

JIS

JAPANESE INDUSTRIAL STANDARD

**Test Code for Performance and
Accuracy of Internal Cylindrical
Grinding Machines**

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In the event of any doubt arising,
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Test Code for Performance and Accuracy of
Internal Cylindrical Grinding Machines

B 6211-1986

1. Scope

This Japanese Industrial Standard specifies the test code for running performance, rigidity, machine accuracy, and work accuracy of internal cylindrical grinding machines of hole diameter of 250 mm or less capable of grinding. However, except planetary type grinding machines and internal groove grinding machines.

Remarks 1. The coordinate axes of machine used in this standard shall be as follows [see JIS B 6310].

Z axis: Z axis shall be taken in a direction parallel to wheel spindle (right-left direction).

X axis: X axis shall be taken in a direction at right angles with Z axis in a horizontal plane (front-rear direction).

Y axis: Y axis shall be taken in a direction at right angles with Z axis and X axis (up-down direction).

2. The units given in { } in this Standard are in accordance with conventional units and are appended for reference.

2. Running Test Method

2.1 Performance Test The performance test shall be carried out according to Table 1.

Table 1

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
1	Starting, stopping and running operation of internal wheel spindle	Continuously carry out the starting, and stopping ten times at a suitable wheel spindle speed to test the smoothness and security of the working.	1-11
2	Conversion operation of internal wheel spindle speed	Convert the wheel spindle speed on all marked speeds to test the smoothness of working and the security of indication of operation device.	1-12
3	Starting, stopping and running operation of work main spindle	Continuously carry out starting and stopping (including inching and braking) ten times at a suitable work main spindle speed to test the smoothness and security of the working.	1-21
4	Conversion operation of work main spindle speed	Convert the work main spindle speed on all marked speeds to test the smoothness of working and the security of indication of operation device.	1-22
5	Conversion operation of table feed speed ⁽¹⁾	Convert the table feed speed from the minimum to the maximum to test the smoothness of working and the security of indication.	1-22
6	Conversion operation of power feed quantity ⁽¹⁾	Convert the power feed quantity of slide from the minimum to the maximum to test the smoothness of working and the security of indication.	1-24
7	Conversion operation of feed speed ⁽¹⁾	Convert the feed speed of slide from the minimum to the maximum to test the smoothness of working and speed conversion according thereto and the security of indication.	1-24

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
8	Automatic reversing operation of table	Run the table at the minimum and the maximum speeds to test on smoothness and security concerning the setting of position of automatic reversing and the working.	1-25
9	Operation of handle for hand-feeding of table	Travel the table in Z-axis direction by hand-feed handle to test the smoothness and uniformity of work over the whole length of movement.	1-27
10	Operation of switching lever of table moving direction	Continuously work the switching lever of table moving direction by hand ten times to test the smoothness and the security.	1-27
11	Operation of hand feed handle for slide	Travel the slide in X-axis direction by hand feed handle to test the smoothness and uniformity of working over the whole length of movement.	1-27
12	Operation of micro-feed device	Carry out the microfeed of slide by hand feeding to test the smoothness and security of working.	1-27
13	Switching operation of feed control system	Operate the switching knobs, dials, etc. to test the smoothness of working of operation device and the security of switching of automatic and manual motion, stopping of feeding, stopping of retreating or other functions.	1-31 1-32
14	Regulating operation of feed-retreating quantity	Convert the retreating quantity of the slide (including rapid retreating quantity) from the minimum to the maximum to test the smoothness of operation and the security of indication.	—

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
15	Operation for swivel and clamping of work spindle stock	Swivel the work spindle stock to test the smoothness of the swivel and the security of clamping at an arbitrary position.	1-33
16	Travelling and clamping operation of the wheel spindle stock or work spindle stock	Travel the wheel spindle stock or work spindle stock on the table or saddle to test the smoothness of respective movements and the security of clamping at an arbitrary position.	1-33
17	Operation for travelling of wheel truing device and clamping	Travel the wheel truing device to test the smoothness of movement and the security of clamping at an arbitrary position.	1-56
18	Micro-regulating operation of position of tip of diamond for wheel truing	Carry out the micro-regulating operation of position of tip of diamond for wheel truing to test the smoothness of movement and the security of indication.	1-56
19	Automatic operation of wheel truing device	Convert ⁽¹⁾ the wheel truing speed from the minimum to the maximum to test the smoothness of working and the security of function of automatic device;	1-56
20	Regulating operation for wheel-consumption automatic correction device	Convert the correction amount from the minimum to the maximum to test the smoothness of working of correction device and the security of indication.	1-56
21	Automatic operation of gauge rod	Automatically work the gauge rod to test the smoothness and security of work.	1-56
22	Operation for attaching and detaching the wheel head	Carry out the attaching and detaching the wheel head to test the smoothness and the security of clamping.	1-41

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
23	Operation for attaching and detaching the wheel	Test the security and smoothness of attaching and detaching of wheel.	1-41
24	Operation for attaching and detaching of work	Test the security and the smoothness of attaching and detaching of work.	1-42
25	Electric apparatus	Test the insulation condition respectively once before and after the running test. However, it does not apply to the circuit having employ semiconductor and the like.	1-51
26	Safety device	Test the safety relative to the operator and the security of machine protection function ⁽²⁾ [see JIS B 6014].	1-52
27	Lubricating device	Test the security of function for adequate distribution of oil tightness and oil quantity and the like.	1-53
28	Oil-hydraulic device	Test the security of function such as oil tightness, pressure regulation, etc.	1-54
29	Accessories	Test the security of function.	1-55
30	Operation for regulation of spark out ⁽¹⁾	Set the number of reciprocations of spark-out grinding or operating time and the like at the minimum, intermediate and the maximum to test the security of the indication.	1-56

Notes ⁽¹⁾ The grinding machine having both functions of rough grinding and finish grinding shall be carried out on respective functions.

⁽²⁾ For example, it means the emergency stop function or the like in case where overheating or overloading of electric motor for wheel spindle or work spindle is generated.

Remark: The table herein, where the wheel spindle stock carries out the reciprocating movement, includes the carriage of wheel spindle stock.

2.2 No-Load Running Test For the no-load running test, start each movement part at the same time, continue the running of work spindle and wheel spindle at the maximum speed (for the replacing type wheel spindle at respective designated speeds) and measure on each item specified in Table 2 Recording Form 1-1 [see 3.3 of JIS B 6201].

Further, measure on each item specified in Table 3 Recording Form 1-2 when the temperature of each part has approximately been stabilized.

Furthermore, at the completion of running, measure the required electric power for whole running.

Further, observe the vibration and noise. In the case where vibration and noise are made particularly the problem, apply JIS B 6003 and JIS B 6004.

Remark: The table herein, where the wheel spindle stock carries out the reciprocating movement, includes the carriage of wheel spindle stock.

Table 2. Recording Form 1-1

No.	Measuring time hour·min	Temperature ℃						Description
		Wheel bearing		Work spindle bearing		Hy- draulic oil	Room tempera- ture	
		Front	Rear	Front	Rear			

- Remarks**
1. The table shall be run at a suitable intermediate speed.
 2. In the case where the temperature of wheel bearing is measured separately, the record is used instead and the effect shall be recorded on the description column.
 3. Relating to front and rear of each bearing, the wheel side in the wheel spindle, and the work side in the work spindle respectively shall be taken as the front and the opposite sides thereto, as the rear.