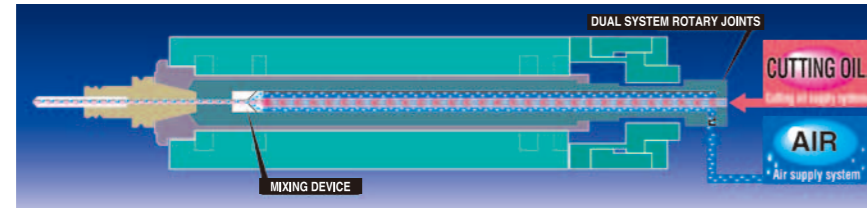


## IMQL cutting system

**Realization of Energy and Resource saving ,  
Preservation of the Environment, High efficiency machining.**  
<Minimum quantity lubrication system (internal spindle mixing) iMQL>

### IMQL cutting system

**iMQL**  
Small amounts of the cutting oil and air separately just before the spindle nose where they are mixed and then sprayed from the tip of the cutting tool



### Environmental Responsiveness

Compared to the conventional wet machining, this method requires only small quantity of lubricant. It realizes earth-friendly machining.

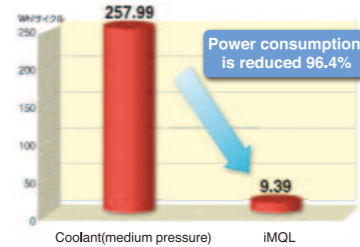


Conventional wet machining iMQL machining

### Energy Saving

No coolant pump unit that consumes major portion of Electric power is required. Power consumption for the operation has been significantly reduced.

**Power consumption for lubrication supply per machining cycle**



### High efficiency machining



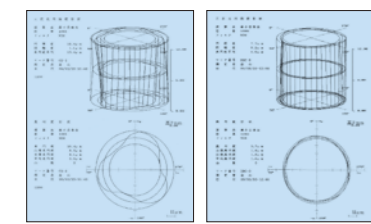
### iMQL machining case example

<i>8x22.5D: Drilling (no through hole)</i>	<i>2.5x30D: Drilling (no through hole)</i>
<i>Work material: SCr20</i>	<i>Work material: S45C</i>
<i>S=4,775, F=1,671</i>	<i>S=5,093, F=382</i>
<i>Main body: NJ50</i>	<i>Main body: NS70</i>

### iMQL machining case examples:

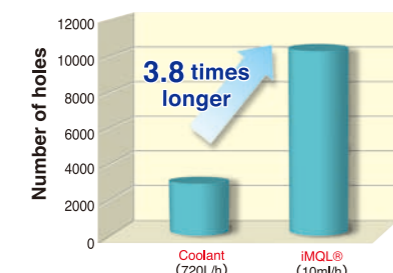
**Steel/Cast iron:** Cylinder-Block, Cylinder-Head, Crankshaft, Camshaft, Connecting-rod etc.  
**Aluminum:** Cylinder-Block, Cylinder-Head, Transmission-Case etc.

### High Precision



Coolant (720L/h)	iMQL® (20ml/h)
16.4 μm	Cylindricity 7.7 μm
1.1 μm	Concentricity 0.2 μm
13.4 μm	Average circularity 5.6 μm

### Long Tool Life



**Workpiece material:** JIS S50C  
**Tool used:** φ 6.8 mm drill  
**Drilling depth:** 20 mm  
**Spindle speed:** 5,600 min<sup>-1</sup>  
**Feed speed:** 1,100 mm/min

## Related products.



Oil mist collector  
OIL MIST COLLECTOR  
**MIST EATER**

Filterless type mist collector  
OIL MIST COLLECTOR  
**MIST EATER Z**

2-stage cell electrical mist collector  
OIL MIST COLLECTOR  
**MIST EATER S**

Automatic cleaning electrical mist collector  
OIL MIST COLLECTOR  
**MIST EATER SX**



Briquetting press machine  
**CHIP EATER**



Vacuum holder



Vacuum cleaner

## HORKOS HORKOS CORP

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ISO 9001:2008 ISO14001:2004 Certificate Division  
• Machine Tool Dept.  
• Environment Improving Equipment Dept.

URL <http://www.horkos.co.jp>  
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WITH HORKOS



HORKOS provides products that serve global benefits.



Economy & Ecology  
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HORKOS CORP

## Bedless Machining Center N-series



Bedless Machining Center  
**NS70/NJ50**



Bedless Machining Center  
**NM100**



Multi Tasking Bedless  
Machining Center  
**NS70 version L**  
C axis revolution 3,000min-1

5-Axis Simultaneous control  
Bedless Machining Center  
**NJ35-5AX**

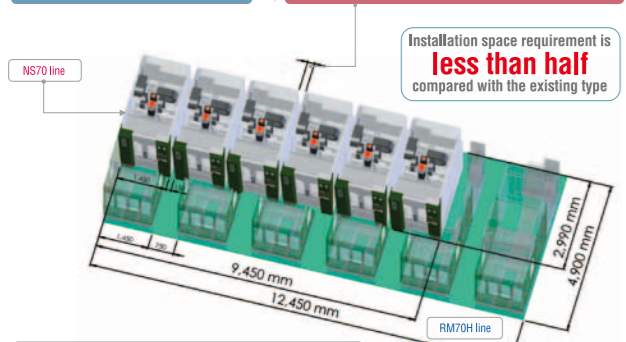


### SPACE SAVING PERFORMANCE

Maintenance area is located only at Machine front and rear, so no need for maintenance work from both sides. This also enables machine located minimized with pitch, or against wall.

New development: Comparison between the **NS70** and our existing horizontal machining center **RM70H** (one unit consists of 6 machines)

No maintenance is required from the sides → Can be installed with the 150 mm pitch between the machines



Floor space for **NS70** line: **28.25 m<sup>2</sup>**  
Floor space for **RM70H** line: **61.00 m<sup>2</sup>**

Type	Travel (X axis x Y axis x Z axis)	Max rotation speed	Tool holder	Tool storage capacity	Machine size
NJ50	350mm x 300mm x 350mm	12,000 min-1	BT30 HSK-A50	20tools	990mm x 2,200mm
NS70	500mm x 450mm x 500mm	12,000 min-1	BT40 HSK-A63 KM6350	16tools 24tools	1,450mm x 2,835mm
NM100	500mm x 500mm x 550mm	6,000 min-1	BT50 HSK-A100 KM10080	16tools	1,800mm x 3,752mm
NS70 version L	500mm x 450mm x 500mm	12,000 min-1	HSK-A63 HSK-T63	16tools 24tools 30tools	1,450mm x 3,380mm
NJ35-5AX	350mm x 250mm x 350mm	40,000 min-1	HSK-E32	32tools	990mm x 2,255mm

### HIPRECISION

Thanks for the Bedless configuration, chip and coolant hardly contact to Machine Body. This reduce drastically thermal displacement caused by heated chip and coolant, which enhance High Precision Machining even for long operation time.

### HIGH RIGIDITY

Machining components and Table/fixture is fixed on the box, which reduce the distance of force transmission between tool point to workpiece. High rigidity performance is therefore generated.



## Horizontal Machining Center T-series



Horizontal Machining Center  
**TS60H**



Horizontal Machining Center  
**TM70H**



Horizontal Machining Center  
**TM100H**

Type	Travel (X axis x Y axis x Z axis)	Max rotation speed	Tool holder	Tool storage capacity	Machine size
TS60H	530mm x 560mm x 530mm	20,000 min-1	BT30 HSK-A50	16tools 24tools 30tools	1,375mm x 3,310mm
TM70H/TM80H	530mm x 560mm x 530mm	15,000 min-1	BT40 HSK-A63 KM6350	16tools 24tools 40tools	1,500mm x 3,425mm
	700mm x 560mm x 530mm				1,670mm x 3,425mm
TM100H	500mm x 500mm x 500mm	6,000 min-1	BT50 HSK-A100 KM10080	16tools	1,500mm x 3,675mm
	670mm x 500mm x 500mm				1,700mm x 3,675mm

## Horizontal Machining Center DM-series



Horizontal Machining Center  
**DM70H**



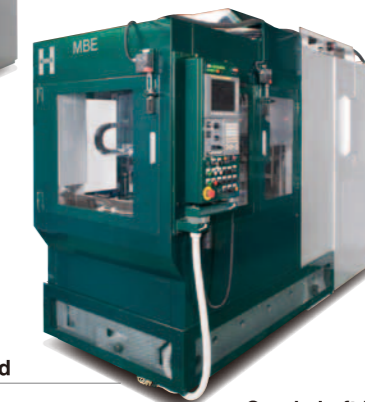
Multi pallet APC  
**DM100H**

Type	Travel (X axis x Y axis x Z axis)	Max rotation speed	Tool holder	Tool storage capacity	Machine size
DM70H	650mm x 730mm x 650mm	15,000min-1	BT40 HSK-A63 KM6350	60tools 124tools	2,200mm x 5,095mm
DM100H	1,000mm x 800mm x 1,000mm	6,000min-1	BT50 HSK-A100 KM10080	60tools 124tools	3,535mm x 6,870mm

## Special Machine for Crankshaft



Special Machine for Crankshaft Oil Hole  
**MOH**



Special Machine for Crankshaft Both End  
**MBE**



Special Machine for Large Crankshaft Oil Hole  
**TG70H-II**



Crankshaft Fixture Crankmaster  
**Crankmaster**

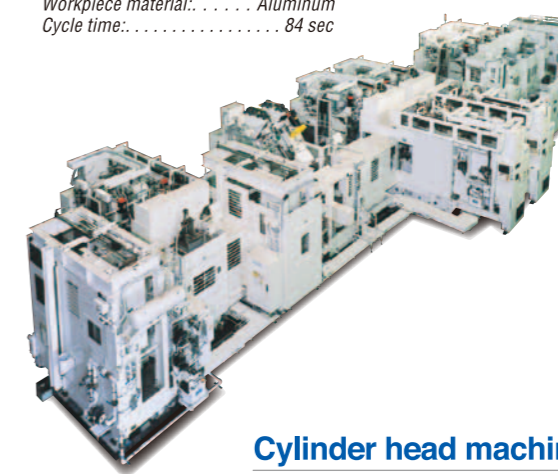
Type	Travel (X axis x Y axis x Z axis)	Max rotation speed	Tool holder	Tool storage capacity	Machine size
TG70H	800mm x 500mm x 1,290mm	8,000 min-1	HSK-A63 KM6350	16tools 24tools	2,900mm x 4,615mm
TG70H-II	1,250mm x 500mm x 1,150mm	8,000 min-1	HSK-A63 KM6350	16tools 24tools	3,400mm x 4,990mm
MOH	500mm x 150mm x 765mm	8,000 min-1	BT40 HSK-A63 KM6350	12tools	1,325mm x 3,750mm
MBE	500mm x 300mm x 400mm	8,000 min-1	BT40 HSK-A63 KM6350	20tools	1,250mm x 3,350mm

## FMS·FTL

Based on the deep production system experience, Total system that involves Special purpose machines and peripheral devices can be offered.

### Cylinder block machining line

Length: ..... 28 m  
Number of workpiece types: ..... 1  
Workpiece material: ..... Aluminum  
Cycle time: ..... 84 sec

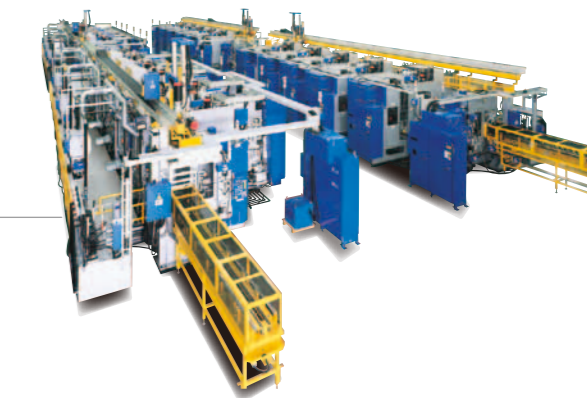


### Mission case machining line

Length: ..... 17.4 m  
Number of workpiece types: ..... 2  
Workpiece material: ..... Aluminum  
Cycle time: ..... 116 sec

### Cylinder head machining line

Length: ..... 52 m  
Number of workpiece types: ..... 8  
Workpiece material: ..... Aluminum  
Cycle time: ..... 45 sec (3 lines)



Three cylinder head machining lines with tandem gantry loader transfer equipment