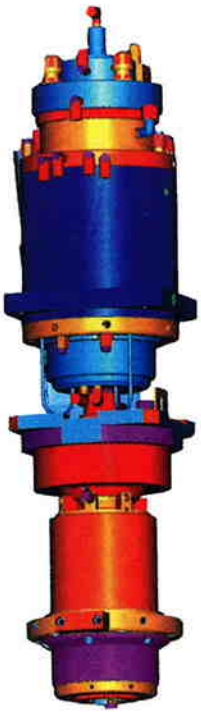
Methods Machine Tools - Die/Mold Division

Matsuura 3-Axis Super High Speed Vertical Linear Motor Machine!

- *Travel (X/Y/Z) :*
  330 / 300 / 250 mm
  (12.99 / 11.81 / 9.84 in.)
- *Spindle taper :*
  BT30 (Double face contact)
- *Spindle speed :*
  40,000 min^{-1}
- *Rapid traverse (X/Y/Z) :*
  90 m/min (3,543 ipm)
- *Acc. / Dec. :*
  1 G



40,000 min^{-1} Ultra High Speed BT 30 Spindle

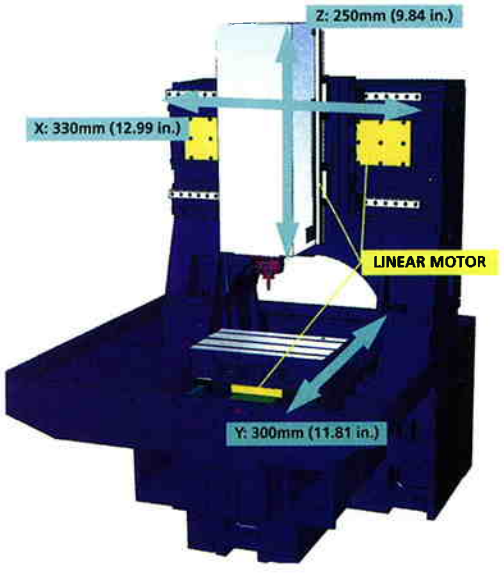
Matsuura's Hi-Tech spindle achieves its top speed of 40,000min^{-1} in just 2 seconds. The spindle runs on ceramic bearings, which are lubricated by a newly developed oil / air lubrication system. This breakthrough in spindle lubrication is silent running, thus contributing to the machine's low overall noise level.

Highly Accuracy Axis Movement

The linear guides on all axes achieve a positional accuracy of under 2 μm (actual result).

Highly Accurate Linear Scales - Supplied as Standard

5/100 μm HEIDENHAIN absolute scales assures precision.



NANO Precision

- **0.1 micron high precision linear scales with NANO interpolation ensure that maximum machine performance is realized.**
- **The control panel has a protective key cover for operating ease, reliability and easy maintenance.**
- **Equipped with UPS (Un-interruptible Power Supply)**

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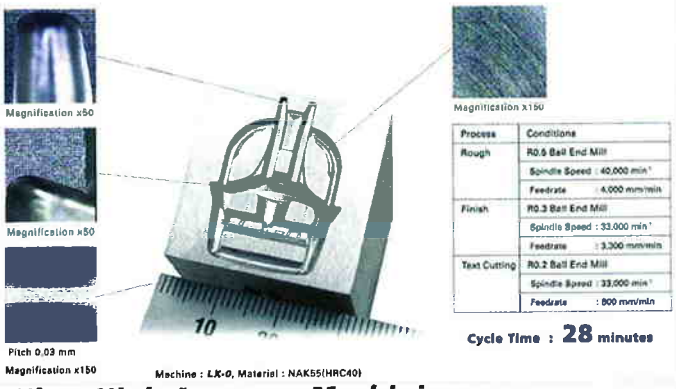
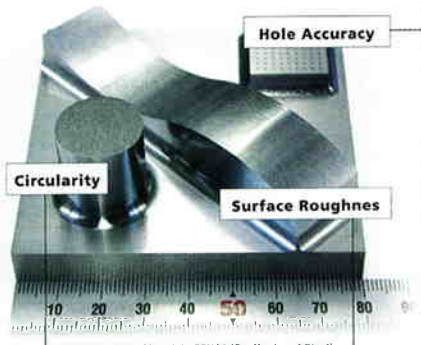
Mold & Die - Direct Machining



Process	Conditions
Rough	R0.5 Ball End Mill
	Spindle Speed : 40,000 min⁻¹
	Feedrate : 4,000 mm/min
Finish	R0.3 Ball End Mill
	Spindle Speed : 33,000 min⁻¹
	Feedrate : 3,300 mm/min
Text Cutting	R0.2 Ball End Mill
	Spindle Speed : 33,000 min⁻¹
	Feedrate : 800 mm/min

Cycle Time : **28** minutes

Ultra High Accuracy Machining



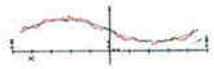
Task	ø0.5 Hole Drilling
Tool	ø0.5 Solid Carbide Drill
Method	Twisting
Spindle Speed	13,000 min⁻¹
Feedrate	65 mm/min

Error of Hole Pitch
: within **2** µm
(±0.0000787 in.)
Error of Hole Diameter
: within **3** µm
(±0.000118 in.)

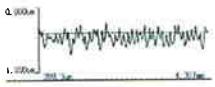
Task	ø20 Cylindrical Cutting
Tool	R3 Ball End Mill
Method	Helical Machining
Spindle Speed	40,000 min⁻¹
Feedrate	4,000 mm/min

Circularity : **1.25** µm
(0.0000492 in.)
Concentricity : **1.1** µm
(0.0000433 in.)

Task	R50 Wave Shape
Tool	R3 Ball End Mill
Method	Simultaneous 3-axis Face Cutting
Spindle Speed	40,000 min⁻¹
Feedrate	4,000 mm/min



Shape Roughness
: within ±**2** µm
(±0.0000787 in.)



Surface Roughness
: R_z=**0.8399** µm
(0.0000330 in.)

Vertical Surface Roughness
: R_y=**0.8624** µm
(0.0000339 in.)

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STANDARD MACHINE SPECIFICATION

	LX-0
TRAVEL	
X-axis travel	330 mm (12.99 in.)
Y-axis travel	300 mm (11.81 in.)
Z-axis travel	250 mm (9.84 in.)
From table surface to spindle end	150 - 400 mm (5.9 - 15.74 in.)
TABLE	
Working surface	540 x 320 mm (21.25 x 12.59 in.)
Loading capacity	100 kg (220 lb.)
SPINDLE	
Speed range	400 - 40,000 min^{-1}
Spindle taper	7/24 taper BT30 (Double contact type)
Max. Spindle torque	7.0 Nm : 50% ED
FEEDRATE	
Rapid traverse (X/Y/Z)	90,000 mm/min (3,543.3 ipm)
Feedrate (X/Y/Z)	1-90,000 mm/min (0.04 - 3,543.3 ipm)
Acceleration / Deceleration	1.0 G
AUTOMATIC TOOL CHANGER	
Type of tool shank	JIS B 6339 tool shank 30T
Type of retention knob	JIS B 6339 pullstud 30P
Tool storage capacity	30 pcs.
Max. Tool diameter	46 mm (1.81 in.)
Max. Tool length	150 mm (5.9 in.)
Max. tool mass :include holder	1.5 kg (3.3 lb.)
Tool changing time : chip to chip	3.8 sec
MOTORS	
Spindle motor	AC 2.2/3.7 kW (3.0/5.0 HP)
Feed motor X-axis	AC 2.4/3.2 kW (3.3/4.6 HP)
Y-axis	AC 2.4/3.2 kW (3.3/4.6 HP)
Z-axis	AC 2.4/3.2 kW (3.3/4.6 HP)
Coolant pump motor	AC 0.25 kW (0.34 HP)
Spindle oil cooler motor	AC 0.75 kW (1.0 HP)
Hydraulic pump motor	-
Chip flow motor	AC 0.73/1.2 kW (1.0/1.63 HP) :50/60Hz
POWER SOURCES	
Electrical power supply	AC200/220V±10%,50/60H±1Hz 22 KVA
Compressed air supply	0.54-0.93 MPa (75.6 - 130.2 psi)
Volume of compressed air to be supplied	1,690 NL/min (446 gpm)
TANK CAPACITY	
Coolant tank	240 L (63 gal.)
Spindle oil cooler tank	9.5 L (2.5 gal.)
Oil air unit tank	3.4 L (0.89 gal.)
Hydraulic unit oil tank	-
MACHINE SIZE	
Mass of machine	5,000 kg (11,022 lb.)
NC control	
Control system	Matsuura L-Tech 15i

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