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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 26698-2022

Replacing GB/T 26698-2011

Pencils and mechanical pencils for exam

考试用铅笔和涂卡专用笔

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1 Scope

The document lays down the classification, the requirements, the test methods, the inspection rules and the provisions for marking, packaging, transport and storage of pencils for exam and of mechanical pencils for exam.

It applies to pencils for exam, called pencils below, and to mechanical pencils for exam, and it applies as well to the leads used in mechanical pencils for exam.

2 Normative references

The content of the following documents becomes, through normative reference in the text, an indispensable part of the document. For a dated reference only the edition bearing that date applies; for an undated reference the latest edition, including all amendments, applies.

GB/T 191, Packaging - Pictorial marking for handling of goods. GB/T 2828.1, Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection. GB 21027, General safety requirements for students articles. GB/T 26704-2022, Pencils. QB/T 1023-2018, Mechanical pencils. QB/T 1024-2018, Black leads for mechanical pencils.

3 Terms and definitions

The following terms and definitions apply to the document.

3.1 pencil for exam: a pencil fitted with a lead of hardness grade 2B, used to fill in the marking points of an examination answer card.

3.2 mechanical pencil for exam: a mechanical pencil fitted with a rectangular or wedgy short lead of hardness grade 2B, which can fill in the marking points of an examination answer card conveniently and quickly.

3.3 rectangular lead: a lead whose cross section is rectangular, used in click type mechanical pencils for exam.

3.4 wedgy short lead: a short lead machined from a cylinder so that its writing end is wedge shaped, used in refill type mechanical pencils for exam.

4 Classification

4.1 Mechanical pencils for exam are divided, by the way the lead is fed out, into the click type and the refill type. A pen that delivers a certain length of lead each time the click mechanism acts once is a click type; a pen in which a single lead can be replaced is a refill type.

4.2 The leads for mechanical pencils for exam are divided by shape into rectangular leads and wedgy short leads.

5 Requirements

5.1 Pencils. Pencils are required to meet the requirements of Clause 5 of GB/T 26704-2022 for a premium grade pencil of hardness grade 2B, with a lead density (absorbance) of 0.38 to 0.46.

5.2.1 Click type mechanical pencils for exam follow the requirements of Clause 4 of QB/T 1023-2018 for click type mechanical pencils with a nominal lead diameter greater than 0.7 mm, with a lead-holding force of not less than 9.8 N.

5.2.2.1 The performance of refill type mechanical pencils for exam is fixed by Table 1, which has three columns - item, requirement and test method - and six items: anti-retraction force not less than 9.8 N; locking force not less than 0.3 N; lead projection length 5.5 mm $\pm$ 1 mm for a nominal width of 1.5 mm and 6.5 mm $\pm$ 1 mm for a nominal width of 2.0 mm; lead feed performance continuous; durability not less than 1 000 operations; and, for impact resistance, a horizontal drop from a height of 1 m after which the lead still feeds continuously and no part cracks, deforms or falls off.

5.2.2.2 The appearance of a refill type mechanical pencil for exam is required to satisfy the following: the marking characters are legible; the surface is smooth; the whole pen and its fittings show no obvious skew or gaping.

5.3.1.1 Table 2 fixes the dimensions of rectangular leads in millimetres for two nominal widths, 1.4 and 1.8. For the nominal width 1.4 the actual width is 1.40 to 1.46 and the thickness 1.00 to 1.04; for the nominal width 1.8 the actual width is 1.78 to 1.84 and the thickness 0.92 to 0.96. The lengths 60 $\pm$ 1, 70 $\pm$ 1, 80 $\pm$ 1 and 90 $\pm$ 1 are given in a cell shared by both rows, and a single test method applies to the whole table.

5.3.1.2 Table 3 fixes the performance of rectangular leads: bending strength not less than 50 MPa for the nominal width 1.4 mm and not less than 70 MPa for the nominal width 1.8 mm; density (absorbance) not less than 0.38; smoothness (coefficient of friction) not more than 0.250; wear not more than 0.10 mm/m; and bend not more than 0.5 mm. The last four items carry one value covering both nominal widths.

5.3.1.3 The appearance of rectangular leads is required to be straight, flat, smooth and free of bent ends.

5.3.2.1 Table 4 fixes the dimensions of wedgy short leads in millimetres for two nominal widths, 1.5 and 2.0, a footnote stating that the nominal width is the width of the wedge end of the lead. Both rows carry the diameters 2.0 $\pm$ 0.03 and 2.5 $\pm$ 0.03 and the lengths 13.5 $\pm$ 0.5 and 14.7 $\pm$ 0.5. The actual width is 1.3 to 1.6 for the nominal width 1.5 and 1.80 to 2.03 for the nominal width 2.0, and the wedge end thickness is 0.5 to 0.8 in both rows.

5.3.2.2 The performance of wedgy short leads is required to meet the requirements of 5.1 of GB/T 26704-2022 for a premium grade lead of hardness grade 2B, with a load-bearing requirement at the lead tip of not less than 9.80 N.

5.4 Safety requirements. For pencils and mechanical pencils for exam used by students aged 14 and under, the provisions of GB 21027 apply to the migratable element content in the coatings of the lead and of the pencil barrel; to the migratable element content and the phthalate plasticiser content of the pencil end cap, treated under the requirements for erasers and for accessible plastic parts; and to the phthalate plasticiser content of the accessible plastic parts of the mechanical pencil for exam.

6 Test methods

6.1 Pencils are tested by the test methods of Clause 7 of GB/T 26704-2022 for premium grade pencils of hardness grade 2B.

6.2.1 Click type mechanical pencils for exam are tested by the test methods of Clause 6 of QB/T 1023-2018 for click type mechanical pencils with a nominal lead diameter greater than 0.7 mm, the HB lead of the test material being replaced by a rectangular lead.

6.2.2.1 Anti-retraction force test. The instrument is a digital force gauge with a resolution not lower than 0.01 N. The test pen is fixed in its holder with the lead touching the load-bearing face of the gauge perpendicularly; force is then applied gradually up to 9.8 N and the lead is checked for retraction into the lead tube.

6.2.2.2 Locking force test. The apparatus is a dedicated 30 g weight. The weight is fixed to the exposed part of the lead, the test pen is lifted slowly and vertically and held for 5 s, and the lead is checked for slipping out of the chuck of the pen.

6.2.2.3 Lead projection length test. The measuring instrument is a vernier caliper with a resolution not lower than 0.02 mm. With the writing end of the test pen pointing downwards, axial pressure is applied to the lead feed mechanism so that the lead is changed, and the exposed dimension of the lead is measured with the caliper and checked against the lead projection length requirement.

6.2.2.4 Lead feed performance test. With the test pen filled with leads and its writing end pointing downwards, axial pressure is applied continuously to the lead feed mechanism and the lead is checked for continuous output. The sentence is cut by the edge of the last page available.