

JIS

JAPANESE INDUSTRIAL STANDARD

Test Code for Performance
and Accuracy of Universal
Tool-Grinding Machines

JIS B 6229—1983

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Test Code for Performance and Accuracy of
Universal Tool-Grinding Machines

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1. Scope

This Japanese Industrial Standard specifies the tests on running performances and methods of inspection on accuracy of the universal tool-grinding machines having right and left traverse distance of table 500 mm or under

- Remarks 1. Regarding front and rear or right and left of the machine mentioned in this standard, the side on which the table lies relative to the wheel spindle stock means the front, and the right hand side standing before the machine means the right of the machine.
2. The units and numerical values given in { } in this standard are in accordance with the gravitational system of units, and are appended for reference.

2. Testing Methods for Running

2.1 Functional Test The functional test for the universal tool-grinding machines shall be in accordance with Table 1.

Applicable Standards:

- JIS B 4131-Diamond or Cubic Boron Nitride Grinding Wheels
- JIS B 6003-Methods of Vibration Testing for Machine Tools
- JIS B 6004-Method of Sound Level Measurement for Machine Tools
- JIS B 6014-General Code of Safety for Machine Tools
- JIS B 6201-Test Code for Performance and Accuracy of Machine Tools
- JIS G 4401-Carbon Tool Steels
- JIS G 4403-High Speed Tool Steels
- JIS H 5501-Cemented Carbide Alloy of Tip
- JIS R 6210-Vitrified Grinding Wheels
- JIS R 6211-Shapes and Dimensions of Grinding Wheels

Table 1

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
1	Start, stop and running operation of wheel spindle	Carry out 10 times of start and stop continuously at an appropriate wheel spindle speed to test smoothness and reliability of the work. This shall be tested on the internal wheel spindle (¹) also.	1-11
2	Changing operation of wheel spindle speeds(¹)	Change the wheel spindle speeds in all of the marked speeds to test smoothness of works and reliability of indications of the operating device. This shall be tested on the internal wheel spindle(¹) also.	1-12
3	Start, stop and running operation of work spindle(¹)	Carry out 10 times of start and stop continuously at an appropriate work spindle speed to test smoothness and reliability of works.	1-21
4	Changing operation of work spindle speeds(¹)	Change the work spindle speeds in all of the marked speeds to test smoothness of works and reliability of indications of the operating device.	1-22
5	Changing operation of table feed speeds(¹)	Change the table feed speeds from the lowest to the highest to test the smoothness and reliability of works.	1-22
6	Changing operation of power feed amounts and feed speeds of wheel spindle stock(¹) (or table)	Change the power feed amounts of the wheel spindle stock (or table) from the minimum to the maximum to test the smoothness of works and reliability of the indications.	1-23 1-24

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
7	Automatic reversing operation of table ⁽¹⁾	Run the table at the lowest and highest speeds to test the smoothness and reliability respectively on the establishment of position of the automatic reversing and works.	1-25
8	Operation of table hand feed handle	Travel the table right and left by the hand feed handle to test the smoothness and uniformity of works throughout overall length of the motion (including fine feed device). This shall be tested on front and rear ⁽¹⁾ and up and down ⁽¹⁾ travelling of the table also.	1-27
9	Operation of hand feed handle of cross feed of wheel spindle stock ⁽¹⁾	Travel the wheel spindle stock front and rear by the hand feed handle to test the smoothness and uniformity of works throughout overall length of the motion. This shall be tested on the vertical feed ⁽¹⁾ of the wheel spindle stock also.	1-27
10	Engaging and disengaging of table power feed and operation of its apparatus ⁽¹⁾	Regarding the establishment of engaging and disengaging positions and works of the right and left power feed of the table, test the smoothness and reliability of respective works. The establishment of engaging and disengaging positions and works of the front and rear power feed of the table shall also be tested.	1-31

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
11	Operation of power feed automatic stop apparatus of wheel spindle stock (or table) ⁽¹⁾	Regarding the establishment of commanding position and work of the power feed automatic stop apparatus of the wheel spindle stock (or table), test respective reliabilities.	1-32
12	Operation of tailstock spindle ⁽¹⁾	Travel the tailstock spindle manually to test the smoothness and uniformity of work throughout overall length of the motion.	1-33
13	Swivel (including for the helical) and clamping operation of table ⁽¹⁾	Over the prescribed swivel range of the table, test the smoothness of swivel and reliability of clamping at an arbitrary position.	1-33
14	Swivel (for rounding of cutting edge) and clamping operation of work head	Test the smoothness of swivel and reliability of clamping at an arbitrary position of the work head.	1-33
15	Swivel and clamping operation of wheel spindle stock	Test the smoothness of swivel of the wheel spindle stock and reliability of clamping at an arbitrary position.	1-33
16	Travel and clamping operation of work head and tailstock ⁽¹⁾	Travel the work head and tailstock on the table to test the smoothness of respective motions and reliability of clamping at an arbitrary position.	1-33
17	Attaching and detaching of grinding wheel	Test the reliability of attaching and detaching of the grinding wheel and the smoothness of fastening operation of the screw.	1-41

Table 1 (Continued)

No.	Test item	Test method	Reference Corresponding No. of 3.2 in JIS B 6201
18	Electric apparatus	Test insulating condition once each before and after the running test.	1-51
19	Safety device	Test the safety for operators and reliability of mechanical protective functions [see JIS B 6014].	1-52
20	Lubricating device	Test the reliability of functions such as oil tightness and adequate distribution of oil quantity.	1-53
21	Oil hydraulic apparatus ⁽¹⁾	Test the reliability of functions such as oil tightness and pressure regulation.	1-54
22	Accessories	Test the reliability of functions.	1-55

Note (1) The test shall be carried out on that provided with this function.

2.2 No Load Running Test In the no load running test of the universal tool-grinding machine, start each moving part simultaneously, measure each item specified in Recording Form 1-1 of Table 2 with continuing the running, and measure each item specified in Recording Form 1-2 of Table 3 when the temperature on each part has nearly stabilized. Furthermore, measure the required electric power of the total running at the end of the running.

In addition, observe the vibrations and noises. In the case where the vibrations and noises are particularly in question, these shall be in accordance with JIS B 6003 and JIS B 6004.

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Table 2. Recording Form 1-1

No.	Time of measurement o'clock · min	Temperature °C								Description
		Wheel spindle bearing		Internal wheel spindle bearing (1)		Work spindle bearing (1)		Hydraulic oil (1)	Room temperature	
		Left	Right	Front	Rear	A side ()	B side ()			

- Remarks 1. The table shall be run at an appropriate intermediate speed(1).
2. The work spindle shall be run at the maximum speed.
3. Right and left of the wheel spindle means the right and left viewed from the table side, and front and rear of the internal wheel spindle means the wheel side as the front and the opposite side as the rear.
4. In the parentheses of the A side and B side of the work spindle bearing, type of taper and nominal numbers of respective shaft ends shall be entered.

Table 3. Recording Form 1-2

Division of use of electric motors		Speed rpm or mm/min		Required power (source frequency Hz)			Description
		Marking	Actual measurement	Voltage V	Current A	Input kW	
Wheel spindle	Lowest speed						
	Intermediate speed						
	Highest speed						
Internal wheel spindle ⁽¹⁾							
Work spindle ⁽¹⁾	Lowest speed						
	Intermediate speed						
	Highest speed						
Table ⁽¹⁾	Lowest speed						
	Highest speed						
Total running							

2.3 Load Running Test

2.3.1 In the load running test of the universal tool-grinding machines, carry out a grinding power test and measure each item specified in Recording Form 2 of Table 4.

Furthermore, observe vibrations, noises and conditions of finished surface. In the case where the vibrations and noises are particularly in question, JIS B 6003 and JIS B 6004 apply.

2.3.2 Grinding Power Test In the grinding power test, carry out a surface grinding under the following conditions, and test whether the machine is endurable to a prescribed electric power.