From the beginning of time humans have had a desire to fly like the birds. It’s been more than a century since intelligence and technology combined to make this eternal dream come true. But development continues in the aerospace industry as safety, comfort and efficiency continue to evolve. And many aerospace suppliers rely on Okuma machine tools and technology to produce the high-quality, complex parts required to keep the iron birds flying.

High-accuracy machined parts and high-performance machines

Aircraft part manufacturing often involves complex shapes, large part sizes and the use of exotic metals – all features that complicate the production process. The use of 5-axis and multitasking machines can help address these issues while raising productivity levels. And today’s highly-intelligent machine tool controls help manage the business end of the operation by supporting the ever-growing need for information, manufacturing data, record keeping and quality control documentation.

With Okuma’s open-architecture control and highly rigid and reliable machines, aerospace parts manufacturers can meet the stringent demands of the production team and the business office.
Okuma Intelligent Technologies fully support the machining environment

5-Axis Auto Tuning System
Automatic tuning with no geometric error, able to be carried out quickly and easily by anyone
GEOMETRIC ERROR CORRECTION | HIGH ACCURACY TUNING

Collision Avoidance System
Allows operators to focus on making parts
COLLISION PREVENTION DURING AUTOMATIC OPERATION | COLLISION AVOIDANCE IN MANUAL OPERATION

Thermo-Friendly Concept
For superior accuracies in “normal” manufacturing environments
THERMO ACTIVE STABILIZER—CONSTRUCTION | THERMO ACTIVE STABILIZER—SPINDLE

Machining Navi
Maximizes machine tool performance
ALLOWS THE MACHINE TO AUTOMATICALLY ACHIEVE OPTIMAL MACHINING CONDITIONS | OPTIMIZATION OF TOOLING WHILE VIEWING ANALYSIS RESULTS
Okuma’s superior processing machinery is perfect for high accuracy machined parts and special-shaped workpiece machining.

Innovating aircraft part machining
Okuma’s latest technologies

- 5-axis multitasking machine lineup providing solutions perfectly suited to the workpiece
  - ENGINE PARTS
  - Engine Case
  - PG. 7

- Highly accurate 5-axis machining
  - ENGINE PARTS
  - Blisk
  - PG. 9

- 5-axis high speed blade machining
  - ENGINE PARTS
  - Blade
  - PG. 11

- Total machining of large, long parts through integrated operations
  - SUSPENSION PARTS
  - Landing Gear
  - PG. 13

- Highly efficient machining with simultaneous 5-axis control + high speed, high torque spindle
  - FUSELAGE/WING PARTS
  - Plate
  - PG. 15

- Multi-sided, angled, curved surfaces—universal heads capable of handling large complex shapes
  - FUSELAGE/WING PARTS
  - Frame
  - PG. 17
5-axis multitasking machine lineup providing solutions perfectly suited to the workpiece

Process-intensive machining from OD turning to side milling
No-interference turning with spindle set on angle
Slide profile and fillet machining with 5-axis control

Highly Accurate 5-axis Multitasking

VTM-1200YB / VTM-2000YB
B-axis control turret (Milling tool spindle)
B-axis control: 0.001 orientation
(Optional: NC-B axis simultaneous 5-axis control)

Ram Multitasking Machine

VTR-160A / VTR-350A
Ram Head (Milling tool spindle)
Large section ram of 250x250mm displays high turning capacity over the entire travel.
Ram Travel: 900mm (VTR-160A) [Opt: 1,250mm]
1,250mm (VTR-350A) [Opt: 1,500mm]

Machine Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>5-Axis Vertical Multitasking Machines</th>
<th>Double-Column Multitasking Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>VTM-1200YB</td>
<td>VTM-2000YB</td>
</tr>
<tr>
<td></td>
<td>VTR-160A</td>
<td>VTR-350A</td>
</tr>
<tr>
<td>Max machining dia mm</td>
<td>ø1,200</td>
<td>ø2,000</td>
</tr>
<tr>
<td>Max turning length mm</td>
<td>1,550</td>
<td>1,400</td>
</tr>
<tr>
<td>Spindle speed min⁻¹</td>
<td>500</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>160</td>
</tr>
<tr>
<td>Spindle kW</td>
<td>VAC 30/22</td>
<td>VAC 30/22</td>
</tr>
<tr>
<td></td>
<td>VAC 45/37</td>
<td>VAC 55/45</td>
</tr>
</tbody>
</table>

Machining Performance

<table>
<thead>
<tr>
<th>Machine</th>
<th>Model</th>
<th>Max machining dia mm</th>
<th>Max turning length mm</th>
<th>Spindle speed min⁻¹</th>
<th>Spindle kW</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-Axis Vertical</td>
<td>VTM-1200YB</td>
<td>ø1,200</td>
<td>1,550</td>
<td>500</td>
<td>VAC 30/22</td>
</tr>
<tr>
<td>Multitasking Machine</td>
<td>VTM-2000YB</td>
<td>ø2,000</td>
<td>1,400</td>
<td>300</td>
<td>VAC 30/22</td>
</tr>
<tr>
<td>Double-Column</td>
<td>VTR-160A</td>
<td>ø1,600</td>
<td>1,250</td>
<td>400</td>
<td>VAC 45/37</td>
</tr>
<tr>
<td>Multitasking Machine</td>
<td>VTR-350A</td>
<td>ø3,500</td>
<td>1,600</td>
<td>160</td>
<td>VAC 55/45</td>
</tr>
</tbody>
</table>

Ram Travel:
VTR-160A: 900mm [Opt: 1,250mm]
VTR-350A: 1,250mm [Opt: 1,500mm]
Highly accurate 5-axis machining

<table>
<thead>
<tr>
<th>Machine:</th>
<th>5-Axis Vertical Machining Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workpiece:</td>
<td>Blisk</td>
</tr>
<tr>
<td>Dimension:</td>
<td>ø400 x L75mm</td>
</tr>
</tbody>
</table>

High speed contouring

High surface quality machining with Super-NURBS (5-axis specs)

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Table: 5-Axis Vertical Machining Center

<table>
<thead>
<tr>
<th>Type</th>
<th>MU-8000V</th>
<th>MU-6300V</th>
<th>MU-5000V</th>
<th>MU-5000II</th>
<th>MU-4000II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table diameter (mm)</td>
<td>800</td>
<td>630</td>
<td>500</td>
<td>500</td>
<td>400</td>
</tr>
<tr>
<td>Table load max. (kg)</td>
<td>700</td>
<td>600</td>
<td>500</td>
<td>500</td>
<td>300</td>
</tr>
<tr>
<td>Trunnion swing (A axis)</td>
<td>+90 to -120° (210°)</td>
<td>+90 to -120° (210°)</td>
<td>+90 to -120° (210°)</td>
<td>+20 to -110° (130°)</td>
<td>+20 to -110° (130°)</td>
</tr>
<tr>
<td>Travels (X x Y x Z)</td>
<td>900 x 1,050 x 600</td>
<td>900 x 1,050 x 600</td>
<td>800 x 1,050 x 600</td>
<td>1,250 x 680 x 540</td>
<td>782 x 460 x 460</td>
</tr>
<tr>
<td>Spindle speed (min⁻¹)</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>8,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Spindle (kW)</td>
<td>VAC 11/7.5</td>
<td>VAC 11/7.5</td>
<td>VAC 11/7.5</td>
<td>VAC 11/7.5</td>
<td>VAC 11/7.5</td>
</tr>
</tbody>
</table>

---

Super-NURBS—the world’s first “Sculptured Surface-Adaptive Acceleration Control.” From routine parts to complex free forms, this high-speed CNC function lets you machine fast—and get superb accuracies and quality.

“Sculptured-surface adaptive acceleration control” consists of Shape Smoothing and Shape Adaptive Control, revolutionary control technologies that apply CAD/CAM system high speed mathematical analysis to speed and acceleration control, real time processes in CNCs.

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High speed and high accuracy
5-axis machining with trunnion table

HIGH SPEED TRUNNION TABLE

Achieves high quality machined surfaces in simultaneous 5-axis machining with high-speed, high-accuracy positioning and light, smooth movements.
Blade Machine/Multitasking Machines

5-axis high speed blade machine

High speed, high quality machining roughing to finishing

- Machine: Blade machine
- Work name: Jet engine Fan blade
- Material: Titanium alloy
- Dimensions: 550 x 200

Steady and highly productive

**BLADE T400**

- Contributes greatly to increased productivity of blade machining
- 5-Axis high speed blade machine

High speed, high quality machining from roughing to finishing

- Reduced roughing time
- High machining performance
  - Cutting performance 667 cm³/min (Results: SUS material)

Reduced finishing time and high surface quality

- Okuma mechatronics achieve higher speeds and quality finishes
- Machine design aimed at maintaining high rigidity while also providing high speeds
- The optimum following error control of the simultaneous 5-axes allows for high speed machining

Increased speed of blade edge reverse operation

- X, Y, Z axis 40 m/min, 0.7G
- A axis 200 min⁻¹, 28,800 deg/sec
- B axis 25 min⁻¹, 2,000 deg/sec

Machine Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Blade machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>BLADE T400</td>
</tr>
<tr>
<td>Max milling diameter</td>
<td>ø600</td>
</tr>
<tr>
<td>Max machining length</td>
<td>1,500</td>
</tr>
<tr>
<td>Tool shank</td>
<td>HSK-63</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>18,000</td>
</tr>
<tr>
<td>Motor kW</td>
<td>VAC 36/19</td>
</tr>
<tr>
<td>Required floor space</td>
<td>6,750 x 9,250</td>
</tr>
</tbody>
</table>

High accuracy contouring of free-form surfaces with 5 axes simultaneously

**MULTUS U series**

- Highly accurate, rigid, hi-tech, and process-intensive
- All that’s required and packed in the ultimate multitasking machine

Max milling or turning performance

- Face milling example
  - Cutting performance 667 cm³/min (S45C)
  - ø50-mm face mill, 5 blades
  - Cutting speed: 300 m/min
  - Cutting depth: 6x35 mm
  - Feeds: 2,865 mm/min

- OD turning example
  - Cutting performance 5.0 mm² (S45C)
  - Cutting speed: 150 m/min
  - Cutting depth: 8 mm
  - Feedrate: 0.625 mm/rev

First priority: large work envelopes

<table>
<thead>
<tr>
<th>Model</th>
<th>Intelligent Multitasking Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>MULTUS U3000</td>
<td>MULTUS U4000</td>
</tr>
<tr>
<td>Max machining dia</td>
<td>ø600</td>
</tr>
<tr>
<td>Max machining length</td>
<td>1,500</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>5,000</td>
</tr>
<tr>
<td>Spindle drive kW</td>
<td>VAC 36/15</td>
</tr>
</tbody>
</table>
Multitasking Machines

Total machining of large, long parts through integrated operations

- Continuous machining of 1-2 processes with opposing spindles and steadyrest
- Internal diameter machining with long boring bar*
- Gear cutting with synchronized control of tool turning and C axis

Machine: Intelligent Multitasking Machine MULTUS B750
Opposing spindle
Long boring bar

Workpiece: Landing gear
Dimensions: ø330 × L1,000 mm

* A featured MULTUS B750 application

Large parts machining with ease
Modular production line with an orthogonal Y axis wide working range integrated on a single machine

- **Y axis travel**
  Y axis travel comparable to that of a large machining center gives a large working range and powerful support capacity to easily handle even large parts.

Maximum workpiece size

<table>
<thead>
<tr>
<th></th>
<th>MULTUS B550</th>
<th>MULTUS B750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max turning dia</td>
<td>ø830 mm</td>
<td>ø1,050 mm</td>
</tr>
<tr>
<td>Max turning length</td>
<td>2,000 mm</td>
<td>3,000 mm*</td>
</tr>
</tbody>
</table>

*4,000 mm, 6,000 mm specifications also available.

Maximum support weight

<table>
<thead>
<tr>
<th></th>
<th>MULTUS B550</th>
<th>MULTUS B750</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tailstock support</td>
<td>1,500 kg</td>
<td>6,000 kg</td>
</tr>
<tr>
<td>Both chucks</td>
<td>--</td>
<td>7,000 kg</td>
</tr>
</tbody>
</table>

Note: Max loads may vary with other specifications not shown above.

Highly rigid bed column
Diagonal rib structure used on bed and column. The rigidity is 7 times greater than without ribs. Withstands bending and torsion and readily handles large loads of heavy-duty cutting, maintaining high accuracy over long periods.

Machine Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Intelligent Multitasking Machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>MULTUS B750M</td>
</tr>
<tr>
<td>Max machining data (mm)</td>
<td>ø1,050</td>
</tr>
<tr>
<td>Max turning length (mm)</td>
<td>3,000</td>
</tr>
<tr>
<td>Spindle speed (min⁻¹)</td>
<td>2,000</td>
</tr>
<tr>
<td>Spindle drive (kW)</td>
<td>VAC 37/30</td>
</tr>
</tbody>
</table>

Rigidity comparison sample (rigidity per unit weight)

- Without ribs: 1.01
- Crisscross rib: 0.2
- Cross rib: 3.5
- Diagonal rib structure: 7.1

High rigidity bed column
Diagonal rib structure used on bed and column. The rigidity is 7 times greater than without ribs. Withstands bending and torsion and readily handles large loads of heavy-duty cutting, maintaining high accuracy over long periods.
Highly efficient machining with outstanding machining capacity

Beefy torque makes easy work even of difficult-to-machine material

Two types of spindle, integral motor/spindle and gear head, are ready for use depending on the purpose, to achieve easy cutting from high-speed machining of non-ferrous material to high-speed machining of difficult-to-machine material.

<table>
<thead>
<tr>
<th>MU-10000H Integral motor/spindle</th>
<th>MU-10000H Gear spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindle speed</td>
<td>6,000 min⁻¹</td>
</tr>
<tr>
<td>Output</td>
<td>VAC 45/37 kW</td>
</tr>
<tr>
<td>Torque</td>
<td>1,071/637 N·m</td>
</tr>
<tr>
<td></td>
<td>6,000 min⁻¹</td>
</tr>
<tr>
<td>Output</td>
<td>VAC 40/30 kW</td>
</tr>
<tr>
<td>Torque</td>
<td>1,920/1,440 N·m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MILLAC 1000VH Gear spindle</th>
<th>MILLAC 800VH Integral motor/spindle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindle speed</td>
<td>6,000 min⁻¹</td>
</tr>
<tr>
<td>Output</td>
<td>VAC 22/18.5 kW</td>
</tr>
<tr>
<td>Torque</td>
<td>525/441 N·m</td>
</tr>
<tr>
<td></td>
<td>10,000 min⁻¹</td>
</tr>
<tr>
<td>Output</td>
<td>VAC 22/18.5 kW</td>
</tr>
<tr>
<td>Torque</td>
<td>165/117/95 N·m</td>
</tr>
</tbody>
</table>

Simultaneous 5-Axis Tool Tilt Compensation

The tool angle on a workpiece (tool tilt) in 5-axis machining will change on a waving surface. CAM processing errors will cause the tool to stagger with unnecessary accel/decel and reverse angles during axis feed. Simul 5-Axis TTC will keep feedrates steady with a smooth sequence of commands to automatically correct tool tilt angles—resulting in shorter cycle times and smoother surface finishes.

Machine Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>5-Axis Horizontal Machining Center</th>
<th>5-Axis Large Machining Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>UNIVERSAL CENTER MU-10000H</td>
<td>MILLAC 1000VH</td>
</tr>
<tr>
<td>Table size</td>
<td>1,000 x 1,000</td>
<td>1,000 x 1,000</td>
</tr>
<tr>
<td>Travels (X x Y x Z)</td>
<td>1,550 x 1,650 x 1,650</td>
<td>1,650 x 1,300 x 1,000</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>6,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Spindle</td>
<td>VAC 45/37</td>
<td>VAC 22/18.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VAC 22/18.5</td>
</tr>
</tbody>
</table>
5-Axis Control Machining Center/5 Surface Machining Double Column Machining Center

Multi-sided, angled, curved surfaces—universal heads capable of handling large complex shapes

Improved machining accuracy through one-chucking
Improved cutting conditions through use of optimal, non-interfering tools
Reduced setup change time and costs

Machining shapes (examples)

Reduced machining lead time through high quality and process-intensive machining

**MILLAC 853PF**

Spindle tilt type 5-axis vertical machining center

- **Spindle speed:**
  - 2 gear spindle 12,000 min⁻¹
  - 7/24 taper No.50 55/45 kW

- **Spindle tilt:**
  - A axis (spindle forward and back swing) 70°
  - B axis (spindle left and right swing) 70°

- **Rapid feedrate:**
  - X/Y axis 30,000 mm/min
  - Z axis 24,000 mm/min

- **Table load maximum mass:** 3,000 kg

**Suitable for powerful cutting of large, complex parts**

**MCR-BIII**

Universal index head (B-/C-axis), NC-BC Universal head

- **Universal index head (B-/C-axis)**
  - 2,000 min⁻¹, 10 kW
  - 5,000 min⁻¹, 7.5 kW

- **NC-BC Universal head**
  - 6,000 min⁻¹, 7.5 kW
  - 15 kW

Machine Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>MILLAC 853PF</th>
<th>MCR-BIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>MILLAC 853PF</td>
<td>MCR-BIII</td>
</tr>
<tr>
<td>Table dimensions mm</td>
<td>2,100 x 600</td>
<td>1,200 x 2,000 to 3,000 x 11,000</td>
</tr>
<tr>
<td>Table (X x Y x Z) mm</td>
<td>1,250 x 550 x 700</td>
<td>3,000 x 1,000 to 3,000 x 11,000</td>
</tr>
<tr>
<td>Spindle speed min⁻¹</td>
<td>4,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Spindle motor kW</td>
<td>VAC 55-45</td>
<td>VAC 30-22</td>
</tr>
</tbody>
</table>

* Machine requires 8,000 min⁻¹ *spindle
Innovation of 5-Axis Machining Volumetric Accuracy—Okuma Original Technologies

5-Axis Auto Tuning System
Taking 5-axis machining accuracy to the next level

Automatic tuning with no geometric error, able to be carried out quickly and easily by anyone

Five-axis machining accuracy is greatly affected by rotary axis misalignment and other "geometric errors" (see Figure 1). Okuma’s 5-Axis Auto Tuning System measures geometric error using a touch probe and datum sphere, and performs compensation using the measured results to tune motion accuracy on 5-axis machines. In this way 5-axis machining accuracy on a higher level is achieved.

Approximately 10 minutes automatically carried out by the machine*
The "Easy Operation" OSP makes things surprisingly easy.

"High accuracy tuning" achieved only through Okuma’s Machine & Control

In multi surface machining, where the tool (table) is tilted at a variety of angles and each surface is machined, when tuning of 4 types of geometric error is carried out manually, the machining surface level difference is a maximum of 12 μm but with 5-axis Auto Tuning this is reduced to a maximum of 3 μm, with a level different of 0 for most surfaces.

Thermo-Friendly Concept
Manageable Deformation—Accurately Controlled

For superb accuracies in "normal" manufacturing environments. The unique approach of "accepting temperature changes"

Machining accuracy of the workpiece changes significantly due to ambient temperatures around the machine, heat generated by the machine, and heat generated in machining. The Thermo-Friendly Concept is the unique concept of "accepting" these temperature changes so that high accuracy can be achieved in normal factory environments with no special measures by the user.

TAS-C (Thermo Active Stabilizer—Construction)
TAS-C accurately controls the machine’s structural thermal deformation, by taking into consideration the machine’s thermal deformation characteristics, temperature data from properly placed sensors, and feed axis positioning information.

TAS-S (Thermo Active Stabilizer—Spindle)
TAS-S takes into account various conditional changes such as the spindle’s temperature data, modification of the spindle rotation and speed, as well as spindle stoppage. The spindle’s thermal deformation will be accurately controlled, even when the rotating speed changes frequently.

Models which can support 5-Axis Auto Tuning
• MU-6300V
• MU-500VII
• MU-10000H
• MU-6300V-L
• MU-500VII-L
• MU-8800V

Thermo-Friendly Concept applicable models
[TAS-S, TAS-C standard equipped models]:
- MULTUS series, MCR-BII
[TAS-S, TAS-C optionally equipped models]:
- MU-5300V, MU-5000V/8000V, MU-400V/5000V,
Maximizing tool life and performance through tool diagnostics

Machining Navi
Cutting conditions search

See also
okuma.co.jp/english/onlyone/process/index.html

Maximizing machine tool performance
Cost reduction—shorter cycle times and higher productivity—is required to compete in today’s global market. Machining Navi, with clear visuals of complex cutting conditions, is a breakthrough tool that enables the machine operator to navigate the machine and tool capabilities to their best performance levels.

Range without chatter (stable region)
Range with chatter (unstable region)

Axial cutting
Spindle speed

We know there is harmonic motion, or periodic vibration, related to machine tool spindle speed and chatter. As the wave cycles show, chatter occurs in the unstable region, while the stable region is chatter-free. Machining Navi helps the operator quickly find the optimum cutting conditions within the stable, chatter-free region.

Machining Navi can be used to carry out tooling diagnostics

For turning
Machining Navi L-g
(guided harmonic spindle speed control)
Chatter-free applications for lathes
Chatter in a lathe can be suppressed by changing spindle speeds to the ideal amplitude and wave cycle.

For milling
Machining Navi M-i
(intelligently optimized spindle speed control)
Simple, auto-mode—leave it to the machine, Finding optimum cutting conditions quickly
Chatter vibration is measured by built-in sensors, and spindle speed is automatically changed to the optimum speed. In addition, advanced graphics of the optimum cutting conditions represent effective alternatives to suppress various chatter characteristics throughout the low to high speed zones.

For milling
Machining Navi M-g
(guided optimization of spindle speed)
Adjust cutting conditions while monitoring the data
From chatter noise picked up by the microphone, Machining Navi will display the best options for chatter-free spindle speed. The operator can select a recommended speed and immediately confirm the result.

Preventing machine stoppages from machine collisions

Collision Avoidance System
Collision prevention

NC controller (OSP) with 3D model data of machine components—workpiece, tool, chuck, fixture, headstock, turret, tailstock—performs real time simulation just ahead of actual machine movements. It checks for interference or collisions, and stops the machine movement immediately before collision. Machinists (novice or pro) will benefit from reduced setup and trial cycle times, and the confidence to focus on making parts.

Collision prevention during automatic operation
NC program is read in advance and axial travel commands are checked for interference with consideration of zero point and tool compensation values set in NC. Axial travel movement is stopped temporarily before collision occurs.

Collision avoidance in manual operation
Especially useful for machine operators setting up a job, collision avoidance in manual mode provides collision-free confidence and faster machining preparations.

Realistic simulation of workpiece cutting
Workpiece shape during machining is displayed accurately and interference checks are performed.
For over 115 years, Okuma has been investing in new technology, pioneering machine tool and control development, and has been helping manufacturers improve quality, enhance productivity and reduce costs. Our commitment to manufacturing extends around the world and our partnerships with industry suppliers and local distributors helps bring the best solutions to our customers.

Okuma provides global support and service for manufacturers around the world. With over 3300 employees worldwide, and over one hundred distributor locations, Okuma is the team to partner with when it comes to engineering support and information. Outfitted with the finest CNC machine tools, Okuma’s technical centers (including the Aerospace Centers of Excellence in Paris, France and Charlotte, North Carolina) provide an opportunity for manufacturers to test and trial new equipment and processes, to improve productivity.