

CONFIRMED
DECEMBER 2007

Accuracy of machine tools and methods of test

Part 38. Specification for surface finish of test pieces

UDC 621.9.01-187.001.4 : 621.793/.795

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee MTE/1, Machine tools, upon which the following bodies were represented:

- Advanced Manufacturing Technology Research Institute
- British Engineers Cutting Tools Association
- Cranfield University
- Gauge and Tool Makers' Association
- Health and Safety Executive
- Institution of Electrical Engineers
- Machine Tool Technologies Association
- Ministry of Defence
- Individual experts

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 July 1995

© BSI 1995

The following BSI references relate to the work on this standard:
Committee reference MTE/1
Draft for comment 94/704506 DC

ISBN 0 580 24243 9

Amendments issued since publication

Amd. No.	Date	Text affected

Contents

	Page
Committees responsible	Inside front cover
Foreword	2
Specification	
1 Scope	1
2 Normative references	1
3 Definitions	1
4 Application of test methods	1
Table	
1 Surface texture values for machined test pieces	2
List of references	Inside back cover

Foreword

This Part of BS 4656 has been prepared by Technical Committee MTE/1.

It is considered that, in specifying the surface texture of the test pieces called up in the practical tests of the various other Parts of the BS 4656 series, the quality and reliability of the test data is enhanced. It is intended to submit this Part of BS 4656 as a proposal for incorporation into appropriate standards prepared by Technical Committee 39, Machine tools, of the International Organization for Standardization (ISO). To meet the needs of UK industry this Part of BS 4656 is being prepared in advance of the potential related ISO work.

This Part of BS 4656 is intended as a specification to those whose task it is to machine test pieces, recognizing that the surface texture of any specimen produced is, amongst other things, an indication as to how a machine will behave under load.

The surface texture values quoted in this specification are values that should be achieved in order that the test piece itself can be reasonably expected to act as a means to provide reliable data within the permitted deviations of the test in question. These values should not be regarded as a statement of the surface texture that may be obtained by the use of any particular machine tool since the ultimate surface texture produced, even with optimum machining conditions, will be influenced by many unrelated variables.

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

Specification

1 Scope

This Part of BS 4656 specifies the surface texture for the practical test pieces contained in various other Parts of BS 4656 and which are listed in table 1.

This Part of BS 4656 is applicable to Parts 1, 2, 3, 4, 5, 6, 7, 8, 9, 21, 22, 23, 24, 28, 29, 30, 31, 32, 35, 36 and 37.

2 Normative references

This British Standard incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on the inside back cover. Subsequent amendments to, or revisions of, any of these publications apply to this British Standard only when incorporated in it by updating or revision.

3 Definitions

For the purposes of this Part of BS 4656, the definition of surface texture given in BS 1134 : Part 1 : 1988 applies.

4 Application of test methods

4.1 In applying the tests detailed in this Part of BS 4656, reference shall be made to the corresponding other Part of BS 4656 given in table 1.

NOTE 1. In table 1, the machining symbol together with a numerical value indicates the particular surface to which the surface texture value applies.

NOTE 2. The figure and table references in table 1 are reproduced directly from the relevant Parts of BS 4656.

4.2 It is emphasized that tests shall be carried out using finishing cuts only. Tools shall be maintained in a sharp condition, they shall be correctly ground, and grinding wheels shall be dressed.

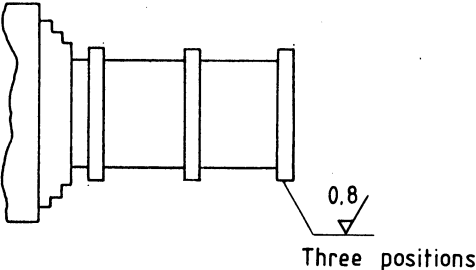
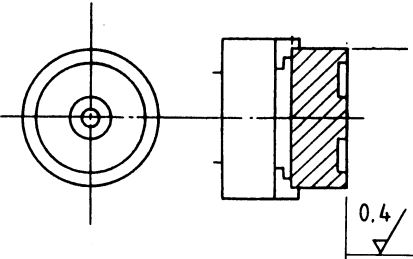
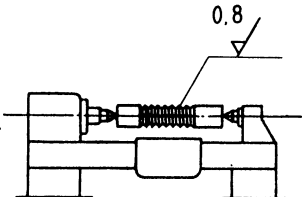
NOTE 1. Coolants may be used to avoid overheating.

NOTE 2. Failure to operate under these conditions may have an adverse effect on surface texture.

NOTE 3. It is permissible to rough out a test piece on another machine leaving 2 mm on all machined surfaces and thread blanks, and 0.5 mm on all ground surfaces.

4.3 Surfaces shall be checked using electrical stylus type measuring instruments. The sampling length (metre cut-off) shall be 0.8 mm.

4.4 A record shall be kept of the surface roughness values obtained from each test piece.

Table 1. Surface texture values for machined test pieces			
Item	Reference to BS 4656		Surface texture value, R_a μm
	Part number and title	Test	
a)	BS 4656 : Part 1 : 1981 Specification for lathes, general purpose type (related to ISO 1708)	P1	
		P2	
		P3	

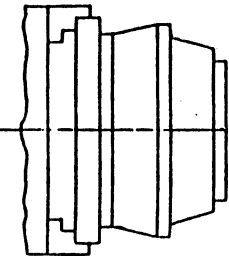
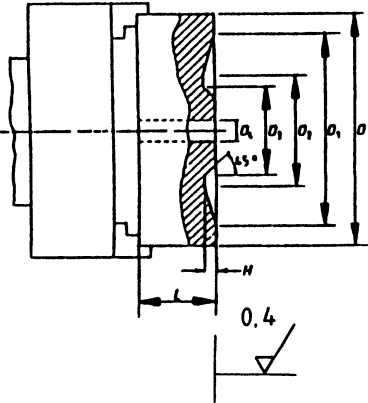
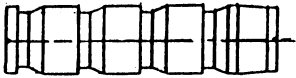
Item	Reference to BS 4656		Surface texture value, R_a μm
	Part number and title	Test	
b)	BS 4656 : Part 2 : 1988 Specification for copying lathes and copying attachments (related to ISO 8956)	P1	 0.4 ▽ All over
		P2	 0.4 ▽
		P3	a) Minimum size test piece  0.4 ▽ All over b) Maximum size test piece  0.4 ▽ All over

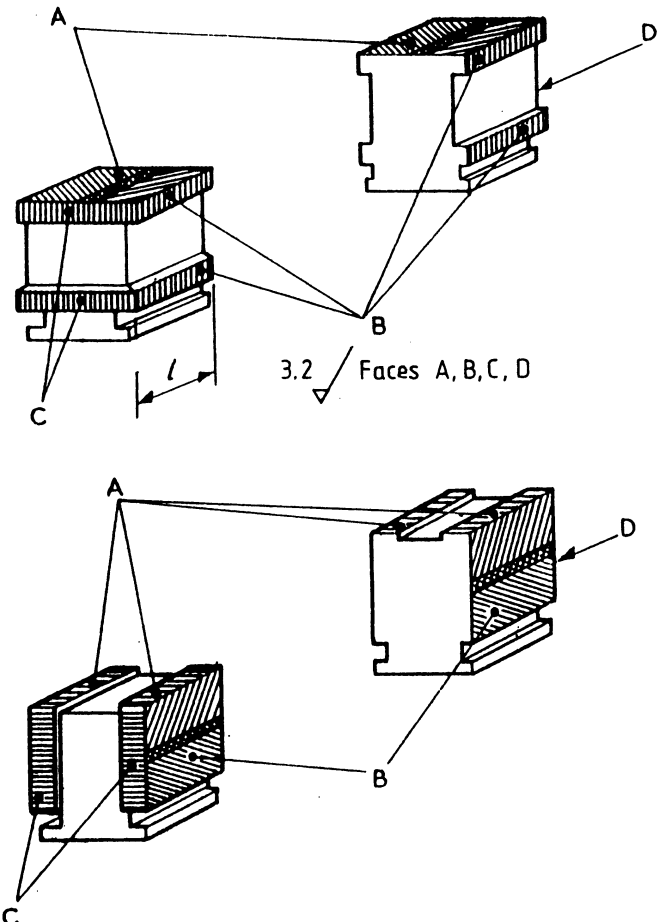
Table 1. Surface texture values for machined test pieces (continued)			
Item	Reference to BS 4656		Surface texture value, R_a μm
	Part number and title	Test	
c)	BS 4656 : Part 3 : 1971 Milling machines, knee and column type, horizontal or vertical spindle plain (related to ISO 1701)	P1	

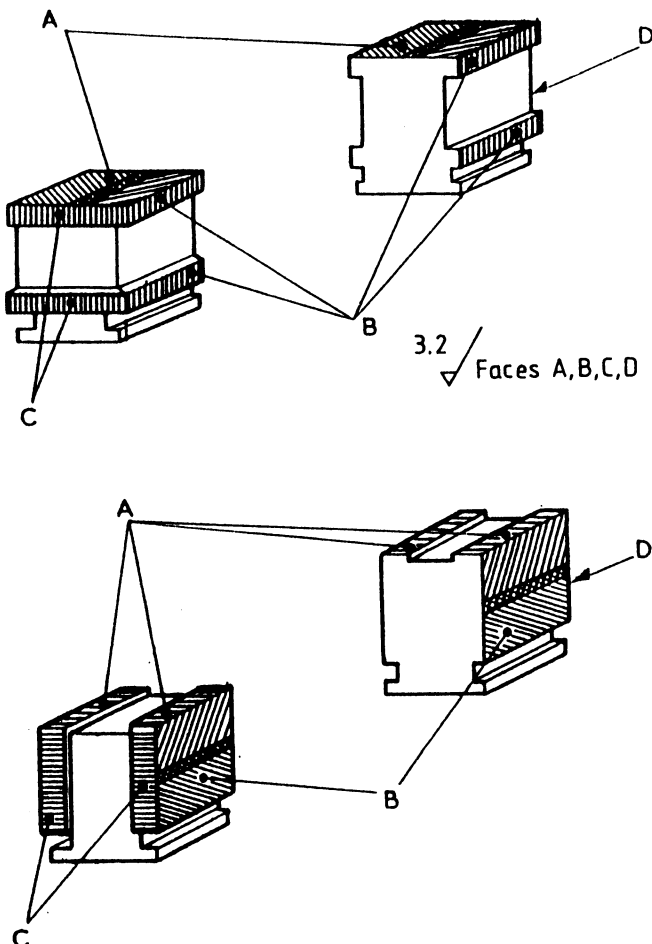
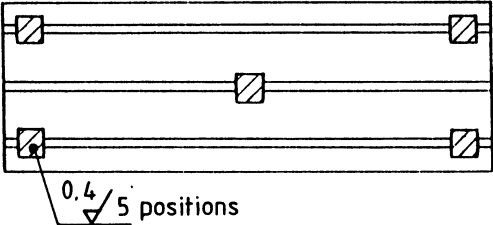
Table 1. Surface texture values for machined test pieces (<i>continued</i>)			
Item	Reference to BS 4656		Surface texture value, R_a μm
	Part number and title	Test	
d)	BS 4656 : Part 4 : 1971 Milling machines, bed type, horizontal or vertical spindle (related to ISO 1984)	P1	
e)	BS 4656 : Part 5 : 1979 Milling machines, knee and column type, horizontal spindle, universal (related to ISO 1701 : Addendum 1)		See Part 3.

Table 1. Surface texture values for machined test pieces (continued)			
Item	Reference to BS 4656		Surface texture value, R_a μm
	Part number and title	Test	
f)	BS 4656 : Part 6 : 1988 Specification for surface grinding machines, vertical spindle, reciprocating table type (related to ISO 1985)	P1	
		P2	