

## Press Release

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April 23, 2008

### **The Integrated Mill Turn Center NT Series for long/large-diameter workpieces has arrived**

#### **We will start receiving orders for the NT6600 DCG.**

On April 23, Mori Seiki will start accepting orders for **NT6600 DCG**, the high-precision and high-efficiency integrated Mill Turn Center for **long/large-diameter workpieces**.

In recent years, demands for machine tools in oil, energy, shipping, and printing machine industries have been spreading worldwide. Accompanied by this, is the demand for large mill turn centers which can handle process integration to improve accuracy for long/large diameter workpieces and faster installation. To answer these demands, the NT6600 DCG has been developed as a new model for mill turn center NT Series.

The NT Series includes all elements of the **DCG<sup>®</sup> (Driven at the Center of Gravity)**, **DDM<sup>™</sup> (Direct Drive Motor)**, and **ORC<sup>™</sup> (Octagonal Ram Construction)** which are all original technologies by Mori Seiki. This mill turn center with a fusion of a lathe and a machining center is popular among various industries.

The NT6600 DCG **succeeds the outstanding machine structure of the NT Series**, with maximum turning length of 6,076 mm, maximum turning diameter of  $\phi 1,070$  mm which will **deal with machining of large parts** compared to the original NT Series. Among the multi-axis turning centers of the same size, the Y-axis stroke of 660 mm is the largest in its class.

Rapid traverse rate of the Z-axis and tool changing time (chip-to-chip) far surpass machines for long workpieces, so they provide the **fastest machining in its class**. **Options for long workpieces**, such as long boring bars and steady rests on a maximum number of 3 turrets can be chosen.

There is a **wide variety of models**, so that customers can choose one according to targeted workpieces. There are 12 variations including 3 types of maximum machining length; 3,076 mm, 4,076 mm, 6,076 mm, 2 types of maximum spindle speed and whether there is Spindle 2.

Mori Seiki will continue to make our line-up of machines substantial, and add variety to machining possibility.

※DCG, DDM and ORC are trademarks or registered trademarks of Mori Seiki Co., Ltd. in Japan, USA and other countries.

Type	High-Precision, High-Efficiency Integrated Mill Turn Center
Model	NT6600 DCG
Market	Aircraft, oil and natural gas, construction machines, shipping, printing machines
Orders start	April 23, 2008
Production	5 units/month

## ■ Features

### 1. Succeeded the outstanding machine structure of the NT Series

For the drive system on the Y and Z linear axes, it uses DCG<sup>®</sup>, which pushes moving parts at their center of gravity using two ball screws. This controls vibration, the main factor preventing high-speed, high-precision machining, and offers greater machining accuracy, shorter machining time and longer tool life. For the structure of the Y-axis, it uses ORC<sup>™</sup> which offsets thermal displacement because of its octagonal ram structure, ensuring superior straightness even when the guideways heat up as a result of high-speed travel.

DDM<sup>™</sup>, a conventional drive system without gears is used for the rotary drive of the B-axis which provides improved transmission efficiency and zero backlash. As a result, high-precision indexing has been made possible.

### 2. Available for machining large parts

The maximum machining length is 6,076 mm, maximum turning diameter is  $\phi 1,070$  mm, and the Y-axis stroke is 660 mm, which is the largest in its class. With the previous NT Series, the machining length was 1,800 mm and machining diameter was  $\phi 920$  mm, but thanks to the additional line-up of the NT6600 DCG, this will enable machining of large parts in industries such as aircraft, oil, and natural gas.

### 3. Achieves the fastest machining in its class

The rapid traverse rate has improved, and the Z-axis rapid traverse rate has become the fastest of its class with 32,000 mm/min.

There was a problem regarding the ATC (Automatic Tool Changer) where it takes time for tool change for long machines depending on the spindle's position when the spindle moves towards the ATC. For the NT6600 DCG, a new ATC that travels to the spindle is used, which shortened the tool change time. The tool change time of 10 seconds or less from any position of the spindle is the fastest among all long work machines.

### 4. Best option for long workpieces

It is suitable for internal diameter machining of long workpieces. Maximum length of 1,270 mm is the longest of its class.

To control run-out when machining long workpieces, steady rests may be put on up to 3 turrets. Steady rests for both the Z-axis and X-axis are servo motor driven that can be moved by hand or by

program, so it will lead to shortening operating time for steady rest centering. Normally, help by people or cranes were needed when chucking workpieces or transferring workpieces from Spindle 1 to Spindle 2. By using synchronized control of Spindle 2 and steady rest with the NT6600 DCG, help of cranes or people will not be needed which will lead to shortening preparation time.

## 5. A wide variety

There are 3 types of maximum machining length; 3,076 mm, 4,076 mm, 6,076 mm, 2 types of maximum spindle speed, with a choice of whether to have Spindle 2. You may choose a model from 12 variations according to target workpieces.

### ■ Major Specifications (Maximum spindle speed of 1,500 min<sup>-1</sup>, with no Spindle 2)

	NT6600 DCG/3000B	NT6600 DCG/4000B	NT6600 DCG/6000B
Max. turning diameter	φ1,070 mm		
Max. turning length	3,076 mm	4,076 mm	6,076 mm
Axis travel (X/Y/Z)	1,040/660/3,150 mm	1,040/660/4,150 mm	1,040/660/6,150 mm
Max. spindle speed	1,500 min <sup>-1</sup>		
Tool spindle speed	8,000 min <sup>-1</sup>		
Tool storage capacity	50 [100, 140, 180]		
Tool changing time (tool-to-tool)	10 sec		
Type of tool shank	BT50, Capto C8, CAT 50, HSK A100		
Spindle drive motor	30/22 kW (30 min/cont)		
Tool spindle drive motor	30/22 kW (30 min/cont)		
Floor space (width x depth x height)	9,100/4,562/4,500 mm	10,100/4,562/4,500 mm	12,100/4,562/4,500 mm
Mass of machine	40,000 kg	45,000 kg	52,000 kg

[ ] Option



Figure 1. Exterior (NT6600 DCG/6000BS)

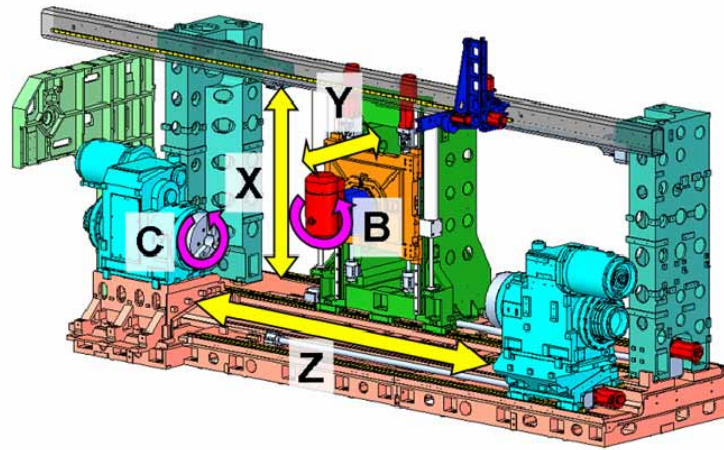


Figure 2. Axis structure (NT6600 DCG/4000CS)

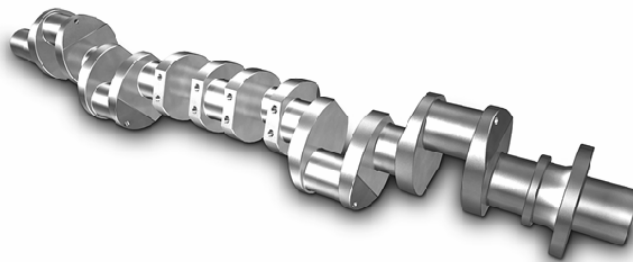


Figure 3. Example of target workpiece (crank shaft for ship)