

Machine Tools
Surface Grinding Machines
with Horizontal Grinding Wheel Spindle
with Movable Rectangular Table for Grinding Length up to 1600 mm
Acceptance Conditions

DIN
8632
Part 1

Werkzeugmaschinen; Flachsleifmaschinen mit waagerechter Schleifspindel mit beweglichem Rechteckstisch bis 1600 mm Schleiflänge; Abnahmebedingungen

For connection with the International Standard ISO 1986 - 1974 published by the International Organization for Standardization (ISO), see Explanations

Dimensions in mm

Type: 715 ZT	Machine number: 084302
Recipient:	Order number:
Date: 2008/08/27	Inspector:

1 Purpose and application

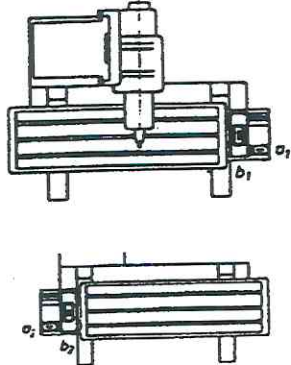
This Standard defines technical acceptance conditions for surface grinding machines with horizontal grinding wheel spindle with movable rectangular table for grinding length up to 1600 mm. They comprise preparatory measures, geometrical tests on the machine (accuracy of manufacture) and practical tests on the workpiece (working circulating as draft), see Explanations.

If some of the tests are not to be carried out or if additional tests are necessary, this is to be separately agreed between manufacturer and operator. The relevant German specifications are to be observed for testing the safety of the machine. The test procedures state only the test principle and the recommended test apparatus usually to be found in the majority of firms. Other test procedures corresponding to DIN 8601 (successor issue at present circulating as draft) and of equivalent accuracy are permissible.

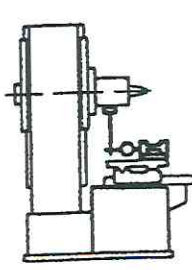
In the column headed "Test instructions" the section number from DIN 8601 (successor issue at present circulating as draft) is shown at the end in cases where the test concerned corresponds to the stipulations contained therein.

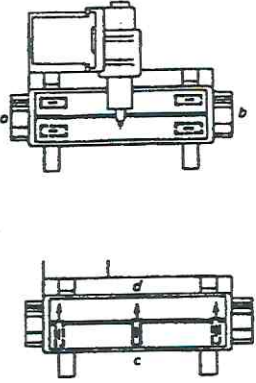
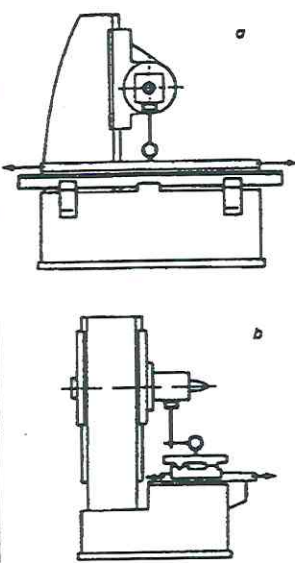
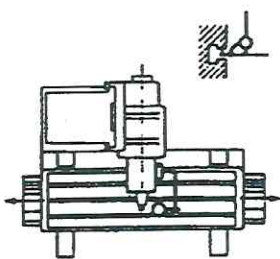
Continued on pages 2 to 7
Explanations on page 7

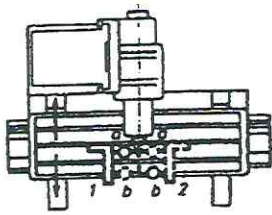
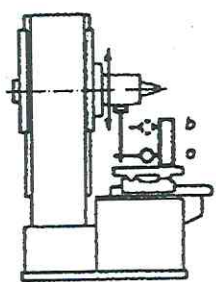
2 Preparatory measures

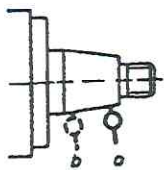
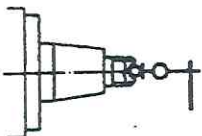
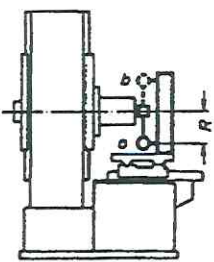
No.	Object of test	Diagram	Test apparatus	Test instructions	Deviations	
					permissible	measures
01	Levelling of slideways of the bed		Precision level scale interval 0,02 mm/m maximum length 200 mm Measuring bridge	Move table to the left to the end position. Place precision level in longitudinal direction at a ₁ on the slideway (flat way) and read off. Place measuring bridge and precision level in transverse direction at b ₁ on the slideways and read off. Then move table to the right to the end position and repeat tests at a ₂ and b ₂ . The test can also be conducted by placing the precision level in the longitudinal and transverse directions on the table in its central position. If, in exceptional cases, the table has to be removed for a test, this must be agreed between manufacturer and operator. 3.1, 3.2 5.2.1, 5.4.1	a) 0,02 mm/m both measured values rising or falling towards the centre of the bed	a) 0.012mm/m
	a) Straightness in longitudinal direction (in vertical plane) b) Parallelism in transverse direction				b) 0,02 mm/m both measured values rising or falling	b) 0.015mm/m

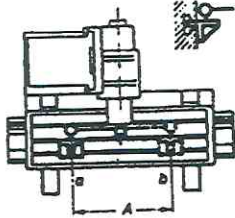
3 Geometrical tests

G1	Straightness of longitudinal movement of table		Support Dial indicator according to DIN 879 Straight-edge or optical test apparatus	Attach support with dial indicator to a stationary part of the machine. Place straightedge on the table. Bring stylus into contact with straightedge in the horizontal plane and line up ends of straightedge parallel to the longitudinal movement of the table. Move table through grinding length and read off the maximum deviation in indication 5.2.3	0,01 mm up to 1000 mm grinding length 0,015 mm over 1000 mm grinding length	0.004mm Grinding length 1000mm
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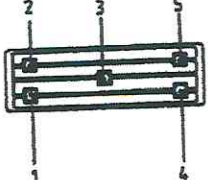
No.	Object of test	Diagram	Test apparatus	Test instructions	Deviations	
					permissible	measured
G2	Flatness of table surface in grinding zone		Precision level scale interval 0,02 mm/m maximum length 200 mm	Table in central position. Place precision level in longitudinal direction a - b and in transverse direction c - d and read off. The number of tests depends on the size of the table surface. 5.3.2.2 5.3.2.3	0,02 mm/m change in inclination over all tests	a-b 0.02mm/m c-d 0.02mm/m
G3	Parallelism of table surface in grinding zone a) to longitudinal movement of the table b) to transverse movement of the table		Support Dial indicator according to DIN 879	Attach support with dial indicator to a stationary part of the machine. Bring stylus on table surface. Move table through grinding length (Diag. a) and grinding width (Diag. b) and read off the maximum deviation in indication. In the case of machines with transverse movement of the wheelhead and a stationary table, the test is to be conducted as appropriate. 5.4.2	a) 0,01 mm up to 1000 mm grinding length 0,015 mm over 1000 mm grinding length b) 0,01 mm up to 1000 mm grinding width Local tolerance for a and b: 0,005 mm over 300 mm	a) 0.01mm Grinding length 1500mm Grinding width 700mm b) 0.006mm
G4	Parallelism of reference tee slot of table to longitudinal movement of table		Support Dial indicator according to DIN 879	Attach support with dial indicator to a stationary part of the machine. Bring stylus on the measuring surface of the reference tee slot. Move table through grinding length and read off the maximum deviation in indication. 5.4.2	0,01 mm up to 1000 mm grinding length 0,015 mm over 1000 mm grinding length Local tolerance 0,005 mm over 300 mm	— Grinding length

No.	Object of test	Diagram	Test apparatus	Test instructions	Deviations	
					permissible	measured
G5	Squareness of reference tee slot of table to transverse movement of table		Support Dial indicator according to DIN 879 Angle 90° according to DIN 875 Length of the measuring leg corresponding to grinding width	Table in central position. Attach support with dial indicator to a stationary part of the machine. Bring stop of angle into contact with the measuring surface of reference tee slot of table in position 1. Bring stylus on the free leg of the angle at a. Move table through grinding width. Read off variation in indication at b with correct sign. Repeat the test in position 2: Bring stylus on the free leg of the angle at b. Move table through grinding width. Read off deviation in indication at a with correct sign. Take mean value. In the case of machines with transverse movement of the wheelhead and a stationary table, the test is to be conducted as appropriate. 5.5.2	0,01 mm over 100 mm grinding width (referred to mean value) Maximum deviation: 0,03 mm	Measured value 1 +0.006mm
						Measured value 2 -0.005 mm Mean value 0.006mm Grinding width 350mm
G6	Squareness of vertical movement of wheelhead to table surface in transverse plane		Support Dial indicator according to DIN 879 Test cylinder (□)	Table in central position. Attach support with dial indicator to wheelhead. Bring stylus on test cylinder at a. Move wheelhead through grinding height. Read off deviation in indication at b with correct sign. Rotate test cylinder through 180° about its longitudinal axis and repeat the test in the same sequence. Take mean value. In the case of machines with movable table and stationary wheelhead the test is to be conducted as appropriate. 5.5.2	0,01 mm over 100 mm grinding height (referred to mean value) Maximum deviation: 0,05 mm	Measured value 1 -0.005mm Measured value 2 -0.004mm Mean value 0.005mm Grinding height 270mm

No.	Object of test	Diagram	Test apparatus	Test instructions	Deviations	
					permissible	measured
G7	Run-out of wheel spindle nose		Support Dial indicator according to DIN 879	Attach support with dial indicator to wheelhead. Bring stylus at right-angles on the surface of the wheel spindle nose. Rotate wheel spindle or allow it to revolve and read off the maximum variation in indication. Carry out testing at a and b. 5.6.1	0,005 mm	a) 0.001mm b) 0.001mm
G8	Periodical axial slip of wheel spindle		Support Dial indicator according to DIN 879 Steel ball according to DIN 5401	Attach support with dial indicator to wheelhead. Insert steel ball in the centring recess of the wheel spindle. Bring stylus on the steel ball. Rotate wheel spindle or allow it to revolve and read off the maximum deviation in indication.	0,005 mm	0.001mm
G9	Parallelism of axis of wheel spindle to table surface		Trammel support Test cylinder Dial indicator according to DIN 879	Table in central position. Attach trammel support with dial indicator to the wheel spindle. Bring stylus on the test cylinder at a and read off the deviation in indication with correct sign at b after turn-round. Rotate test cylinder through 180° about its longitudinal axis and repeat the test in the same sequence. Take mean value. 5.5.1.2	0,01 mm over 100 mm Measuring radius R (referred to mean value)	Measured value 1 +0.007mm Measured value 2 +0.006mm Mean value 0.007mm Measuring radius R 150mm

No.	Object of test	Diagram	Test apparatus	Test instructions	Deviations	
					permissible	measured
G10	Squareness of axis of wheel spindle to reference tee slot of table		Trammel support Dial indicator according to DIN 879 Straight-edge or slip gauges according to DIN 861	Table in central position. Attach trammel support with dial indicator to wheel spindle. Bring stylus at a on the measuring surface of reference tee slot (of straightedge or of slip gauges) and read off the deviation in indication at b after turn-round. 5.5.1.2	0,005 mm over 100 mm Test distance A	0.005mm Test distance A 300mm

4 Practical tests

No.	Object of test	Diagram	Grinding conditions	Test apparatus	Test instructions	Deviations	
						permissible	measured
P1	Working accuracy of the machine: Uniformity of thickness of the test workpiece	 	5 test workpieces are to be placed on the table in accordance with the diagram. In the absence of any special agreements, the manufacturer will specify: Quality and dimensions of the grinding wheel; material of the test workpieces (cast iron or steel); grinding and workmounting conditions. The bearing surfaces of the test workpieces must be flat to within 0,002 mm.	External micrometer with dial indicator according to DIN 879	Measure the maximum deviation in thickness of the test workpieces with external micrometer and dial indicator. 4.1, 4.2	0,005 mm up to 400 mm grinding length 0,01 mm over 400 mm up to 800 mm grinding length 0,015 mm over 800 mm up to 1600 mm grinding length	Grinding length 1000mm 1 0µm 2 0µm 3 0µm 4 -1µm 5 -1µm

Further Standards

- DIN 8632 Part 2 Surface grinding machines with horizontal grinding wheel spindle with movable rectangular table for grinding length over 1600 mm; acceptance conditions
- DIN 8632 Part 3 Surface grinding machines with horizontal grinding wheel spindle with round table; acceptance conditions
- DIN 8633 Part 1 Surface grinding machines with vertical grinding wheel spindle with movable rectangular table for grinding length up to 1600 mm; acceptance conditions (at present circulating as draft)
- DIN 8633 Part 2 Surface grinding machines with vertical grinding wheel spindle with movable rectangular table for grinding length over 1600 mm; acceptance conditions (at present circulating as draft)
- DIN 8633 Part 3 Surface grinding machines with vertical grinding wheel spindle with round table; acceptance conditions (at present circulating as draft)

Explanations

DIN 8632 "Acceptance conditions for surface grinding machines with horizontal grinding axis and vertically adjustable wheelhead up to 2 m grinding length", edition June 1942, has already been revised once and published as draft DIN 8632 Part 1 in July 1968.

Since, in the meantime, surface grinding machines have been included in the study programme of Technical Committee ISO/TC39/SC2 "Machine tools; acceptance conditions for metal cutting machines" it became necessary in March 1973 to publish a second draft, so that the international agreements could be taken into account in the DIN Standard.

This Standard contains some deviations from the ISO Standard 1986 - 1974 published by the International Organization for Standardization (ISO)

- E: Test conditions for surface grinding machines with horizontal grinding wheel spindle and reciprocating table - Testing of accuracy
- F: Conditions d'essais des machines à rectifier les surfaces planes, à broche porte-meule à axe horizontal - Contrôle de la précision

In contrast with the ISO Standard it has been divided into DIN 8632

- Part 1: Surface grinding machines with horizontal grinding wheel spindle with movable rectangular table for grinding length up to 1600 mm; acceptance conditions
- Part 2: Surface grinding machines with horizontal grinding wheel spindle with movable rectangular table for grinding length over 1600 mm; acceptance conditions

so that, in respect of these grinding lengths, different permissible deviations have become necessary for certain tests.

The test methods of the Standard correspond with the ISO/R 230-1961

E: Machine Tool Test Code

F: Code d'Essais des Machines-Outils

on the basis of which DIN 8601 "Acceptance conditions for machine tools for machining metal; general rules" (successor issue, at present circulating as draft) has been prepared.