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***SPEEDIO***

**Cutting Out the Waste**



*shaping your dreams*

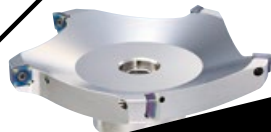




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**OSG is a comprehensive cutting tool manufacturer known for its world-renowned taps and other product offering such as end mills, drills, and rolling dies.**

Moving toward an era of carbon neutrality, OSG will strive to achieve further growth as an essential player that contributes to the global manufacturing industry and the realization of a sustainable society based on its "global presence" corporate philosophy.



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## **Cutting Out the Waste** ***SPEEDIO***

SPEEDIO is a brand of #30 machine for customers who demand high productivity, which has high machining ability while having compactness and speed not found in #40, and is eco-friendly.

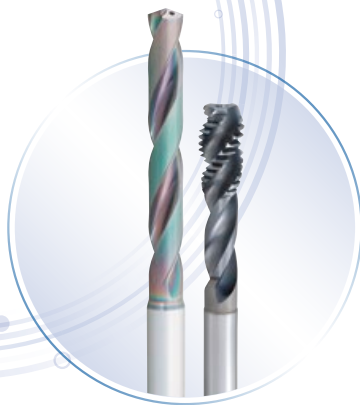
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Initiatives to Achieve Carbon Neutrality ————— P.3

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## Tool layout proposal that brings out the best of SPEEDIO



### Key Services

Proposal of tool layout not only for machine introduction

Selection of optimal OSG tools

Technical support during machining trials

Creation of machining timetable based on work drawings

Proposal of optimum cutting conditions according to the machining environment

Support special tools according to machining needs

On-site inspection for machining

Post-machining technical support

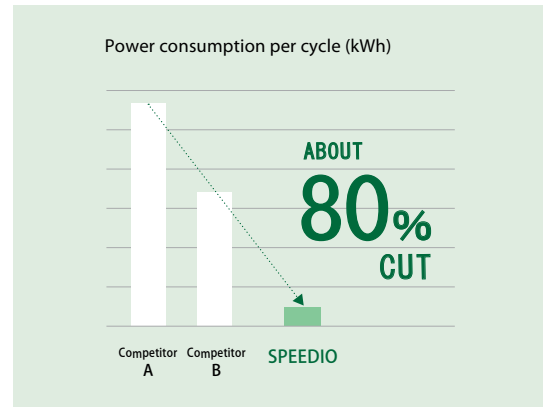
**Achieves highly efficient tool layout!**

# Initiatives to Achieve

SPEEDIO pursues overwhelmingly high productivity, machining ability, and ease of use based on its commitment to the #30 spindle and proprietary technology, as well as the industry's top level environmental performance.

## ■ When machining is performed by replacing a general #40 machining center with the SPEEDIO, power consumption can be reduced by approximately 80%.

The SPEEDIO has been developed with a focus on high speed and high efficiency. Compared to #40 machining centers, the SPEEDIO provides faster machining speed and superior energy efficiency. By shortening machining time, it not only reduces power consumption per cycle, but also reduces labor time, which contributes to reducing power consumption for the entire factory, including air conditioning and lighting.

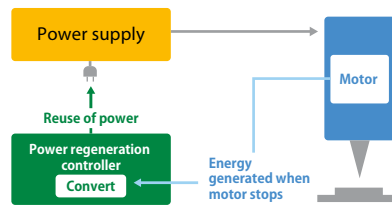


※Data taken from using a machining program created by Brother.

## ■ Energy-saving technologies

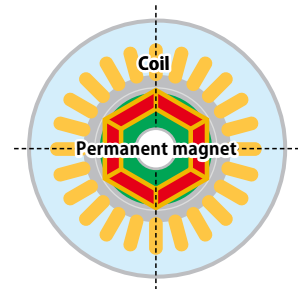
### • Low power consumption

The combination of IPM motor and power regeneration system generates high regenerative power, resulting in energy savings.



Power regeneration system

Equipped with power regeneration technology that reuses the energy generated when the servo motor decelerates.



IPM motor is used for the spindle motor

Since a permanent magnet is used for the rotor and no current is required to create magnetic flux, the IPM motor is more effective than a general induction motor and can start up instantaneously. In addition, this high-efficiency motor with high torque in the medium-to-high-speed range enables higher work efficiency and energy saving.

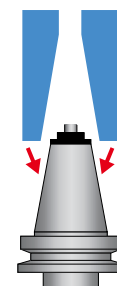
### • Low air consumption

Reduces air consumption by eliminating and optimizing functions. Demonstrates high environmental performance. Compared to general machining centers, air consumption is reduced by approximately 80%.



Air purge

After substantial flowrate analysis, a highly sealed structure that prevents the coolant from penetrating the spindle even with less air purge has been achieved. Significant reduction in air consumption.



Air blow

While reducing air consumption by half, three times the conventional volume of air is discharged only when required to enhance cleaning power. Compared to the case of using only a pump, cleaning is possible with less power consumption.

Scan for details



# Carbon Neutrality



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Towards sustainable development of society, OSG proposes initiatives that can be achieved with cutting tools.

Small efforts, such as using environmentally friendly coolant and reducing the number of cutting tools used, are a step toward the realization of a sustainable society. Increasing machining efficiency also leads to a reduction in power consumption, which in turn leads to the major initiative of carbon neutrality.

OSG will continue to promote environmentally friendly initiatives, starting with cutting tools.

## ■ Introduction of Environmentally Friendly Cutting Tools

### ■ Stable Threading with Water-soluble Coolant

Highly Efficient and Multi-purpose Tap

#### A-TAP



Cutting fluids have a significant impact on the environment. Due to A-TAP's unique cutting edge specification that emphasizes sharpness and the effect of V coating, stable machining is made possible with environmentally friendly chlorine-free, water-soluble cutting fluid.

### ■ Reduce Environmental Impact by Tool Consolidation

High-efficiency Thread Mill with End-cutting Edge for Non-ferrous Materials

#### AT-2 R-SPEC



Tool consolidation is made possible by simultaneous processing of helical drilling and threading. Good positional accuracy can also be obtained in cast holes, which reduces defect rate.

### ■ The Effect of the R Gash Achieves Overwhelmingly Low Thrust and Long Tool Life

Carbide Drill with Oil Holes

#### ADO



High-efficiency machining with low thrust leads to a reduction in power consumption. Furthermore, longer tool life contributes to the reduction of waste and resource conservation.

### ■ Long Tool Life with DLC Coating

DLC Coated Carbide End Mills for Non-ferrous Materials

#### AE-TS-N · AE-TL-N · AE-VTS-N



Extending the life of cutting tools reduces waste and contributes to resource conservation. By implementing the DLC coating with high welding resistance, longer tool life can be obtained.

### ■ Environmentally Friendly Products

Anti-vibration Carbide End Mill

#### AE-VM Series

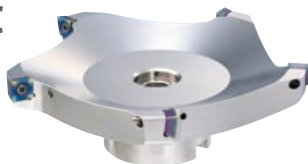


DUARISE coating, which has excellent lubricity, abrasion resistance, and high-temperature oxidation resistance, exhibits stable durability in dry, wet, and mist machining, making it compatible with environmentally friendly cutting fluid processing.

### ■ $\phi 125$ Compatible with BT30

OSG PHOENIX Disc Cutter

#### PFDC



Lightweight large-diameter disc cutter that can be used on BT30 even at  $\phi 125$ . By replacing machining that was previously performed with a machining center equivalent to #40 with a small machining center equivalent to #30, a significant reduction in power consumption can be achieved.

Scan to learn  
about other  
products

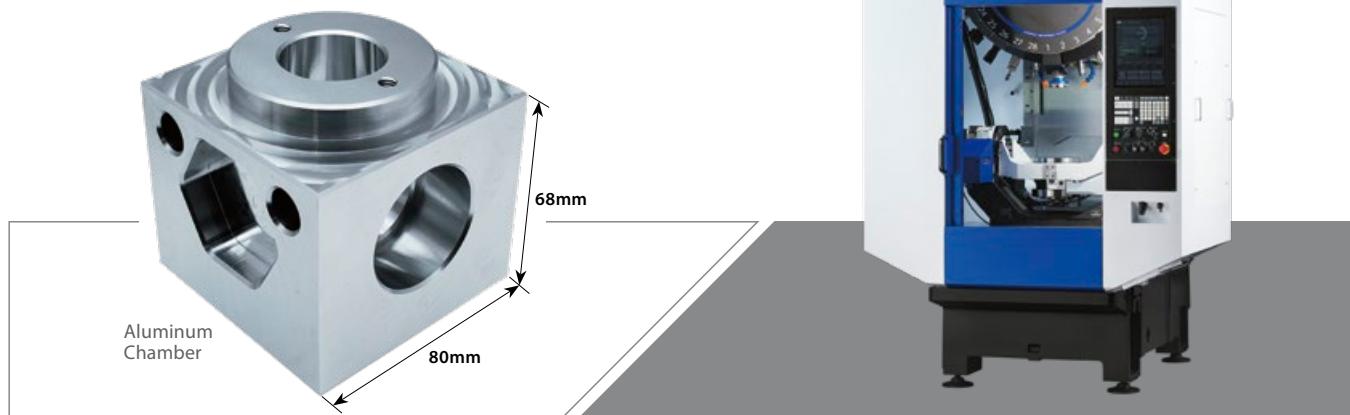


## High-efficiency Machining of Aluminum Alloy to Reduce Environmental Impact

In order to reduce environmental impact, it is necessary to reduce power consumption per cycle. To achieve this, it is necessary to use a machine tool with low power consumption, reduce machining time as well as machine standby time. Below is a performance highlight using SPEEDIO U500Xd1, which has high processing capacity and productivity, where it is able to demonstrate high-efficiency machining with a total machining time of approximately 5 minutes to reduce environmental impact.

Work Material : A7075  
 Machine : U500Xd1  
 Coolant : Water-soluble Coolant

Approximately 5 minutes of machining time


















Process	Machining Method	Machining Detail	Tool	Cutting Speed (m/min)	Feed (mm/min)	ap (mm)	ae (mm)
1	Face Milling	Roughing, Finishing	PFDC09R100M22-4 $\phi$ 100 $\times$ 4-flute Insert: SDHT09T308FR-NM (XP4610)	2,000 (6,400min <sup>-1</sup> )	2,600 (0.1mm/t)	1	80
2	Drilling	Hole Diameter: 30mm Pilot Hole Drilling (Through)	PDZ3000F532M08-3D $\phi$ 30 Insert: ZPNT080304EN (XP8030)	200 (2,100min <sup>-1</sup> )	210 (0.1mm/rev)	80	—
3	Cross Hole Processing	$\phi$ 30 $\times$ 60mm (Blind)	PDZ3000F532M08-3D $\phi$ 30 Insert: ZPNT080304EN (XP8030)	300 (3,200min <sup>-1</sup> )	160 (0.05mm/rev)	60	—
4	Contour Milling	Hole Diameter: 38mm Hole Finishing	AE-TS-N $\phi$ 16 $\times$ 48	300 (6,000min <sup>-1</sup> )	2,800 (0.16mm/t)	20	2 $\times$ 2 Times
5	Boss, Side Milling	Roughing, Finishing	Head: PXAL160C16-03R000 $\phi$ 16 Collet: PXMC-C1605 Holder: BT30-SLK12-35 P30T-2 (MAS2)	500 (10,000min <sup>-1</sup> )	3,000 (0.1mm/t)	10	10
6	Helical $\rightarrow$ Pocket Enlarging	Roughing, Finishing	AE-VTS-N $\phi$ 10 $\times$ 30	314 (10,000min <sup>-1</sup> )	3,000 (0.1mm/t)	10	6
7	Side Milling	Notching	AE-TL-N $\phi$ 10 $\times$ 50	314 (10,000min <sup>-1</sup> )	3,000 (0.1mm/t)	45	2
8	Drilling	Hole Diameter: $\phi$ 12 Pilot Hole Drilling (Blind)	ADFO-3D $\phi$ 11.8	200 (5,400min <sup>-1</sup> )	1,300 (0.24mm/rev)	18	—
9	Reaming	Hole Diameter: $\phi$ 12 Hole Finishing	CJ 12.000	300 (8,000min <sup>-1</sup> )	8,000 (1mm/rev)	16	—
10	Helical Drilling + Threading	M6 $\times$ 1 Threading	AT-2 R-SPEC $\phi$ 4.6 $\times$ 12 P1	145 (10,000min <sup>-1</sup> )	200 (0.08mm/rev)	10	—
11	Chamfering	C1 Processing	HY-HSCM-P 3 $\times$ 45 $\times$ 10 $\times$ 6F	314 (10,000min <sup>-1</sup> )	6,000 (0.1mm/t)	1	1

# Machining Examples

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Work	Material	Machine	Tool (Examples)
 Mechanical Component	S50C	Compact Machining Center <b>S</b> S700Xd1	 <ul style="list-style-type: none"> <li>• P2D Indexable Drill BT30 Integrated (Special)</li> <li>• A-SFT Highly Efficient and Multi-purpose Tap</li> </ul>
 Inverter Case	AC4C Aluminum Alloy Casting	Wide Travel Compact Machining Center <b>W</b> W1000Xd2	 <ul style="list-style-type: none"> <li>• PFAL Finishing Cutter for Aluminum</li> <li>• PXAL DLC Coated Exchangeable Head End Mill for Non-ferrous Materials</li> <li>• AE-TS-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> <li>• AE-VTS-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> <li>• AE-VML Anti-vibration Carbide End Mill (Long Type)</li> <li>• ADO-SUS-3D and 5D Drills for Stainless Steel and Titanium Alloy</li> <li>• ADF-2D Carbide Flat Drill · AD-LDS Carbide Starter Drill</li> <li>• A-SFT Highly Efficient and Multi-purpose Tap · S-XPX X Performer Forming Tap</li> <li>• AT-2 R-SPEC High-efficiency Thread Mill with End-cutting Edge for Non-ferrous Materials</li> <li>• P2D Indexable Drill BT30 Integrated (Special) · CRM Carbide Straight Reamer</li> </ul>
 Rocker Shaft   Connecting Rod	S45C S50C	Pallet Changing Compact Machining Center <b>R</b> R650Xd1	 <ul style="list-style-type: none"> <li>【Rocker Shaft】</li> <li>• ADO-20D Carbide Drill with Oil Holes</li> <li>• AD-2D Carbide Drill</li> <li>• W-HSCT-P WXL Coated 3-flute Carbide End Mill for Chamfering (Positive Type)</li> <li>【Connecting Rod】</li> <li>• ADO-TRS-3D 3-flute Carbide Drill with Oil Holes</li> <li>• AE-VMS Anti-vibration Carbide End Mill</li> <li>• W-HSCT-P WXL Coated 3-flute Carbide End Mill for Chamfering (Positive Type)</li> </ul>
 Gear Housing Cover	AC4C Aluminum Alloy Casting	Universal Compact Machining Center <b>U</b> U500Xd1	 <ul style="list-style-type: none"> <li>• PFAL Finishing Cutter for Aluminum</li> <li>• PXAL DLC Coated Exchangeable Head End Mill for Non-ferrous Materials</li> <li>• AE-TS-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> <li>• ADO-SUS-3D and 8D Drills for Stainless Steel and Titanium Alloy</li> <li>• ADO-8D Carbide Drill with Oil Holes</li> <li>• ADFLS-2D Long Shank Carbide Flat Drill</li> <li>• VP-LDS V Coated Powdered Metal HSS Starter Drill</li> <li>• PXCE Exchangeable Head Chamfering Cutter (Special)</li> <li>• A-SFT Highly Efficient and Multi-purpose Tap · AT-1 One Pass Thread Mill</li> <li>• AT-2 R-SPEC High-efficiency Thread Mill with End-cutting Edge for Non-ferrous Materials</li> </ul>
 Manifold	S45C	High Rigidity Compact Machining Center <b>F</b> F600X1	 <ul style="list-style-type: none"> <li>• PSTW 6-corner Shoulder Cutter</li> <li>• ADO-TRS-3D 3-flute Carbide Drill with Oil Holes</li> <li>• AE-VMS Anti-vibration Carbide End Mill</li> <li>• PXCE Exchangeable Head Chamfering Cutter (Special)</li> <li>• ADO-5D Carbide Drill with Oil Holes</li> <li>• W-HSCT-N WXL Coated 3-flute Carbide End Mill for Chamfering (Negative Type)</li> <li>• P2D Indexable Drill BT30 Integrated (Special)</li> <li>• TIN-NC-LDS TIN Coated HSS Starter Drill</li> <li>• A-SFT Highly Efficient and Multi-purpose Tap</li> </ul>
 Vacuum Chamber	A5052 Aluminum Alloy	Compact Multi-Tasking Machine <b>M</b> M300Xd1	 <ul style="list-style-type: none"> <li>• PSE SF Shoulder Cutter (Screw Fit Type)</li> <li>• P1.5D Indexable Drill BT30 Integrated (Special)</li> <li>• PSTW 6-corner Shoulder Cutter</li> <li>• Side Milling Cutter (Special)</li> <li>• AE-TL-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> <li>• P4D Indexable Drill</li> <li>• ADO-SUS-3D Drill for Stainless Steel and Titanium Alloy</li> <li>• PXCE Exchangeable Head Chamfering Cutter (Special)</li> <li>• A-SFT Highly Efficient and Multi-purpose Tap</li> <li>• AE-TS-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> </ul>
 Mechanical Component	A5052 Aluminum Alloy	Horizontal Compact Machining Center <b>H</b> H550Xd1	 <ul style="list-style-type: none"> <li>• P1.5D Indexable Drill BT30 Integrated (Special)</li> <li>• P2D, P3D Indexable Drills</li> <li>• AE-TL-N DLC Coated Carbide End Mill for Non-ferrous Materials</li> <li>• PXAL DLC Coated Exchangeable Head End Mill for Non-ferrous Materials</li> <li>• PXCE Exchangeable Head Chamfering Cutter (Special)</li> <li>• ADO-SUS-3D and 5D Drills for Stainless Steel and Titanium Alloy</li> <li>• CAO-GDXL Extra-long Carbide Drill with Oil Holes for Copper and Aluminum</li> <li>• VP-LDS V Coated Powdered Metal HSS Starter Drill</li> <li>• OIL-S-XPX X Performer Forming Tap with Oil Holes</li> <li>• PFAL Finishing Cutter for Aluminum</li> </ul>

# Cutting Data

Scan to watch machining in action



## Large Diameter Threading (M33 × 3)

**S**  
 Work Material : S50C  
 Machine : S700Xd1  
 (High Torque)  
 Coolant : Water-soluble  
 Coolant



Mechanical Component



Tool	P2D3000BT30M09 $\phi$ 30	A-SFT M33 × 3
Machining Method	Pre-drilling	Threading
Cutting Speed	200 m/min (2,122 min <sup>-1</sup> )	28 m/min (270 min <sup>-1</sup> )
Feed	424 mm/min (0.2 mm/rev)	—

P2D Indexable Drill BT30 Integrated  
 P2D (Special)



Highly Efficient and Multi-purpose Tap  
 A-SFT



Scan to watch machining in action



## High-speed and High-efficiency Milling of Inverter Case

**W**  
 Work Material : AC4C  
 Machine : W1000Xd2  
 Coolant : Water-soluble  
 Coolant



Inverter Case



Tool	PXAL200C20-03R000 $\phi$ 20	AE-VTS-N $\phi$ 10 × 30
Machining Method	Face Milling	Slot Milling
Cutting Speed	502 m/min (8,000 min <sup>-1</sup> )	408 m/min (13,000 min <sup>-1</sup> )
Feed	4,000 mm/min (0.17 mm/t)	3,820 mm/min (0.1 mm/t)

DLC Coated Exchangeable Head End Mill for Non-ferrous Materials  
 PXAL



DLC Coated Carbide End Mill for Non-ferrous Materials (High Performance Type)  
 AE-VTS-N





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# High-efficiency Shape Processing

**Work Material** : S45C/S50C  
**Machine** : R650Xd1  
**Coolant** : Water-soluble Coolant



<b>Tool</b>	ADO-20D $\phi 8$	AE-VMS $\phi 10$
<b>Machining Method</b>	Drilling	Slot Milling
<b>Cutting Speed</b>	90 m/min (3,600 min <sup>-1</sup> )	121 m/min (3,840 min <sup>-1</sup> )
<b>Feed</b>	900 mm/min (0.25 mm/rev)	806 mm/min (0.05 mm/t)

Carbide Drill with Oil Holes  
**ADO-20D**



Anti-vibration Carbide End Mill  
**AE-VMS**



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# High-speed Multi-sided Processing of Aluminum Alloy Casting

**Work Material** : AC4C  
**Machine** : U500Xd1  
**Coolant** : Water-soluble Coolant



Gear Housing Cover



<b>Tool</b>	A-SFT M6×1	AT-2 R-SPEC 6.2×16 P1.25 (2D Type)
<b>Machining Method</b>	Threading	M8×1.25 Pre-drilling + Threading Simultaneously
<b>Cutting Speed</b>	113 m/min (6,000 min <sup>-1</sup> )	240 m/min (12,322 min <sup>-1</sup> )
<b>Feed</b>	—	1,633 mm/min (0.13 mm/rev)

Highly Efficient and Multi-purpose Tap  
**A-SFT**



High-efficiency Thread Mill with End-cutting Edge for Non-ferrous Materials  
**AT-2 R-SPEC**



# Cutting Data

Scan to watch machining in action



## High-efficiency Milling

Work Material : S45C  
Machine : F600X1  
Coolant : Water-soluble Coolant



Tool	PSTW12R050M22-4 ( $\phi 50 \times 4$ -flute) Insert : TNKU120608ER-GM (XP3025)	AE-VMS $\phi 10$
Machining Method	Frontal Milling	Pocket Milling
Cutting Speed	251 m/min (1,600 min <sup>-1</sup> )	129 m/min (4,100 min <sup>-1</sup> )
Feed	2,000 mm/min (0.3 mm/t)	800 mm/min (0.05 mm/t)

6-corner Shoulder Cutter  
PSTW



Anti-vibration Carbide End Mill

AE-VMS



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## Process Consolidation by Multi-tasking

Work Material : A5052  
Machine : M300Xd1  
Coolant : Water-soluble Coolant



Tool	PSE11R032SF16-5 ( $\phi 32 \times 5$ -flute) Insert : ZDKT11T304FR-NM (CK010)	AE-TL-N $\phi 16 \times 80$
Machining Method	Slot Milling	Side Milling
Cutting Speed	1,005 m/min (10,000 min <sup>-1</sup> )	100 m/min (1,990 min <sup>-1</sup> )
Feed	5,000 mm/min (0.1 mm/t)	800 mm/min (0.13 mm/t)

Shoulder Cutter (Screw Fit Type)

PSE SF



DLC Coated Carbide End Mill for Non-ferrous Materials (Long Type)

AE-TL-N



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machining in  
action



# Machining of Large Part

Work Material : A5052  
Machine : H550Xd1  
Coolant : Water-soluble  
Coolant



Mechanical  
Component



Tool	CAO-GDXL $\phi 10 \times 15D$	OIL-S-XPF M10 $\times 1.5$
Machining Method	Drilling	Threading
Cutting Speed	125.6 m/min (4,000 min <sup>-1</sup> )	188.4 m/min (6,000 min <sup>-1</sup> )
Feed	800 mm/min (0.2 mm/rev)	—

Extra-long Carbide Drill with Oil Holes  
**CAO-GDXL**



X Performer Forming Tap with Oil Holes  
**OIL-S-XPF**



## Watch the Machining in Action

Brother Industries, Ltd.  
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Official Channel



OSG Official Channel



More machining examples using SPEEDIO  
are available via our subchannel  
“OSG Monozukuri Club”





## Brother Industries, Ltd.

1-5, Kitajizoyama, Noda-cho, Kariya, Aichi, 448-0803, Japan

### Global Service Sites

#### Brother Technology Center Chicago

BROTHER INTERNATIONAL CORP.  
2200 North Stonington Avenue, Suite 270, Hoffman Estates,  
IL 60169, U.S.A.  
PHONE: (1)224-653-8415 / Fax: (1)224-653-8821

#### Brother Technology Center Frankfurt

BROTHER INTERNATIONALE INDUSTRIEMASCHINEN GmbH  
Hochster Str.94, 65835 Liederbach, Germany  
PHONE: (49)69-977-6708-0 / Fax: (49)69-977-6708-80

#### Brother Technology Center Bengaluru

BROTHER MACHINERY INDIA PVT LTD.  
SB-111-112, 1st Stage, 2nd Cross, Peenya Indl Estate,  
Bengaluru - 560058 Karnataka, India  
PHONE: (91)80-43721645

#### Brother Technology Center Shanghai

BROTHER MACHINERY SHANGHAI LTD.  
Unit 01, 5/F., No.799, West Tianshan Rd., ChangNing District  
Shanghai 200335, China  
PHONE: (86)21-2225-6666 / Fax: (86)21-2225-6688

#### Brother Technology Center Chongqing

BROTHER MACHINERY SHANGHAI LTD.  
Room 30, 31, NO.104 Cuibai Road, Dadukou District,  
Chongqing Province, 400084, China  
PHONE: (86)23-6865-5600 / Fax: (86)23-6865-5560

#### Brother Technology Center Nanjing

BROTHER MACHINERY SHANGHAI LTD.  
Room 106, Building 02, Tian An Cyber Park, No.36, Yongfeng  
Avenue, Qinhuai District, Nanjing City, Jiangsu Province, China  
PHONE: (86)25-8718-5503 / Fax: (86)25-8718-5503

#### Brother Technology Center Queretaro

BROTHER INTERNATIONAL DE MÉXICO, S.A. DE C.V.  
Calle 1 No.310 Int 15, Zona Industrial Jurica,  
Parque Industrial Jurica, Queretaro, QRO C.P. 76100 México  
PHONE: (52)55-8503-8760 / Fax: (52)442-483-2667

#### Brother Technology Center Bangkok

BROTHER COMMERCIAL (THAILAND) LTD.  
317 Pattanakarn Road, Pravet Sub-District, Pravet District,  
Bangkok 10250, Thailand  
PHONE: (66)2321-5910 / Fax: (66)2321-5913

#### Brother Technology Center Gurugram

BROTHER MACHINERY INDIA PVT LTD.  
Plot No. 60, Sector 34, HSIIDC, Gurugram, Haryana 122001, India  
PHONE: (91)0124-4449900

#### Brother Technology Center Dongguan

BROTHER MACHINERY SHANGHAI LTD.  
Room 103, Building 1, No.2 Nanbo Road, Songshan Lake District,  
Dongguan City, Guangdong Province, China  
PHONE: (86)769-2238-1505 / Fax: (86)769-2238-1506

#### Brother Technology Center Ningbo

BROTHER MACHINERY SHANGHAI LTD.  
1F, Building 1, No. 102, Hongtang South Road West Section,  
Jiangbei District, Ningbo City, Zhejiang Province, China  
PHONE: (86)574-87781232 / Fax: (86)574-88139792

Figures in brackets ( ) are the country codes.

# OSG Corporation

#### International Headquarters

3-22 Honnogahara, Toyokawa, Aichi, 442-8543, Japan  
TEL : +81-533-82-1118 FAX : +81-533-82-1136

#### OSG USA, Inc.

620 Stetson Avenue, St. Charles, IL 60174, U.S.A.  
TEL : (1)800-837-2223 FAX : (1)800-837-3334

#### OSG Europe Logistics S.A.

Avenue Lavoisier 1, B-1300 Z.I. Wavre-Nord, Belgium  
TEL : (32)10-230511 FAX : (32)10-230531

#### OSG (Shanghai) Co., Ltd.

1003-1007, 10F, T1, Raffles City, 1133 Changning Rd., Changning  
District, Shanghai, China, 200051  
TEL : (86) 21-5255-2588 FAX : (86) 21-5888-3300

#### OSG Asia Pte Ltd.

2 Kaki Bukit Ave 1, #03-08, Singapore, 417938  
TEL : (65) 6844-4350 FAX : (65) 6844-4351

#### OSG Distributor

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