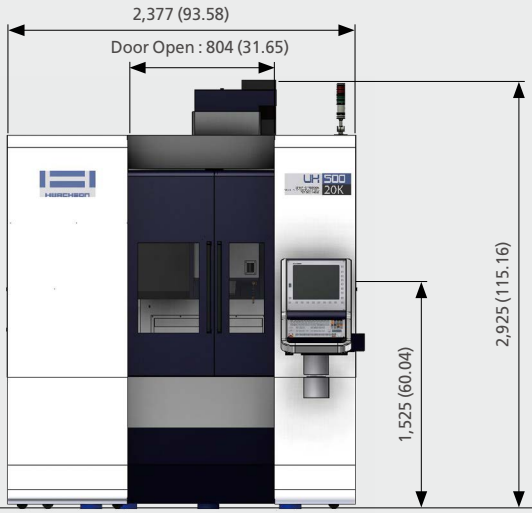
User Graphic Measuring Cycle which is customized for Die & Mold machining will provide intuitive environment of making program and high precision cutting result on machine. In addition, Tool Probe and Work probe Interface will help to set-up workpieces easily.

Product Data

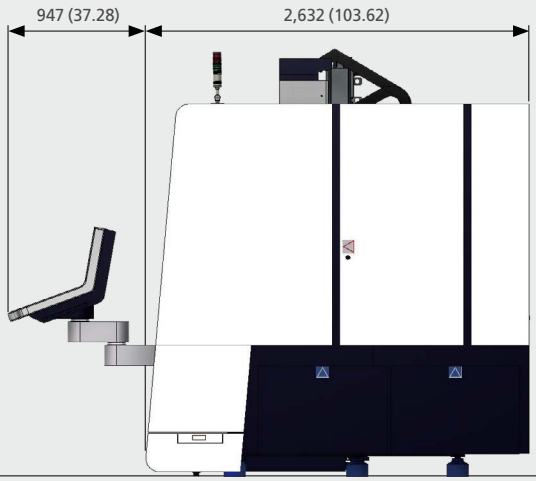
* Unit: mm(inch)



Top



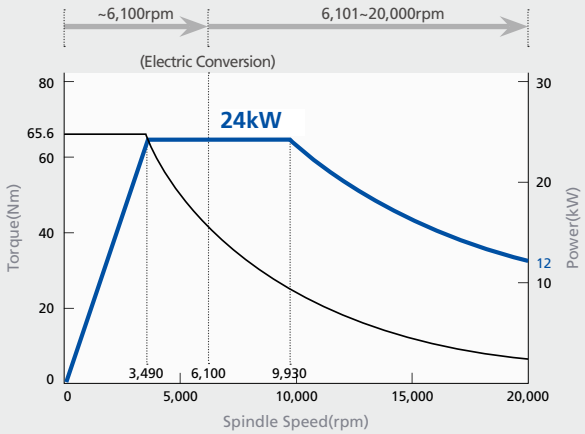
Front



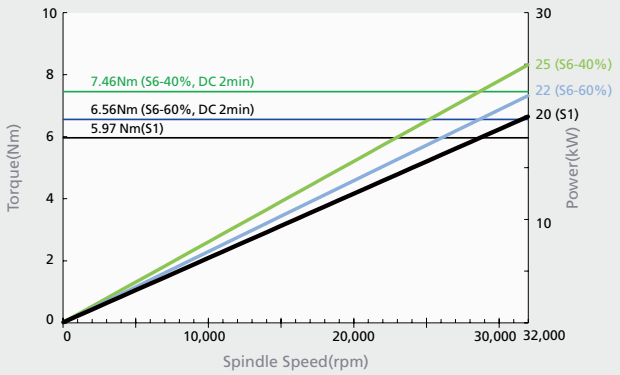
Right side

Spindle Power – Torque Diagram

Standard (20,000rpm)

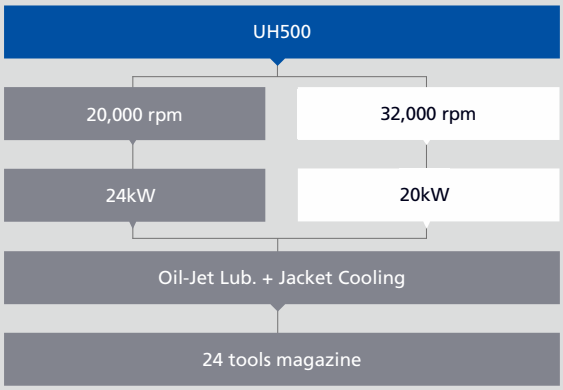


Option (32,000rpm)



Product Configuration

Each product can be configured to fit your application.



Machine Specifications

ITEM		UH500	
		20,000	30,000
Stroke			
Stroke (X / Y / X)	mm(inch)	750 / 500 / 350 (29.53 / 19.69 / 13.78)	
Distance from Table Surface to Spindle Gauge Plane	mm(inch)	150 ~ 500 (5.91 ~ 19.69)	
Distance Between Columns to Spindle Center	mm(inch)	179 (7.04)	
Distance Between Column	mm(inch)	950 (37.40)	
Table			
Working Surface	mm(inch)	850 x 500 (33.46 x 19.70)	
Table Loading Capacity	$kg_f(lb_f)$	800 (1,764)	
Table Surface Configuration (T slots WxP / No. of Slots)	mm(inch)	18 x 100 (0.71 x 3.94) / 5ea	
Spindle			
Max. Spindle Speed	rpm	20,000	32,000
Spindle Motor	kW(HP)	24 (32)	20 (27)
Type of Spindle Taper Hole	-	ISO#40, 7/24 Taper (BBT-40)	HSK-E40
Spindle Bearing Inner Diameter	mm(inch)	Ø70 (Ø2.76)	Ø45 (Ø1.77)
Method of Spindle Lubrication & Cooling	-	Oil Jet Lubrication + Jacket Cooling	
Feedrate			
Rapid Speed (X/Y/Z)	m/min(ipm)	24 / 24 / 24 (945 / 945 / 945)	
Feedrate (X/Y/Z)	mm/min(ipm)	1 ~ 24,000 (0.04 ~ 945)	
Motor			
Feed Motor (X/Y/Z)	kW(HP)	3.1 / 3.1 / 6.5 (4.15 / 4.15 / 8.7)	
Coolant Motor (Spindle, Chip Flushing)	kW(HP)	0.4 / 0.4 (0.54 / 0.54)	
Spindle Cooler (50/60Hz) : Inverter Type	kW(HP)	5.0 / 5.6 (6.7 / 7.5)	
ATC			
Type of Tool Shank	-	MAS-403 BBT-40 (OPT: CAT-40)	HSK-E40
Type of Pull Stud	-	MAS P40T-1 (45°)	-
Tool Storage Capacity	ea	24	
Max. Tool Diameter [With / Without Adjacent Tools]	mm(inch)	Ø90 / Ø127 (Ø3.54 / Ø5)	Ø50 / - (Ø1.97 / -)
Max. Tool Length	mm(inch)	250 (9.84)	200 (7.87)
Max. Tool Weight	$kg_f(lb_f)$	8 (17.64)	2 (4.41)
Method of Tool Selection	-	Fixed Address	
Method of Operation (Magazine/Swing Arm)	-	Servo Motor	
Power Source			
Electric Power Supply	kVA	65	
Compressed Air Supply (Pressure x Consumption)	-	0.5 ~ 0.7MPa x 690Nℓ/min	
Tank Capacity			
Spindle Cooling / Lubrication / Coolant	ℓ(gal)	40 / 12 / 210 (10.57 / 3.17 / 55.48)	
Machine Size			
Height	mm(inch)	2,925 (115.16)	
Floor Space (Length x Width)	mm(inch)	2,377 x 3,579 (93.58 x 140.91)	
Weight	$kg_f(lb_f)$	8,000 (17,637)	
NC Controller		HEIDENHAIN iTNC-530 HSCI	

Standard and Optional Product Components

Standard Accessories		Optional Accessories	
• Adjust Bolt & Block, Plate	• Spindle Cooler	• Air Gun	• Tool & Work Piece Measuring Interface
• Air Blower	• Tool Kit & Box	• Auto Door	- Renishaw/Blum (Optical type)
• Air Dryer	• Tool Life Management	• Coolant Gun	• 4-axis Interface
• Base Around Splash Guard	• Tool Offset Pairs (100ea)	• Lift Up Chip Conveyor	• Adaptive Feed Control (AFC)
• Coil Conveyor (2ea)	• Work Light	(Hinge Type, Scraper Type)	• Dynamic Collision Monitoring (DCM)
• Coolant System	• Workpiece Coordinate System (100ea)	• Linear Scale (X/Y/Z)	
• Door Interlock	• 15" Color LCD	• Oil Mist (Semi Dry Cutting System)	
• Lubrication System	• Cutting Feed Optimization System (OPTIMA)	• Oil Skimmer	
• MPG Handle (1ea)	• Hwacheon Artificial Intelligence	• Spindle Through Coolant (3MPa / 7MPa)	
• Operation Manual & Parts List	Control system (HAI) : 1024Block	•Tool Measuring system	
• Pneumatics System	• Hwacheon Efficient Contour Control	- Renishaw/Blum (Touch type, Laser type)	
• Program Storage Memory	System (HECC)	• Transformer	
(21GB-SSDR Type)	• Hwacheon Tool Load Detect	• Work Piece Measuring System	
• Rigid Tapping	System (HTLD)	- Renishaw/Blum (Touch)	
• Signal Lamp (R / G / Y, 3 Color)	• Hwacheon Thermal Displacement Control		
• smarT.NC (GUI)	System (HTDC)		

NC Specifications [HEIDENHAIN iTNC-530 HSCI]

※ — : Not available S : Standard O : Option

ITEM	SPECIFICATION	
Controlled Axis		
Controlled Axis (Cs Axis)	3-axis	S
Controlled Axis (Cs Axis)	18-axis (Max.)	O
Least Input Increment	0.001mm, 0.001deg, 0.0001inch	O
Least Input Increment 1/10	0.0001mm, 0.0001deg, 0.00001inch	S
Display and Input in inch / metric		S
Control Systems		
Main computer	MC7422	S
Controller Unit	CC6106 (6loops)	S
Visual Display Unit	15" Color LCD	S
Keyboard	TE735	S
NC Program Memory	21GB (SSDR Type)	S
Program Jumps		
Sub and Program Selection Repeats		S
Calling any Program as subprogram		S
Axis Feedback Control		
With Following Error		S
With Feedforward		S
Error Compensation		
Linear Axis Error		S
Backlash & Reversal Peak with Circular		S
Interpolation Function		
Straight Line	In 5-axis	S
Circle	In 3-axis	S
Helix		S
Data Interfaces		
Ethernet (100 baseT)		S
USB		S
Approaching and Departing the Contour		
Via Straight Line	Tangential & Perpendicular	S
Via Circular arc		S
Feed function		
Rapid Traverse Override	F0, F25, F100	S
Feedrate (mm/min)		S
Feedrate Override	0-150%	S
Program Input		
HEIDENHAIN Conversational and ISO Formats	.H, .I	S
Program Entry with SMART.NC		S
Touch Probe Cycle		S
Cycles		
Pecking / Tapping		S
Slot Milling		S
Pocket Milling		S
Circular Pocket		S
Datum Shift		S
Oriented Spindle Stop		S
Contour Definition		S
Tapping (Controlled Spindle)		S
Thread Cutting		S
Working Plane		S
Contour Data		S
Pilot Drilling		S
Contour Train		S

ITEM	SPECIFICATION	
Cycles		
Axis-specific Scaling Factor		S
Rough-out		S
Floor Finishing / Side Finishing		S
Cylinder Surface / Slot Milling/ Ridge Milling		S
Cylinder surface External Contour Milling		S
Tolerance (HSC mode, TA)		S
Drilling / Reaming		S
Boring / Back Boring		S
Universal Drilling		S
Rigid Tapping / Circular Slot		S
Helical Finish Milling		S
Tapping with Chip Breaking		S
Slot with Reciprocating Plunge		S
Rectangular Pocket / Stud Finishing		S
Rectangular Stud Finishing		S
Circular Pocket / Stud finishing		S
Point Pattern on Circle / Lines		S
Thread Milling / Counter Sinking		S
Thread Drilling / Milling		S
Helical Thread Drilling / Milling		S
Outside Thread Milling		S
Tool Function / Compensation		
Tool Life Management	In Tool Table	S
Position-controlled Spindle		S
Three-dimensional Tool-radius Comp		S
In the Working Plane and Tool Length		S
Spindle Speed Function		
Spindle Override	10-150%	S
Position-controlled Spindle		S
Oriented Spindle Stop		S
Setting and Display		
Calculation of Machining Time		S
Display of the Current Machining Time		S
Help Function		S
Graphic Simulation During Real-time	In Real Time Machining	S
Plan View, Projection in 3 Plane / 3D View		S
Multi-language Display	English, German, French, Czech, Italian, Spanish, Portuguese, Swedish, Danish, Finnish, Dutch, Polish, Hungarian, Russian, Chinese, Slovenian, Norwegian, Slovak, Korean, Turkish, Romanian	S
Additional Function		
DXF Convert		O
AFC	Adaptive Feed Control	O
HWACHEON Machining Software		
Look-ahead Blocks are Up to 1024 Blocks		S
Hwacheon Efficient Contour Control System (HECC) : Cycle 332 function		S
Hwacheon Tool Load Detect (HTLD)		S
Cutting Feed Optimization System (OPTIMA)		S
Hwacheon Thermal Displacement Control System (HTDC) = Hwacheon Spindle Displacement Control System (HSDC) + Hwacheon Frame Displacement Control System (HFDC)		S
4-axis Interface Function Option		
Software License	included 4-axis interface option	O

Hwacheon Global Network

Hwacheon Headquarters Hwacheon Europe Hwacheon Asia Hwacheon America

HWACHEON

Please contact us for product inquiries.

www.hwacheon.com

The product design and specifications may change without prior notice.
Read the operation manual carefully and thoroughly before operating the product,
and always follow the safety instructions and warnings labels attached on the surfaces of the machines.

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HC-M290-R1.9-201901