

Super HiCELL400

S-series

Super Integrated Machining Cell



***Super* HiCELL 400**

“Eco·eco[®]”

Super Integrated Machining Cell

Superior Unique Technologies Present
**High Accuracy,
 Process Integration, and Complete Machining**

〈CNC Lathe +Machining Center〉
 "Eco•eco[®]"
 Super Integrated machining cell
Super HiCELL 400



Triple-station turret head (PAT.pending)



1 the 1st station

Turning tool station

Thermal growth is minimized by separating the machining spindle from turning tool station.

2 the 2nd station

Machining tool station

The maximum Spindle speed
 10000min⁻¹(rpm)

3 the 3rd station

Assist station

Special tools, combined tools, or dedicated finishing tools can be used.

Specifications

● Swing over bed	710mm(28")
● Chuck outside dia.	380mm(15")
● Max.shaft length	1100mm(43.3")
● Bar capacity	103mm(4.0")
● Turning spindle speed	20-3000min ⁻¹ (rpm)
(Motor)	37/30KW(50/40HP)
● Rotating spindle speed	100-10000min ⁻¹ (rpm)
(Motor)	25/22KW(33/30HP)



- Super HiCELL 400 is composed of 4 axes, **X Y Z C**, enhancing the versatile machining functions of the well known HiCELL 40 II.
- Hitachi Seiki's unique triple-station turret is employed. The turning tool station and the machining tool station are separated, and also a special high tensile strength material "COOL METAL[®]" is used, so that thermal distortion can be minimized. Further, the assist station is available for combined tools or special tools.
- High-performance machining spindle provides versatility of machining.
- High speed ATC unit can store up to 32 tools as standard.
- The sub-spindle (optional) enables finishing a complex workpiece in a single set-up.

Powerful Cutting and High Productivity

Super HiCELL 400 Cutting capacity

Material: Carbon steel

Turning Spindle

OD turning	(Depth of cut x Feed)	14 x 0.5mm/rev.(0.55" x 0.02ipr)
ID turning	(Depth of cut x Feed)	9 x 0.5mm/rev.(0.35" x 0.02ipr)
OD grooving	(Width x Feed)	8 x 0.1mm/rev.(0.32" x 0.004ipr)
ID grooving	(Width x Feed)	7 x 0.1mm/rev.(0.27" x 0.004ipr)
Face grooving	(Width x Feed)	8 x 0.1mm/rev.(0.32" x 0.004ipr)
Drilling	(Dia. x Feed)	φ 50 x 0.4mm/rev.(2.0" x 0.015ipr)

Machining Spindle

Face mill	φ 80mm(3.1") 4-blade (Depth of cut x Width x Feed)	4 x 80 x 600mm/min.(0.15" x 3.1" x 23.6ipm)
End mill(Grooving)	φ 32(1.26") 2-flute (Width x Depth of cut x Feed)	32 x 20 x 0.15mm/rev.(1.26" x 0.78" x 0.006ipr)
End mill(Side grooving)	φ 32(1.26") 2-flute (Width x Depth of cut x Feed)	20 x 16 x 0.15mm/rev.(0.78" x 0.63" x 0.006ipr)
Drill	(Dia. x Feed)	φ 40 x 0.3mm/rev.(1.6" x 0.012ipr)

*Accuracy data are the actual results obtained under static testing conditions in a temperature controlled environment per JIS-Standard.

Machining Spindle

Equipped with a 25kW high power built-in motor and it removes material just like a machining center with #50 taper spindle.

S Q C T (K V) Tooling System

Hitachi Seiki's
unique tooling system
<Patented>

S : Solid and Super
Q : Quick
C : Change
T : Tool

Features

1. Stable heavy-duty cutting

Short taper shank and 2-face contact where a taper and an end face are restrained to support heavy-duty cutting

2. Strong solid tool lock system

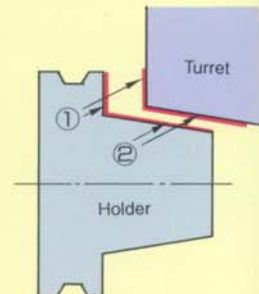
Instead of conventional spring system, the new clamp system containing a wedge mechanism holds the tools with a 1.4-ton force.

3. High accuracy

ATC tool change repeatability in X and Z axes is 2 μm.

4. Commercially available universal tools can be used.

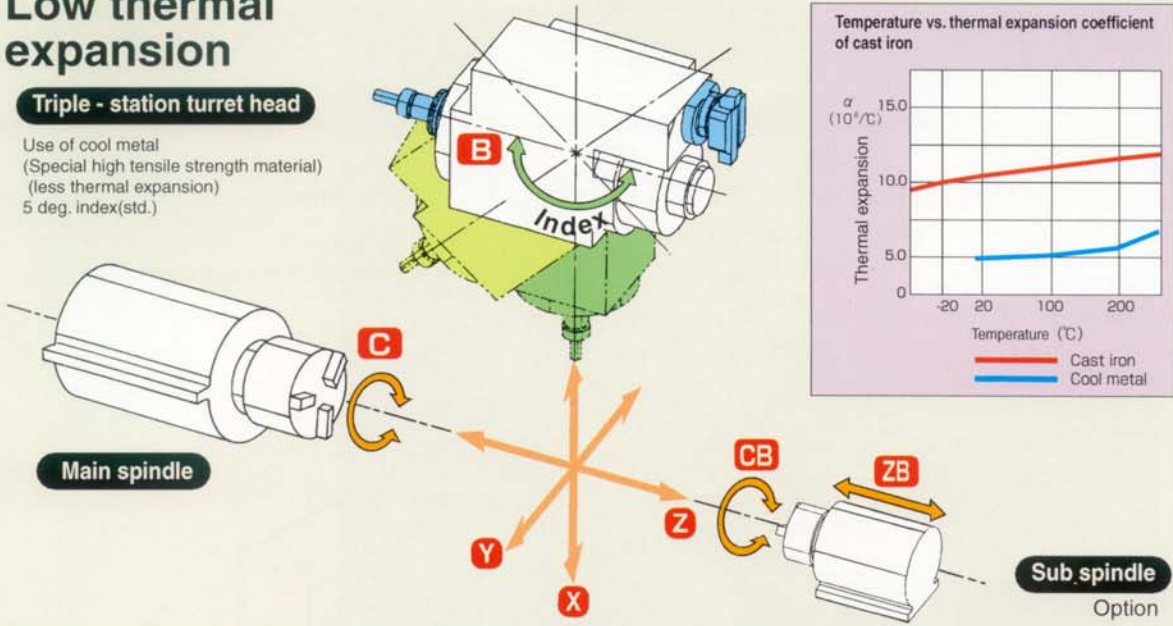
Economical tooling system.



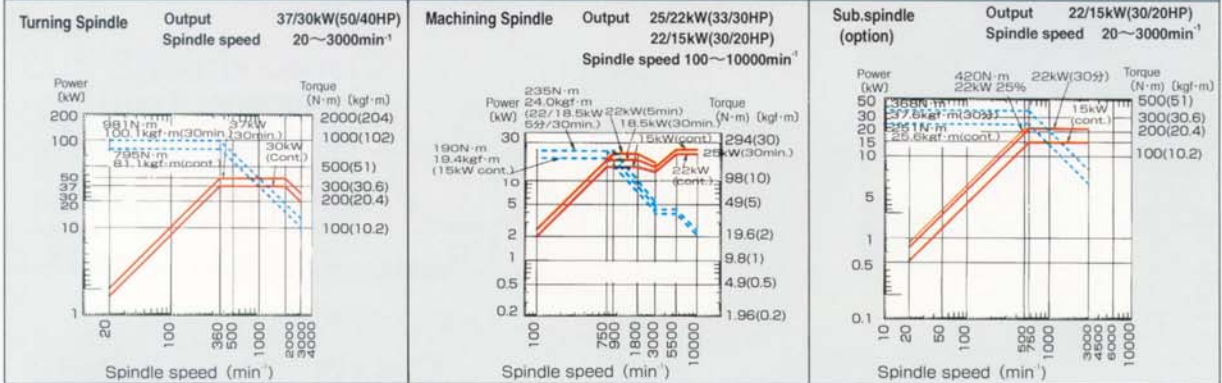
Low thermal expansion

Triple - station turret head

Use of cool metal
(Special high tensile strength material)
(less thermal expansion)
5 deg. index(std.)

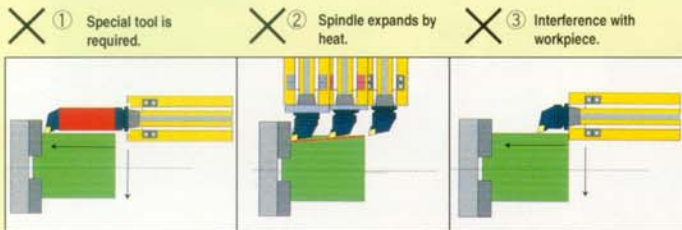


Spindle Output Diagram



SQCT system(KV) of Super HiCELL 400 is effective particularly for OD turning.

Simultaneous machining of OD and end face does not cause problems as shown below.



- ① Using universal tools
- ② High accuracy machining can be done
- ③ Safety

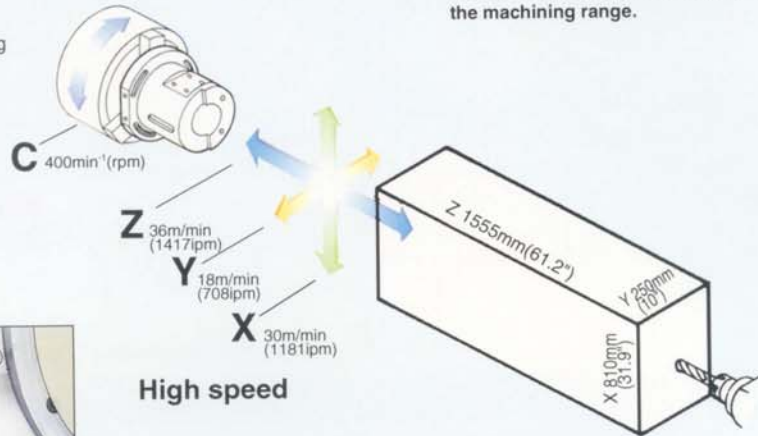


User friendly

Orthogonal 3-Axis Structure < Patented >

X, Y, and Z axes are positioned at right angles (90°) to each other.

- Reduced programming time.
Programming can be made in the same manner as that of machining centers.
- Tool edge can be seen even during cutting, thus making the operation easy.



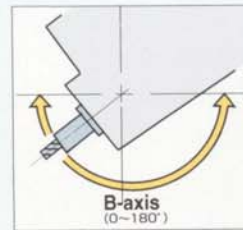
4-axis control

4-axis control of X, Y, Z axes plus C axis widens the machining range.



Finishing with the 3rd station (assist station)

High speed



Turret NC index (Contouring B-axis)

It works like a 5 axis machining center.

Programming of the tool is just like programming in the Z axis, regardless of the position of B-axis.

Q-Setter < Patented >



- Adjustment of one tool in 40 sec.
- Make tool edge touch the sensor, that's all.
- Q Setter arm slides out above the spindle head. Tool can be measured even with large work or center work in the chuck.
- Stored during machining, so free from chip and coolant.

C-axis control

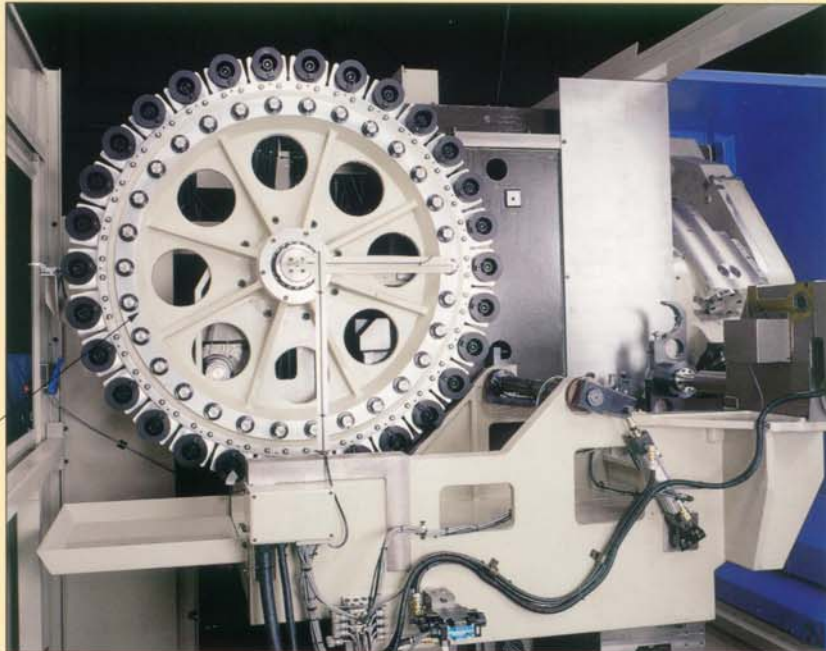


The C axis control, machining tools and axis feed function facilitate machining of a wider range of items.

High Speed ATC

ATC unit of Super HiCELL 400 has double arms just like the machining centers and the tool change is instantaneous. There is no waiting since the next tool is called to the stand-by position in advance of tool change.

30 tool ATC



Sub Spindle < Option >

Complete machining or processing with "One Set-up" using sub-spindle

No idle time between processes

↳ Shortens the inter-process time

Synchronized part transfer

↳ Improves total machining accuracy

*Rapid traverse
25m/min(984ipm)*

After No.1 (First) process finished, the sub-spindle immediately moves to the workpiece transfer position. After workpiece transfer, No.2 (Second) process starts.

Super HiCELL 400 w/Sub spindle	
Chuck size	380mm(15")
Spindle speed	20~3000min ⁻¹ (rpm)
Bar capacity	103mm(4.0")
Motor for spindle	22/15kW(30/20HP)



Super HiCELL400 Machine Specifications

	Items	Super HiCELL400	
Capacity	Swing	710mm(28")	
	Chuck dia.	380mm(15")	
	Max. cutting dia. (turning)	710mm(28")	
	Max. shaft length	1100mm(43.3")	
	Bar capacity	103mm(4")	
Spindle	Spindle speed	20-3000min-1(rpm)	
	Number of speed ranges	Stepless	
	Spindle nose	A2-11	
	Hole through Spindle	120mm(4.7")	
	Spindle Positioning	0.001deg.	
	Turret	Style of turret	SQCT
Turret head index		5deg.	
Travel		X-axis	810mm(31.9")
		Z-axis	1555mm(61.2")
		Y-axis	250mm(10")
		C-axis	Rotating
		ZB-axis(Sub-spindle)(op.)	1450mm(57")
Rapid traverse		X-axis	30m/min(1181ipm)
		Z-axis	36m/min(1417ipm)
		Y-axis	18m/min(708ipm)
		C-axis	400min-1(rpm)
		ZB-axis(Sub-spindle)(op.)	25m/min(984ipm)
Cutting feed		X/Z/Y/ZB axes	0.001-500mm/rev(0.0001-20ipr)
		C-axis	5.6min-1(rpm)
Jog feed			0-5000mm/min(0-200ipm)
No. of stations		2+1	
Max. turning tool(OD/ID)		32/50mm(1.25"/2")	
No. of Machining spindle tool on turret		1pc	
Machining spindle speed		100-10000min-1(rpm)	
Machining spindle steps		Stepless	
ATC	Type of tool shank	7/24taper No.45	
	Tool storage capacity	30	
	Max. diameter	120mm(4.7")	
	Max. tool length	(X-axis)	350mm(13.8")
		(Z-axis)	450mm(17.7")
	Max. tool weight	10kg(22lbs)	
Tool selection method		Random bi-direction Address change	
Tailstock	Travel	1420mm(55.9")	
	Spindle travel	120mm(4.7")	
	Style of taper hole	MT No.5	
	Travel method	Power op.	
Sub spindle	Chuck outside diameter	380mm(15")	
	Spindle speed	20-3000min-1(rpm)	
	Speed ranges	Stepless	
	Type of spindle nose	A2-11	
	Spindle Positioning	0.001deg.	
	Spindle through hole diameter	∅ 114mm(4.5")	
Motor	Main motor	AC37/30kw(50/40HP)	
	Machining spindle	AC25/22kw(33/30HP)	
	Sub spindle	AC22/15kw(30/20HP)	
	Hydraulic	1.5kw(2HP)	
	Flood coolant	0.4kw(0.53HP) x 4	
Power source	Electric power supply	60kVA	
	Air pressure source	0.5MPa(5kgf/cm ²)(70psi)	
	Air source required	400NL/min(105gal/min)	
Machine Weight		14000kg(30800lbs)	

Standard accessories

- Hydraulic hollow chuck
- Soft jaws
- Chuck op.by M-code
- Tailstock op.by M-code
- C-axis control
- Disc brake device for C-axis
- ATC 30 tools
- Power op.tailstock
- Q-setter
- Flood coolant
- Chuck overhead coolant
- Splash cover(incl.ATC auto shutter)
- Operator side door interlock
- ATC door interlock
- Spindle speed meter on screen
- Spindle load meter on screen
- Separate type machining sp. Load meter
- Spindle/feedrate override
- Call light(yellow)
- Electric leakage detection breaker
- Spindle cooling unit
- Machining completion pre-call/
Work counter/Run hour display on screen
- Work light
- Leveling block
- Spanners & wrenches

Optional accessories

- Sub-spindle 380mm(15")chuck
(ZB-axis,CB-axis)
- NC Chuck (Main and sub)
- Turret NC index(Universal B-axis)
- Push out device for sub-spindle
- Scale feedback
- ATC 60 tools
- Built-in tailstock
- Programmable tailstock
- Chip conveyor
- Chip conveyor intermittent feed
- Chip wagon with roller
- Air blow device
- Jet coolant
- Gun coolant
- Machining spindle through coolant
- Coolant filtration device
- NC chuck
- M code for NC chuck
- System M code for NC chuck
- Chuck open/close confirmation
- High/low 2-step pressure chucking
- Tailstock 2-pressure
- Tailstock operation by foot pedal
- Inside spindle workpiece stopper
- Face driver anti-powerfailure
- Face driver
- Workpiece fit confirmation device
- Auto door
- Bar feed equipment
- Bar puller
- Parts catcher
- Spindle end coolant collector for bar feed att.
- Work pusher
- Separate type spindle speed meter
- Separate type machining sp. speed meter
- Separate type spindle load meter
- Separate type counter
- Separate type run hour meter
- Weekly timer
- Additional call light
- Call light & buzzer
- Automatic power cut-off device
- Separated start / stop / emergency button
- Cycle start interlock
- ATC type Z-Setter
- Auto presetter & Q-setter,tool breakage detection
- ATC type workpiece measuring device
- SQCT tool set gauge
- Cleaning tool for workpiece measuring
- Coolant fluid temperature control
(Room temperaturd following type)
- Hyd' oil temperature control
- Transformer