

Breakthrough with Intelligent Solutions

Go Beyond with Okuma Machine & Control Technology

OKUMA MACHINE FAIR 2013



Tue Wed Thu Fri

Dates: 12 / 13 / 14 / 15 November 2013

10:00-16:00

Site: World Headquarters Plant (Oguchi)

Okuma Corporation Japan

OKUMA Corporation

Breakthroughwith Intelligent Solutions

Go Beyond with Okuma Machine & Control Technology

5-axis multitasking machines provide many ways to add value to machining

Intelligent technologies and new OSP-P300 CNC elicit the most in user creativity and machine capability

New DS1 factory—a manufacturing facility of the future that blends refined skills and automation



5-axis, multitasking machines

MULTUS U3000
MULTUS U4000
MULTUS B200II
MULTUS B300II
MULTUS B750 (W)
VTM-1200YB

UNIVERSAL CENTER MU-5000V-L
UNIVERSAL CENTER MU-6300V-L
UNIVERSAL CENTER MU-400V II

BLADE T400



Machining centers

MP-46V ACE CENTER MB-56VB GENOS M460-VE MILLAC 44V II

MB-5000H

MILLAC 44H Ⅱ

MA-600H Ⅱ

MB-8000H

MCR-B Ⅲ

MCR-A5C Ⅱ



CNC lathes

SPACE TURN LB3000 EXII (M)
SPACE TURN LB4000 EXII (MY)
TWIN STAR LT2000 EX (3T3MY)
SIMUL TURN LU4000 EX (M)
LU35II (M)
GENOS L250H+OGL

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LU-S1600 HJ-250 2SP-V40 2SP-150H



Grinders

GA-26TII GI-20NII GI-2N-SP



Control solutions

Double-column for 5-sided

3D Direct Machining
Single source for Machine and Control
—OSP celebrates 50 years
OSP-P300S / L / M



applications FMS
Horizontal machining center FMS
Multitasking machines Robot cell
Vertical machining centers Robot cell
Large horizontal machining center MA-12500H

Intelligent multitasking machine

MULTUS U3000









■ The ultimate multitasking machine packs in all kinds of application requirements

Large working range allows flexible machining from all directions

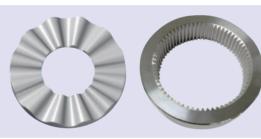
- Main spindle: 5,000 min⁻¹
- Opposing spindle: 5,000 min⁻¹
- Milling spindle: 12,000 min⁻¹
- NC-B axis
- High-accuracy C axis



Cutting demo

Highly efficient machining of clutches with simultaneous 5-axis machining

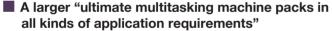
High-speed internal gear cutting with skiving





Intelligent multitasking machine





■ Highest machining efficiency for both milling and turning

Milling: 600 cm³/min Heavy-duty cutting: 5.0 mm²

■ Shortest cycle times with highly rigid lower turret

- Main big bore spindle: 3,000 min⁻¹
- Opposing spindle (big-bore): 3,800 min⁻¹
- Milling spindle: 12,000 min⁻¹
- Lower turret: V12 turning applications
- NC-B axis

Cutting demo



☐ 200-mm contouring

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Intelligent multitasking machine

MULTUS B200II







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■ The fastest first part machining with latest evolution of Machining Navi and One-Touch IGF

- Big bore spindle: 5,000 min⁻¹
- Milling spindle: 12,000 min⁻¹
- Distance between centers: 750 mm
- NC B axis
- High-accuracy C axis
- NC tailstock



Machining Navi chatter control on a long workpiece

- L/D = 13
- Searched conditions easily programmed
- Work: Shaft
- Size: ø30 × 400 mm
- Material: S45C













■ The global standard for space-saving, compact multitasking machines

Featuring

- Main spindle: 5,000 min⁻¹
- Opposing spindle: 5,000 min⁻¹
- Milling spindle: 10,000 min⁻¹
- Distance between centers: 900 mm
- NC B axis
- High-accuracy C axis



Cutting demo Simultaneous 5-axis, highly accurate bevel gear machining

■ Special-purpose gear machines covered by Okuma's multitasking machine

- Work: Spiral bevel gear
- Size: ø160 × 135 mm
- Material: SCM415



5-axis vertical multitasking machine

UNIVERSAL CENTER MU-5000V-L











Achieves high-accuracy, powerful machining that recasts the common wisdom regarding 5-axis machines

- Spindle: 12,000 min⁻¹, 22/18.5 kW
- Took shank: HSK-A63
- 5-Axis Auto Tuning System
- C-axis table rotation: 1,000 min⁻¹



Cutting demo

High-accuracy, high-quality machining of blisks

- High surface quality machining of thin blades for wings
- Process integration with 1-chuck machining including turning
- Tool paths for highly efficient machining
- Size: ø550 × 110 mm
- Material: SUS





5-axis multitasking machine

UNIVERSAL CENTER MU-6300V-L









■ Large machining space and comfortable working space that are among top in class

- Spindle: 10,000 min⁻¹, 26/18.5 kW
- Took shank: HSK-A100
- 5-Axis Auto Tuning System
- C-axis table rotation: 800 min⁻¹



Cutting demo

High accuracy, multi-sided machining of aluminum joints

- Seamless opposite-end boring
- Work: Joint
- Size: ø400 × 500 mm
- Material: Aluminum



5-axis vertical machining center

UNIVERSAL CENTER MU-400V II











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■ Long-term stability and high accuracy maintained with 5-Axis Auto Tuning System and the **Thermo-Friendly Concept**

- Spindle: 15.000 min⁻¹, 22/18.5 kW
- Took shank: BT40
- 5-Axis Auto Tuning System



5-Axis Auto Tuning System

- Anyone can improve 5-axis accuracies quickly and easily
- Auto tuning of 5-axis machine geometric errors











Advantages of process-intensive machining powerfully displayed in machining of very large shafts

MULTUS B750 (W)

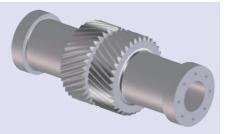
Intelligent multitasking machine

- Main spindle: 2,000 min⁻¹
- Opposing spindle: 2,000 min⁻¹
- Milling spindle: 10,000 min⁻¹
- Distance between noses: 3.000 mm
- High accuracy C axis
- Auto steadyrest



Complete process-intensive machining of ship reduction gear shaft

- Highly accurate machining of gears
- Highly accurate deep ID holes made with a long boring bar
- Work: Gear shaft
- Size: ø400 x 1,000 mm
 Material: S45C



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5-axis multitasking machine VTM-1200YB







■ Multitasking machines for big bore workpieces combine high milling and turning capacity

Featuring

- Turning spindle: 500 min⁻¹
- Milling spindle: 10,000 min⁻¹
- ATC magazine: 60 tools
- Took shank: BT50
- NC B axis
- High-accuracy C axis



Cutting demo

Highly efficient machining of thin materials for aircraft parts

- Thin workpiece chatter control
- Manual hydraulic multi-jaw chuck
- Work: Combustion chamber case
- Size: ø700 x 200 mm



High-speed blade machine

BLADE T400







World's fastest speed and highest quality 5-axis blade machining

Featuring

- Spindle: 18,000 min⁻¹, 38/28 kW
- Max torque: 198 N-m
- Took shank: HSK-A63



Cutting demo

High efficiency machining of steam turbine blades

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- High surface quality and short finishing time
- Work: Blade (stub wing)
- Size: 76 × 60 × 340 mm
- Material: SUS



3D Direct Machining

"3D Straight" from designing [CAD/CAM] to machining

■ 3D-CAM OSP post processor

• In cooperation with 3D-CAM makers, greater reliability with Okuma verification

edgecam

Gillus CAM Mastercam NX TopSolid

Delcam is a registered trademark of Delcam plc.

Partners:

Edgecam is a registered trademark of Planit Holdings Ltd.

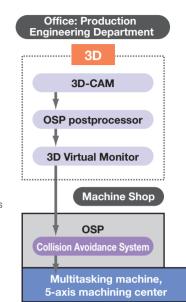
EXPRIT is a registered trademark of DP Technology Corp.

Gibbs CAM is a registered trademark of Gibbs and Associates in the United States and/or other countries. Mastercam is a registered trademark of CNC Software, Inc.

NX is a trademark or registered trademark of Siemens Product Lifecycle Management Software Inc. or its subsidiaries in the United States

TopSolid'Cam is a registered trademark of Missler Software Corporation.

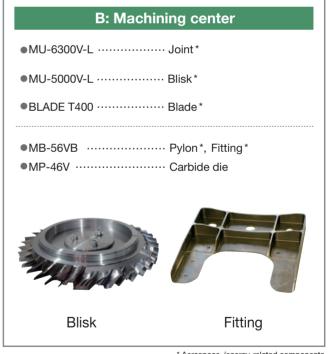
Note: CAM-created tool paths are converted to OSP (or other control) part programs and adjusted per specific machine applications.



Programming solutions using 3D-CAM



Drill head



* Aerospace-/energy-related components

3D Virtual Monitor

 Thorough production prep front loading: Off-line advance verification simulation

Front loading: Burden placed (loading) on early processes (front) to accelerate work



Collision Avoidance System

 Machine tool that can be used with assurance by anyone: Collision prevention function allows workers to concentrate on machining without worrying about collisions

LT2000 EX demo



VMC for high-precision parts and die molds

MP-46V







Extremely high accuracy and minimum following error achieve max productivity for die/mold and micromachining applications

- Spindle: 30,000 min⁻¹, 15/11 kW
- Took shank: HSK-F63
- Linear scale detection (X/Y/Z)
- Ball screw cooling (X/Y/Z)
- Super-NURBS



Cutting demo

High accuracy with micromachining



ACE CENTER MB-56VB







■ Best-selling machine that meets diverse needs

• Spindle: 12,000 min⁻¹, 26/18.5 kW • Took shank: BT50 (BIG-PLUS®)



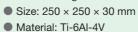
Cutting demo Highly efficient machining of aircraft parts (titanium alloy)

Work: Pylon bracket*





Work: Fitting*





Vertical machining center **GENOS M460-VE**







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■ High quality global machine

- Spindle: 12,000 min⁻¹, 22/18.5 kW
- Took shank: BT40



Cutting demo

Photo machining

■ Webcam ID photo images of OMF visitors cut on aluminum plates (giveaway!)









■ The best mass production machine for automated lines

- Spindle: 12,000min⁻¹, 15/11kW
- Took shank: BT40 (BIG-PLUS®)



Cutting demo

Mass production parts machining with fast indexing NC rotary table

- Slope machining with vertical MC
- Improved productivity with high-volume machining
- Work: Bracket
- ●Size: 120 × 110 × 45 mm ●Material: S50C



Material: Ti-6Al-4V (STA)





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Horizontal machining center

MB-5000H







■ Mass production, high efficiency machining achieved with ease

Featuring

- Spindle: 15,000 min⁻¹, 26/18.5 kW
- Took shank: BT40



Cutting demo

Highly efficient production of aluminum casting parts L/D = 6 boring with the Machining Navi M

- Harmonic spindle speed control for the milling spindle
- Work: Transmission case
- Size: 450 × 350 × 450 mm
- Material: Aluminum





13 Horizontal machining center MILLAC 44H II









Narrow machine ideal for mass production lines

- Spindle: 12,000 min⁻¹,15/11 kW
- Took shank: BT40 (BIG-PLUS®)



Cutting demo

Highly efficient machining of a crank shaft

- Eccentric axis machining with OD boring
- Through-hole machining with long drill (w/part turnaround opposite end drilling)
- Process splitting of mass produced part in a robot cell
- Work: Crank shaft
- Size: ø50 x 300 mm
 Material: S45C



Double-column for 5-sided applications MCR-BⅢ







■ The pinnacle for double-column machining centers worldwide

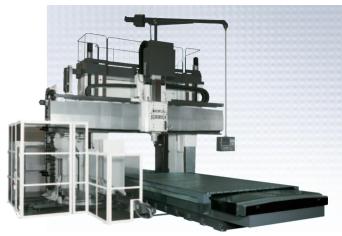
- Spindle: 8,000 min⁻¹, 26/22 kW
- Full enclosure shielding
- Attachment heads

NC-BC universal head

Extension head

90° angular head

B-/C-axis universal head



Cutting demo

Highly efficient machining of airplane parts with NC-BC universal head

- Work: Bulkhead
- Size: 1,900 × 1,250 × 50 mm
- Material: A7075





Double-column for 5-sided applications

MCR-A5CII











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High productivity in a wide range of fields, from parts machining to die/mold machining

- Spindle: 6,000 min⁻¹, 26/22 kW
- Attachment heads Extension head 90° angular head
- SERVONAVI



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1-saddle CNC lathe **HJ-250**

■ 1-saddle compact lathe

- Spindle: 3,000 min⁻¹
- V8 turret



Cutting demo

Eccentric hole turning

- Eccentric chuck
- Work: Crank shaft
- Size: ø46 × 33 mm
- Material: S45C



15 2-spindle Horizontal CNC lathe

2SP-150H





- Spindle: 6,000 min⁻¹
- V12 + V12 turrets
- On-machine loader



Cutting demo

Mass production machining with short cycle times

■ Minimum "tact time" loader: 17 sec/part (TACT: Total Average Cycle Time)

13

- Work: Idler gear
- Size: Ø84 × 35 mm Material: SCr440



1-saddle CNC lathe + loader

GENOS L250H + OGL





Compact automated cell with loader

- Spindle: 3,000 min⁻¹
- V8 turret
- Compact on-machine loader



Cutting demo

Short cycle operation for a flange

- OD, axial face, and ID machining with a single chucking
- Auto workpiece loading/unloading with loader
- Work: Front cover
- Size: ø100 × 38 mm
- Material: S45C



Opposing spindle 3-saddle turning center TWIN STAR LT2000 EX (3T3MY)









■ The ultimate process-intensive machining achieved with 3 turrets

Featuring

- Main spindle: 6,000 min⁻¹
- Milling spindle: 6,000 min⁻¹
- Opposing spindle: 6,000 min⁻¹
- 3-turret specifications (V16, MY)
- Collision Avoidance System



Cutting demo

Highly efficient machining with 3 turrets

Process-intensive machining: 1-machine die/mold application

Collision Avoidance System (See how it works)

- Offering customers "collision-free" assurance
- Work: Drill-head for deep-hole drilling
- Size: ø110 × 130 mm Material: S45C









- New standard for compact 2-saddle lathes
- High rigidity with slide guideway (X, Z axes)
- Time savings with simultaneous top and bottom machining

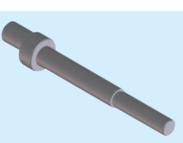
- Spindle: 4,000 min⁻¹
- Upper and lower V6 turrets
- FANUC 0*i*-TD
- Distance between centers: 550 mm



Cutting demo

Highly-efficient machining of a crank shaft

- Simultaneous upper/lower turning without a steadyrest
- Process splitting of mass produced part in a robot cell
- Work: Crank shaft
- Size: ø50 × 300 mm
- Material: S45C





1-saddle turning center

SPACE TURN LB3000 EXII (M)







■ Best-selling machine displays the highest performance in all types of turning

- Spindle: 5,000 min⁻¹
- Milling spindle: 6,000 min⁻¹
- V12 M-turret
- Distance between centers: 550 mm



Cutting demo

Variable spindle speed threading (VSST)

■ Various machining cycles available for the ideal threading application

15

- Work: Trapezoidal thread
- Size: ø33 × 363 mm
- Material: S45C





CNC cylindrical grinder

GA-26T II

- Simple setup with in-process multi-step gauging
- Many types of automation for improved productivity



- Grinding motor: 15 kW
- Grinding wheel speed: 45 m/s

Cutting demo High quality OD grinding of stepped shafts

- In-process accuracy guarantee (post-process gauging not necessary)
- Easy dimensional setup changes
- Work: Eccentric shaft
- Size: ø50 × 300 mm
- Material: SCM435



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Highly efficient grinding with 2 grinding wheel spindles



- 2WS specifications
- Thermo-Friendly Concept

Cutting demo Process-intensive gear grinding

- Process-intensive 2 wheel spindles
- Work: Idler gear •Size: Ø84 × 35 mm
- Material: SCr440







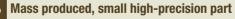
Super-precision, compact internal grinder

GI-2N-SP

High speed mass production with linear motor



- Grinding hole diameter: ø2 to 20 mm
- Grinding wheel power source: 3.1 kVA



- Work: Valve Size: ø14 × 7 mm
- Material: SUJ2





2013

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MACHINE

Collision Avoidance

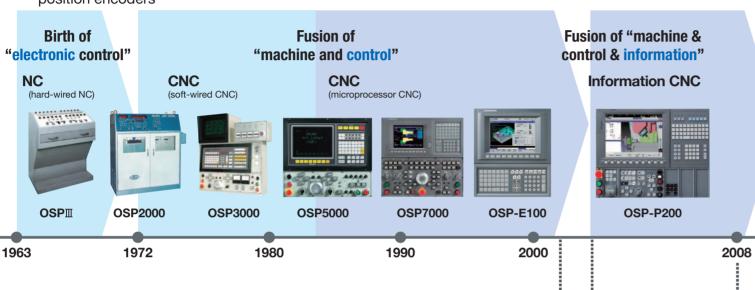
System

0

05P-P300

Exhibition of 50 years' of CNC history, the foundation for machine, electronics, information, and knowledge creation

- Okuma has continued to create OSP CNCs to create trends in machine tool technology
- Okuma machine tools are equipped with our own CNC control boards, drives, motors, and absolute position encoders

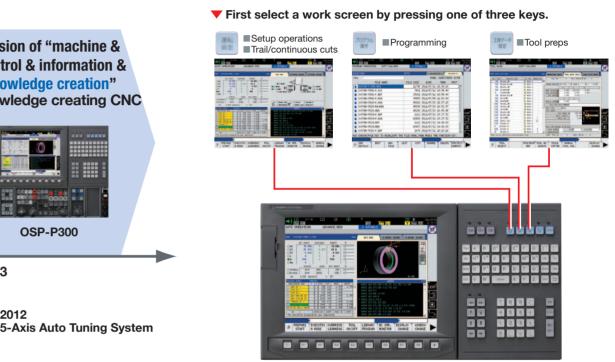


New OSP-P300 CNC S/L/M lineup

*For multitasking machines: OSP-P300S/ For NC lathes: OSP-P300L/ For machining centers: OSP-P300M

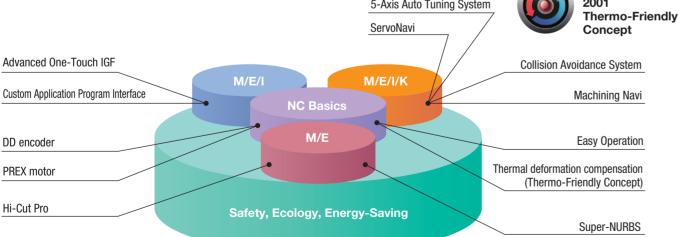
OSP-P300 with "Easy Operation" — Even beginners can operate without guesswork

Everything you want to see and do is brought together in a single mode "Single-mode operation"





Okuma's OSP Series of CNC controls supports machine shops with fusion technology 5-Axis Auto Tuning System



- Safety, eco, energy-saving ··· As required for NC controls
- NC basics As required for NC controls
- M/E Innovations from Mechanics/Electronics
- M/E/I Innovations from Mechanics/Electronics/Information tech
- M/E/I/K Innovations from Mechanics/Electronics/IT/Knowledge creation

Easy-to-use operation panel with

19-inch touchscreen

Fusion of "machine &

control & information &

knowledge creation"

OSP-P300

2013

Machining Navi

knowledge creating CNC

With tilting keyboard—Okuma's new operation panel coordinates with the new machine "premium design"

Large screen designed for more effective use of "Easy Operation" featured in the OSP-P300 control



NEW

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2-saddle turning center LU35II (M)









Increased productivity of heavy workpieces with simultaneous upper and lower machining

■ Process-intensive operations with M machining

Featuring

- Spindle: 3.200 min⁻¹
- Upper M-V12 + lower V10 (VDI) turrets
- Milling spindle: 2,000 min⁻¹
- Distance between centers: 1,500 mm







Highly efficient machining of cylinder rods

- Shorter cycle times with simultaneous machining using upper and lower turrets
- Long shaft end slotted with steadyrest support
- Work: Rod
- Size: ø150 × 1,000 mm
- Material: S45C



2-saddle turning center

SIMUL TURN LU4000 EX (M)









■ The pinnacle for 2-saddle turning centers Brings productivity increases to all kinds of shaft work

- Spindle: 3,000 min⁻¹
- Milling spindle: 6,000 min⁻¹
- Upper M-V12 + lower V10 turrets
- Distance between centers: 650 mm



Cutting demo

Very efficient turning with upper/lower turrets

- Work: Drive shaft
- Size: ø100 × 500 mm
- Material: S45C





1-saddle turning center with Y axis

SPACE TURN LB4000 EX II (MY)









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Reduces after-process jobs with process-intensive machining based on powerful milling and high accuracy Y axis

Featuring

- Spindle: 4,200 min⁻¹
- Milling spindle: 6,000 min⁻¹
- M-V12 turret
- Distance between centers: 750 mm



cutting demo

Process-intensive machining of hydraulic parts

- Process-intensive machining of mount seats achieved with powerful milling and high accuracy Y axis
- High machine rigidity for stable intermittent heavy-duty cutting
- Work: Hydraulic motor head
- Size: ø190 × 100 mm
- Material: FCD450
- **Vertical 2-spindle CNC lathe**

2SP-V40

■ Split 2-process mass production cell for flanges and a specialty chuck for odd-shaped workpieces

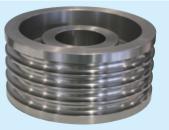
Featuring

- Spindle: 2,500 min
- V12 turret



Stable machining of a heavy workpiece

- Work: Pulley
- Size: ø280 × 130 mm
- Material: FC250



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Horizontal machining center

MA-600HII







High quality parts production

■ Multitasking in a machining center

Featuring

- Spindle: 6,000 min⁻¹, 45/37 kW
- Took shank: BT50
- Turning cut function



Cutting demo

Bi-directional machining with turning cuts

- Work: Torque rod
- Size: 300 × 400 mm
- Material: S45C





32 Horizontal machining center

MB-8000H







■ Highly efficient machining of large prismatic parts

Featuring

- Spindle: 6,000 min⁻¹, 45/37 kW
- Took shank: BT50



Cutting demo

Highly accurate machining of machine tool components

- Using full-length travels
- Long runs still maintain high accuracies

Variable-mix, variable-volume production runs continuously for 48 hours

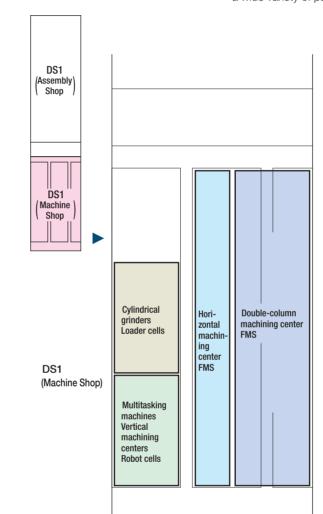
DS1 automation system

DS1 (Dream Site 1)

DS1 West (Machine Shop)

This is a start-to-finish production plant with multitasking machines, vertical lathes. and medium-sized and large horizontal grinders laid out directly from materials input to machining, assembly, and shipping.

The west side of DS1 is a machine shop. A flexible, highly-efficient, automated production system that can handle variable-mix, variable-volume production machines a wide variety of parts continuously day and night.



Machined components: beds, bases

- Double-column machining center FMS
- Double-column machining center (tandem tables)
- Large surface grinder (OSP retrofit)

Okuma machines

MCR-BⅢ 30 x 65, MCR-BⅢ 30 x 50

Machined components: headstocks, saddles, columns

Horizontal machining center FMS

Okuma machines

MA-600HⅡ, MB-8000H NEW

MA-12500H

Machined components: spindles, housings, collars

Multitasking machine robot cell

Okuma machine

MULTUS B400Ⅱ

Vertical machining center robot cell

Okuma machine

ACE CENTER MB-66VA

Cylindrical grinder loader cell

Okuma machine

GP-47FⅡ

Large horizontal machining center

MA-12500H







■ Stable machining accuracy and ease of use in a large machine

- Large machining space and working area
- FMS, large capacity ATC compliant

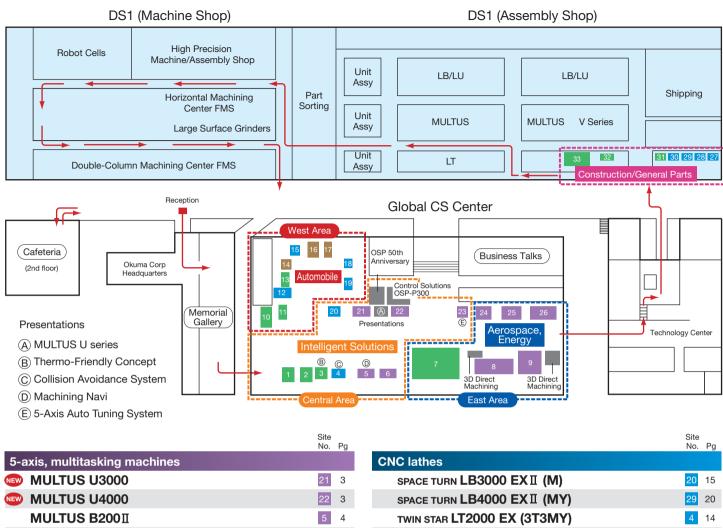
Featuring

- Pallet size: 1,250 □ 1,250 mm
- Axis travel distance: X: 2,200, Y: 1,600, Z: 1,650 mm
- Maximum loading mass: 5,000 kg



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Site Guide



		NO.	гy
5-a	xis, multitasking machines		
NEW	MULTUS U3000	21	3
NEW	MULTUS U4000	22	3
	MULTUS B200 II	5	4
	MULTUS B300 II	6	4
	MULTUS B750 (W)	8	6
	VTM-1200YB	9	7
NEW	UNIVERSAL CENTER MU-5000V-L	24	5
	UNIVERSAL CENTER MU-6300V-L	25	5
NEW	UNIVERSAL CENTER MU-400VII	23	6
NEW	BLADE T400	26	7
Ма	chining centers		
	MP-46V	3	9
	ACE CENTER MB-56VB	2	9
	GENOS M460-VE	1	10
NEW	MILLAC 44V II	11	10
	MB-5000H	10	11
NEW	MILLAC 44H II	13	11
	MA-600HII	31	21
	MB-8000H	32	21
	MCR-BⅢ	7	12
	MCR-A5CII	33	12

See Nos. 1 ~33 in above Site Guide map

		No.	Рg
CN	C lathes		
	SPACE TURN LB3000 EX II (M)	20	15
	SPACE TURN LB4000 EX II (MY)	29	20
	TWIN STAR LT2000 EX (3T3MY)	4	14
NEW	SIMUL TURN LU4000 EX (M)	28	19
NEW	LU35II (M)	27	19
	GENOS L250H+OGL	19	14
	LU-S1600	12	15
	HJ-250	18	13
	2SP-V40	30	20
	2SP-150H	15	13
Gri	nders		
	GA-26TII	14	16
	GI-20N I	16	16
	GI-2N-SP	17	16
Co	ntrol solutions		
	3D Direct Machining		8
	OSP 50th Anniversary		17
	OSP-P300S / L / M		18
Ne	w DS1 production systems		
	Automation systems		22
	Double-column MC FMS		
	Horizontal machining center FMS		
	Multitasking machine Robot cells		
	Vertical machining center Robot cells		
NE	₩ Large horizontal machining center MA-12500H		