

BS 887:2008

Incorporating Corrigenda Nos. 1 and 2



BSI Standards Publication

Precision vernier callipers – Requirements and test methods

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This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 16, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 November 2008. It was prepared by Technical Committee TDW/4, *Technical product realization*. A list of organizations represented on this committee can be obtained on request to its secretary.

The start and finish of text introduced or altered by Corrigendum No. 1 (and No. 2) is indicated in the text by tags C1 C1 (and C2 C2).

Supersession

This British Standard supersedes BS 887:1982, which is withdrawn.

Information about this document

This standard has been revised to bring it up to date.

Readers are informed of the drafting of ISO DIS 13385-1 Geometrical product specifications (GPS) — Dimensional measuring equipments — Part 1: Callipers; Design and metrological requirements, currently being carried out by ISO/TC 213, due to be adopted by CEN as an EN ISO.

Because industry still has a need for imperial callipers, this revision specifies requirements for both metric reading and imperial reading instruments. It includes requirements for a single design of vernier scale which can have graduations either in metric or in imperial units.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

NOTE 1 Attention is drawn to the fact that the metric dimensions are not necessarily direct conversions of the imperial dimensions. For instance, the vernier division of 0.02 mm marked on the metric calliper corresponds to a 0.001 in vernier division on the imperial calliper, whereas the actual conversion is 0.001 in = 0.0254 mm.

NOTE 2 Recommended minimum beam  sections  are given in Annex A, methods of test are given in Annex B and guidance on the use of a precision vernier caliper is given in Annex C.

This British Standard specifies requirements for the construction, for the accuracy at the reference temperature of 20 °C and for the protection of metric and imperial precision vernier callipers with external and internal contact faces. The standard specifies requirements for metric callipers to measure lengths up to a maximum of 1 000 mm using a main scale and a vernier scale graduated to read to 0.02 mm and for imperial callipers to measure lengths up to a maximum of 48 in using a main scale and vernier scale graduated to read to 0.001 in.

This standard does not specify full requirements for callipers with an electronic display, although the requirements for the beam, slider and measurement  jaws  may be the same as the vernier calliper.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 817, *Surface plates – Requirements*

BS 1133-19, *Packaging code – Section 19: Use of desiccants in packaging*

BS 2795, *Specification for dial test indicators (lever type) for linear measurement*

BS EN ISO 463, *Geometrical Product Specifications (GPS) — Dimensional measuring equipment — Design and metrological characteristics of mechanical dial gauges*

3 Terms and definitions

NOTE The components of a precision vernier caliper are illustrated in Figure 1, which also gives the nomenclature.

For the purposes of this British Standard, the following terms and definitions apply.

3.1 deviation of reading

difference between the vernier scale reading and the length separating the external measurement faces

3.2 measuring range

range of lengths that can be measured using the external measurement  jaws  without the vernier scale extending beyond the main scale

4 Construction

4.1 Material

The slider and beam shall be of carbon steel or stainless steel.

The coefficient of thermal expansion of the steel, in the temperature range 10 °C to 30 °C shall be $(11.5 \pm 1.0) \times 10^{-6}/^{\circ}\text{C}$. The measurement faces shall be hardened to not less than 700 HV for carbon steel and not less than 550 HV for stainless steel.

Finished callipers shall be free from internal stresses.

4.2 Measuring ranges

The measuring ranges shall be as specified in Table 1.

Table 1 Measuring ranges

Metric	Imperial
mm	in
0 to 150	0 to 6
0 to 300	0 to 12
0 to 600	0 to 18
0 to 1 000	0 to 24
—	0 to 36
—	0 to 48

4.3 Beam

NOTE The beam should have a minimum $\square_{C1}$ section $\square_{C1}$ in accordance with Annex A.

The beam shall be long enough to prevent the sliding jaw assembly from protruding beyond the end of the beam when the assembly is at the upper limit of the measuring range.

4.4 Jaws

4.4.1 Projections from beam (J)

The projections of the jaws from the $\square_{C1}$ guiding surface $\square_{C1}$ shall be as shown in Table 2.

The projections J of the two jaws shall be equal to within 0.03 mm or 0.001 in, as shall projections J_1 . (See Figure 1.)

Figure 1 Illustration of the components of a precision vernier caliper, and their nomenclature

