

## Machine, Drives and Control all in one hand

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**Okuma ranks amongst the worldwide leading manufacturers of CNC Lathes and CNC Machining Centres. The proven success receipt is called "Machine, Drives and Control all in one hand". Okuma Users profit from it with the high availability and long-term precision as well as a high resale value. We had the opportunity to visit the production of these machines locally in the Japanese Okuma factories Oguchi and Kani.**

Okuma was founded in 1898, near Nagoya, Japan and ranks today among the most important manufacturers of CNC Machine Tools worldwide. The name Okuma stands for broad pallet of CNC Machine Tools of high technology, both for the rotation, milling, boring and grinding. The worldwide success of Okuma Machines is from the high quality and reliability – even after many years of application. Okuma's brand name is the singular production and manufacturing conception of "Single Source Supply". It defines the fact that all elements of Okuma products, be it mechanical, electrical or CNC and software is investigated on ones own to be developed and brought to production with the customer thoroughly homogeneous



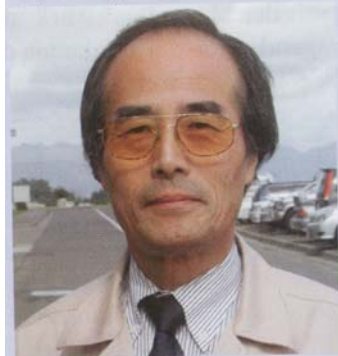
**Photo 1: Here the turning and milling center MacTurn 250, is in the final assembly of the Okuma factory Oguchi, processes complex workpieces up to 1,000 mm lengthens and 250 mm in diameter in only one voltage fixed and ready to be installed. It summarizes turning, milling and machining and shortens the turn-around time also more compartment radically complex.**

products for the order. A production philosophy, which is today a glaring contrast to the production methods of most European Machine Tool Manufacturers. The question is, which is from today's view the better concept. In order to anticipate the answer, it depends on. At first the answer sounds quite ridiculous, but is clear at a closer view.



**Photo 2: Horizontal Machining Center FMS**

**Dipl.-Ing. Satoru Hirose**



**General Manager International Business Okuma Corporation:**

**"The success receipt of Okuma is called Mechatronik: Machine, Drives and Control all in one hand brought to the highest user-use.**

**In the Machine Tool Manufacture, who has the better concept?**

Who builds machine tools in a region, whose infrastructure is shaped by a multiplicity of efficient suppliers, can merge into its production flow, so that the risk and fixed costs minimize and liquidity is protected. The quality and stock availability of the final product



**Photo 3: If a tool breaks in the FMS or is worn, the "Toolboy" changes it in the manufacturing system fully automatically.**

depends then also strongly on the quality and reliability of the subcontractor. A development, as we know it today from the automotive manufacture. Advantage: the supplier



**Photo 4: OKUMA manufactures with few exceptions all mechanical parts on their own machining centers. Depending on size of each tool the Double Column machine is equipped individually...**



**Photo 5: ... or with enormous pallet changer automatically operated**

specializes in certain sectors and modules and thereby job fluctuations often adjusts better and production methods must be constantly optimised, in order to remain competitive.

Disadvantages: Discharge of know-how and dependency on the deliverability of the partners. With the ever more briefly becoming product cycles and even smaller lot sizes a way which can be observed, which more and more European Machine Tool Manufacturers successfully go.

It looks differently with the large volume manufacturers. If item numbers are large enough, it's naturally more meaningful to manufacture the necessary sections themselves. Presupposed, the costs agree. This way the large Japanese Machine Tool Manufacturers go traditionally, as so Okuma. Nevertheless Okuma manufactures its own mechanical components themselves and develops and produces its own CNC controls, but even still builds its drives and measuring systems. The reason: By the respective application

constructional tuning can optimise functionality, quality and reliability in such a way that a product with higher user us is developed. We looked closely it in two Okuma factories, Oguchi and Kani and are impressed.

Firstly of the enormous width of the Okuma supply program and on the other hand the enormous manufacturing depth. While the machine or module assembly is also substantially not differently organized that the German Machine Tool Manufacturers, it is noticeable that the parts manufacture takes place almost without exception on Okuma machines or up to the large steep handling on Okuma FMS. Of most different development the enormous Okuma Double Column Machining Centres with large pallet changeover switch up to 10,000 kg is here exactly the same like a whole set used in Okuma FMS, on which fully automatic and manpower decrease can be produced round the clock. At night the machines run unsupervised in the "Ghost Shift". Since the precisions of the parts manufacture with the FMS so its influence by the accuracy of the workpiece pallets on its way to the individual centres, Okuma manufactures these with highest precision in fully air-conditioned rooms themselves.

Only deficiency: The extent of utilization of the production plants leaves to be desired, because the economic situation crisis continuing worldwide does not naturally make Okuma stop.



**Photo 6: FMS from Double Column Machining Centers for the 5 page handling**



**Photo 7: For the automatic production of machine tool turret is in Kani Machining Center and Lathe with a NC-loader connected to FMS**

What makes a renowned machine builder in such a case? It brings innovations on the market, in order to set the demand in motion, so to Okuma. The end of October at JIMTOF Exhibition, 11 new machine tools were presented of which we present below.



**Photo 8: Junro Kashiwa, President of Okuma Corporation, at JIMTOF 2002. The last few years he was proud to present genuine new series of developments.**

### **Hexapod Series?**

According to Okuma and vehicle manufacturer Toyota with 8 sold machines, the Cosmo Center PM 600 ha has proved the practice fitness of the Hexapod kinetics in the exciting machine tool. With 100m/min machine rate and 1.5g acceleration are able to solve economically complex machining functions competition-less.



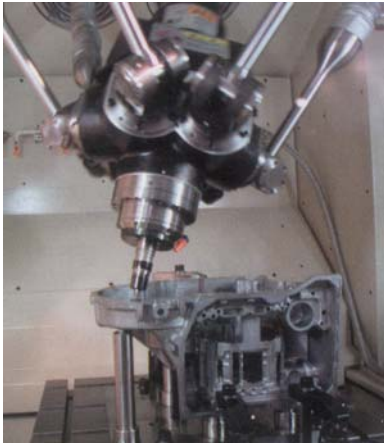


Photo 9: Processing example shown on Cosmo-Center taken at JIMTOF

### Internal Cylindrical Grinding with Linear Drives

The new, extremely compact (1m broad) built internal cylindrical grinder GI-2N-SP is for mass production of small parts of the diesel injecting technique. Super fast and super exact developed linear motors are propelled through all axes with  $0.01\mu\text{m}$  Dissolution.

### 5-Axes Vertical Machining Center

With a new developed swivel and integrated round table the universal center MU-400VA for highly exact 5-axes machining function is suitable for hypoid gears.

Okuma coordinates from Krefeld all Europe activities for CNC Machine Tools. For over 25 years Hommel CNC-Technik GmbH is the exclusive Okuma Partner for sales and service in Germany.

### Lathes

Also with Lathes there were novelties to see, so the new turning milling center MacTurn 350W with sub spindle for front and rear sides simultaneous handling with 9-axes. The new Twin Star LT200-M has an adequate sub spindle and the new 4-axes Simul Turn LU300 for the handling of long slim sections such as cam shafts became 20% faster and needs 16% less set up surface.



Photo 10: Complete Ultra Precision Cylindrical Surface Grinder GA-5N-SP

### High Speed Horizontal Machining Center

For production suited by cylinder heads the new machining center MA-400HA is horizontal. With  $60\,000\text{min}^{-1}$  machining rate and area of  $X=560$ ,  $Y=610$  and  $Z=625$  mm is one of the largest in its class.

### Super Precision Cylindrical Surface Grinder

Just as compactly presented for the same application scope of the diesel injecting technique the new cylindrical surface grinder GA-5N-SP has hydrostatic guidance and workpiece spindle accuracy of  $0,01\mu\text{m}$ .

### High Accuracy Vertical Machining Center

The new MB46V-SS is for the production of high gloss spherical parts from aluminium and equipped with a vibration arm, high-speed spindle with  $60,000\text{min}^{-1}$ . Spindle accuracy of  $0.03\mu\text{m}$ , tool shank HSK-25. The roller-stored guidance of  $0,01\mu\text{m}$  is equipped with a CNC control and addressed with absolute dissolution of  $0,003\mu\text{m}$ .



Photo 11: Handling impeller from Al on the 5-axes universal machining center MU-400 VA