Sodick

Rigid Linear Motor Driven **Ultra High-Speed Milling Center**

UH650L
UH430L

create your future

Introducing
Sodick UH Series Ultra-High-Speed Milling Center

Expanded, Ergonomic Work Area

The new UH Series is built with the operator in mind, featuring a spacious interior work area for maintenance and setup. By further building on the previous HS Series design, the UH is able to optimize this interior space without sacrificing floorspace. Moreover, with a tilted bellows cover it is easy to clean the UH work area, automatically collecting chips into receptacles at the front of the machine.

Improved Spindle Options

To better fit the wide variety of applications handled by our milling customers, Sodick has introduced a wider range of spindle capabilities. Whereas previous models offered only one spindle option, an E32 with min. 5,000 RPM and max. 40,000 RPM, the new Sodick line significantly improves these capabilities. The new minimum spindle speed is now 1,500 RPM, with max. options ranging between 40,000 and 60,000 RPM, and sizes ranging from E32 to E25. All spindles continue to use Sodick's economical oil mist system and dual-contact heat-shrink tool holder.

Range of Materials & Applications

The UH Series Mill is capable of handling a wide range of materials, including not just copper and aluminum, but even ultra-hard materials exceeding 60 HRC, such as titanium and Inconel. Brittle matterials, too, are no obstacle for the UH Series, and materials such as graphite, glass, and even silicon are easily machined.

Patented "Automatic Evasive Action"

If, for any reason, the compressed air supply is interrupted during milling, the Z-axis performs an evasive maneuver, rising straight up to a preset elevation and preventing damage to the tool, workpeice, and spindle. If also equipped with UPS, this feature will operate even in the event of a power outage.

Perfect for Automation Cells

Sodick's UH Series Mills have the ideal design for automation, featuring a pre-installed, easy-access automation gate. The result is a hassle-free setup and a factory design built for next generation manufacturing technologies. Whether you're exploring automation for the first time or you're already running a large, extensive facility, it is easy to appreciate the productivity gains possible through these machining cells.

Beginning with the UH series, Sodick offers a newly expanded range of spindles to ensure that regardless of your application, Sodick has the solution right for you.

Size	Min RPM	Max RPM
E32	1,500 RPM	40,000 RPM
E25	1,500 RPM	50,000 RPM
E25	1,500 RPM	60,000 RPM

Oil/Air Lubrication
HSK Dual-Face Shrink Fit Tool Holder

Simulation Software

MotionExpert®-S

MotionExpert®-S analyzes NC programs in commercially available CAM software based on SEPT conditions. By analyzing machining times, velocities, trajectories, and more, it is possible to optimize your process to eliminate waste and optimize your shop's performance.

Machining Process Confirmation

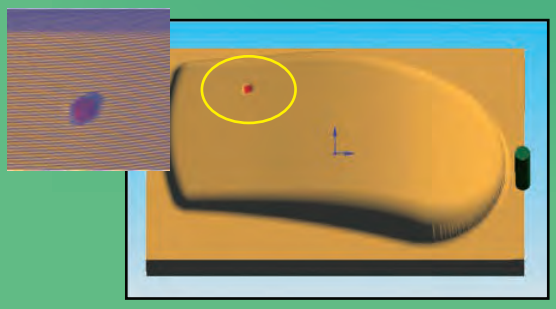
Before starting your machining program in an actual mill, the process can be confirmed through a graphic 3D simulation of the machining program.

Surface Finish Prediction

By evaluating velocity distribution data, ir is possible to predict actual machining surface finish for a given machining program.

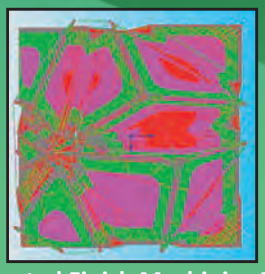
Gouge Checking

Prevent damage to your machine and tools by detecting defects and gouging before they happen. By comparing interference between the axis command trajectory and the machining model, it is possible to save significant rework time.

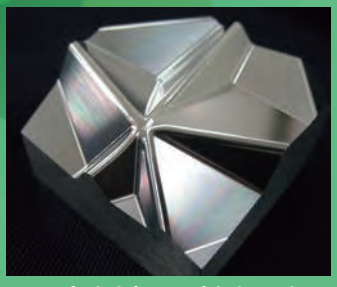


Machinining Time Estimation

By considering accelleration and deceleration rates, in addition to other data, MotionExpert®-S is capable of estimating actual machining time to a high degree of accuracy based on traditional CAM data.



Estimated Finish Machining Time
18 min 49 sec



Actual Finish Machining Time
18 min 49 sec

Software Operating Environment

OS	Windows 7 [32/64 Bit, English/Japanese
CPU	Intel Core i5 or higher reccomended
Memory	4 Gb or more reccomended
Resolution	1280 x 1024 or higher
HDD	50 Mb or more free disk space
Hardware	DVD Drive Required for Installation, USB port required for dongle

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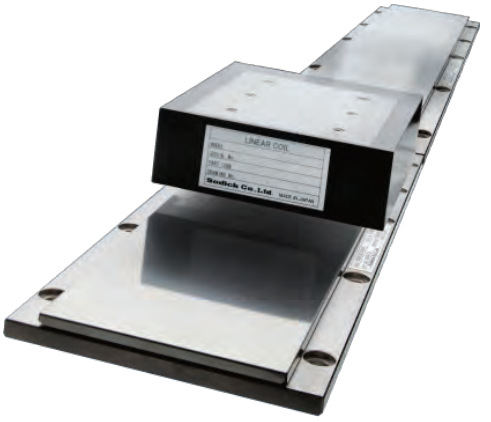
UH Series
Features and Core Technologies

Rigid Linear Motors

Sodick's patented Rigid Linear Motors employ a direct-drive, non-contact magnetic system which eliminates friction from the drive mechanism. The result is an axis drive with no vibration, no backlash, no overshoot, and no wear. Unlike Shaft motors, the Rigid Linear Motor is mounted directly into the machine castings, creating a stable environment with zero alignment issues. With unrivaled accelleration, accuracy, and reliability, Sodick's Rigid Linear Motors are the ideal technology for precision manufacturing. Many will imitate, but none can replicate our high performance system.

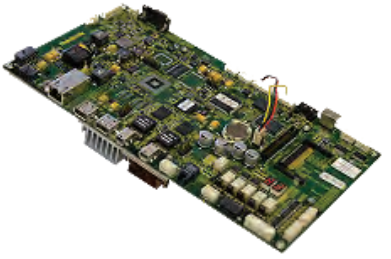


Absolute Glass Scales

With the use of Heidenhain's absolute glass scales, it is possible to achieve the finest levels of precision, unlocking the full potential of your Rigid Linear Motor drives.

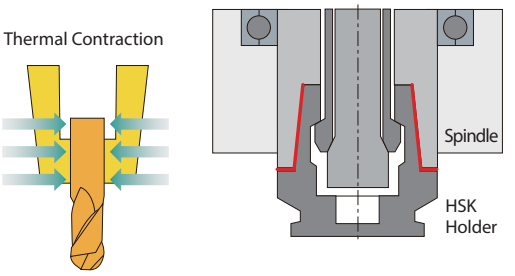
Sodick Motion Controller

Developed in Silicon Valley at Sodick's R&D facility, the Sodick Motion Controller accurately controls the high-speeds and accelleration of the Rigid Linear Motors through commands from the NC unit. The motion controller was heavily researched and developed to bring about new technical innovations in machining. With the capacity to make over 500 micro-adjustments per second, Sodick's motion controllers achieve the highest levels of precision.



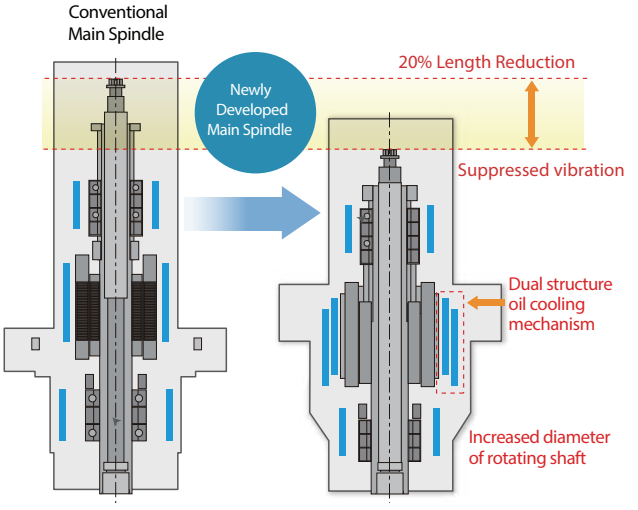
HSK Dual Face Contact & Heat Shrink Fitting

By ensuring simultaneous contact at both the flange edge and taper of the tool holder, it is possible to maintain accuracy during high speed rotation, without experiencing distortion. Likewise, the heat-shrink method of tool holding uses thermal expansion and contraction to insert and hold a tool in place, allowing for a holding force up to 4x as strong as that of a collet-type holder, while minimizing deflection.

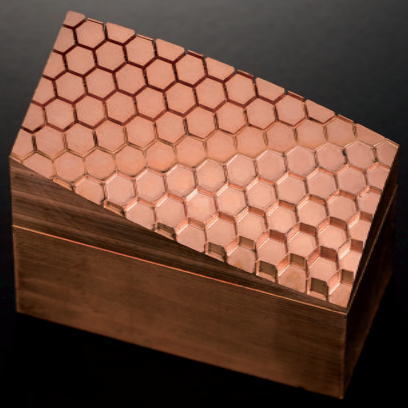


High Performance Spindle Design

Sodick's redesigned High-Speed Spindle achieves significantly greater precision over traditional machining methods through a number of stability-improving modifications. By shortening the length of the spindle, while increasing its diameter, vibration is significantly reduced. Likewise, the use of a dual structure cooling mechanism and thermally stable ceramic bearings ensure minimal distortion and wear over the life of your tool.



Samples



Honeycomb Electrode

Material	Cu
Rib Height	2.5 mm
Groove Depth	2.5 mm
Machining Time	2 h. 27 min.
Tools Used	Ball EM R1.5
	Ball EM R0.5
	Ball EM R0.3

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Wave Pattern Hard Milling

Material	STAVAX
Hardness	HRC 52
Machining Time	62 min. per part
Tools Used	Ball EM R1.5
	Ball EM R1.0
	Ball EM R0.5

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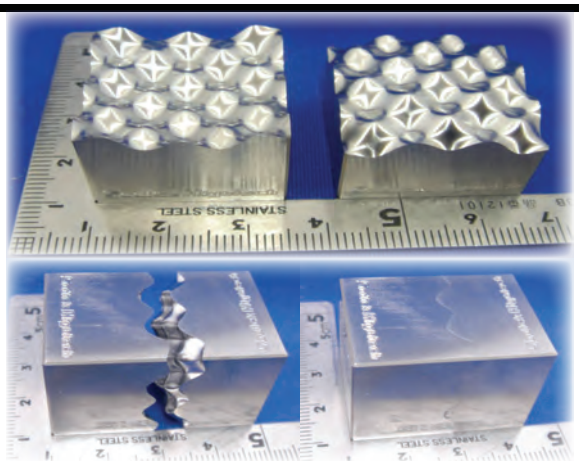
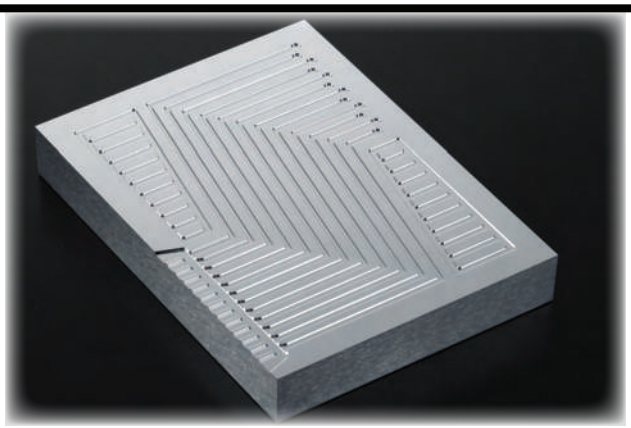


Separator for Press Mold

Material	SKD-11
Hardness	HRC 63
Form Accuracy	± 1µm
Tools Used	TOWA CBN End Mills
	Radius EM φ1.0R0.3
	Radius EM φ0.4R0.1
	Radius EM φ0.4R0.05
Features	High Hardness

TOWA

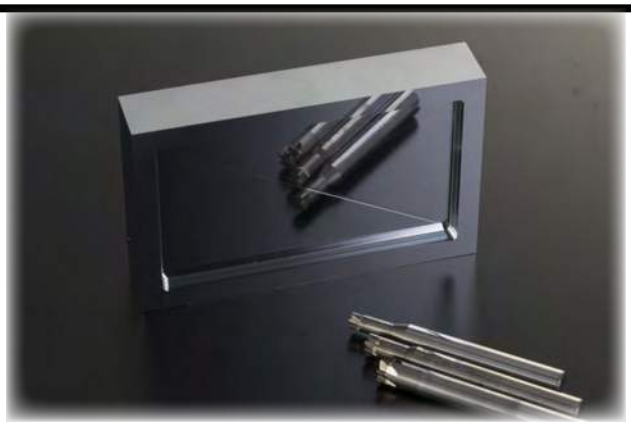


Tools Used: TOWA HPL-CBN End Mill

Pocket Form

Material	SKD-11
Hardness	HRC 63
Surface Finish	5 nmRa (0.19 RMS)
Tools Used	TOWA CBN End Mill
	Radius EM φ3.0R0.2
	Radius EM φ1.5R0.2
	Radius EM φ1.0R0.1
Features	HSM Mirror Finish

TOWA



Tools Used: TOWA HPL-CBN End Mill

Specifications

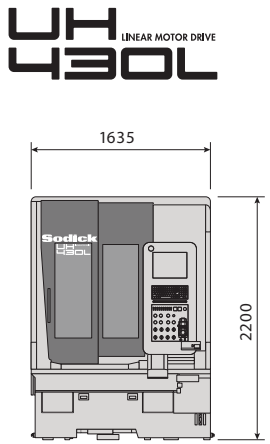
Machine Tool Specifications	UH430L	UH650L
X-Axis Travel	16.54" (420 mm)	24.41" (620 mm)
Y-Axis Travel	13.78" (350 mm)	19.69" (500 mm)
Z-Axis Travel	7.87" (200 mm)	11.81" (300 mm)
Drive Mechanism	Rigid Linear Motor Drives	
Distance from Table to Spindle End	4.53” - 12.40” (115 - 315 mm)	5.91” - 17.72” (150 - 450 mm)
Table Size	23.62" x 15.75" (600 x 400 mm)	29.53" x 19.69" (750 x 500 mm)
Max. Workpiece Weight	220 lbs (100 kg)	330 lbs (150 kg)
Tool Holder Type	HSK Dual Face Contact Holder	
Automatic Tool Changer Capacity	16 tools (E32), 20 tools (E25)	
Max Tool Length	E32 4.33” (110 mm) | E25 3.94” (100 mm)	4.33” (110 mm)
Distance from Floor to Table Top	30.51" (775 mm)	32.48” (825 mm)
Machine Tool Dimensions (W x D x H)	64.37" x 119.49" x 86.81" (1,635 x 3,035 x 2,205 mm)	71.85" x 125.98" x 100.00" (1,825 x 3,200 x 2,540 mm)
Machine Tool Weight	13,227 lbs (6,000 kg)	17,636 lbs (8,000 kg)
Total Power Input	3-phase 50/60 Hz 25 KVA	3-phase 50/60 Hz 30 KVA

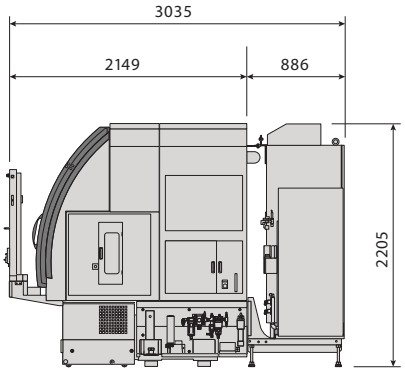
Semi-Dry Machining System	UH430L	UH650L
Cutting Fluid	Vegetable Oil	
Fluid Consumption	0 - 50 mL/h	0 - 50 mL/h
Mist Particle Size	3 µm	3 µm
Fluid Storage Capacity	1,200 mL	1,200 mL
Operating Pressure Range	0.2 - 0.7 MPa	0.2 - 0.7 MPa

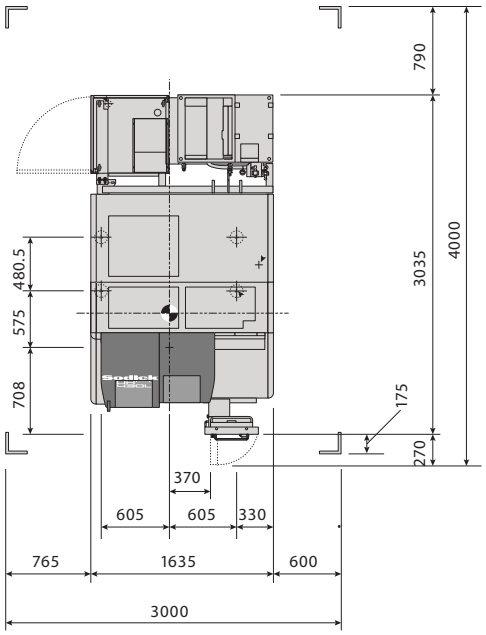
CNC Specifications	LN2X
Control Axes	4 axes (X, Y, Z & Spindle)
Simultaneous Control Axes	Max. 4 axes
Min. Input Unit	0.000001 in (0.00001 mm)
Min. Movement Unit	0.000001 in (0.00001 mm)
Max. Command Value	± 9999.999999 in (± 99999.99999 mm)
Display Type	15" TFT-LCD
Character Set	Alphanumeric Characters and Symbols
Keyboard	Standard 101 Keys, Function Keys
Positioning Command	Incremental and Absolute

Features	Options
Blum Laser Tool Length Measurement	Heat-Robo Shrink-Fitting Device (230v)
Touch Sensor Automatic Part Centering	Uninterruptible Power Supply (UPS)
16 Position Automatic Tool Changer	45 Position Automatic Tool Changer
Step-Down Transformer (35 kV)	Graphite Package
Mist Collector Unit	Automation Interface

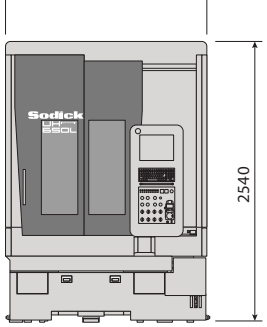
UH430L
Layout

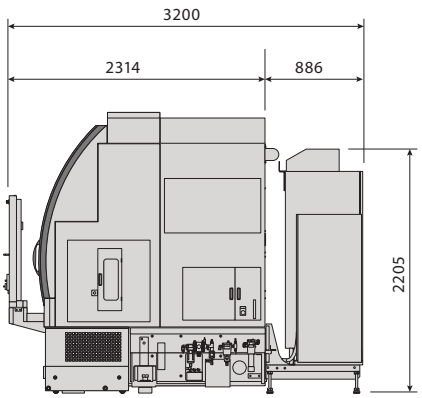


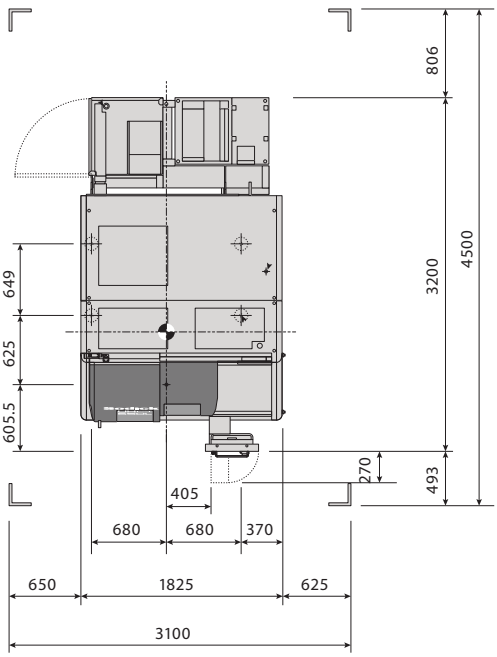




UH650L
Layout







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