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Office Furniture-Office Chair

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Foreword

This standard was drafted according to the rules specified in GB/T 1.1-2009.

This standard supersedes "Office Chair" (QB/T 2280-2007).

Compared with QB/T 2280-2007, this standard has the following major technical differences in addition to the editorial changes:

-- The standard name was changed to have a better relevance with the standard names of other office furniture;

-- Normative references were added (see Chapter 2);

-- In the chapter of "Terminologies and Definitions", the terminologies of "revolving chair", "sliding friction", "trundle friction" and "load bearing members" were deleted; the definitions of "the lowest seat height" and "the highest seat height" were modified; the terminologies and definitions of "gas spring" and "nominal force F_a" were added (see Chapter 3);

-- In the chapter of "Classification", "unadjustable office chair" was modified; classification by "horizontal rotation mode of office chair" and "framework and load bearing member material" was deleted (see Chapter 4);

-- In the chapter of "Requirements", the requirements for the following items were deleted: "seat inclination", "wood material", "leather substance", "various other materials", "air leg", "water permeability of textile fabric", "salt bath resistance of metal parts coating", "bonding performance of galvanized coating", "plastic parts" and "trundle / sliding friction"; the requirements for the following items were modified: “physical and chemical properties of metal parts coating”, “static load test on seat and back”, “vertical downward static load on armrest”, “horizontal static load test on armrest”, “reciprocating abrasion test on castor”, “static load test on base” and “seat durability test”; the requirements for the following items were added: “resistance to salt spray of metal parts coating”, “TVOC” and “safety” (see Chapter 5);

-- In the chapter of "Test Methods", the test methods for the following items were deleted: "wood material", "leather substance", "various other materials", "air leg", "water permeability of textile fabric", "salt bath resistance of metal parts coating", "bonding performance of galvanized coating", "plastic parts" and "trundle / sliding friction"; the test methods for the following items were modified “physical and chemical properties of metal parts coating”, “static load test on seat and back”, “vertical downward static load on armrest”, “horizontal static load test on armrest”, “reciprocating abrasion test on castor”, “static load test on base” and “seat durability test”; the test methods for the following items were added:

Office Furniture-Office Chair

1 Scope

This standard specifies the terminologies and definitions, product classification, requirements, test methods, inspection rules and marking, packaging, transportation and storage of office chairs.

This standard is applicable to office chairs; chairs of similar uses in other occasions may refer to this standard.

2 Normative References

The following documents for the application of this document are essential. Any dated reference, just dated edition applies to this document. For undated references, the latest edition (including any amendments) applies to this document.

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 3325-2008	Metal Furniture - General Technical Requirements
GB/T 3920	Textiles - Tests for Colour Fastness - Colour Fastness to Rubbing
GB 5296.6	Instructions for Use of Products of Consumer Interest - Part 6: Furniture
GB/T 6343	Cellular Plastics and Rubbers - Determination of Apparent Density
GB/T 6669-2008	Flexible Cellular Polymeric Materials - Determination of Compression Set
GB/T 6670-2008	Flexible Cellular Polymeric Materials - Determination of Resilience by Ball Rebound
GB/T 9286	Paints and Varnishes - Cross Cut Test for Films
GB/T 10357.2	Test of Mechanical Properties of Furniture - Part 2: Stability of Chairs and Stools
GB/T 10357.3-2013	Test of Mechanical Properties of Furniture - Part 3: Strength and Durability of Chairs and Stools
GB 17927.1	Upholstered Furniture - Assessment of the Resistance to Ignition of Mattress and Sofa - Part 1: Smouldering Cigarette
GB 17927.2	Upholstered Furniture - Assessment of the Resistance to Ignition of Mattress and Sofa - Part 2: Match Flame Equivalent
GB/T 18204.2-2014	Examination Methods for Public Places - Part 2: Chemical Pollutants
GB 18587-2001	Indoor Decorating and Refurbishing Materials-Limitations of

Back eccentric

Distance between a vertical line through forced points at back top and a line through support points at outermost side of base.

3.7

Soft and rigidity covering frame

Members and parts covered by textile fabric, natural leather and imitation leather.

3.8

The lowest seat height

Height of seat when it is adjusted to the lowest point.

3.9

The highest seat height

Height of seat when it is adjusted to the highest point.

3.10

Lift travel

Difference between the highest seat height and the lowest seat height.

3.11

Gas spring

An elastic element, composed of a sealed cylinder tube, sliding piston and piston assembly inside, using nitrogen or other inert gas as the medium for storing energy.

3.12

Nominal force

F_a

The sum of the minimum stretching force and the minimum compression force divided by 2.

$F_a=(F_1+F_3)/2$

Where,

5.3.1 Appearance of plastic parts

5.3.1.1 Plastic parts shall be free from crack and obvious deformation.

5.3.1.2 Plastic parts shall be free from obvious shrinkage cavity, bubbles, impurities and scars.

5.3.1.3 Plastic parts used on the outside surface of chairs shall be smooth and clean, and free from scratch, stain and visible color difference on the surface.

5.3.2 Appearance of soft and rigidity covering frame

5.3.2.1 Members and sewing shall be free from damage, stain, thread slippage, open seam or degumming.

5.3.2.2 Members and sewing shall be symmetrical at symmetrical positions. The sewing stitch shall be uniform without obvious floating thread, skipped stitch. The pattern shall be clear without washboard effect or visible color difference. *

5.3.2.3 Soft covering frame shall be plump, round, uniform and symmetrical at the symmetrical positions; the inserted line is smooth and straight. The rigidity covering frame shall be smooth without wrinkle. *

5.3.2.4 All-in-one foaming parts shall be well combined without shedding, wrinkle or looseness, etc. The self-curtaining part shall be flat and smooth on the surface without pit and with a uniform thickness and compact texture; the split gap has no influence on the appearance.

5.3.3 Appearance requirements of wooden parts

5.3.3.1 Surface wooden parts shall be free from crack, wane, dead knot, moth-eaten material or slight decayed wood.

5.3.3.2 Surface wood-based panel parts shall be overedged.

5.3.3.3 Overedge and veneer shall be free from swelling and degumming.

5.3.3.4 Overedge or veneer shall be put together tightly and flatly with similar texture and colors without dents, indentation or obvious glue penetration; the veneer shall be free from scratch, pit, crack, broken corner or knife cut.

5.3.4 Appearance of metal pieces

5.3.4.1 Metal pieces shall be subjected to rust-proof treatment until no rust stain is found.

5.3.4.2 Metal pieces shall be free from pipe fittings with unsealed ends. The piping

No.	Inspection items	Test conditions	Requirements	Test methods
			4. During the test, test pieces shall not make any obvious and differentiable noise; 5. Both lift mechanism and rotating mechanism shall not fail; 6. Parts and accessories such as screw shall be free from visible looseness	revolving chair
4	Vertical downward static load on armrest	750N, 1min		6.6.4
5	Horizontal static load on armrest	445N, 1min		6.6.5
6	Reciprocating abrasion on castor	Apply 113kg of load vertically on seat, then test 2,000 times on test platform with obstacles and 98,000 times on horizontal test platform without obstacles.	1. There shall be no loss or damage of serviceability after the test; 2. After the test, pull the castor along the center line of each castor with a force of 22 N, the castor shall not drop	6.6.6
7	Static load on base	7,560N, 1min, 2 times	Structural integrity of the base shall be free from damage or sudden obvious deformation	6.6.7
8	Durability of seat and back	Load on seat 950N, 100,000 times Back load 330N, 100,000 times Balanced load on seat: 950 N	1. Chair components are free from fracture or gap; 2. Loading parts are free from obvious deformation; 3. Chair structure is free from looseness; 4. During the test, test pieces shall not make any obvious and differentiable noise; 5. Both lift mechanism and rotating mechanism shall not fail; 6. Parts and accessories such as screw shall be free from visible looseness	6.6.8 is not applicable to revolving chair
9	Back reciprocating durability	Load on seat: 102kg; back load: 445N, 120,000 times		6.6.9.1 is applicable to Type I office chair
		Load on seat: 102kg; load on back: 334N; 120,000 times		6.6.9.2 is applicable to Type II and Type III office chairs
10	Tilt mechanism	300,000 times		6.6.10 is applicable to Type I and Type II office chairs
11	Seat rotating durability	Static load on seat: 102kg, angle of rotation: (360±10)°; frequency of rotation: 5 times/min~15 times/min; for 120,000 times. If the seat is adjustable, it may be adjusted respectively to the		6.6.11

5.9.3 High and low temperature resistance

It shall meet the requirements of 6.6 in GB/T 29525-2013.

5.9.4 Cycle life

For the sample subjected to high and low temperature resistance test, after 50,000 times of cycle life (it shall be subject to the actual travel when the travel is not greater than 60 mm; or else, it is subject to 60 mm) test, the total attenuation of nominal force F_a of gas spring shall not be greater than 13%.

6 Test Methods

6.1 Precision

Unless otherwise specified, the following measuring precision shall be adopted:

-- Loading force: ±5% of the rated value;

-- Mass: ±1% of the rated value;

-- Dimension: ±1mm;

-- Position precision of loading pad: ±5mm.

6.2 Main dimensions

6.2.1 Determination of Point A

Put a 64 kg-load module (see Appendix A) on the seat with center line as symmetry plane, ensuring that the center of guiding axle of the main weight is consistent with the center of the seat's rotation axle. Before the test, the seat shall be loaded before being unloaded, repeat 5 times.

6.2.2 Determination of Point S

For office chairs with unadjustable back, as shown in Figure 7 a), Point S shall be the most forward point on the back 170 mm ~220 mm above Point A at the central plane.

For office chairs with adjustable back, as shown in Figure 7 b), Point S shall be the most protruding point on the back at the central plane 400 mm vertically from the seat's front edge when the back is inclining from back to front.

distance of 200 mm ~300 mm. Observe if the soft damp cloth or white degreased gauze has the color of the finished parts.

6.4.2 Other appearance inspections

They shall be inspected by 3 persons under the natural light or approximate natural light with illuminance within the range of 300 lx ~600 lx (e.g. 40 W daylight lamp), and assessment result is obtained if at least 2 persons have the same opinions.

6.5 Physical and chemical properties

6.5.1 Flexible polyurethane foam

6.5.1.1 Density

It shall be tested according to the requirements of GB/T 6343.

6.5.1.2 Rebound resilience

It shall be tested according to Method A in GB/T 6670-2008.

6.5.1.3 75% compression set

It shall be tested according to Method A in GB/T 6669-2008 with compression of 75% ± 4%.

6.5.2 Color fastness to dry friction of textile fabric

It shall be tested according to the requirements of GB/T 3920.

6.5.3 Metal parts coating

6.5.3.1 Resistance to salt spray

It shall be tested according to the requirements of QB/T 3826.

6.5.3.2 Adhesive force

It shall be tested according to the requirements of GB/T 9286.

6.5.4 Resistance to salt spray of galvanized coating

It shall be tested according to the requirements of QB/T 3826.

6.6 Mechanical property

6.6.1 Stability

It shall be tested according to the requirements of GB/T 10357.2.

6.6.8 Durability of seat and back

6.6.8.1 Seat durability

It shall be tested according to the requirements of 4.7 in GB 10357.3-2013.

6.6.8.2 Back durability

It shall be tested according to the requirements of 4.8 in GB 10357.3-2013.

Seat durability test and back durability test can be combined into one test as they have the same loading position and loading period. In each loading / unloading period, seat shall be loaded before the back is loaded; then unload the back before the seat is unloaded.

6.6.9 Back reciprocating durability (not applicable to office chair with back height less than 200 mm)

6.6.9.1 Back reciprocating durability (applicable to Type I office chair)

Place a sample on the test bed, fix the chair leg or base to prevent movement. If force is applied to the back by test equipment, then the chair shall be prevented from rotating. Fix it properly to prevent the back or armrest from moving.

If there is any adjustable component, it shall be adjusted to the state during its normal use.

As for the chair whose tipping device may be locked, different test methods shall be selected for different locking states. The office chair whose tipping device is not locked shall be tested according to this part, and another office chair with its tipping device set to vertical locking state shall be tested according to 6.6.9.2.

Mark the points respectively 406mm and 452mm above the seat on the chair's vertical center line.

a) If the top of the back is not less than 452mm above the seat, press the compression device at the place 406mm above the seat (see Figure 18);

b) If the load-bearing part on the back is less than 452mm from the seat, press the compression device at the top of the back (see Figure 19);

c) If the back has a pivoting point, and the included angle between the back and rear perpendicular is larger than 20°, then press the compression device on the pivoting point of the back (see Figure 20); if the included angle between the back and rear perpendicular is less than or equal to 20°, then press the compression device at the position determined according to a) or b).

Remove the parts above the seat of the sample.

Keep the gas spring compressed, then measure the seat height according to 6.2.3; and measure the seat height again according to 6.2.3 after storing for 72 h at normal temperature.

6.10.3 High and low temperature resistance

The prepared sample shall be subjected to high/low temperature treatment: firstly, put it into a (-30±2)℃ low temperature test chamber for 48h, take it out, then put it into a (60±5)℃ high temperature test chamber for another 48h. Take out the gas spring and calculate the decrement of its nominal force F_a.

6.10.4 Cycle life

The gas spring piston rod undergone high/low temperature storage test shall be clamped on the testing machine downward for cycling life test at the frequency of 8 times / min - 12 times / min, and the temperature of the wall of outer drum shall not be larger than 50℃ during the test. After cycling for 50,000 times, measure the decrement of nominal force F_a.

7 Inspection Rules

7.1 Inspection classification

Product inspection may be classified into type inspection and end-of-manufacturing inspection. Type inspection evaluates the compliance of all inspection items in addition to those specified in the contract. While end-of-manufacturing inspection judges the compliance of the items specified in 5.1, 5.2 and 5.4 of this standard.

7.2 End-of-manufacturing inspection

7.2.1 End-of-manufacturing inspection shall be carried out at the end of manufacturing of the product or in case of delivery. The items specified in 5.1, 5.2 and 5.3 of this standard are end-of-manufacturing inspection items.

7.2.2 End-of-manufacturing inspection shall be total inspection. Due to large batch, if it is difficult to conduct total inspection, sampling inspection may be carried out. According to those specified in GB/T 2828.1, the sampling inspection method shall adopt normal inspection, single sampling scheme, general inspection level (II), the acceptance quality limit (AQL) is 6.5, and the sample size and judgment value shall be in accordance with those specified in Table 5.

Table 5 -- Rules of Sampling and Judgment

In: pcs.

Total quantity of this batch of	Sample size	Acceptance quantity (Ac)	Rejection quantity (Re)

supplier and the purchaser have other contract provisions, then samples shall be taken according to those specified in the Contract.

7.3.3 Inspection procedure

The inspection procedure shall comply with the principle in which the accuracy of the rest inspection items is not affected as much as possible.

The inspection items specified in 5.1 ~ 5.4 may be completed on one sample. The inspection items specified in 5.5 may be completed on two samples and components respectively. The inspection items specified in 5.6 ~ 5.9 may be completed on the same sample. The same sample shall be subjected to appearance inspection, then mechanical property inspection and then physical and chemical properties inspection.

7.3.4 Judgment of inspection result

The judgment of inspection result covers all selected items. All the inspection items without "*" in the main dimension, tolerances of form and position, appearance, physical and chemical properties, mechanical property, flame retardance, formaldehyde emission, TVOC and safety shall meet the requirements; while those without "*" and with no more than 5 defects are judged as qualified, otherwise they shall be judged as unqualified.

7.3.5 Reinspection

7.3.5.1 Re-inspection may be carried out in case either party has disagreement on the inspection results during inspection and to the objectionable items of un-accepted products within the specified period during delivery.

7.3.5.2 Re-inspection shall be directly carried out to stand-by samples.

7.3.5.3 The items unqualified last time or failing to be inspected last time due to damage of sample shall be subjected to re-inspection and noted with "re-inspected" in the report.

8 Marking, Packaging, Transportation and Storage

8.1 Marking

The products shall be provided with marking and application instruction, and shall meet the requirements of GB 5296.6. The contents of product instructions shall at least include:

a) Product name, specification/model and executive standard No.;

b) Description of product features, the name, feature and class of main raw and

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