

# ***SPEEDIO*** **W1000Xd2**

**Wide Travel  
Compact Machining Center**



**Machine Tools Sales Department,  
Machinery Business Division,  
Brother Industries, Ltd.**

# ***SPEEDIO*** **W** series Wide Travel Compact Machining Center

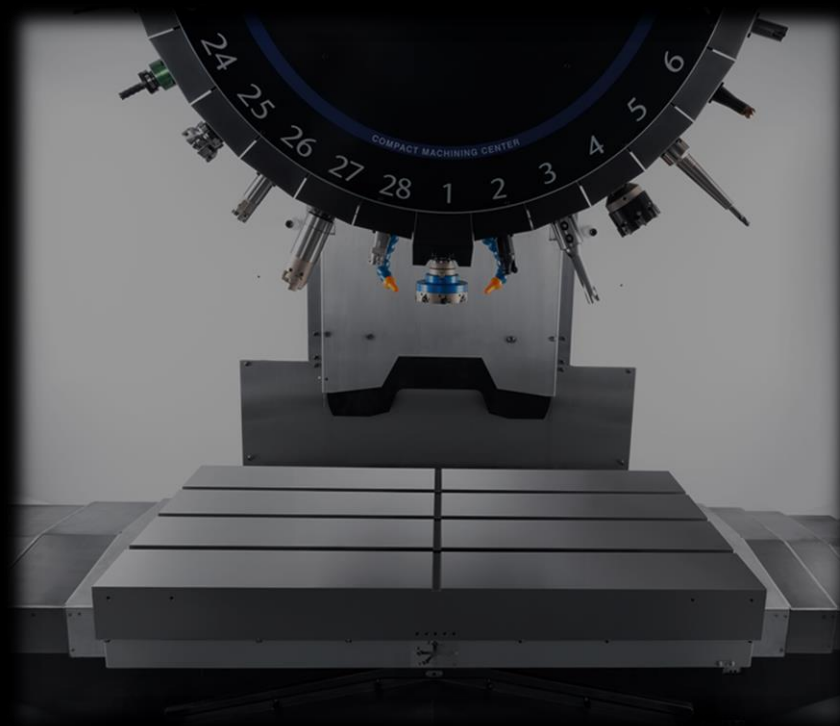
## Introduction of **W1000Xd2**

1. Description of ***SPEEDIO***
2. Description of Wide Travel Compact Machining Center
3. Features of **W1000Xd2**
4. Case Study
5. Introduction of Demonstration Machining

# Cutting Out the Waste

Times are changing. Are you ready?  
You need a machine that's fast and compact.  
With the ability to make any cut.  
In this world, only the strong survive.  
Make it better with SPEEDIO.

***SPEEDIO***



# ***SPEEDIO***

**SPEEDIO is a brand of No. 30 machine for customers who demand high productivity, which has high machining ability while having compactness and speed not found in No. 40, and is eco-friendly**



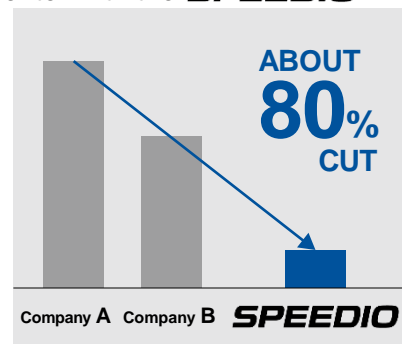
# Exceptional Environmental Performance



## **SPEEDIO** for the Environment Looking to Achieve Carbon Neutrality

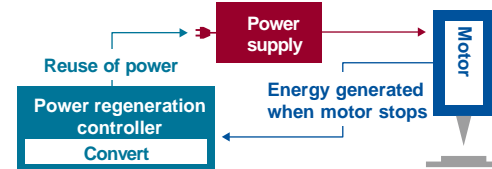
While retaining the #30 spindle, and based on Brother's original technology, the **SPEEDIO** strives for industry-leading environmental performance, in addition to overwhelming high productivity, machining capabilities, and usability.

When machining is performed by replacing a general #40 machining center with the **SPEEDIO**



### Power-Saving Functions

#### Power Regeneration system



#### Power consumption application



- LED work light
- Coolant automatically turns OFF
- Standby mode
- Machine light automatically turns OFF
- Display automatically turns OFF
- High efficiency pump, etc.

# **W**

## ***SPEEDIO*** **W1000Xd2** Wide Travel Compact Machining Center



**S** Compact Machining Center  
**S300Xd1**  
**S500Xd1**  
**S700Xd1**



**M** Compact Multi-Tasking Machine  
**M200Xd1**  
**M300Xd1**



**R** Pallet Changing Compact Machining Center  
**R450Xd1**  
**R650Xd1**



**U** Universal Compact Machining Center  
**U500Xd1**



**F** High Rigidity Compact Machining Center  
**F600X1**



**H** Horizontal Compact Machining Center  
**H550Xd1**



**Special Options**  
**T-200Ad/ BV7-870Ad**  
**T-200A**



A wide travel compact machining center is shown from a front-facing perspective. The machine features a large, dark grey metal structure with a central vertical column. A drill bit is positioned at the top of the column, and two blue and orange coolant hoses are attached to the sides. The machine is mounted on a large, multi-tiered metal base. The background is a plain, light-colored wall.

## 2. Description of Wide Travel Compact Machining Center



## Largest travels and loading capacity among BT30 machines

Travels X1,000 Y500 Z380 mm

×

Max. table loading capacity 500 kg

×

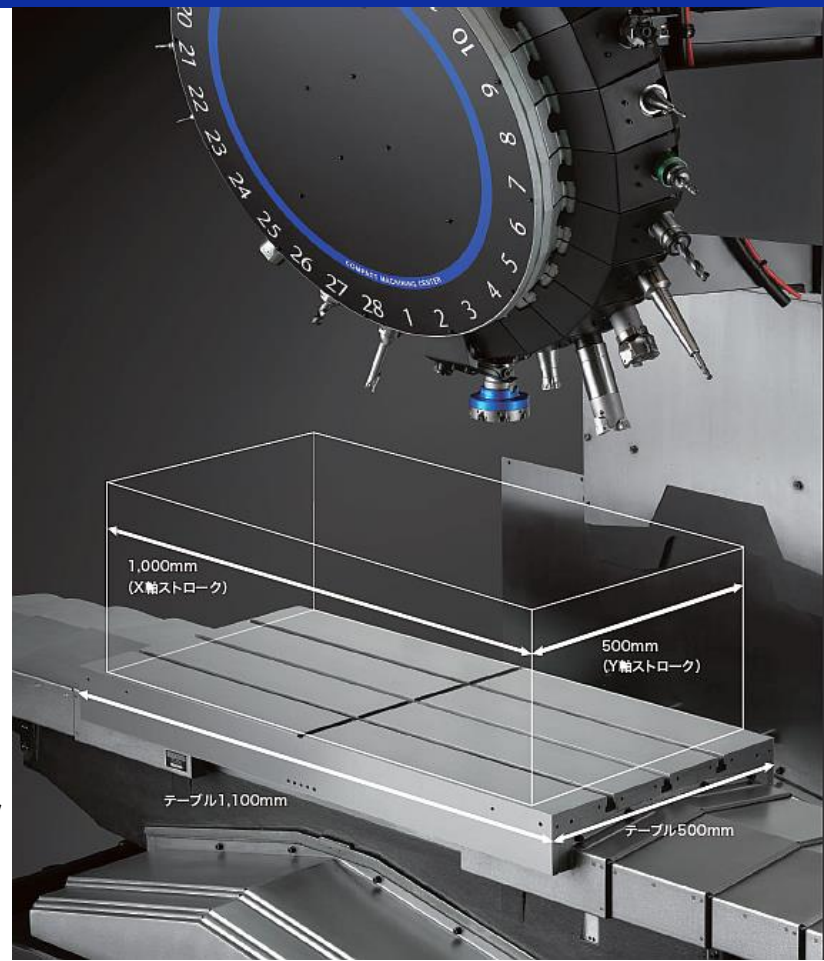
SPEEDIO's high productivity

×

Excellent environmental performance



## Wide Travel Compact Machining Center





## The widest machining area in BT30 machines' history

### Ample travels and table size

Ample X/Y-axes travels and sufficient loading capacity allow machining large workpieces and mounting a large jig, not available on conventional BT30 machines.

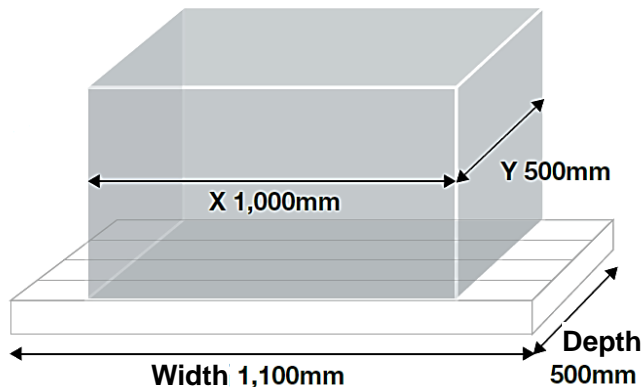
#### Travels

X1,000 Y500

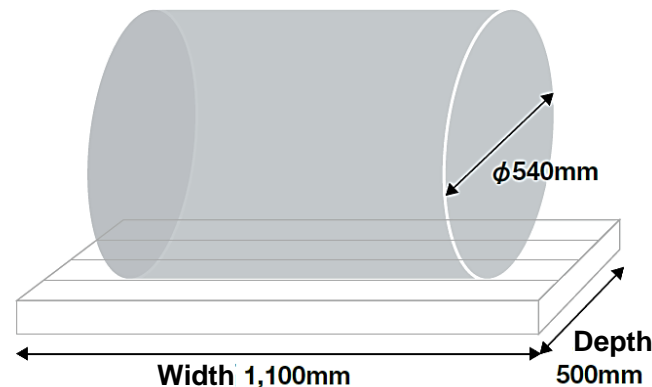
#### Work area size

X1,100 Y500

Max. loading capacity  
500 kg



A trunnion jig with a turning diameter of 540 mm can be mounted.  
(High column 250 mm)



## Contributes to replacing BT40 machines in various scenarios

### Expands target machining parts and process flexibility

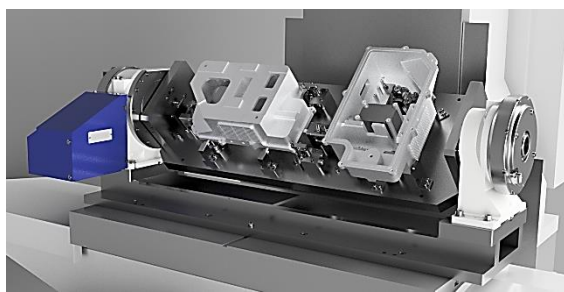
#### One-part machining of large workpieces

Enables multi-face machining of large workpieces, such as EV battery case and automobile subframe.



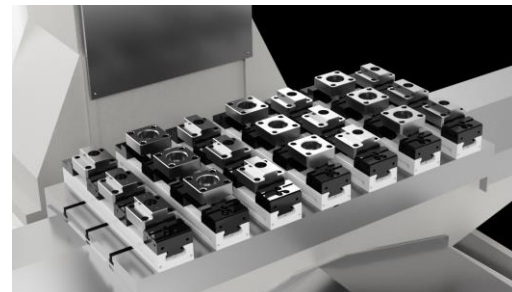
#### Two-part machining of medium-sized workpieces

Enables efficient machining by simultaneously machining right and left parts of the workpiece or the front of one workpiece and the rear of another.



#### Multi-part machining of small workpieces

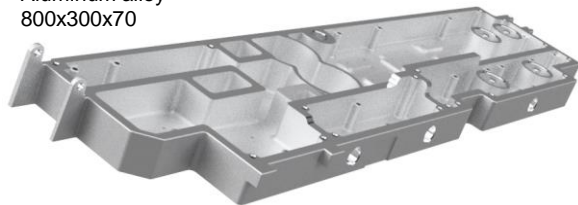
Enables maximum hours of operation by performing multi-part machining of small workpieces or suitably placing multiple types of workpieces.



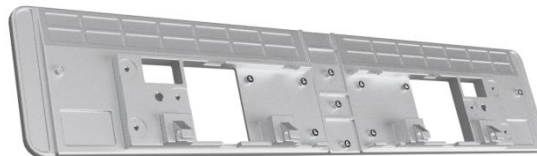
# Enables workpiece machining previously considered impossible in various industries, including the automobile industry

## Automobile parts

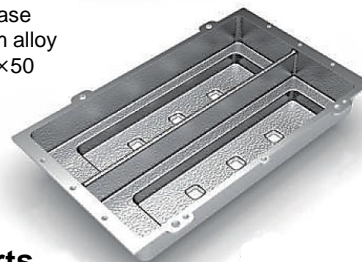
Battery control box  
Aluminum alloy  
800x300x70



Instrument panel  
Aluminum alloy  
800x200x50



Battery case  
Aluminum alloy  
720x300x50



EV frame  
Aluminum alloy  
800x430x170



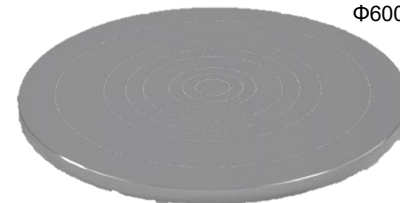
## General parts

Frame parts  
Aluminum alloy  
800x50x50



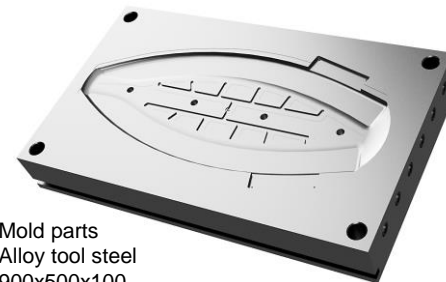
## Semiconductor production equipment parts

Shower plate  
Aluminum alloy  
Φ600x30



## Mold parts

Mold parts  
Alloy tool steel  
900x500x100





### 3. Features of W1000Xd2

October 2014

**S1000X1**



SPEEDIO's new series  
X1,000, Y500

April 2021

**W1000Xd1**



Equipped with new D00 controller  
Productivity improved by 3%  
Supports CTS 7 MPa  
Max. tool weight 4 kg


April 2023

**W1000Xd2**



- Increased tool capacity: 28-tool magazine
- Increased max. table loading capacity to 500 kg
- Increased Z-axis travel to 380 mm
- Increased standard spindle spec to 12,000 min<sup>-1</sup>

## A variety of specifications available to meet customers' various applications

<p>Wide Travel Compact Machining Center <b><i>SPEEDIO</i></b></p>	<p><b>W1000Xd2</b></p> 
Travels X / Y / Z	1,000 mm / 500 mm / <b>380 mm</b>
Max. spindle speed	<b>12,000 min<sup>-1</sup></b> 16,000 min <sup>-1</sup> (optional) 10,000 min <sup>-1</sup> High-torque (optional)
Tool storage capacity (pcs.)	14 / 21 (optional) / <b>28</b> (optional)
Spindle options	BT dual contact spindle Coolant Through Spindle (CTS) *1 Max. 3 MPa / Max. 7 MPa
Max. table loading capacity	300 kg ( <b>500 kg</b> ) *2

## Advancements in W-series

#### ① Tool magazine

**28-tool** magazine optionally available  
(Selected from 14-, 21-, or 28-tool magazine)



#### ③ Z-axis travel

300 mm → **380 mm**

#### ④ Newly developed, highly efficient spindle motor

Standard 10,000 min<sup>-1</sup>  
→ **12,000min<sup>-1</sup>**

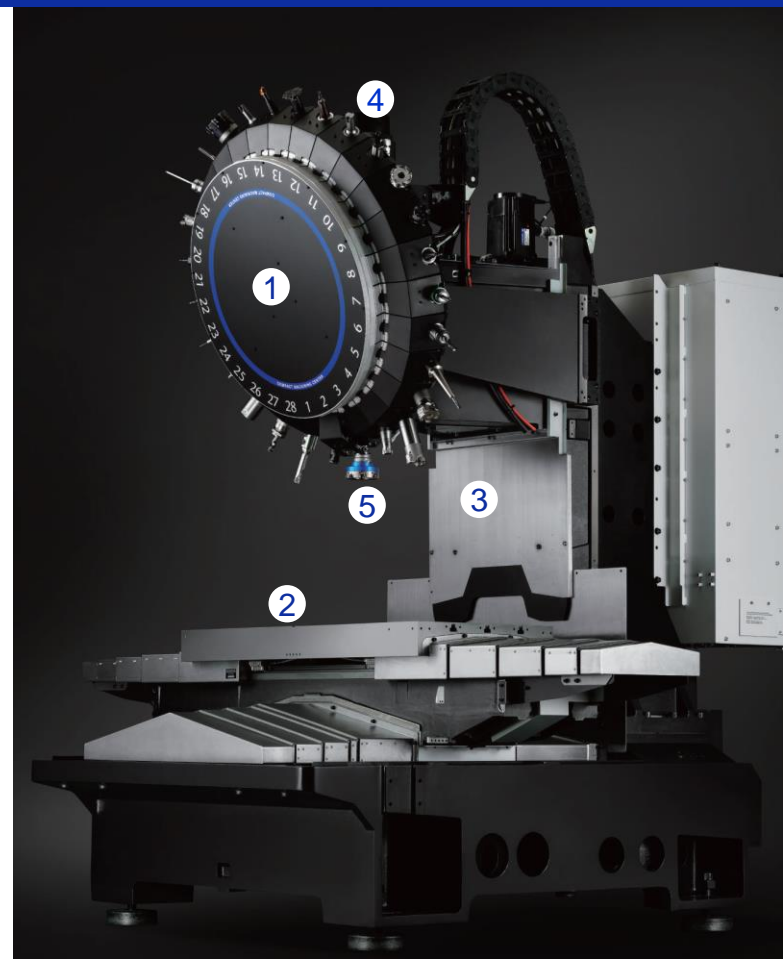
#### ② Max. table loading capacity

400 kg → **500 kg**



#### ⑤ Improved spindle rigidity

**Improved spindle rigidity of high-torque motor spec**





## Further Advanced W-series



**Enhanced Extensive  
Functions**

**Untiring Improvement  
of Reliability**

**Advanced  
New D00 Control**

## Further Advanced W-series



**Enhanced Extensive  
Functions**

**Untiring Improvement  
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### 28-tool magazine

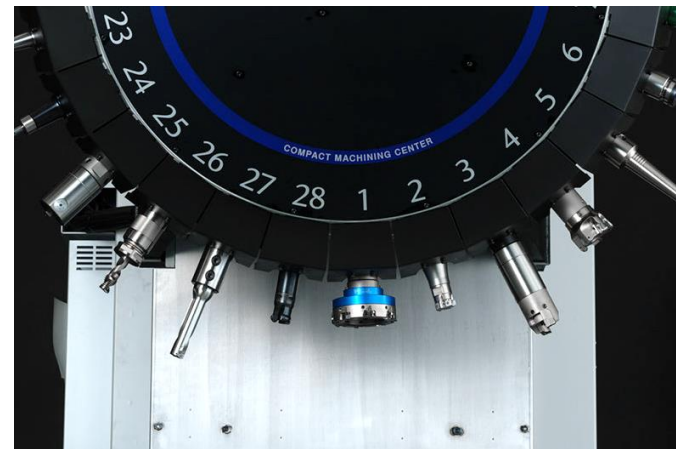
Growing need for  
process integration  
→ Increased required  
tool quantity.



Job shop expansion  
→ Need for reduction  
in tool change time



Maintains high productivity in large  
workpiece machining and multi-product  
small-volume machining, and responds  
to a wide range of processes

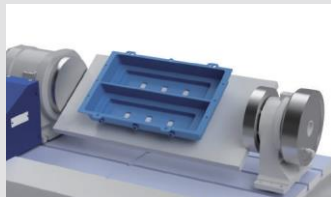


Max. tool length 250 mm  
Max. tool diameter  $\varnothing 110$  mm  
Max. tool weight 4 kg

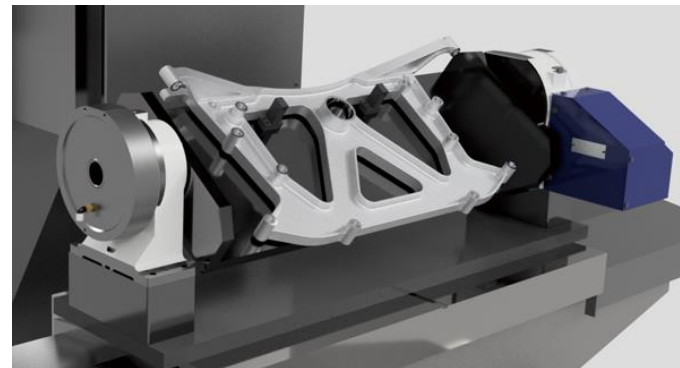
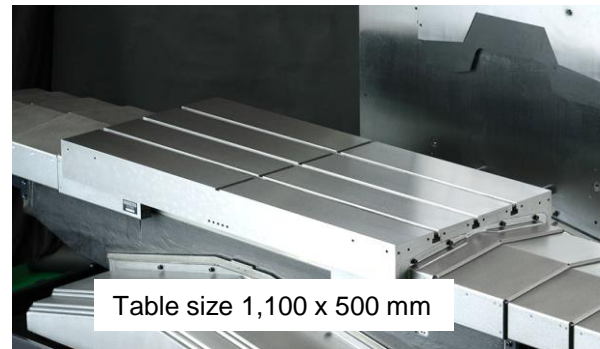
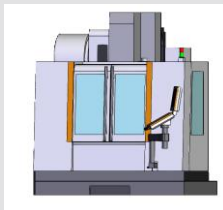
	14/21-tool MG (Standard tools)	28-tool MG (Standard tools)	28-tool MG (Heavy tools)
Chip - Chip	1.3s	1.4s	1.5s
Tool - Tool	0.6s	0.7s	0.8s

## Max. table loading capacity 500 kg

Trend in increase in  
workpiece size due to  
electrification of automobiles



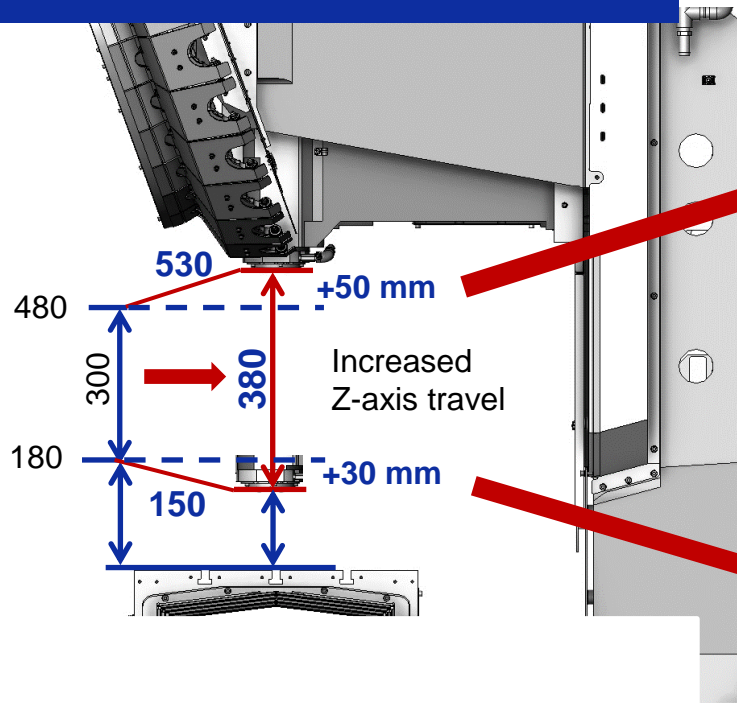
Replacing BT40 machines  
Wants to replace machines only  
while continuing to use current jigs.



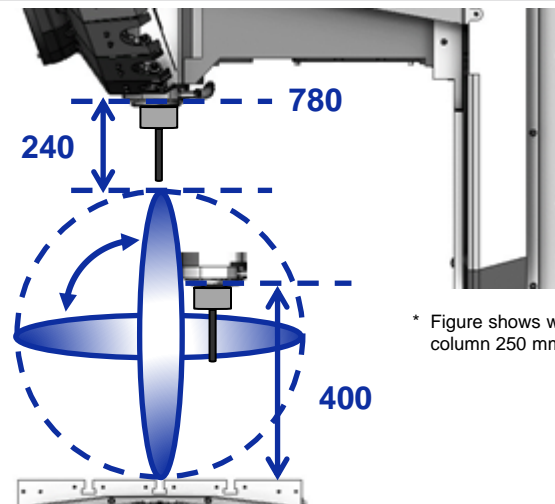
\* When the table loading capacity has been changed via parameter,  
machining speed and positioning speed are suitably adjusted automatically.

## Increased Z-axis travel

**Z-axis travel 380 mm**

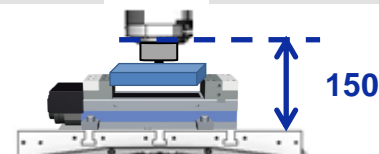


Growing need for process integration  
Improved tool accessibility  
when indexing a large workpiece



\* Figure shows when high column 250 mm is used

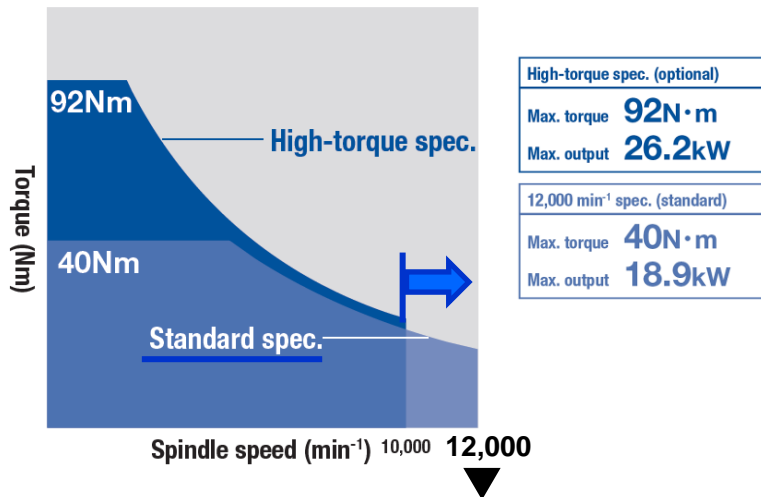
W-series spreading into job shop markets  
Expanded versatility by improved  
tool accessibility at the lower limit



## Increased standard motor spec

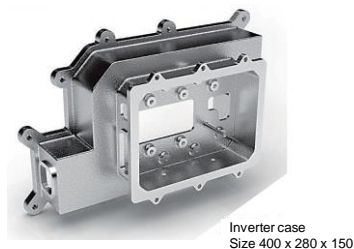
Newly developed, highly efficient  
12,000 min<sup>-1</sup> spindle motor

Motor torque characteristics

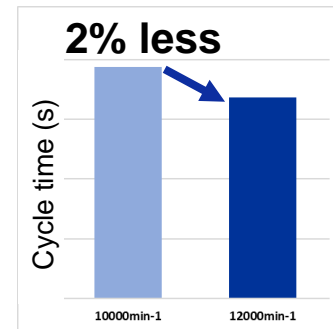


Drives performance of small-diameter tools  
to the fullest.

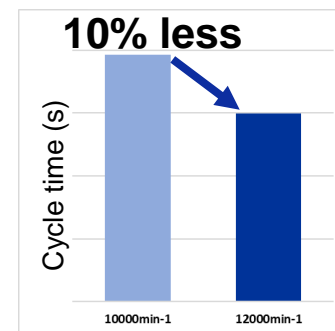
## Reduction in cycle time



- Machining inverter case
- Optimized cutting conditions of small-diameter tools



- Machining approx. ø450 mm shower plate
- Drilling ø0.5 multiple holes



# Enhanced rigidity of 10,000 min<sup>-1</sup> high-torque spec spindle

## Highly rigid spindle spec

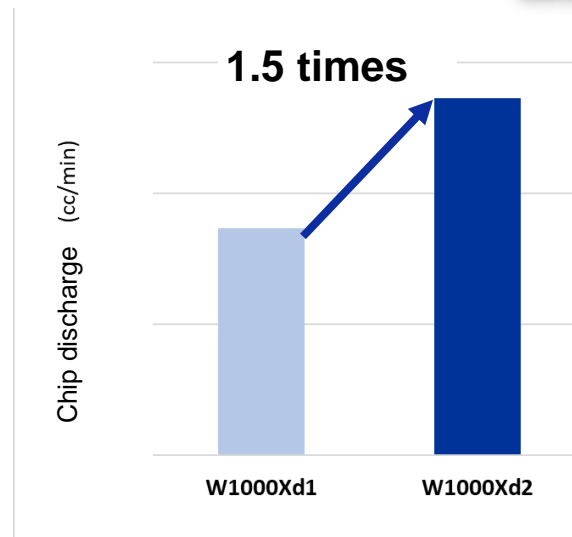


- Increased spindle bearing diameter
- Increased spindle clamp force
- Improved tool retention force



Increasing demand for replacing BT40 machines:  
Pursuit of further machining stability

- ◇ Machining capabilities
  - Improved over previous model
  - Material: Aluminum (A6061)
  - Side milling
  - Tool: ø16 End mill
  - Conditions: S3950 rpm, F1550



This test result is an example and does not guarantee processing under the conditions.



## Environmental performance

**Provides excellent environmental performance, including low power and air consumption, to achieve carbon neutrality.**

### Low power consumption

In addition to the low inertia spindle and highly efficient spindle motor, the machine is equipped with various energy saving functions to lower power consumption.

### Power regeneration system

Reuses the energy generated when the servomotor decelerates.

### Power consumption app

Current and past power consumption can be checked.

### Highly efficient spindle motor

### Energy-saving pump

### LED work light

### Energy-saving NC functions

Automatic coolant off  
Automatic work light off  
Standby mode  
Automatic display off  
Automatic power off

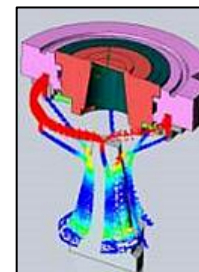


### Low air consumption

Air related functions have been reviewed and optimized to eliminate any waste, leading to reduction in air consumption.

### Air purge

A highly airtight structure achieved through repeated flow rate analysis reduces the amount of air used.



### Spindle air blow

Amount of air used is reduced by discharging three times the conventional volume of air only when required.



## Further Advanced W-series



Enhanced Extensive  
Functions

Untiring Improvement  
of Reliability

Advanced  
New D00 Control

## Support for defective workpiece outflow prevention

### Detection of chips caught in spindle

Chips caught between the spindle and the holder are detected without using a sensor. Detecting any chips caught during ATC prevents defects being delivered to downstream processes.

\* Patent pending



Sample program

G80G90G40G0G54A0

**M318 (chips-caught-in detection ON)**

G100T1G43H1Z0.S16000M3・・

G1X340.0

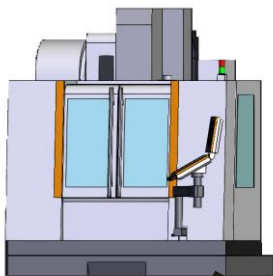
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M30

App screen



- Deflection detection sensor must be attached.
- Additional interface work



Special device sensor is attached to spindle.

Holder deflection is monitored by external special device.



This function is achieved by NC.

- No need for deflection detection sensor
- No need for additional work
- Detection ON/OFF is set by M code

\* ATC time is slightly longer when the chips-caught-in detection function is used.



## Support for defective workpiece detection and machine collision avoidance

### ■ ATC monitoring function

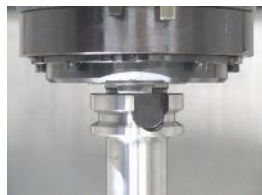
Detects problems due to omission of tool attachment or incorrect attachment



**Incorrect  
attachment  
to magazine**

**Tool holder  
missing**

**Alarm stop  
applied at ATC**

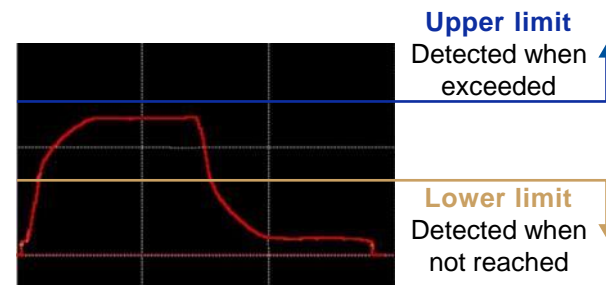


**Prevent outflow  
of defective  
workpieces**

### ■ Machining load monitoring function

Detects increase in machining load

Prevents outflow of defective workpieces, such as re-machining of the same workpiece.



## Further Advanced W-series



Enhanced Extensive  
Functions

Untiring Improvement  
of Reliability

Advanced  
New D00 Control

## Global user interface



Using a touch panel appropriate for worksite environments

- Can be operated like a smartphone
- Can be used reliably onsite.

## Consolidated access on “home screen”

### Cycle time

Remaining time can also be displayed

### Workpiece counter

Workpiece counters enabled in program are displayed

### Tool life

5 tools are displayed in order of shortest life.

### Support apps keys

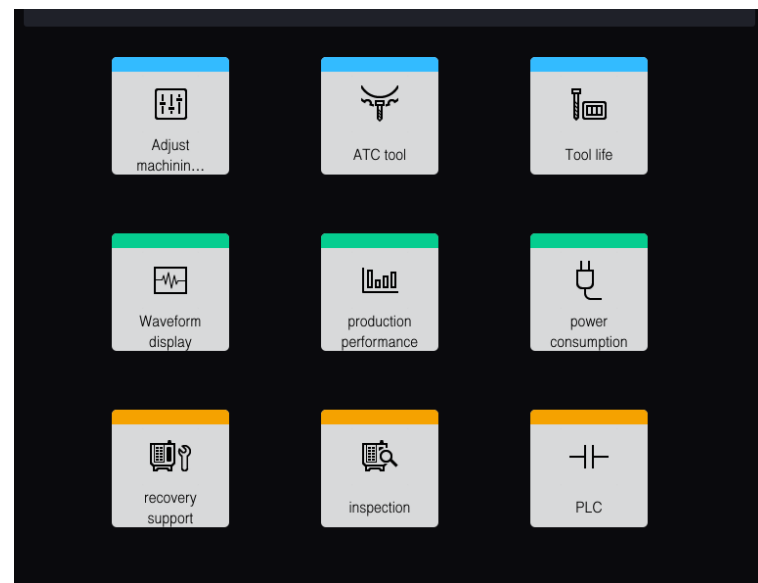


Screen size 15 inch

Shortcut keys

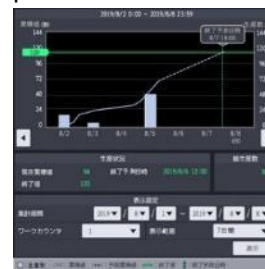
# Easy-to-understand user interface

Equipped with new “support apps” to help users with everyday tasks



## More visibility

Production performance



## Task support

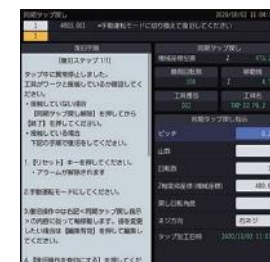
ATC tools



Operational performance



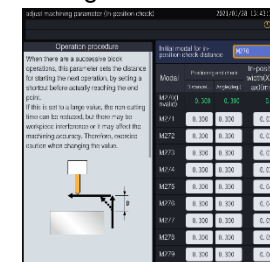
Recovery support / Check



Power consumption



Shorten cycle time settings





## Many new convenient functions added

### ■ Tap override

Spindle or cutting **override enabled** during tapping

**\* Also enabled during tap return, a recovery operation**

**\* Cannot be used for end mill tapping (G177/178)**

### ■ Cycle time log

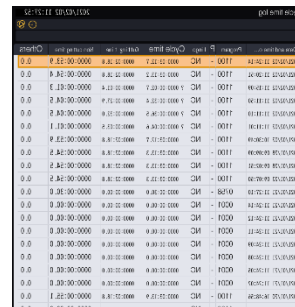
Keeps the most recent **20 records** for cycle time

### ■ Tool log

After selecting a record from the cycle time log, the **cutting time of each tool** in that program **can be displayed**.

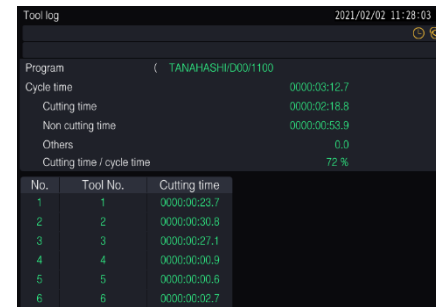
### ■ Additional functions

- Accessories
- Multiple skip
- Program restart from automatically saved position
- Time measurement for specified section
- Load monitoring to predict and display overload
- Multiple block support in MDI operation
- External sub program call
- Added new ST/FBD languages to built-in PLC



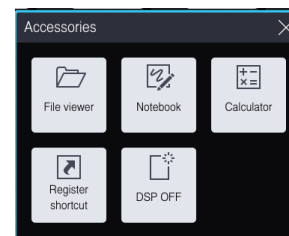
No.	Tool No.	Cutting time
1	1	0000:00:23.7
2	2	0000:00:30.8
3	3	0000:00:27.1
4	4	0000:00:00.9
5	5	0000:00:00.6
6	6	0000:00:02.7

Cycle time log

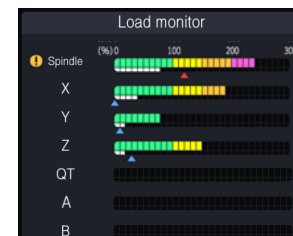


No.	Tool No.	Cutting time
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3	3	0000:00:27.1
4	4	0000:00:00.9
5	5	0000:00:00.6
6	6	0000:00:02.7

Tool log



Accessories



Load monitor

## Hardware specifications upgrade

### ■ Faster block processing speed

Block processing speed increased fourfold

### ■ Increased look-ahead blocks in high accuracy mode B

Standard 40 → **160**

Optional 200 → **1000**

### ■ Increased memory capacity and workpiece coordinates zero point settings

◎ Memory capacity

Standard 100MB → **500 Mbytes**

Optional 500MB → **3 Gbytes**

(Number of files that can be registered: 4000 for either)

◎ Extended workpiece coordinate zero point settings

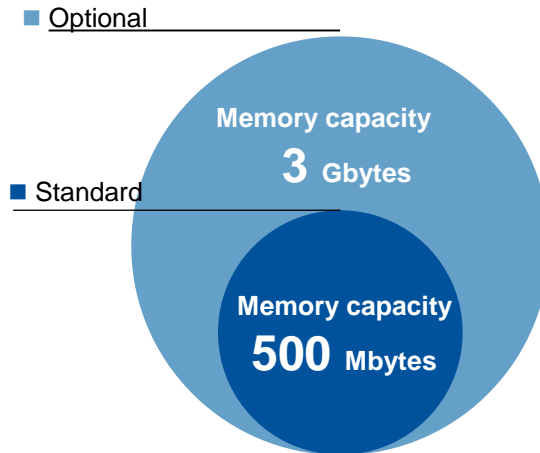
48 → **300**

### ■ Doubled tool data capacity (NC only)

99 → **198**

Units of tool life can be set to seconds.

Example of three-dimensional machining workpiece

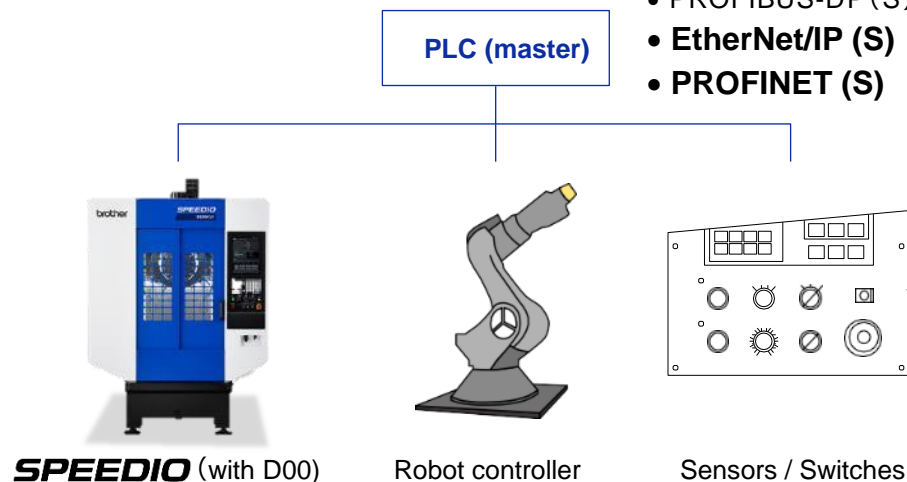


\* Data compared to CNC-C00

## Added compatible standards

Added 2 types of industrial Ethernet to fieldbus networks:  
Ethernet/IP and PROFINET.

- CC-Link (M/S) \*1
- Device Net (S)
- PROFIBUS-DP (S)
- **EtherNet/IP (S)**
- **PROFINET (S)**



## Also compatible with OPC UA

Users can connect the machine directly to other companies' monitor software that is compatible with OPC UA.



\*1. PLC (Master) is not necessary for CC-Link (Master).

\*2. All fieldbus networks are optional. Only one type can be selected.

## Basic Specifications

Item			W1000Xd2
Spindle	Speed	min <sup>-1</sup>	12,000 / 10,000 high-torque (optional) / 16,000 (optional)
	Tool		BT/BBT
	CTS pressure resistance		3 MPa / 7 MPa *1
Travels	X-axis	mm	1,000
	Y-axis	mm	500
	Z-axis	mm	380
Feed axis	Rapid traverse rate X x Y x Z	m/min	50 x 50 x 56
Table	Work area size	mm	1,100 x 500
	Max. loading capacity	kg	300 (500 *2)
Tool changer	Tool storage capacity	pcs.	14 /21 /28
	Max. tool length	mm	250
	Max. tool diameter	mm	110
	Max. tool weight	kg/tool	3.0 (4.0 *2)
NC unit			CNC-D00 control

\*1. CTS pressure-resistance indicates piping specifications.

\*2. Parameter setting needs to be changed.

A detailed view of an industrial robotic arm assembly. The arm is composed of various metal joints, pneumatic cylinders, and a blue and silver gripper. It is positioned above a large, dark, rectangular metal workpiece. The background is a plain, light-colored wall. The lighting is focused on the robotic arm and the workpiece, creating a professional and technical atmosphere.

## 4. Case Study

## [Customer reviews]

### Productivity greatly improved by approx. 30%

- Workpiece : EV related parts “battery tray”
- Material : ADC
- Size : 800 mm x 400 mm~
- Machining details : Mainly drilling and tapping
- Conventional machine : BT40 machine (produced by Japanese manufacturer in China),  
24-tool magazine, X-axis 762 mm, Y-axis 570 mm
- **Reason for selection: High productivity and cost performance,  
replacing current BT40 machines as Y travel of 500 mm can be used**

Workpiece image “battery tray”

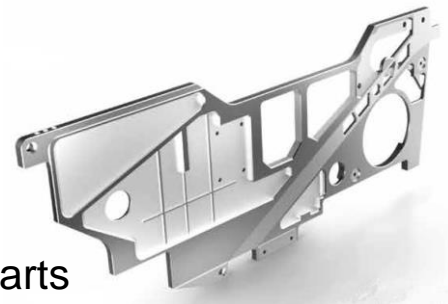


### [Customer reviews]

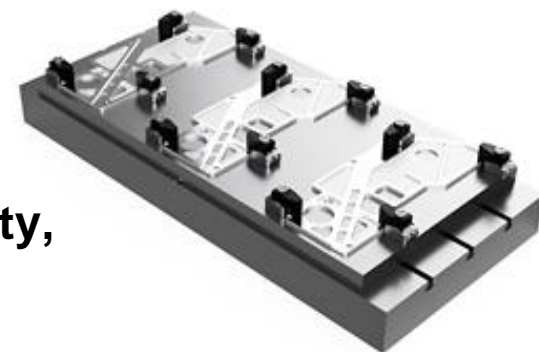
### Productivity increased by multi-part (three-part) machining

- Workpiece : Semiconductor production equipment (chip mounter) parts
- Material : Aluminum (A2017)
- Size : Approx. 200 mm x 400 mm
- Machining details : Drilling, small-diameter milling
- Conventional machine : BT40 machine
- **Reason for selection: Sufficient table size,  
multi-part machining possible, higher productivity,  
range of work that can be taken on will expand**

Workpiece image “chip mounter parts”



Jig image



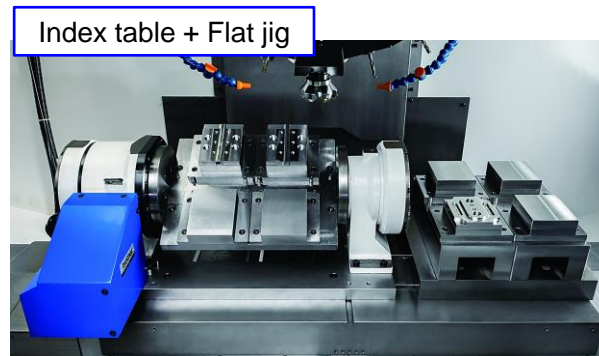
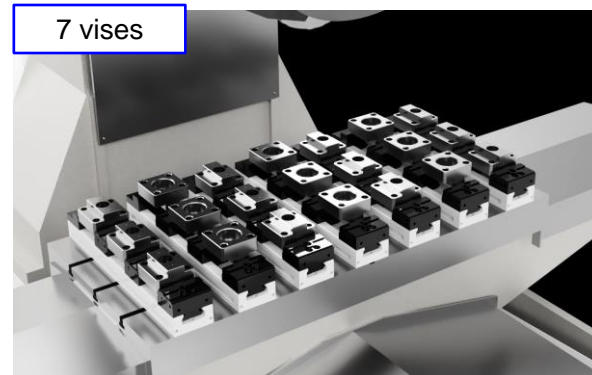


## [Customer reviews]

### Productivity is important even for multi-product small-volume production.

- Workpiece : Multiple products in small volume (Job shop)
- Material : Die cast, aluminum, steel
- Size : A variety of sizes
- Machining details : A variety of machining conditions
- Conventional machine : BT40 machine made in Taiwan
- **Reason for selection: Ample X/Y travels, high productivity, replacing BT40 machines**

<Image>





## 5. Introduction of Demonstration Machining

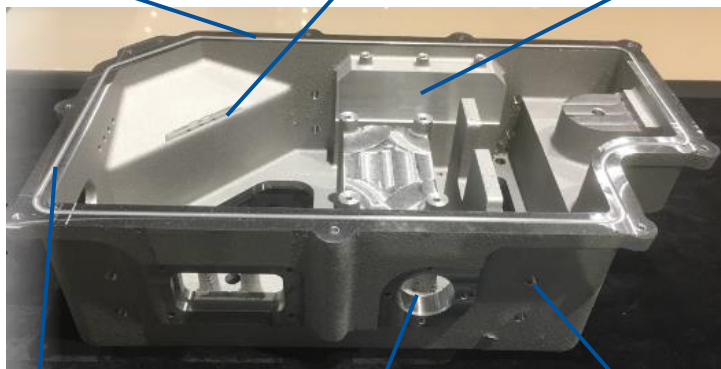
## Machining inverter case using trunnion jig

Two-part machining

**Φ63 Face mill**  
Reference plane  
milling

**M3 Tap**  
Small-diameter  
tapping

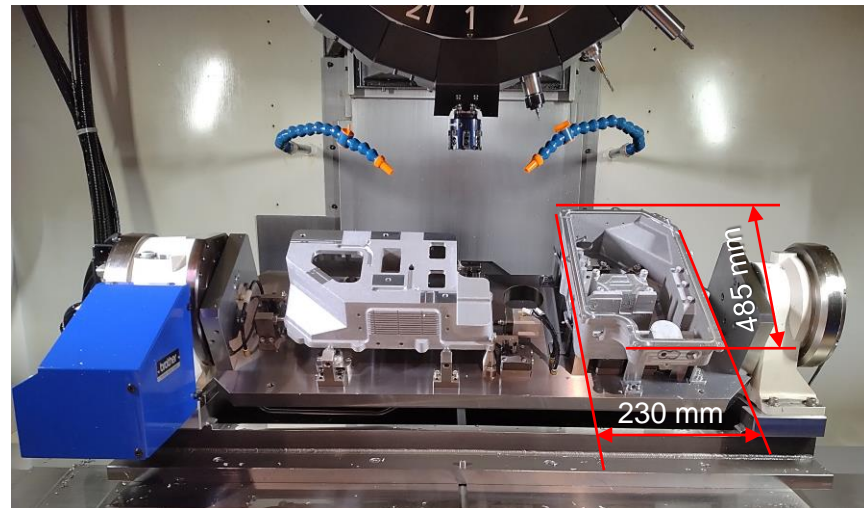
**Φ12 End mill**  
Finishing



**Φ3 End mill**  
Grooving

**Φ30 Drill**  
Drilling

**M8 Thread Mill**  
Drilling and  
tapping

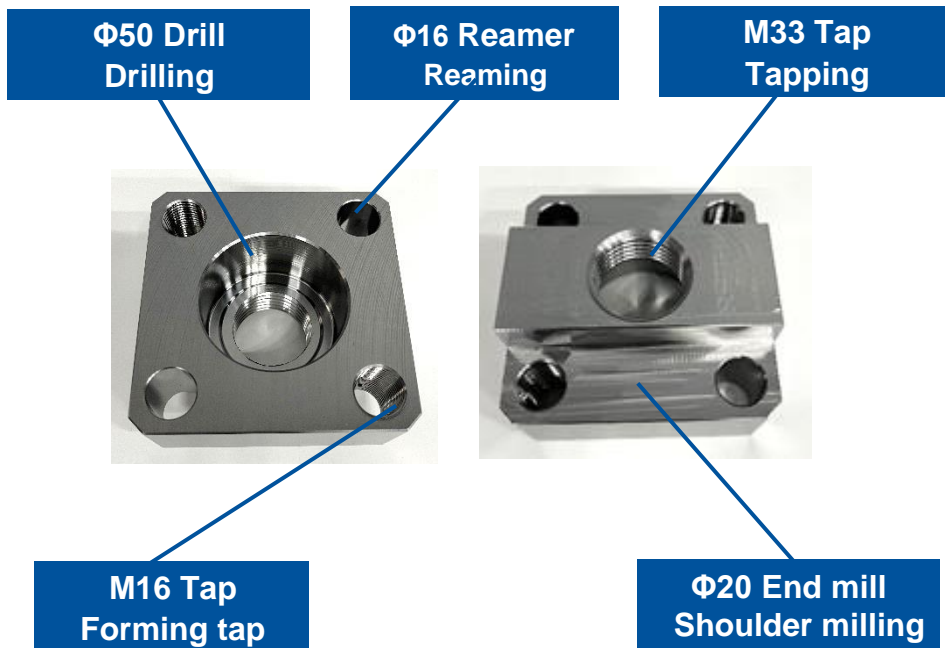


Two-part machining using hydraulic trunnion jig

Item	Details
Workpiece material	Aluminum cast
Workpiece size	485×230×100 mm
Jig / Workpiece weight	Approx. 230 kg
T-200Ad	High inertia mode

### Machining steel using multiple vises

Multi-part machining using multiple vises  
assuming job shop production



Item	Details
Workpiece material	Carbon steel
Workpiece size	90×90×50 mm
Spindle speed	300 to 8,000 min <sup>-1</sup>
Feed	175 to 6,400 mm/min

**brother**  
at your side

## 4. Case Study Reference Materials

## [Customer reviews]

### Attractive X-axis travel of 1,000 mm even on BT30 machine

- Workpiece : EV related parts “in-vehicle display frame”
- Material : Aluminum
- Size : 730 mm x 150 mm
- Machining details : Mainly drilling and tapping
- Conventional machine : BT40 machine (produced by Japanese manufacturer in China), 30-tool magazine, X-axis 1,050 mm, Y-axis 530 mm
- **Reason for selection: Productivity, stability, sufficient table size that makes jig design easier, suitable for a variety of workpieces**

Workpiece image “in-vehicle display frame”





### [Customer reviews]

#### Satisfied with wide travel in spite of BT30 machine

- Workpiece : Guide rail parts
- Material : Extruded aluminum
- Size : 600 mm x 1,000 mm
- Machining details : Mainly drilling and tapping
- Conventional machine : BT40 machine (made in Japan)

- **Reason for selection:**

**Sufficient capabilities for light cutting,  
long travels, reasonable introduction cost**

Workpiece image



Jig image

