

ICS 97.140
CCS Y 80



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

GB/T 10357.3-2013

**Test of mechanical properties of furniture -- Part 3: Strength
and durability of chairs and stools
(English Translation)**

Issued on: October 10, 2013

Implemented on: May 1, 2014

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine**

Table of Contents

Foreword...	3
1 Scope...	5
2 General Test Conditions...	5
3 Test Facilities...	6
4 Test Items and Procedures...	13
5 Assessment of Test Results...	25
Appendix A (Informative) Test Level Selection Table...	26
Appendix B (Normative) Summary Sheet of Test Items...	27

Foreword

GB/T 10357 "Test of Mechanical Properties of Furniture" is divided into eight parts:

- Part 1: Strength and Durability of Tables;
- Part 2: Stability of Chairs and Stools;
- Part 3: Strength and Durability of Chairs and Stools;
- Part 4: Stability of Storage Units;
- Part 5: Strength and Durability of Storage Units;
- Part 6: Strength and Durability of Beds;
- Part 7: Stability of Tables;
- Part 8: Stability of Rocking Chairs and Chairs with Tilting or Reclining Mechanisms When Fully Reclined.

This Part is Part 3 of GB/T 10357.

This Part is drafted according to the rules given in GB/T 1.1-2009.

This Part replaces GB/T 10357.3-1989 Test of Mechanical Properties of Furniture - Strength and Durability of Chairs and Stools.

Compared with GB/T 10357.3-1989, the main technical changes in this Part are as follows:

- The application scope of this Part is modified;

- Principle and test classification are deleted;
- The position of clause specifying the loading template is modified;
- Armrest durability test and its device are added;
- Precision requirement is modified and angle requirement is added;
- Methods of seat static load test and backrest static load test are modified and static load test of front edge of seat is added;
- Static load tests of feet crosspiece/bracket and leg bracket are added;
- Armrest durability test is added;

Test of Mechanical Properties of Furniture - Part 3:

Strength and Durability of Chairs and Stools

1 Scope

This Part of GB/T 10357 specifies test methods for determining the strength and durability of various chairs and stools.

This Part is applicable to various chairs and stools used in household, hotel and restaurant.

This Part is not applicable to revolving chair, Children's chair as well as chairs and stools made of ceramic, vine and osier.

2.1 Specimen

If the specimen is made by gluing timber or similar materials, after manufacture, it shall be stored continuously in general indoor environment for at least 7d before the test.

Specimen shall be finished product. If the specimen is knock-down, the product shall be assembled in accordance with assembly instruction; if the specimen may be assembled or combined according to different modes, during the test, it shall be assembled or combined according to the most adverse combination for the strength test and durability test. Before the test, the connection piece of knock-down product shall be fastened; the assembling components shall be firmly installed and cannot be reinforced additionally without special requirements of manufacturer.

2.2 Loading requirements

The forces in strength tests shall be applied sufficiently slowly to ensure that negligible dynamic load is applied. The forces in durability tests shall be applied sufficiently slowly to ensure that kinetic heating does not occur. Unless otherwise specified, the load shall be maintained for (10 ± 2) s in strength test and shall be maintained for (2 ± 1) s in durability test.

2.3 Load

The test is divided into five levels according to the normal use frequency and potential misuse degree of product under intended application conditions and based on the magnitude and times of loading; the determination of test level is detailed in Appendix A.

2.4 Test conditions

In addition to the specified test equipment, any suitable equipment is applicable to this part. During running, the loading equipment for seat shall neither restrict the free tipping of specimen, nor obstruct the horizontal movement of chair during backrest test. All load pads shall rotate towards the direction of applied force and the rotation center shall be close to the bearing surface as possible.

Each test shall be carried out on the same specimen according to the test procedures specified in this part; in case that the specimen does not conform to the specified test procedures due to its particular structures, the differences associated shall be recorded in the test report.

Except for seat impact test, foam plastic pad may be positioned between the loading pad and test equipment.

2.5 Precision requirements

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

- Loading force: $\pm 5\%$ of the rated value;
- Mass: $\pm 1\%$ of the rated value;

- Dimension: $\pm 1\text{mm}$;
- Angle: $\pm 2^\circ$;
- Positional accuracy of loading pad: $\pm 5\text{mm}$.

3.1 Loading positioning template

Loading positioning template (see Figure 1 and Figure 2) is composed of two shaped members fastened together by pivot at one end, and the loading point marks - A, B and C are respectively marked on the template surface. The total load at the load point of seat is 20kg.

Loading point A corresponds to the point 175mm forward from the seat and backrest intersection point on the seat. Loading point B corresponds to the point 300mm upward from the seat and backrest intersection point on the backrest. Loading point C corresponds to the point on a stool as 175mm from one edge.

3.9.1 Cylinder

The cylinder, 200mm in diameter, connecting with the impact head through the spiral compression spring assembly, moves relatively along the axis of the impact head (central area). The mass of cylinder plus relevant accessories (excluding the springs) is $(17\pm 0.1)\text{kg}$; and the mass of the whole seat impactor (including the spiral compression springs assembly and impact head) is $(25\pm 0.1)\text{kg}$.

3.9.2 Spiral compression spring assembly

The rated elasticity coefficient of the spiral compression spring assembly shall be $(6.9\pm 1)\text{N/mm}$ and the total friction resistance of the moving parts shall be 0.25~0.45N. The pre-compression force of spiral compression spring assembly shall be $(1040\pm 5)\text{N}$ and the amount of recompression shall not be less than 60mm.

3.9.3 Impact head

Rigid round object, 200mm in diameter, the loading surface of which is covered with leather materials and filled with dry fine sand; the loading surface is spherical with curvature radius of 300mm and with a peripheral rounding radius of 12mm.