QB

LIGHT INDUSTRY STANDARD

OF THE PEOPLE'S REPUBLIC OF CHINA

ICS 97.180
Classification No.: Y50
Record No.: 18373-2006

QB/T 1655-2006

Replacing QB/T 1655-1992

Roller Ball Pen and Refill

水性圆珠笔和笔芯

Issued on: August 19, 2006 **Implemented on: December 1, 2006**

Issued by: National Development and Reform Commission of the PRC

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Foreword

This Standard is the modification against QB/T 1655-1992 *Ink Pen*.

Compared with QB/T 1655-1992, this Standard has the major changes as follows:

--- Add the Chapter on terms and definitions (Chapter 3 of this Edition);

--- Modify the classification, delete the technical requirements on relevant roller ball microporous ink pen (Chapter 4, Chapter 5 of this Edition; Chapter 3, Chapter 4 of QB/T 1655-1992);

--- Add the Chapter on the general test instrument, materials and conditions (Chapter 6 of this Edition);

--- Delete three items, namely, initial-writing angle, extended force of the nib, strength of the nib (5.1, 5.4, 5.5 of QB/T 1655-1992);

--- Add seven items, namely, ink amount, writing performance, leakage resistance, transparency, temperature resistance, difference between pen-holder head aperture and nib outer diameter, and pull-off force of the cap, etc. (7.2, 7.3, 7.4, 7.8, 7.9, 7.13, 7.17 of this Edition);

--- Change the original metal pen clip elasticity into metal clip clipping force (7.14 of this Edition; 5.12 of QB/T 1655-1992);

--- Change the original anti-corrosive property into the physical and chemical property of decorative surface (7.15 of this Edition; 5.9 of QB/T 1655-1992).

The Appendix A of this Standard is normative.

This Standard was proposed by China Light Industry Council.

This Standard shall be under the jurisdiction of National Pen-Manufacturing Standardization Center.

The drifting organization of this Standard: National Pen-Manufacturing Standardization Center, Beifa Group Co., Ltd., Qingdao Changlong Stationery Co., Ltd., Shanghai Jinwannian Industrial Development Co., Ltd., Shanghai Lotus Stationery Co., Ltd., Wenzhou Aihao Pen Trade Co., Ltd., and Wenzhou Tianjiao Pen Industrial Co., Ltd.

The chief drafting staff of this Standard: Chen Rongzhong, Fu Yuanlong, Qi Guangming, and Chen Jingqiang.

Since the date of implementation, this Standard replaced the light industry standard QB/T 1655-1992 issued by the Light Industry Department.

Roller Ball Pen and Refill

1 Scope

This Standard specifies the terms and definitions, classification, requirements, test methods, inspection rules, and marking, package, transportation, storage of roller ball pen and refill.

This Standard is applicable to the various roller ball pens and refills filling water-based ink.

2 Normative References

The provisions in following documents become the provisions of this Standard through reference in this Standard. For dated references, the subsequent amendments (excluding corrigendum) or revisions do not apply to this Standard, however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 191 Packaging - Pictorial Marking for Handling of Goods

GB/T 622 Chemical Reagent - Hydrochloric Acid

GB/T 678 Chemical Reagent - Ethanol

GB/T 1468 Tracing Paper

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/T 6388 Transport Package Shipping Mark

GB/T 12654 Writing Paper

QB/T 2774 Pencil

QB/T 3833 Testing Method of the Oxidation Treatment Coatings of the Aluminum and Aluminum Alloys for the Light Industrial Products

7.1.1 Test instrument

60g special counter poise.

7.1.2 Methods and Procedures

Set the 60g counter poise onto the bottom of pen-holder, so that the pen and the writing paper form elevation angle of 50°~70°; use hand to draw straight line with the marking line speed of 20 mm/s ~ 25 mm/s, then check whether the handwriting conforms to the requirements of Table 2.

7.2 Out-inking amount test

Out-inking amount indicates the amount of the ink per meter when the pen draws the marking lines within 100m.

7.2.1 Test instrument

Balance with sensitivity accuracy no less than 0.001g.

7.2.2 Methods and procedures

a) Weigh the mass G_1 of the test pen that has not been written on the balance;

b) Adjust the circle-painting and writing machine to meet the conditions of 6.1; writing paper meets the requirements of 6.2;

c) Install the test pen onto circle-painting and writing machine, start the circle-painting and writing machine to draw line. Observe whether the line is broken during the line-marking process, if there is line broken, take off the test pen, use the alcohol cotton to wipe the ink accumulated on the nib; then use hand to continuously draw five circles with Φ20mm~Φ25mm onto the test paper; if the stitches can be drawn at this time, continue to install the test pen onto the circle-painting and writing machine; the above treatment is only for once; if after the treatment, the stitches are still broken, then it shall be treated as the broken line;

d) When the marking line length is 100m, take off the test pen, and use the alcohol cotton to wipe the ink accumulated on the ball seat side of the nib; then weigh the mass G_2 of test pen on the balance;

e) Calculate the out-inking amount *W*as per Formula (1), check whether the out-inking amount conforms to the requirements of Table 2:

$$W = \frac{G_1 - G_2}{L} \quad \cdots\cdots (1)$$

Where:

Test methods and procedures: continue to mark line as per the b), c) methods stipulated in 7.2.2; the accumulated length can meet the requirements in Table 2, and there shall be no broken line.

7.6 Water resistance test

Water resistance indicates the performance of stitches resisting the water erosion.

7.6.1 Instrument and materials

a) Distilled water;

b) Beaker with capacity of 500mL.

7.6.2 Methods and procedures

Use hand to draw five consecutive circles with diameter of Φ20mm ~Φ230mm on the writing paper; after 2h of drawing circle; dip the writing paper with drawn circles into the distilled water; take out the paper as per the time stipulated in Table 2, check the stitches, which shall be identifiable.

7.7 Interval writing test

Interval writing indicates the performance of pen under the circumstance of normal out-inking, and nib is in the exposed or stop-writing state, after a period of suspension, the pen can still be used.

7.7.1 Test instrument

60g special counter poise.

7.7.2 Methods and procedures

Remove the cap of the test pen, draw the normal stitches on the writing paper, place it into the test environment, when it reaches the time stipulated in the Table 2; take it out; set the 60g counter poise on the end of the pen-holder, so that the pen and writing paper form elevation angle of 50°~70°; use hand to draw lines for 100mm with marking line speed of 20 mm/s ~ 25mm/s; check the test pen, the out-inking of which shall be normal.

7.8 Transparency test

Transparency indicates the degree of stitches transparent the paper.

7.8.1 Instrument and materials

a) Ruler;

7.10 Drying time test

Drying time indicates the property of stitches that don't contaminate the covering paper after the prescribed time.

7.10.1 Test instrument

a) Stopwatch;

b) 500g special counter poise, with bottom surface diameter of 500mm.

7.10.2 Methods and procedures

Use hand to draw five consecutive circles with diameter Φ20mm~Φ30mm on the writing paper; start the stopwatch to count time, when the time stipulated in Table 2 is reached; cover the stitches by the writing paper with the same nature; use counter poise to press on the covering paper surface; after 30s to separate the two papers, check whether the covering paper has no ink.

7.11 Light resistance test

Light resistance indicates the property of stitches to resist the sun light.

7.11.1 Test instrument

UV light box (inner diameter of light box 220mm~230mm, UV light: power 30W, wavelength 2.537×10^{2}nm, light tube length 900mm)

7.11.2 Methods and procedures

Use hand to draw five consecutive circles with diameter Φ20mm~Φ30mm on the writing paper; then place the writing paper drawn the circles into the UV light box, take it out after 24h, check whether the stitches are identifiable.

7.12 Ball fixation test

Ball fixation indicates the property of ball which doesn't leave the ball seat under the role of certain force.

7.12.1 Test instrument

Centrifuge (with specific speed numerical indication).

7.12.2 Methods and procedures

a) Use the unwritten test pen to draw lines on the writing paper till the out-inking is normal; then install the test pen into the centrifuge with the special rack [the distance between the nib ball and the centrifuge rotation center radius

7.14.2 Methods and procedures

Spring the pen clip for twice ~ 3 times; fix the cap onto the fixture of the pen clip clipping force instrument; put the insert in between the cap and clip; the inserting depth is (10±1) mm. Start the instrument to make the insert drip off the pen clip. Check whether the value when the insert dripping off the pen clip meet the requirements of Table 3.

7.15 Decorative surface physical and chemical property test

Physical and chemical property of decorative surface indicates the property of cladding and oxide layer resisting corrosion and film attachment.

7.15.1 Instrument and materials

a) Water batch;

b) Thermometer with accuracy no less than 1°C;

c) Beaker with capacity of 500mL;

d) Measuring cylinder with capacity of 500mL;

e) Hydrochloric acid (GB/T 622);

f) Anhydrous ethanol (GB/T 678);

g) Single-edge blade;

h) Transparent pressure sensitive adhesive tape, 25mm wide, adhesive force (10±1) N/25mm;

i) 2H advanced drawing pencil (QB/T 2774);

j) 400# water sandpaper;

k) Advanced drawing rubber.

7.15.2 Methods and procedures

7.15.2.1 Corrosion resistance of cladding

a) Mix the hydrochloric acid and distilled water thoroughly with ratio of 1:2 as the test solution;

b) Weigh 250ml of above test solution by measuring cylinder, place it into 500ml beaker; then transfer into the (25±2) °C water bath with constant temperature device;

7.16.2 Methods and procedures

a) Place the fir board on the ground;

b) Keep the test pen axis parallel to the board surface; freely drop off on the height about 1m away from the board;

c) Check whether the test pen meets the requirements of Table 3.

7.17 Pull-off force of the cab test

Pull-off force of the cab indicates the force exerted when cab is removed from the pen body.

7.17.1 Test instrument

Tensile strength tester.

7.17.2 Methods and procedures

Fix the inserted cab and pen-holder onto the fixture of the tensile strength tester; after adjusting the fixture, start the tester, so that the cab is separated from pen body; check whether the value when separating meet the requirements of Table 3.

7.18 Appearance test

Visual inspection at 200 lx ~ 250 lx incandescent lamp (see Appendix A in detail).

8 Inspection rules

The inspection of roller ball pen and refill can be divided into type inspection and exit-factory batch-by-batch inspection.

8.1 Type inspection

8.1.1 The type inspection shall be carried out in case one of the following conditions:

a) When performing the normal production, no less than twice regular inspection each year shall be carried out;

b) When designing new products, or improving the design of old products, and production and technical conditions have great changes;

c) When stopping production for three months or above, the product is restored;

d) When National Quality Supervision Department proposes the requirements for type inspection.