

USER'S VOICE

Vol. 5

OKUMA
Vertical
Machining Center
MB-V Series

● MB-V User Testimonials

Full operation as core machines on production lines that can be relied on

The MB-V is a machine that stimulates creativity

Dies machined on the MB-V really stand out

● Dealer Top Sales Reps Talk About MB-V

Recommended as a “strategic machine to get work”

Soja Kogyo, Inc. is engaged in the mass production of parts for automobiles (engines, transmissions, suspension, etc.), air-conditioning equipment, and hydraulic equipment. It is a strong engineering company that has won awards for the design of innovative transfer machines and cleaning equipment.

Here they describe what led them to set up a large number of ACE CENTER MB-V vertical machining centers on their production lines with strict quality control.

Hiroyuki Fujii, President Soja Kogyo Ltd

Address: 82-1 Shirino, Soja, Okayama Prefecture

Tel: 0866-93-3621

Business: Mass production and assembly of parts for automobiles, air conditioner compressors, and agricultural machinery
ISO 9001/14001 certified



ACE CENTER MB-Vs are used to full capacity as core machines on production lines that can be relied on

Drawn to the MB-V for its high accuracy, we selected it as the core machine for our CVT parts production line

Our company makes CVT parts for mini vehicles to mid-size passenger cars. Among them are parts for oil pumps to drive devices that produce hydraulic pressure.

We are currently operating production lines centered around 14 MB-Vs, and in the future plan to bring in more so that we have over 20 of these machines. This expansion of our lines is supported by the recent good condition of Japanese auto makers, and the high demand for CVT in countries around the world.

In selecting the MB-V, the thing that attracted us most was its accuracy. We have had absolutely no problems with accuracy running these machines full-time, 24 hours a day with no special climate controlled environment. Compared with other vertical machining centers, the thermal stability is outstanding.



Before we brought in the MB-Vs, we experienced real difficulties with measures to combat thermal deformation during the machining of scrolls (compressor parts) for air conditioners, as strict accuracy is required for the positioning reference hole. That alone was enough to make us realize the high level of accuracy of the MB-V.



Continuously variable transmission (CVT) parts, a main product

Reduced machining time for semi-dry deep boring

Even after the startup of a production line, we constantly work to improve quality and production efficiency while meeting the demands of our customers. In that sense a production line can be viewed as a living thing, which we need to spend time nurturing. One of the efforts we made to increase monthly output was the development of a semi-dry machining method for deep bores



Hiroshi Okahara, Foreman
Engineering Group, Production Dep



Machining line at Factory No. 2, with full operation of MB-Vs

(oil holes). We attached a special long drill to the MB-V for use in high accuracy, high speed finishing by mist cutting of deep bores in oil pump parts. In the process of jointly developing the drill with a tool maker we also received the cooperation of Okuma, and were able to overcome the problem of chip discharge.

They also proposed a tool breakage detection system with no-load monitoring of the spindle, which led to fewer defects, improved quality, reduced machining time, and decreased operator load. Higher productivity and quality result from the accumulation of many small improvements. In that sense the regular information and advice related to machining technology that we receive has been a tremendous benefit.

Convenience of OSP's easily editable program is felt in line startup and test machining

Recently we seem to be continuously

starting up lines for new parts, and our production engineering staff have realized again how easy to use OSP is. In building the line we conducted numerous machining trials, using trial and error in selecting the machining procedures and tools. Modifications to stabilize accuracy, reduce machining time, and lower costs led in the end to production of an optimal program.

This means we were continuously editing the program, but compared with other controllers it was much easier to make program changes to OSP, which contributed directly to faster modifications and improvements. During tool compensation an alarm sounded if there was an input mistake, so we could head off internal collisions in advance—needless to say this is something we appreciated.

Anticipate further evolution as a machine for mass production lines

An improvement we would like to see

in the MB-V is in the sensor that confirms whether the shutter is opened or closed. Coolant splashed on this sensor causes it to malfunction, producing temporary stops. This leads to a decrease in machine utilization, so we hope to see early improvements here.

Another concept, which seems to have been announced in the newspaper and elsewhere, is enhancement of machining centers for mass production lines. From that perspective, we would like to see improved operability by making the MB-V controller flat as in NC lathes, and the introduction of a sister machine with the same motor power but a more compact table size or frontage and depth. Or perhaps a machine with an internal loader.

A compelling problem today is how to reduce the space of mass production lines, and I am sure we are not the only ones that would like to introduce more MB-V-like functions in our lines.

Reported by Atsunori Sakamoto

Tsuyoshi Namioka, President Best Technical Ltd
 Ashikaga, Tochigi Prefecture
 Business: Manufacture of prototype models using CAD/CAM, design and manufacture of quick delivery dies, manufacture of injection molded parts, other



Multi-piece mold components



Multi-piece mold and product

Superior thermal stability makes the MB-V essential in manufacturing “multi-piece molds” with very short delivery times

Production of dies with very short delivery times to meet the demand for speedy trial production models

In industries with rapid model changes, such as mobile phones, automobile parts, toys, interior goods, and games, high quality and short lead times are required even in trial production. To meet these needs, we use multi-piece aluminum mold machining to provide very short lead times of two days from CAD drawings to completed plastic mold models. We had a great response when this process was announced at the “Intermold 2005” Okuma booth.

Three-some package proves effective (3-D software, multi-piece mold know-how, high accuracy)

This very short lead time prototype formation is made possible by bringing together our originally developed 3-D CAD/CAM software, know-how for easily formed plastic multi-piece molds, and the superior thermal stability of the MB-V. By

using multi-piece molds for complex products, deep grooves become simple steps and the amount to be cut is also dramatically reduced. Moreover, by simultaneously machining molds on multiple machines, the lead time can be greatly shortened.

The key point here is the dimensional accuracy of the machining. When fitting together the multi-piece molds, cumbersome compensation is required in the finishing process if there is any discrepancy in the accuracy of the different machines. With the MB-V, even multi-piece molds machined on different machines in a non-air-conditioned environment have outstanding dimensional accuracy, and the mold pieces fit together like a piece of fine Hakone marquetry.

Time reduction also made in cutting for outsourced “shibo” surface texturing

“Shibo” surface texturing gives added value to the texture of plastics that were shown simultaneously in this exhibition. In the past, it was common to outsource “shibo” texturing to companies specializing in etching. Just for fun, we tried this on an MB-V ball end mill, and found that we were able to machine it in about 1.5 hours and vary depth at will. Here again we can expect great time reductions, and we have received inquiries from toy and exercise equipment manufacturers.

Working with Okuma machines and their people, I can see their approach of continuously absorbing new needs from the market and customers, and

putting this to use in their next products. As someone involved in engineering, I share this feeling.



Sample cuts with various “shibo” patterns (surface textures)

**Futoshi Hiramatsu, President
Hiramatsu Iron Works Co., Ltd**

Hekinan, Aichi Prefecture
Business: Fixture and tool design
and manufacture,
machining of all kinds of
precision parts, precision
machining of ceramics,
precision machining of
developmental
prototypes



Good work requires a keen sensibility. We use the highly accurate MB-V like a jig borer.

**Difficult orders at the
submicron level are our
lifblood**

Customers bring us ultra-precision machining and difficult jobs that demand accuracies and delivery times other companies cannot handle. Examples are creation of automobile developmental prototype parts or fixtures, contact lens or DVD molds, medical equipment and aerospace parts, and more.

For most of these jobs, drawings and workpiece blanks are provided, and the jobs involve machining of single parts with complex shapes that require accuracy on the micron level. I am often impressed, looking at the shapes on the drawings, at the functions our clients think up. These unprecedented developmental prototypes are difficult, but it is that difficulty which motivates us.

**With jig grinders the ma-
chining dimensions change
over time, so we imme-
diately attack these jobs
with an MB-V**

In addition to having complex shapes, there are cases in which accuracies

within $\pm 1-2$ microns in the depth direction are demanded. For these jobs jig grinders take too much time and machining dimensions change because of thermal deformation. We therefore conduct high-speed cutting with a diamond tool on an MB-V, and finish what's left quickly with a jig grinder. Because of the thermal stability of the MB-V, we can manage these feats given that the plant is temperature controlled and we have experienced workers.

If not for the ability to use a ma- chining center in this way in place of a jig borer, we could never meet these strict accuracy and delivery time demands.

**A great feeling
to draw out the
maximum per-
formance from
a machine**

Whether demands beyond a certain level can be met is determined by the sensibility of the person. Unless you can fully utilize

machine and tool selection, set-up, and factory environment to realize maximum performance, you will not be able to meet customers' expectations.

On the other hand, there are moments when the test parts we worked so hard to make put out figures according to plan, and the people involved spontaneously applaud. Those are the moments that make it all worthwhile.

Line of MB-Vs in Factory 3



MS Ltd

Haruhi-cho, Nishikasugai-gun, Aichi Prefecture

Business: Design and development of dies for forming rubber and weather stripping



NC Leader **Kenji Matsumoto**



NC Subleader **Tomohiro Sakamoto**

Cutting with the MB-V, the “sharpness and luster” are different. The dies really stand out.

Modifications reflecting the needs of the die user are fully put into play

One of our company’s strengths is designing and making rubber forming dies to make weather stripping attached to automobile doors and windows. These rubber forming dies are complex connected dies, with thin single layers and strict accuracy demands. They also require 3-dimensional machining, so high level techniques are needed.

During the developmental stage of the MB-V, our company’s wishes and accuracy demands were served as an aid in performance evaluation. This machine reflects the needs of users with such demands everywhere. Okuma thought much about saving space and good access through front operation, and great improvements have been made in reducing setup change and finishing times.

Customers can see the impressive workmanship of the dies at a glance

We operate our MB-Vs an average of 18-20 hours a day, but there are almost no machining steps on square surfaces, and customers who visit our company comment that the “sharpness and luster” are different, as if the dies were saying “Hey, look at me!”

Since we brought in our MB-Vs, the machines we had been using for finishing have been used only for semi-finishing. But when you use a good machine like this, you always start wanting even better accuracies. There is no variation between machines with our MB-Vs, and it is easier to narrow down the compensation values, but it would be helpful if the compensation control for the spindle were one step higher in the 13,000-15,000 rpm range.

Good service handling is also a factor in Okuma’s strong reputation

Five years ago during a heavy rain and flood in this area 8 of our machining centers were buried in mud

during automatic operation. Ball screws were also damaged. At that time Okuma’s service people did a great job in quickly getting the machines back in operation, and we did not miss a single delivery time.

We provide the same handling, even in other countries, for maintenance and repair of our dies, and know that such a quick response system is fundamental to building trust.



Die maintenance and refurbishing



Hirono Iron Works Ltd

Izumi Otsu, Osaka

Business: Machining, sheet metal fabrication, and assembly for agricultural machinery, engine, and car parts



Yukisei Hirono
Director and Plant Manager



Kenji Morisaki
Manufacturing Section Manager



Keiichi Shibata
Engineering Dep

Getting ahead with “Smart monozukuri” –the best people, machines, tools, fixtures, and workpieces

60 years’ experience in the world of very high variety, low-volume production for agricultural and construction machinery

Our company was founded in 1945, and since that time our main thrust has been in parts for agricultural and construction machinery. This covers a wide range of some 2,000 items with sizes of 1 g–100 kg, and volumes of 1–130,000 pieces. In addition, production volume for agricultural machines varies greatly with the season, and claw shafts to till the soil change in length, angle, pitch, and interval to match the soil quality in the prefecture. This is a world of very high variety, low-volume production.

Today there is an increase in jobs of not just single part machining, but also assembly and delivery of multiple parts, which increases worker-hours. Stricter accuracies are also demanded.

Raised production efficiency with the high-speed, high-

accuracy, and energy-saving MB-V

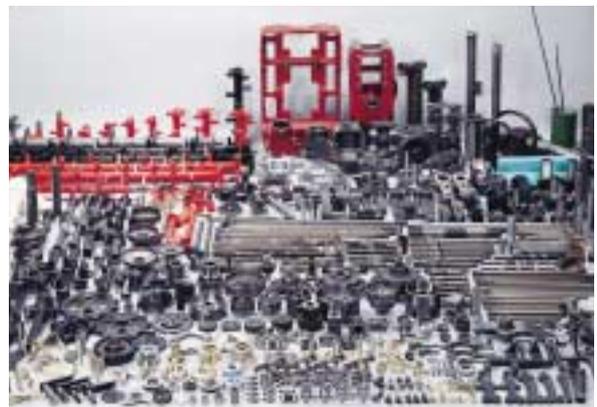
One of our company’s specialties is machining welded parts such as precision hydraulic parts on machining centers. To get surface roughness and perpendicularity to a level of less than 10 microns, we used 60 tools on the machining center alone. To make this process more efficient and labor-saving, we brought in an MB-V.

This machine has high rigidity that makes it easier to achieve high accuracies. Moreover, its good access makes set-up changes easy as well. As a result, we have achieved productivity improvements of nearly 30% for some work. We also appreciate the low electricity consumption for the power it puts out.

Digitizing our machining know-how

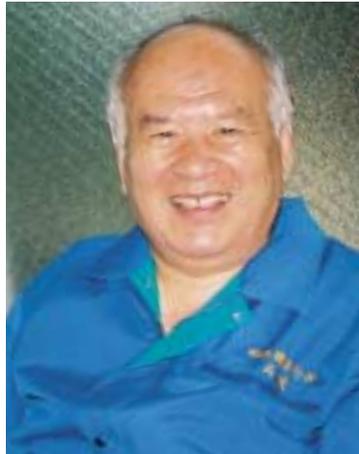
with ADMAC-Parts

Technology is improved with the best matching of people, machines, tools, fixtures, and workpieces. The real key is training the best people, and with young engineers mainly from Japan and China we are working to digitize processing technology with Okuma’s ADMAC-Parts CAD/CAM system for parts machining. Full utilization of this helps us to advance smart “monozukuri” (making things better), together with the immediate goal of raising machine utilization rates.



**Yoshio Takahashi
President
Takahashi Manufacturing
Ltd**

Chonan-machi, Chosei-gun,
Chiba Prefecture
Business: Machining of a wide
range of precision, high-
accuracy parts of (hard-
machining titanium,
tantalum, Inconel,
Xastelloy, stainless steel)
and irregularly-shaped
semiconductor related
workpieces



Takashi Komatsu
(Foreman, Horizontal
Machining Centers)



Yuichi Ishizuka,
Manufacturing Section 2
(Section Chief,
Large Machine Dep)

High skill level lets us take on challenging and interesting work. In this the MB-V is a machine that stimulates creativity.

Outstanding thermal stability leads to dramatic reduction in compensation work, and greatly improves productivity

The MCR-A double column machining center for 5-sided applications provided the opportunity for us to start working with Okuma. We bought an MCR-A to handle precision machining of large parts, but the usability of the universal head and SUPER-NURBS exceeded its reputation: no special fixtures were needed and it gave good accuracy even for complex shapes. We use the machines for a wide range of jobs, even machining of parts related to semiconductors and liquid crystal displays.

This laid the groundwork, and we



next brought in an MB-56V to do something about the thermal deformation that was giving us such a hard time. Up to that point we had had thermal deformation of 20-30 microns, which we had to deal with through compensations several times each day. Thanks to the MB-V, we are now okay to go with a single measurement in the morning. This really surprised our people on the shop floor. Productivity has improved dramatically.

Extremely accurate end milling per Super-NURBS

When machining with an MB-V, we do not use a boring bar even when drilling the H7 hole as the alignment reference. That is, with gradual relief of a circular contour using an end mill, we can get a hole with high roundness. This technique can also be used with angled holes, and we have never had a defect even with accuracy demands of less than 5 microns.

Our company is given complex parts or hard-machining materials that pose real problems in terms of how to

clamp for machining. We approach these jobs with the idea that they are interesting puzzles to be enjoyed, and attack them using the full capabilities of the MB-V. This gives rise to new techniques, and is a driving power in broadening the range of our work.

Feeling the ease of use of user-friendly OSP

We have used the NCs of other companies, so we could really understand the outstanding features of OSP. For example, we appreciate the personal computer-like operability, such as enabling automatic operation by switching between main and sub-programming screens and calling up files. Productivity is improved through the synergistic effects of machine performance including spindle speed, high positioning accuracy, and thermal stability, together with the ease of use of the NC. I am very much looking forward to seeing what new things we can do with the MB-66V we are bringing in this fall. This machine has the OSP-P200 with a touch panel and 2 gigabytes of capacity.

Dealer Top Sales Reps Talk About MB-V



Katsumi Kawaguchi
Kyowa Koki Ltd
Section 1 Manager, 1st Sales Department
Nagaizumi-cho, Shizuoka Prefecture

I feel confident in recommending the MB-V as a strategic machine that will help bring in work

Thinking of Okuma, a key sales point is surely the ease of use and reliability that comes with single source for machine and control, fusing the machine and OSP. But there are many people who think of the MB-V as a strategic machine that will help them actively bring in new work by differentiating them from other companies in the same business.

One of our customers machines motorcycle parts and had lines consisting

of machining centers from another machine tool maker. Then last year they purchased two MB-V2s and two machines from another company. Their new order, however, is a repeat order for six MB-Vs only. Drawn by their high assessment of Okuma's good accuracy, they also ordered three of Okuma's new lathes.

During the same period we also received orders for MB-Vs from customers who perform midlevel mass

production and smaller sized companies.

Many of our customers are companies of different sizes involved in parts machining, prototype dies, and high variety, low-volume machining. If they are considering a machining center despite these conditions, the first candidate is Okuma's MB-V. The post-purchase reputation of the MB-V is excellent, so as a trading company we can recommend it with assurance.



Nobuyuki Kurahashi
Kurahashi Kiko Ltd
Yakage-cho, Okayama Prefecture

The machine makes a fabulous impression, with superior accuracy and operability

When I first saw the MB-V I was impressed with what a good-looking machine it was.

I used to work in a large machine trading firm, and now have taken over my father's business. Through this process I have been in contact with many machines, conducting technical marketing while programming and operating these machines. I have found that superior machine tools have beautiful design and are easy to use

even while giving high accuracy.

Working from the front is fundamental to the MB-V, together with the ATC installed directly on the side of the main body. Working from the front makes tool change simple and lets you work immediately upon opening the cover. The rigidity is also good, and high-speed machining can be done because of the good match with current tools. The makes it easy to achieve good accuracy. I advise customers who are

using other machines and are troubled by thermal deformation to change the machine location, so that it is right by an air conditioning vent. With the MB-V there is no need at all to do this.

My philosophy is to please customers so that they are truly satisfied, but proof of satisfaction with the MB-V can also be seen in the orders I receive; I sold 10 machines in the first year after they were introduced, and had repeat orders for 20 machines in the second year.

Iizuka Seisakusho Ltd

(Musashimurayama, Tokyo)

We do continuous machining of semiconductor manufacturing devices and precision parts, but with machining centers from other manufacturers we have had dimensional errors of about 20-30 microns.

Compensating for this was always a bother.

After purchasing an MU-400V in March 2005, we have been able to keep error down to a maximum of 10 microns, so that we no longer had to make such efforts for compensation. While the MU-400V is a 5-axis machine, we strongly feel that the machining dimensional change over time was small.

Thanks to this, we have a solid reputation among clients and our work volume has increased.

[The MU-400V is a 5-axis machine sharing the same basic configuration with the MB-46V (Editor)]

Pearl Giken Ltd

(Shiroi, Chiba Prefecture)

We introduced two MB-46VAs for test production of automobile parts.

We had used Okuma machining centers before, but compared with these the accuracy was much better with the MB-46V, giving machining accuracy of roundness within 3 microns with high speed circular cutting. Machining time was just one-third of previous times.

Even in multiple arrangement machining of small, 3-dimensional shapes we get the same accuracy for all positions, which enables us to put out consistent products.

This is a reliable machine.

Good job OKUMA Messages from customers

A common desire among all people involved in manufacturing is to make a good product. These pages show comments by users who have chosen Okuma as their work partner in realizing this desire. Okuma shares this desire, and assists with its new Thermo-Friendly Concept. Welcome to Okuma.

Kihara Seiki Ltd

(Sanjo, Niigata Prefecture)

We machine parts for construction machinery, and one of our customers demands very strict accuracies. We introduced a 3-dimensional measuring machine with the aim of strengthening dimensional control.

With other manufacturers' machines, we had the repeated experience that even when the first piece was measured and found to be clearly within tolerances, the dimensions of the next piece changed. This was because of the sensitivity to ambient temperature, which was much more than we had imagined. When we brought in an MB-56VA and tried it, however, we had stable measurement results with the first piece and subsequent pieces. We really appreciate the peace of mind this gives us.

Miyama Seiko Ltd

(Chikuma, Nagano Prefecture)

We machine parts for semiconductor and liquid crystal manufacturing equipment.

We purchased an MB-V after hearing from the sales rep that it provides stable machining accuracy in the Z direction. When we actually used the machine we were very satisfied in finding that the surface steps in the Z direction from the start to the end of machining were very nearly zero.

Very recently we were looking to bring in new equipment, and considered other manufacturers' machines. The word from the shop floor, however, was "We want an MB-V, with its stable accuracies." We ordered an MB-66V.

Ono Seiko Ltd

(Okazaki, Aichi Prefecture)

We machine aluminum automobile parts.

We used to repeatedly measure and check our workpieces each day out of concern for thermal deformation on the Z axis. After introducing an MB-46VA, however, we have had very little thermal deformation, only 1-2 microns, over the course of a day. Because of that we ordered 3 more.

Just as with developing good people, the process of making better products requires a sound “mind, body, and skill” to mature. Respectively this represents the “mind-set” of our employees, our “machines,” and our “know-how.” Since our body is the highly developed MB-V, we can focus on improving our mind and skills.

Okai Kosakusho Ltd

(Asaminami-ku, Hiroshima)

We machine die-cast dies. Before we brought in an MB-56V, we thought roller guides had poor rigidity and were unsuited to die machining, so we always insisted on sliding guides. However, in a test of face milling with the MB-V, we heard the actual cutting sound and saw the milled surface, and judged that the rigidity was greater than we had imagined.

This made it possible to speed up small diameter end milling and long finishing operations, and also provided stability of deformation less than 10 microns on the Z axis. Now we feel we can leave the work to the machine with no worries.

Homei Ltd

(Ota-ku, Tokyo)

We machine plastic dies, but with the machining centers of another manufacturer that we had been using the surface roughness of the machined surface was unstable. In the final process, finishing, we often found nicks that required work to fix. After we started using the MB-46V, not only was there no variation in surface roughness, but the time for the polishing process was also shortened.

We have no breakdowns, and perhaps because of the machine rigidity from its double-column construction, tool life is also long. In the company this machine is highly regarded as the “trouble-free” machine, and we recently introduced a second MB-46V.

Hida Kiko Ltd

(Toyosato-cho, Inukami-gun, Shiga Prefecture)

Since we mass produce cast metal and ceramic parts, we bought an MB-56V because we thought its double-column construction would give it high rigidity. After actually using it, we are satisfied with its stable machining accuracy and machining capability that is as good as we had imagined. Roundness is particularly good, and it gives machining accuracy equal to that of very expensive machines from other manufacturers’ that perform high accuracy machining of ceramics and other materials.

Another attraction is the good operability of OSP, which is not found anywhere else. We bought another MB-56V for increased production of mainly ceramic high accuracy parts.

We are happy to have the increased competitive strength that high accuracy machining gives us.

Ikeda Tekko Ltd

(Ibara, Okayama Prefecture)

We machine parts related to liquid crystal and semi-conductors, so our customers have very strict demands for accuracy and quality. Compared with other machining centers we have used, the MB-56V has clearly superior accuracy and quality and there is little protrusion between quadrants. This makes machining much easier, with less anxiety about accuracy and quality.

In addition, the good approachability makes work easier, and even high speed spindles are quiet. Moreover, the coolant does not get dirty because the machine uses grease lubrication.

I hope to replace our older machines with MB-Vs as soon as possible.



Next-generation global standards

Highly-accurate machines for the big parts.
The MB-66VA/B completes the lineup.
Featuring Okuma's
Thermo-Friendly Concept—
for superb, extremely accurate machining.



MB-46/56V

Machining dimensional change over time
Room temperature change: 8°C

MB-66V

Machine thermal deformation change over time
Room temperature change: 8°C

Per 8°C room temperature change. Actual data with TAS-C.

8 μ m

10 μ m

ACE CENTER

Vertical Machining Centers



MB-46VA/B



MB-56VA/B



MB-66VA/B