

# JIS

**JAPANESE INDUSTRIAL STANDARD**

**Test Methods for  
Performance and Accuracy  
of Vertical Wood  
Milling Machines**

**JIS B 6513—1989**

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In the event of any doubt arising,  
the original Standard in Japanese is to be final authority.

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Test Methods for Performance and Accuracy  
of Vertical Wood Milling Machines

B 6513-1989

1. Scope

This Japanese Industrial Standard specifies test methods as well as inspection methods of static accuracy and working accuracy relating to function, operation performance and rigidity of vertical wood milling machines, hereinafter referred to as the "wood milling machines", specified in No. 6311 of JIS B 0114 which has travelling distance in right and left of 600 mm up to and including 1200 mm, and the maximum distance from the main shaft end up to the table surface of 300 mm up to and including 700 mm.

Remark: In this Standard the units and numerical values shown in { } are in accordance with the conventional units and, appended for informative reference.

2. Function Test Method

The function test method of wood milling machines shall be in accordance with Table 1.

Table 1. Function Test

| No. | Test item                                                 | Test method                                                                                                                                                                                                                                               |
|-----|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Electric equipment                                        | Test the insulation condition each once before and after the running test.                                                                                                                                                                                |
| 2   | Operation of starting, stopping and running of main shaft | Carry out starting and stopping continuously ten times at a suitable rotational speed of main shaft and test the smoothness and security of working.                                                                                                      |
| 3   | Converting operation of rotational speed of main shaft    | Relating to all marked rotational speeds, convert the rotational speed of main shaft, and test the smoothness of working and security of indication of operation device.                                                                                  |
| 4   | Operation for hand-feed handle of table                   | Travel the table in right and left by hand-feed handle, and test the smoothness and uniformity of working over the whole length of travelling.<br><br>Carry out the similar test also relating to the front-and-rear and up-and-down directions of table. |

Applicable Standards and Reference Standards: See page 14.



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Table 1 (Continued)

| No. | Test item                                                                                                          | Test method                                                                                                                                                                                                                                                                                                           |
|-----|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5   | Converting operation of feed speed of table                                                                        | Relating to all marked feed speeds, convert the feed speed of table, and test the smoothness of working and security of indication of operation device.                                                                                                                                                               |
| 6   | Operation of hand-feed handle of main shaft head or main shaft sleeve                                              | Travel the main shaft head or main shaft sleeve by handfeed handle, and test the smoothness and uniformity of working over the whole length of travelling.<br><br>Further, at an arbitrary position of travelling, carry out microfeeding by micro-handfeed handle and test the smoothness and uniformity of working. |
| 7   | Operation of "on" and "off" of power feed of main shaft head or main shaft sleeve and of automatic stopping device | Test the smoothness and security of work of "on" and "off" of power feed of main shaft head or main shaft sleeve and relating to setting of command position and working of automatic stop device of main shaft head or main shaft sleeve, test respectively the smoothness and security.                             |
| 8   | Operation of "on", and "off" device of table power feed and quick-feed                                             | As to power feed and quick feed in right and left of table, relating to setting and working of "on", "off" position by hand work and automatic work, test respectively the smoothness and security.<br><br>Also relating to front-and-rear and up-and-down directions of table, carry out the similar tests.          |
| 9   | Clamping operation                                                                                                 | Relating to each clamping mechanism of table, saddle, knee and main shaft head or main shaft sleeve, clamp at an arbitrary position of respective movement and test the security.                                                                                                                                     |
| 10  | Mounting and dismounting of tool                                                                                   | Test the security and smoothness of mounting and dismounting of tools and fastening screws.                                                                                                                                                                                                                           |
| 11  | Mounting and dismounting of works                                                                                  | Test the security and smoothness of mounting and dismounting of works.                                                                                                                                                                                                                                                |
| 12  | Safety device                                                                                                      | Test the security of safety function to worker and machine protective function [Refer to JIS B 6507].                                                                                                                                                                                                                 |
| 13  | Lubricating device                                                                                                 | Test the security of functions such as oil tightness, suitable distribution of oil amount, etc.                                                                                                                                                                                                                       |

Table 1 (Continued)

| No. | Test item                 | Test method                                                                      |
|-----|---------------------------|----------------------------------------------------------------------------------|
| 14  | Oil hydraulic device      | Test the security of functions such as oil tightness, pressure regulation, etc.  |
| 15  | Pneumatic pressure device | Test the security of functions, such as gas tightness, pressure regulation, etc. |
| 16  | Accessories               | Test the security of function.                                                   |

Remark: For wood milling machine having not the function, the test items corresponding to this function in Table 1 are omitted.

### 3. Running Test Method

**3.1 No-Load Running Test** Rotate the main shaft, continue the running for 30 to 60 min to stabilize the bearing temperature, thereafter measure the required electric power and noise, record relating to each item specified in Table 2 Recording Format 1 and at the same time observe that there is no abnormal vibration by touch perception.

Further, the measurement of noise shall be in accordance with JIS B 6521.

Table 2. Recording Format 1

| No. | Time of measurement<br>hour and min | Main spindle speed of rotation<br>min <sup>-1</sup> (rpm) |                    | Temperatures °C      |       |                  | Required electric Power |              |             | Noise<br>dB (A) | Description |
|-----|-------------------------------------|-----------------------------------------------------------|--------------------|----------------------|-------|------------------|-------------------------|--------------|-------------|-----------------|-------------|
|     |                                     |                                                           |                    | Main spindle bearing |       | Room temperature | Voltage<br>V            | Current<br>A | Input<br>kW |                 |             |
|     |                                     | Marking                                                   | Actual measurement | Upper                | Lower |                  |                         |              |             |                 |             |
|     |                                     |                                                           |                    |                      |       |                  |                         |              |             |                 |             |

Remarks 1. For machines having converter of rotational speed of main shaft, record the rotational speed at least of two levels containing the maximum rotational speed.

2. Relating to the noise measuring conditions, record them on the description column.

**3.2 Load Running Test** Carry out cutting of specimen, measure the requiring electric power and noise, record relating to each item specified in Table 3 Recording Format 2 and at the same time observe that there is no abnormal vibration and condition of cutting face by touch perception.

As to the measurement of requiring electric power, make the feed speed definite, change the cutting depth or make the cutting depth definite and change the feed speed to carry out the test.

Table 3. Recording Format 2

| No. | Test member |          |              |                        |                    | Tool        |              |                  |                   |                          | Cutting condition                                      |                     |                  |                  | Required electric power |           |           |                  |               | Noise dB (A) | Description |                                 |
|-----|-------------|----------|--------------|------------------------|--------------------|-------------|--------------|------------------|-------------------|--------------------------|--------------------------------------------------------|---------------------|------------------|------------------|-------------------------|-----------|-----------|------------------|---------------|--------------|-------------|---------------------------------|
|     | Dimension   |          |              | Kind of tree or lumber | Moisture content % | Diameter mm | Thickness mm | Number of blades | Shape of blade    | Material of cutting edge | Rotational speed of main shaft min <sup>-1</sup> {rpm} | Cutting speed m/min | Feed speed m/min | Cutting depth mm | Cutting width mm        | Voltage V | Current A | Input            |               |              |             | Cutting power kW<br>$P_1 - P_0$ |
|     | Length mm   | Width mm | Thickness mm |                        |                    |             |              |                  |                   |                          |                                                        |                     |                  |                  |                         |           |           | No load $P_0$ kW | Load $P_1$ kW |              |             |                                 |
|     |             |          |              |                        |                    |             |              |                  | Annexed otherwise |                          |                                                        |                     |                  |                  |                         |           |           |                  |               |              |             |                                 |

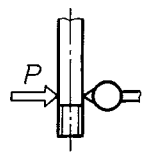
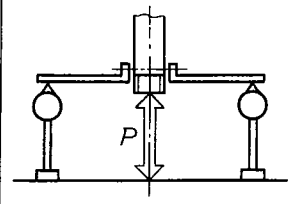
Remarks 1. The cutting direction of specimen and noise measuring conditions shall be recorded on description column.

2. For shape of blade, its main dimensions shall be described with indication by drawing.

#### 4. Rigidity Test Method

The rigidity test of wood milling machine shall be in accordance with Table 4.

Table 4. Rigidity Test

| No. | Test item                                | Measuring method                                                                                                                                                                                                                                                                                           | Figure for measuring method                                                           |
|-----|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1   | Bend rigidity of main shaft system       | <p>Contact the stationarily placed test indicator to the top end (side face) of main shaft, apply the load (<math>P</math>) facing each other<sup>(1)</sup>, and measure the deflection of main shaft.</p> <p>Carry out this measurement respectively in right-and-left and front-and-rear directions.</p> |  |
| 2   | Overall rigidity of main shaft and table | <p>Measure the relative displacement between the main shaft and the upper surface of table in right-and-left and front-and-rear directions when the load (<math>P</math>) is applied vertically between the main shaft<sup>(2)</sup> and the table<sup>(3)</sup></p>                                       |  |