

Accuracy of machine tools and methods of test —

Part 6: Specification for surface grinding machines, vertical spindle, reciprocating table type

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Committees responsible for this British Standard

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- Advanced Manufacturing Technology Research Institute
- Cranfield Institute of Technology
- Department of Trade and Industry [Mechanical Engineering and Manufacturing Technology Division (Mmt)]
- Federation of British Engineers' Tool Manufacturers
- Health and Safety Executive
- Institution of Production Engineers
- Ministry of Defence
- University of Aston in Birmingham

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Foreword

This Part of BS 4656 has been prepared under the direction of the Machine, Engineers and Hand Tools Standards Committee and implements, in part, agreements of the International Organization for Standardization (ISO). This Part of BS 4656 supersedes BS 4656-6:1971, which is withdrawn.

This Part of BS 4656 is generally in accordance with ISO 1985:1985 “*Acceptance conditions for surface grinding machines with vertical grinding wheel spindle and reciprocating table — Testing of accuracy*”, which has been prepared by Technical Committee 39, Machine Tools, of ISO. The UK voted against ISO 1985 on technical grounds. This Part of BS 4656 varies from ISO 1985 in the following respects.

Clauses. Clauses 1 and 2 contain the same information as is given in ISO 1985 but they are expressed more in accordance with accepted English usage. Clauses 3 and 4 have been added.

Inch dimensions. In accordance with the UK policy of metrication, inch dimensions given in ISO 1985 have not been included in this Part of BS 4656.

Tests. In test G6 the values from the 1971 edition of this Part of BS 4656 have been included instead of the values in the corresponding test of ISO 1985:1985, which are considered to be too tight for practical use.

Tables. In column 6 of Table 1 and column 7 of Table 2, reference to ISO/R 230 has been replaced by reference to BS 3800.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 4656 specifies, with reference to BS 3800, both geometrical and practical tests for surface grinding machines, vertical spindle, reciprocating table type and gives corresponding permissible deviations that apply.

This standard is applicable to machines of general purpose use and normal accuracy.

It deals only with the verification of accuracy of the machine. It does not apply to the testing of the running of the machine (vibrations, abnormal noises, stick-slip motion of components, etc.) nor to its characteristics (speeds, feeds, etc.) which should generally be checked before testing accuracy.

Appendix A contains comments relating to slideway straightness.

This standard is not applicable to machines with fixed or rotating tables or to machines which have longitudinal traverse of the wheelhead.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Application of test methods

2.1 In applying the tests detailed in Table 1 and Table 2, reference should be made to BS 3800, especially concerning the installation of the machine before testing, warming up of spindles and other moving parts, the description of measuring methods and the recommended accuracy of testing equipment.

2.2 The tests may be applied in any order that is practicable and that makes for ease of mounting of instruments or gauging. The sequence in which the geometrical tests are listed in Table 1 is related to the subassemblies of the machine and it is not intended to impose the practical order in which the tests are to be done.

2.3 It is not always necessary for all the tests specified in this standard to be carried out. The purchaser shall be at liberty to select, in agreement with the manufacturer, those tests relating to the properties that are of interest to him. The appropriate tests are to be clearly stated when the machine is ordered.

2.4 Practical tests shall be made with finishing cuts.

2.5 When establishing the tolerance for a measuring range different from that given in this standard (see **2.311** of BS 3800:1964), it should be taken into consideration that the minimum value of tolerance is 0.001 mm for geometrical and practical tests.

3 Abbreviations

For the purposes of this standard, various methods of expressing permissible deviations are employed, each having a particular type of application. The methods employed are as follows.

---/---	This type of expression applies to deviations of perpendicularity that are ratios.
--- for any length of ---	This type of expression applies to deviations of straightness and parallelism, and is used in fact for local permissible deviations, the measurement length being obligatory.
--- per ---	This type of expression applies to deviations of straightness and parallelism and is used to recommend a measurement length, but in this case the proportionality rule comes into operation if the measurement length differs from that indicated.

4 Diagrams

For reasons of simplicity the diagrams in this standard illustrate only one type of machine.